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TUESDAY, DECEMBER 14, 1993, 8:30 A.M.

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MR. DEL PIERO: Ladies and gentlemen, this hearing will come to order.

For those of you who have not been with us before, this is a continuation of the hearing by the State Water Resources Control Board on the matter regarding the amendment of the City of Los Angeles' water rights licenses to divert water from water bodies tributary to Mono Lake.

My name is Marc Del Piero, Vice Chair of the State Water Resources Control Board. With me is my good friend and colleague, and who now holds the title of saviour (laughter), Mr. James Stubchaer, to whom I am eternally grateful for having taken care of business yesterday when I was away playing with politicians.

This evening, ladies and gentlemen, we are going to be going into the evening hours. We will break at about 5:15 and return at about 7:15, giving you two hours for dinner, and I anticipate going until at least ten.

Unless anybody thinks that's long hours, I got up at 3:30 this morning to arrive back here. My day is half over.

When last we left, I understand from my good colleague that you were about to begin redirect, Mr. Thomas. Is that correct?

MR. THOMAS: Correct.

MR. DEL PIERO: Proceed.

MR. THOMAS: We would have loved to show you all about the ducks.

MR. DEL PIERO: Maybe I will be able to benefit from the redirect.

There is one thing I do need to take care of this morning.

Mr. Frink, in regard to the representative from Metropolitan Water District of Southern California, do you want to outline what we discussed?

MR. FRINK: Yes. We have had a request that Metropolitan Water District be allowed to present their single witness, who is Tim Quinn, on Thursday morning, the 16th, and that is our plan right now that he would be the first witness on the 16th.

MR. DEL PIERO: Hearing no objection --

MS. SCOONOVER: I have a concern. As you know, I am going to be unavailable next week. Although my colleague is able to cover the hearings, I would just as soon our case in chief be presented while I am here. We have been working with the National Audubon Society and Mono Lake Committee to present our witnesses jointly with the National Audubon Society and Mono Lake Committee, and Thursday seems to be the best day for us to do that.

We would be willing to push our witnesses off until

Friday, I believe, without talking to Mr. Dodge. However, Friday is kind of a firm deadline for us.

MR. DEL PIERO: Mr. Dodge.

MR. DODGE: I would suggest that we do the joint panel with the State Lands Commission Thursday morning and take Mr. Quinn Thursday evening.

I understood the request from MWD to be for Thursday, not Thursday morning.

MR. FRINK: He is unavailable beginning Friday. Now, I don't know if he could get back to Los Angeles by air Thursday evening or not. I could give them a call and discuss that.

MR. DEL PIERO: We were talking to a representative of the Metropolitan Water District.

MR. FRINK: Yes.

MR. DEL PIERO: He can probably arrange transportation. How long do you anticipate his testimony to take?

MR. FRINK: I don't believe the testimony would require very long, maybe half an hour. There may be extensive cross-examination or there may not.

MR. DEL PIERO: Mr. Birmingham, are you going to extensively examine Mr. Quinn?

MR. BIRMINGHAM: I don't know. I read the paper on the State Water Project and we will ask Dr. Quinn those

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questions.
Yes, I am going to examine Dr. Quinn.
MR. DEL PIERO: Do you know how long?
MR. BIRMINGHAM: Probably less than 20 minutes.
MR. DEL PIERO: Okay.
MR. DODGE: I believe Mr. Flinn has cross-examination for Mr. Quinn.
MR. DEL PIERO: Do you know how much?
MR. DODGE: I don't know.
MS. SCOONOVER: I do have cross-examine of Mr. Quinn.
MR. DEL PIERO: Mr. Frink, let's go Thursday night -- he can't be here Wednesday?
MR. FRINK: That's a possibility. They have requested he be allowed to appear on Thursday, and he would be unavailable Friday through the first week of January.
MR. DEL PIERO: See if you can get ahold of them and see if he can be heard on Wednesday.
Any problem with putting him on on Wednesday evening?
MR. ROOS-COLLINS: Potentially.
MR. DEL PIERO: What is it?
MR. ROOS-COLLINS: Mr. Del Piero, Cal Trout is supportive of Dr. Quinn's testifying this week. On the other hand, we would suggest that we evaluate the schedule for the remainder of this year before Dr. Quinn is allowed to testify out of order. If he is testifying out of order,

we will have scheduling problems.
MR. DEL PIERO: The problem is he is not available after Thursday. That was the first thing I thought about and I was advised he is not going to be around, so it's a choice which day we are going to do him.
All things being wonderful, we are doing exactly what you are recommending.
MR. ROOS-COLLINS: Then, Mr. Del Piero, let me make my request more generally. I do request that we have a discussion today on your scheduling for the remainder of the year in light of the number of witnesses still to be presented and your efforts to accommodate the witnesses who have scheduling problems, and also scheduling problems of attorneys.
MR. DEL PIERO: Okay, I will be happy to have that conversation later this afternoon because, as I pointed out, I got here about ten minutes ago. A number of you saw me as I walked in.
I would like to get this show under way. Nonetheless, I have to deal with the Quinn issue now.
Mr. Frink, would you be kind enough to see if we can arrange to have him here Wednesday night? That's in order to accommodate Board members who do want to hear his testimony, and who want to be here Thursday or Friday.
In the meantime, we will proceed, Mr. Thomas, and

then we will get back with a definitive answer one way or the other.

Did you have a good weekend, Mr. Birmingham?

MR. BIRMINGHAM: Mr. Del Piero, I spent the weekend preparing for the cross-examination of the Department of Fish and Game's witnesses and some of the Mono Lake witnesses.

I hear for the first time this morning that now the State Lands Commission, which would come after the Mono Lake Committee and Cal Trout is going to present its witnesses as part of the panel this week with the National Audubon Society and Mono Lake Committee.

I fully support doing whatever we can to speed this process along, but there was an outline that was established at the beginning concerning the presentation of evidence and we are now starting to combine on individual panels witnesses from different parties, which will expedite the process, but is contrary to the schedule that was established at the incorporation of the process, and that interferes with our ability to prepare and to conduct meaningful cross-examination of these witnesses.

Mr. Roos-Collins informed me last week, he was kind enough to inform me last week he had planned on calling some of the witnesses with the Mono Lake Committee, and I appreciate that. That gives us an opportunity to prepare.

But we would like to know what changes are going to be made in terms of parties' presentations of their cases in chief, and then we can hopefully prepare and accommodate that.

But right now, I am going to object if the State Lands Commission intends to call any member of their panel this week, or any of its witnesses as a panel this week.

MR. DEL PIERO: I appreciate Mr. Birmingham's enthusiasm this early in the morning.

Whether State Lands Commission witnesses get called is going to be dependent upon the schedule as it develops during the course of this hearing.

One thing I can assure you of and that is if we continue talking about it, we aren't going to get very far along in terms of testimony today. I intend to have meaningful discussions in regard to the scheduling sometime late this afternoon or early tomorrow morning. I haven't had an opportunity to talk to the staff, and more importantly, I haven't had an opportunity to talk to Board members about it.

So, I am going to be doing that in the meantime, and this afternoon if all Board members are in the office today, once I have had the good counsel of my colleagues, then I will be prepared to indicate what the schedule is going to be.

In the meantime, Mr. Frink, you will see to Mr. Quinn?

MR. FRINK: Yes.

MR. DEL PIERO: Mr. Thomas, please proceed.

REDIRECT EXAMINATION

by MR. THOMAS:

Q These questions are addressed to each or any of the panel members.

Yesterday we had a couple of cross-examinations, one of which was inferences about the veracity of Mr. Dombrowski. I wanted to show you DFG Exhibit 96, which is the entire Dombrowski report conducted under the name of Pacific Flyway Waterfowl Investigation in 1948, which I will pass to each of you, and my question would be, can you draw any conclusions as to the veracity of Mr. Dombrowski from the quality and methodologies incorporated in that document?

MS. CAHILL: Objection, calls for speculation by these witnesses.

MR. DEL PIERO: Sustained. Rephrase it.

MR. THOMAS: Q I will go one by one.

Dr. Reid, you are an expert in the waterfowl of the Great Basin; am I correct?

DR. REID: A The Pacific Flyway, yes.

Q And you are familiar with the waterfowl surveys that are conducted by biologists?

A I am.
Q Is this document consistent with the type of waterfowl surveys that you would see in your work?
A Well, understand this survey was done in the forties and in itself that's a relatively unique sample. At this time, there was initiation of waterfowl surveys being conducted on the Atlantic Coast, on the Mississippi River, by Frank Bellrose and by Jess Low in the marshes of the great Salt Lake, and we have the information here that California Fish and Game had a survey conducted by Mr. Dombrowski.

As we look at the sheet what we see is a quantified sampling and the sampling is twofold. It's a sampling of the initial -- it is labeled No. 3, Estimated Total Number of Waterfowl, identified by species. The individual species are broken down by numbers, and then we learned that this is based on specific eye count done on fresh water ponds near Rush Creek.

He then takes the number of flocks he sees and the number of birds out on the lake and estimates a total number of birds for that particular time period on Mono Lake and surrounding Mono Lake on the bottom.

This is very consistent with the way that we sample numbers, surveys of ducks at the current time. We subsample a region to give us the breakdown of the species composition

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and we have an estimate based on eye viewing.
Q Is there anything about that document that you can see from its face that would lead you to question the veracity of the observer?
A No.
Q Is there anything about the document that would lead you to question the veracity of the methodology used by that observer?
A No, the observer records the weather, records the time, records the date, records the air, records in some cases specific flock numbers relative to his individual counts or counting the individuals on the ponds.
Q Do you believe that to be the work of a professional waterfowl observer?
A I believe that it's done by someone who has knowledge of waterfowl and someone who is trying to reveal what kinds of numbers were out on the lake.
Q Thank you.
Dr. Stine, I am going to ask you a similar series of questions, vis-a-vis the map that was attached and is blown up, and is DFG 96.
Is there anything about the map reportedly drawn by Mr. Dombrowski that would lead you to believe that he was accurate and correct in his observations?
DR. STINE: A Yes. I think that he did a very very

precise job of drawing the arcs, as I described them yesterday, which indicates both waterfowl abundance in areas where fresh water flows into Mono Lake, and I pointed out several things here, and as an example, at the Lee Vining Creek Delta area, there's a protrusion, a little protuberance that goes off to the south right along the shoreline from this more generalized arc, and that little protrusion there coincides with something that's shown at approximately the seven o'clock position on NAS/MLC Exhibit 142.

At approximately seven o'clock here is the Lee Vining Creek Delta where you expect to see freshwater coming into the lake, and this area, rather rough topography just to the southeast of it is Lee Vining tufa and Lee Vining tufa is where it is because it is a spring area, and that, too, then, would constitute one of the freshwater influent areas around Mono Lake, and he has, in fact, shown that. He has encompassed that.

If we go up to approximately the ten-o'clock position or to the Monte Vista Springs area on the northwestern shore of Mono Lake, there, too, is good reason to believe that he has drawn the end point of the arc, not just by chance, but actually has plotted them very carefully because we have aerial photographs of Mono Lake that show Mill Creek and Wilson Creek carrying sediment into the lake, and there's a

back-set eddy, a current that sets up right here and takes the sediment right over to where he shows the leftmost; that is the westernmost point of his arc.

All of these areas are drawn, I think, very very precisely. They are the areas where topography and freshwater inflow dictate these hypopicnal conditions that I was talking about yesterday.

I would also add in terms of the veracity something else comes to mind there, and that is I talked to Mr. vestal, who I have a lot of faith in because he says, I don't know sometimes, and when he says he does know, I can usually verify it.

He knew Mr. Dombrowski and he felt Mr. Dombrowski --

MS. GOLDSMITH: Objection. This is hearsay.

MR. DEL PIERO: That's an inappropriate objection. As you all know, counsel, hearsay is allowed in the course of these proceedings. Los Angeles Department of Water and Power has presented hearsay evidence in this proceeding.

Please proceed.

A Mr. Vestal's opinion was that Mr. Dombrowski was a very very careful observer and, in fact, I should point out Mr. Vestal remembered that these counts were being taken for the U. S. Fish and Wildlife Service. He was counting not only ducks, but he was counting, for example, also in the Mono Basin as well and turning over that information to the

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U. S. Fish and Wildlife Service.
MR. THOMAS: Q Thank you, Dr. Stine.
Mr. Thomas, yesterday, am I correct that you testified that you are a field biologist in active involvement with the wildlife in Mono Basin?
MR. THOMAS: A That is correct.
Q And you testified that you had hunted and observed waterfowl on Mono Lake on numerous occasions; is that correct?
A That's correct.
Q Could you examine DFG Exhibit 96, the Dombrowski Report, and draw any conclusions about the veracity of the species counts?
MS. GOLDSMITH: Objection, calls for speculation.
Mr. Del Piero, if he is going to ask him about whether or not the counts appear to be done in an accepted methodology, that's one thing; but if he is going to ask if he thinks the counts are being accurate, Mr. Dombrowski was truthful --
MR. DEL PIERO: That's not the question. The question was whether or not he could draw any conclusions, and I assume you were qualified as an expert.
MR. THOMAS: Yes, he was qualified as an expert.
MR. DEL PIERO: The question is appropriate.
Mr. Thomas, answer the question.

A I can only say, looking at the various sheets that the distribution of species; that is, the relative numbers of the different species as reported on the forms, tend to cause me to believe that these are reasonable counts. That is, the habitat in existence at that time, as well as today, would tend to support large numbers of shovelers, specifically ruddy ducks would be common in that type of habitat, with lesser numbers of other species.

These counts, in fact, portray that type of species distribution that I would expect.

MR. THOMAS: Q The same question for Dr. Reid. Is the species diversity shown on that DFG 96 Report consistent with your knowledge of the species diversity of the Mono Basin?

DR. REID: A Absolutely. The predominance of shovelers and ruddy ducks correlates with the type of alkaline wetlands that are out there, and certainly, if Mr. Dombrowski were trying to be leaning to a not-accurate basis because he was running a hunting club, he would put down, there's a hell of a lot more mallards than pintails than there were, because he is going to try and get hunters from the Los Angeles basin, and he is not going to put down there's a lot of shovelers and ruddy ducks.

Q Did you observe that the number of mallards and pintails is accurate in your knowledge of waterfowl in the

Mono Basin?
A Certainly during the time it was taken in the 1940s, there were far more pintails within the Flyway.
Q Now, the second line of questions, Dr. Reid, is a question for you.
We heard some inferences that the reason that the duck population in the Mono Basin collapsed is because the Flyway collapsed in other locations.
Do you remember that line of cross-examination?
A Yes, I do.
Q And could you give us your opinion as to the causes of the waterfowl population declines on Mono Lake after 1960 or thereabouts?
A Certainly. Would you like me to go before that and talk about --
Q Yes.
A I think the question related to the forties and what was happing on the continent at that time, and I am very familiar with what's happened since 1955. I had to look up yesterday afternoon what happened prior to that.
In the questioning that was related yesterday we were talking about normality and what is a normal year, and we need to recognize that on the breeding grounds, on the migration grounds and on the wintering grounds, these are cyclical patterns of flooding and drying, and the very

patterns of dry and wet periods are extremely important in maintaining long-term productivity in wetland complexes in this continent.

What we see in continental waterfowl populations is that they are reflective, not simply of what happens in the breeding ground, not simply what happens on the wintering grounds, and not simply what happens on the migration grounds, but a combination of all three.

I would like to maybe make a diagram of that to show that in a second, but what's basically happened in the prairies of Canada, in the southern parts of the United States in the late twenties and early thirties, we saw severe drought in the Canadian prairies, and as I mentioned before, this was actually the impetus for our early numbers of Ducks Unlimited to create Ducks Unlimited, to begin a private organization to actually funnel dollars into Canada to preserve wetlands there.

At the same time there were major floodings in the Southern United States which meant that the wintering populations were being maintained. The birds were actually returning to the prairies in good condition in the late thirties and early forties. The Canadian prairies again became wet and we had more flooding, populations increased.

By the mid and late forties, however, we returned to the drought conditions and populations again declined.

In the early 1950s, and in the mid-1950s, we had very very wet conditions in the Canadian prairies and there's all indications that this time frame actually probably was at least a hundred-year peak in terms of the kind of conditions we saw in the prairies, and our initial population estimates that we took on a continental basis in the early and mid-fifties indicate substantially high populations that we have never been able to return to since.

One of the most severe circumstances or severe situations occurred in the sixties with the severe drought in the Canadian prairies. By the mid-seventies we again returned to wet conditions and many of the continental populations returned. There were good conditions on the wintering grounds in the mid-seventies and I would like to return to the seventies here in a second, but we know in the eighties we had severe drought, we had intensification of agriculture in Canada as was represented yesterday.

This last year we saw good wet conditions in the Central Valley, we saw excellent runoff in Southern Alberta and we saw substantial increases in pintail populations in Southern Alberta.

That's basically a quick summary of what's happened in Canada. How that relates to what we see in Mono Basin, I think, is influenced by a couple of things. I would, first of all, like to talk about this continental basis.

MR. THOMAS: We will mark that as DFG 166.
A Okay. What we have learned in recent years is that there are different hydrologic long-term cycles in various regions, prairie pothole regions, major breeding areas; and migration grounds. They have certain hydrologic cycles. And we know that the wintering cycle, like the Central Valley of California, like the Mississippi Delta wetlands, have very specific wetland cycles.
What I have got here is a graph. This is wetland area and quality. Higher wetland quality here, lower wetland quality here for the breeding areas, same for the migration areas, and the same for the wintering grounds. This is time here on the horizontal axis.
What we found is that as we look at the continental waterfowl population where we have high continental populations, where we have high continental populations is where we line up excellent conditions, wet conditions, good quality conditions on the breeding grounds, good quality conditions on the migration grounds, and good quality conditions on the wintering grounds.
Where we have low populations such as we have experienced in the late eighties and early nineties, thirteen years of drought in the Canadian prairies, substantially seven years of drought in the Central Valley of California, and poor conditions in the migration grounds,

that's when we get our lowest population.
Now, typically they don't all line up together and we may have intermediate quality continental populations. The problem is if we take a major migration ground and we eliminate that, you have knocked the tops off, you know, the quality and area, and you will never potentially get those high continental or high corridor populations, and that's the problem.
MR. THOMAS: Q And then, sir, are you saying that when Mono Lake was removed as a migration spot, that you knocked the top off?
A You lowered the threshold and it's never ever going to be able to be reached.
I don't know what you want to call that.
Q DFG Exhibit 166.
A I am going to another page. Why this is so important for waterfowl is if you look at strategies of migration, if we take a neotropical passerine board like a warbler or like a vireo, if you look at the migration strategies, they basically just have to follow forest corridors and they don't go to big huge concentrations. They will move down from the northern breeding grounds in Alaska and Canada and move down to their southern areas, oftentimes in the tropics.
In contrast, and in sharp contrast in terms of

strategies of migration, what waterfowl and shorebirds do is that they move from vast large areas of breeding grounds, arboreal forests, prairie regions, et cetera, and they concentrate in very specific important staging grounds, and I talked about some of these staging grounds yesterday. They don't all necessarily take the exact same pattern, but what you see is that these migration areas like the Klamath Basin, like the marshes, like the Delta marshes associated with the great Salt Lake, like Mono Basin was in terms of a corridor with Owens Valley into the Colorado Delta, into the Sinaloa marshes. These are incredibly important and this is why, you know, we are so concerned about our migrational staging grounds because if we lose these areas, there is not a lot of strategies where these birds can alter their fly corridor.

Q So, it is your testimony that Mono Lake is one of those important staging areas or link in the chain?

A All the evidence suggests that when we look at, again, the historical reports by people that talk about the million birds that came through, hundreds of thousands of birds that came through there, they talk about Owens Valley having a million birds in migration. These kinds of reports, Dombrowski's quantitative data, suggests that these were exactly that.

MR. HERRERA: Excuse me, Mr. Thomas, your 20 minutes

are up.
And also, staff requests that you label the various features of that particular drawing.
MR. THOMAS: The upper being passerine, I think, and the lower section being migratory strategy.
A This is based on a paper by J. P. Meyers, et al., 1987, that's an American Scientist. This is migratory birds, ducks, shore birds.
MR. THOMAS: And I would petition for another 15 minutes. I don't think I am going to need 15 minutes.
MR. DEL PIERO: Granted.
A This is based on a paper by Heitmeyer and Frederickson in 1983, I believe.
MR. CANADAY: Dr. Reid, are these listed citations in your --
DR. REID: No.
MR. CANADAY: If you are going to put the names -- could you please put the names and years, if you know what journals they came from -- could you cite those for both exhibits?
DR. REID: Transactions of the North American Wildlife Conference, 1967. This is in, I believe, American Scientist.
MR. THOMAS: Q So, Dr. Reid, let's sum up then your testimony on the causation issue.

A Right. So, what I was saying is as we look at the strategies that migratory waterfowl have, what happens on the prairies is extremely important to the continental population, what happens on the wintering grounds is extremely important, but so, too, is what happens on the migration grounds, and we know that for a number of species that these migration grounds are not simply out there, you know, in a plethora. There are certain concentration areas that have historically been important for these populations.

I think as I talked about the Canadian prairies, I think it is important to look at what was the response then on the wintering grounds, and if we look at the data in the 1950s, we see that the Central Valley of California wintered somewhere between 20 to 30 million birds. So, the fifties, again, was that big peak.

In the sixties there was a crash in the population, but by the seventies, we returned somewhere to 10 to 12 million birds, 6 million birds wintering somewhere, 10 to 12 million birds in migration.

Okay, so from the fifties and then to the seventies, we saw that there was a decline by about half. Even though we came back with a good population, it had declined by half.

By sharp contrast, in the Mono Basin we have data from 1948 which showed we had somewhere in the hundreds of thousands to a million birds, 500,000 to 1,000,000 birds.

There appears to have been a crash from the 1959-60 and then when we turn and look in the seventies throughout the locations in North America, in the Central Valley, California, in the Mississippi Delta, populations rebounded. This did not happen in the Mono Basin. We held a stable population that's never exceeded about 10,000 birds.

So, there was a hundredfold crash in the populations that never rebounded, and the fact that it never rebounded, you know, speaks that this is not simply a relationship of the Canadian prairie, because the Canadian prairies returned with heavy rainfall, good runoff, excellent patterns, improved continental populations.

That was not evidenced as we look at data from the California Fish and Game in populations in the seventies.

Q Is it your testimony that if we were to restore the habitat at Mono Lake, we would see a rebound on a scale similar to the background conditions in the prairies and on the wintering grounds?

A That's my testimony, and while we have now lost a tradition by individuals who use that pattern, but those traditions can be redeveloped by pioneering, and as the lake levels would return to higher levels as we discussed yesterday, I do believe that you will get a new tradition developing there.

Q Changing subjects, the hypopicnal layer -- I guess I

ask this of Dr. Stine, our expert in this area. There were environmental impact report comments that spoke of hypopicnal layers on saline lakes in North Dakota.

Are you at all familiar with that phenomenon in the hypopicnal stratification in other lakes in the Great Basin?

DR. STINE: A Yes, it occurs wherever you have a saline water body that's being fed by freshwater. This occurs at Pyramid Lake when the density difference is not nearly as great. It occurs at Owens Lake when there is, indeed, water in Owens Lake. It occurs in Walker Lake. It's a very common phenomenon.

I should also say I am familiar with it in the Dakota's and up into Saskatchewan. I have been on a field conference there and observed this in the midwestern and Canadian midwest as well, where we have freshwater floating on salt water.

Q And, Dr. Reid, have you observed ducks using those hypopicnal stratifications in other parts of the country?

DR. REID: A I have observed ducks in coastal areas doing that. There are studies, specifically ones by Swanson, that are cited in the DEIR that deal with wetlands in the Dakotas, and there they describe a very shallow freshwater fringe running over more saline water in which the waterfowl concentrated the same as they concentrate in the feather edges of floodwaters.

Q Again, changing subjects, and this is for Dr. Reid, you have testified yesterday about scrapes and some mitigating construction methodologies to bring back waterfowl.
Do you remember that testimony?
A Yes, I do.
Q Could you comment on the cost/benefit of conducting manmade interventions to restore wildlife habitat versus using a strategy of refilling the lake to recreate wildlife habitat, which is most effective?
A Well, I think as we look at the individual cases, the best case we can point out is our project that we currently have under way at the Dechambeau Pond and in my testimony I described the fact that this is going to cost above $400,000 for a restoration of 30 acres of wetlands, and as we look at, you know, viable wetland restoration in an interim period, or if the lake is not modified, it's going to be very costly to have any kind of viable waterfowl habitat established.
We believe that by raising the lake level as has been described to a lake level as Dr. Stine talked about in the presentation of the wetlands, to say, 6405, that would create a vastly superior waterfowl habitat.
Q And on a per-unit per-acre waterfowl habitat basis, do you have an opinion if it is more cost effective to

conduct manmade interventions or to merely fill the lake?
A The manmade interventions honestly, will only be postage stamps out on an alkali flat, and if we are really going to see this as truly a return of a major staging ground for North American waterfowl, it's not going to be through small intermittent projects.
Q Then, you are saying you cannot get back to the quantity of habitat --
A No, I do not believe so.
Q -- using manmade interventions?
A No, not alone.
Q What was the cost per acre of the Dechambeau project?
A I don't have my calculator.
DR. STINE: A Thirteen thousand dollars per acre, and at the prices given by Dr. Reid.
DR. REID: A We typically don't get involved in anything that costs over a thousand dollars an acre. Most of our projects are done for about $100 an acre and with our investitures with partners, typically Ducks Unlimited, paid about $33 per acre.
Now, the reason we get this rate cost effectiveness is because, as I mentioned yesterday, most of our projects that we have in the West are large in nature, 4,000 acres I mentioned at Klamath Basin, and with these large projects,

obviously the cost effectiveness is pretty great.
MR. THOMAS: All right, thank you very much.
I have no further questions.
MR. DEL PIERO: Thank you very much.
Mr. Dodge.
MR. CANADAY: Mr. Del Piero, seeing the chart reminded me of something. We are not able to locate DFG 163, which was a diagram written by Stacy Li, and I believe it might have been on a Department of Water and Power flip pad.
Can you check to see if that's one of your pads?
MR. POLLAK: We will check.
MR. CANADAY: Would you, please.

RECROSS-EXAMINATION

by MR. DODGE:
Q I just have a few questions of this panel.
Dr. Reid, I have a question for you. I am trying to figure out who was questioning you yesterday and I am not sure who it was, but you got a question to the effect that if Mono Lake were raised to 6405, would ducks -- and I am paraphrasing the question and your answer, would ducks approximate the prediversion levels, and I believe you testified that they would substantially increase, that there was a potential to see the historic numbers, but it would depend on resources along the corridor.

Is that a fair summary of your answer?

DR. REID: A That's a good summary. I am not sure I exactly said that, but --

Q Here is my question, and I would like you to elaborate on the concept that it would depend on restoration along the corridors?

A As I testified yesterday, the interior flight corridor includes a variety of northern breeding grounds. It includes high latitude wetlands in Alaska, in the Northwest territories, in the Yukon, in the northern prairie provinces and park land areas funneling down through the very important prairie potholes areas through the intermountain west areas down through the great Salt Lake primary area, Klamath Basin.

Now, we have seen substantial losses in some of these northern areas. As I mentioned before, Ducks Unlimited continues to funnel most of its dollars into Canada because there is no other mechanism other than the North American plan to funnel any American dollars into Canada.

Canada has a much lower population than the United States does and it does not put anywhere near the dollars into the natural resources that the U. S. does, and this year we will probably go over 800 million dollars in total investiture in this continent in wetland restoration.

Now, the corridor that you are speaking of where we need to continue our major effort includes wetland restoration along the primary marshes of the great Salt Lake, includes the Bear River marshes, includes public shooting grounds, includes Farmington Bay, et cetera.

There's recently available some substantial dollars to help out in this effort.

As we move further into the Ruby Marshes of Nevada, still-water marshes of Nevada, Humboldt Sink, these are areas that have been substantially degraded. We have wetland projects in each of those and we need to continue in that effort.

Certainly, if we look at the corridor along the Eastern Sierras, the primary areas that need to be restored there are the Mono Basin and the Owens Valley and these areas have been greatly impacted by man.

In addition, along the Colorado River, wetlands have been modified and today there's tremendous human disturbance along the Colorado River by boaters that greatly impact the quality of waterfowl use and the Federal and State agencies that are responsible for these are having now to deal with how they are going to respond in that fashion.

As you move further south along this flight corridor, along the Colorado River, we see that the Colorado Delta into the Sea of Cortez has been greatly modified

because of the water diversions. Until this last spring, for five years the Colorado River did not reach the Sea of Cortez. It dried up before it got there.

The Rio Hagde (phonetic) was a river that reached Colorado and historically has been an extremely important Delta for waterfowl.

It has been greatly modified, as I mentioned, because of the water diversion. There are currently ongoing projects for restoration both with the U. S. Government and with the Mexican State and Federal governments.

As we move further south, both in Baja and in Sonora and Sinaloa, we see modifications of wetlands there.

In some cases we see intensification of agriculture. In Sinaloa and in Baja, we see intensification of large resorts that are modifying lagoon habitats.

As we move from Mono Lake, we cross the Sierras and move into the Central Valley which is a relatively easy flight for any waterfowl. You see, you come right into the San Joaquin Valley. The grasslands area is the largest wetland that's left in the Central Valley of 110,000 acres of both private and public wetlands. There are major restoration activities going on there. Ducks Unlimited in the Pacific Flyway in the United States has spent its most amount of money in the project in the grasslands region. We continue to have projects there.

We have another project that is about to come before the North American plan for a $600,000 restoration in association with new lands that were made available because of the Kesterson settlement.

Q Let me ask you, is it fair to say, sir, that there are substantial projects ongoing and expected in the corridor for restoration?

A Absolutely.

Q And you understand even under the best of circumstances, that it would take many decades to bring Mono Lake to 6405 feet?

A Yes, I understand that.

Q And while that process was ongoing, there would be ongoing restoration in the remainder of the corridor; correct?

A There would, and I would hope there would be ongoing restorations on small levels even within the basin to take care of habitat as the lake level rises.

Q Turning to a different subject, Dr. Stine, you told us yesterday that your testimony was that one area in the Mono Basin that was not discussed much was Mill Creek.

Is that right? Do you recall that?

A That's correct.

Q You said on a dollar-for-dollar basis, you could do a restoration program at a low cost because the water was

not being exported.
Do you recall that testimony?
A Yes, I do.
Q Can you elaborate as to what you refer to when we would have a restoration program on Mill Creek?
A Well, again, I would say that it would be one involving very little mechanical work. It would be basically taking water out of the Southern California Edison tailrace and putting it back into Mill Creek. A ditch already exists to make that transfer of water. The water in Mill Creek would then go toward restoring riparian vegetation, toward channel forming processes, and toward whatever fishery restoration or any other type of restoration that people wanted to go on there.
But I envision no mechanical means of restoration. It is simply a matter of putting water back into the stream and allowing nature to take its course there.
Q As you testified yesterday, Los Angeles does not divert Mill Creek water; does it?
A Los Angeles does not divert Mill Creek water, that is correct.
Q So this would be a mitigation measure; correct?
A That is what I suppose I had in mind there, is to the extent that there are certain activities of the Department of Water and Power that cannot be restored in

some number of decades, or even centuries, because of, say, millennial scars that have been left there, and perhaps some of this could be made up for on Mill Creek, yes.

Q Now, you mentioned that Southern California Edison has water rights on Mill Creek; correct?

A Yes, they do down to the power plant which is high in the drainage.

Q So that any sort of mitigation measure, as you have described, would have to involve the cooperation of Southern California Edison; correct?

A I am not sure that's the case. I did not envision restoration going on on land above the Southern California Edison power plant. I saw -- or I should put it this way, the channel above the Southern California Edison power plant, which is actually not in the channel, it's way over to the north, but the channel there has been kept in pretty good shape by seepage around the Lundy Lake Dam, so the vegetation, the riparian vegetation in the upper portion of Mill Creek remains in very good shape, and therefore, the channel remains in very fine shape.

It is just in Mill Creek below the Southern California Edison power plant that the channel needs to be rewatered, and so, it wouldn't involve Southern California Edison. It would involve the irrigation water users below the Southern California Edison power plants.

Q Who are they, sir?
A They include Conway Ranch, the cemetery on Lee Vining Creek has, I think, about a one cubic foot per second water right or something like that. The Los Angeles Department of Water and Power actually does have a water right there, although I think it is a 1.5 second-foot water right or something like that, and various other users.
There's seasonally more water coming down Mill Creek than at least in normal and wet years than is allotted for in the water rights. So, to the extent that the State Water Resources Control Board would love to become involved in this, perhaps some accounting can be done of that water and some of the excess water can be put into Mill Creek.
Q You mentioned the cemetery on Lee Vining Creek. Did you mean --
A I meant Mill Creek, excuse me.
Q Any sort of restoration of Mill Creek, as you have described, would require the cooperation through one way or another of third parties and by third parties, I mean people who are not parties to this proceeding?
A That is correct.
Q The last line of questions is to Dr. Reid.
Now, you have told us that the Dechambeau project that you are involved with which preceded any of this argument about Mono Lake elevation, the Dechambeau project

is expensive?
A Yes, relatively expensive for the kind of projects we do. There are people out there, and mainly private consultants, who would try and sell you something for more, but what we do and try to do is fairly inexpensive.
Q That is because it involves pumping --
A Pumping of groundwater, using an aquifer to obtain water and then having to pump it potentially out on the landscape.
Q I want to put aside pumping of groundwater because I think you told us yesterday, or started to tell us yesterday about another way to approach an interim restoration program for ducks, and that was related to scrapes.
A Right.
Q Can you tell the Board what a scrape is and how it works?
A We use scrapes a lot in our restoration projects where what we are trying to emulate is a slough-like depression or a swale, a very small micro-habitat change in an area. We know from recent investigations that the optimal foraging depth for most waterfowl, most dabbling ducks is somewhere between zero to ten inches of water depth, so by providing small scrapes, et cetera, in the Warm Springs area, Simon Springs area where you will collect spring waters, hold those waters for the summer, sometimes

into the fall if it is not too warm a summer, those kinds of operations have potential.

Likewise, the water table in the Rush Creek area is relatively high and any kind of scrapes that are done in the form of a floodplain may create during wet periods water movement and water swales in those areas.

Q Is a scrape something that you just come in with a bulldozer basically?

A You can use a bulldozer. Again, subtlety is the real key here. I would use a D-6 or a Bobcat versus a D-8 in these particular cases. You don't want to overdo the process.

We oftentimes use what are an excavator with a shovel to just pull the dirt back, or if we want to get more dirt out, use a potbellied scraper and move along and scrape the dirt up in more or less a linear fashion.

Q The three places you identified at Mono Lake were Warm Springs, Simon Springs and Rush Creek bottom lands?

A Right, and there are certain other locations, other floodplains within the major creeks. There are other areas.

Again, I would not suggest either for the aesthetics or for the modification of the soils that we necessarily want to get in all shoreline areas where we are modifying tufa or modifying certain geologic situations.

I know Dr. Stine would be after my head.

Q Now, you told us about the comparative cost of raising Mono Lake as opposed to a Dechambeau type of approach. Where on the continuum of relative costs do scrapes come in?
A Well, scrapes require heavy equipment. They require mobilization. They require subcontractors. If you don't have to have a pump system, if you don't have to have long-term maintenance, whether it is solar, whether it is electric, whether it is propane, you are going to cut the cost for long-term O&M, but the initial cost of moving the dirt, et cetera, can be expensive.

What I am saying is, you are not going to have to pay for the kind of pumping delivery infrastructure that we have got at Dechambeau, but you will have to pay for the development costs.
Q If you can't answer this question, just tell me that.

You have talked previously about cost per acre. Is there any industry standard on cost per acre for scrapes, or do you have any thought as to what it might cost at Mono Lake?
A The only thing I can give you is that you can get a bulldozer operator in California for about $80 an hour, but you have to mobilize, et cetera. To get a good individual it is going to run at least over $1,000 an acre for any kind

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of operation.
MR. DODGE: I have no further questions.
MR. DEL PIERO: Thank you very much, Mr. Dodge.
Ms. Goldsmith.

RECROSS-EXAMINATION

by MS. GOLDSMITH:
Q We talked yesterday, Dr. Reid, about losses of breeding habitat in the Canadian prairies.
DR. REID: A Right.
Q And on Department of Fish and Game Exhibit 166 this morning you explained to us about the cyclical nature of populations in the three major stages; the breeding, the wintering and migration?
A Correct.
Q And you explained how the drought comes and goes, and when there are wet periods the breeding habitats are more productive and in the droughts less productive?
A That's right.
Q We were talking yesterday about the prairie potholes and you were talking about permanent loss of those areas due to agriculture.
A What I tried to explain was --
Q Yes or no?
A Say the question again.
Q When we were talking yesterday about prairie

potholes in part we were talking about permanent loss of those areas for breeding due to agriculture; isn't that right?
A No, I didn't infer that you are talking about permanent losses due to agriculture.
Q Have there been permanent losses --
MR. THOMAS: Objection, the witness is trying to finish his answer.
MR. DEL PIERO: I will sustain that objection. He needs to be allowed to finish his answer.
A What's happening is that we have not substantially lost the basins that formerly flooded. These are not permanently lost in that sense. Where intensification of agriculture has really modified that habitat, is, as I mentioned yesterday, loss of upland habitat where many of these duck species nest. Most specifically, I mentioned pintail, which can nest anywhere even to three to four miles away from a water body and moves the brood overland.
If you have intensification of agriculture that is taking out upland habitat, then you have lost the nesting area.
Where we have modified the basins, is by putting in tile drains, et cetera, which allows greater drainage for those areas.
Now, the question you were asking me, have we

permanently impacted these areas, I would say no, because we have shown time and time again in the prairies of the U. S. and in the prairies of Canada that we can go back and take those tiles out. That's a simple thing for us to do.

I can show you wetland after wetland that exists, not because we have planted vegetation, not because we have gone in and done some very artificial thing. All we have done is take the tiles out and let nature run its course, and recreate hydrology which established these wetlands.

Q However, absent intervention, the normal land use is permanent agriculture; isn't that right?

A In the current status, it is. But, as you know, just recently the province of Saskatchewan was set to absolutely go bankrupt because the intensification of agriculture has caused so many of those farmers to lose because they have invested more and more dollars into larger and larger machinery, and they have been unable to compete on the world market.

We see a crash in the agricultural economy of Canada and will agriculture in Canada be able to exist without working with other bodies? I think no.

Q No, there were three levels or three stages that you drew on DFG 166. One of them was breeding, you talked about. One of them was migration, which you have talked about at great length. One was winter habitat, and I

believe in your redirect you talked about problems with loss of habitat in the wintering grounds due to agricultural expansion in Mexico and along the Colorado River; is that right?
A I think I talked about it in relation to some of the marshes of Mexico. The problem along the Colorado River in many cases has been water diversion, and many times it has been diversion of water for agriculture, but it is not direct modification of the landscape in the floodplain for agriculture.
Q But there has been a loss of wintering habitat due to man's actions down there?
A That's true.
Q And that's not cyclical; is it?
A The loss of wetlands?
Q The loss of wetlands in the wintering grounds due to agricultural activities?
A Actually, and I am not being flippant here, but it is. What we see in terms of loss of wetlands is very much tied to the price of commodities, so that in the Mississippi Delta, when the price of soybeans goes above $10 a bushel, boom, you have a big loss of forested wetlands. So, in a sense, it is cyclical.
If you are saying, does it return because of agriculture, I would have to say in relation to the

wetlands, no. But if we look at waterfowl habitat, we see that currently agriculture in both Canada and the United States is looking for alternates which allow both continued agriculture and the availability of waterfowl habitat.

A classic example is what we are currently doing with the rice industry in the Central Valley of California. Here we see an industry that has upwards of 600,000 acres of habitat and if, in fact, they are able to flood even 100,000 acres in the valley to six inches of water depth, you know, we are getting a tremendous return of potential waterfowl, shore bird habitat and still have viable agriculture.

Q Now, I think I wrote this down accurately, but you talked about the wintering grounds and you talked about in the 1950s there were lots of birds and then a crash in the 1960s, and a rebound in the 1970s.

Have I correctly --

A We see --

Q I really don't have a lot of time. Is that basically correct?

A Basically, right.

Q And that despite there's about a 50-percent decline in birds in the winter habitat?

A In the Central Valley, yes.

Q My question is, given the collapse in population carrying capacity, both of the feeding grounds and wintering

grounds, can you make any conclusion as to whether or not the carrying capacity of stopover points on the interior route are currently limiting the population?
A That's a good question. You said you didn't have very much time.
Q Can you really make that statement with any certainty?
A Can I make a statement that there's any evidence to suggest -- I am trying to understand your question.
Q Can you reach a conclusion that the carrying capacity of the stopover points in the interior route are limiting the duck populations that use those routes?
A Yes, absolutely. The classic example would be canvas back in which their migration habitat along the Mississippi River had been greatly modified through sedimentation, and we saw a tremendous crash of the canvas back population in the sixties and seventies, and it appeared to be directly related to the migrational habitat.
Q But I am talking about the migrational route that you have identified as using Mono Lake, Owens Valley, that interior route of the Pacific Flyway?
A Well, the problem with addressing that question is that because the impact occurs previously, we don't have good testimony to know what was limiting it at that time.
Q Now, Mr. Thomas asked you whether it was your

opinion that you cannot get back to prediversion population levels using solely manmade intervention, and I believe your answer was you didn't think that was possible.

And I would like to ask you, whether in light of the incision that Dr. Stine has talked about in the Rush Creek area, the Lee Vining Creek area, whether even without man's intervention, the same amount of habitat would return?

MR. DODGE: Objection, unintelligible.

MR. DEL PIERO: Would you read the question back.

(The reporter read the question as follows:
Now, Mr. Thomas asked you whether it was your opinion that you cannot get back to prediversion population levels using solely manmade intervention, and I believe your answer was you didn't think that was possible.
And I would like to ask you, whether in light of the incision that Dr. Stine has talked about in the Rush Creek area, the Lee Vining Creek area, whether even without man's intervention, the same amount of habitat would return?)

MR. DEL PIERO: Did you understand the question? Can you answer the question?

A No, I believe --

MR. DEL PIERO: No, you didn't understand the question?

A I understand the question and my answer is, no, I believe that it will not return exactly as it has been previously. I believe that there will be substantial wetlands along the edge of where the land interfaces with the water. I believe there will be substantial habitat up the riparian corridor in that valley, or I believe the term is called Ria, in Ria, that there will be a deep water basin.

As I talked about earlier, the optimal foraging depth for dabbling ducks is ten inches or less, and thus, that will not be in the area right where that has been incised, a substantially good habitat for dabbling ducks.

In the area of the hypopicnal areas out in the lake, those areas will be similar, and I believe in the previous unmodified system where it was excellent habitat for waterfowl.

Q Are you aware that the Dechambeau Ponds prediversion were manmade?

A Yes, I am. That's actually why we are working in the Dechambeau Pond area, because we did not want to get a lot of public sentiment saying that we had gone in and destroyed part of the Mono Basin.

Q Are you aware that the ponds which Mr. Dombrowski reported in his Pacific Flyway Report were also manmade?

A I am aware that they are freshwater shallow ponds,

but I didn't know they were manmade.
Q Are you aware that Los Angeles has been diverting water from Owens Valley since about 1913 and there has been no particular change in the Owens River since that time?
MS. SCOONOVER: Objection. The question relates to facts that are not in evidence on the Owens Valley system and whether or not it is in the same condition it was pre-1913 has not been proven here and she is not presenting it as a hypothetical, but as a fact. So, I would object on that ground.
MS. GOLDSMITH: The witness has testified there has been a decline in Owens Valley based on diversions, and I think the question is a fair one.
MR. THOMAS: Objection, it misstates the witness's testimony. He testified that there were anecdotal reports of a million ducks and the decline, but he has not testified as to his personal knowledge.
MR. DEL PIERO: Ms. Book, will you please read the question.
(The reporter read the question as follows:
Are you aware that Los Angeles has been diverting water from Owens Valley since about 1913 and there has been no particular change in the Owens River since that time?
MR. DEL PIERO: Particular change in the Owens

River?
MS. GOLDSMITH: Through man's intervention.
MR. DEL PIERO: The question is, are you aware? I am going to overrule the objection.
A I am not aware of the specifics in terms of Los Angeles' involvement in the Owens Valley since 1914.
MS. GOLDSMITH: Q Are you aware of any particular changes in the Owens River system since 1913?
A No, I am not aware of that.
Q Are you particularly aware of declines in waterfowl in that area since 1913?
A No, as I think it states pretty clearly in my direct testimony that there are statements which call for a million or more birds in the Owens River Valley during fall migration, and that's as much as I know.
Q Now, one last question to you. You testified about the cost-benefit ratio of the Dechambeau Ponds and various other cost estimates concerning potential manmade or intervention as to mitigation measures, and I would like to ask you what are the elements that you included in the cost of these mitigation measures?
A The elements would be in the major costs that are incurred in a wetland restoration project; first of all, related to the planning of the project, the working with all the other agencies or personnel that may be involved in a

particular project, and in this particular case because it is Mono Basin, that's going to be fairly substantial.

You have got a lot of People that are involved out there, a lot of agencies which have responsibility in that area.

The next stage is a planning stage in which elements are identified as to what former habitats existed, what kind of habitat you might be trying to restore, putting together both biological and engineering expertise to develop a viable plan, working with your partners to identify whether these restorations meet the kind of needs and kind of replications you are trying to deal with, and then one of the most costly projects you have to do is a permitting process.

Typically that process runs about 18 months for most projects.

Once the permits are obtained from all the agencies that are necessary, then it is a matter of identifying subcontractors who will do the work, bidding the process, having subcontractors come out, look at the project.

They then mobilize any materials they have, move into the site, do whatever earth moving is necessary, do whatever kind of infrastructure is needed to create the water delivery if it is groundwater, for instance, and then once the initial project is completed, it has to be

inspected by biologists and engineers.
Usually modifications are necessary, final modifications are made, agreements with the various agencies or partners are established, and then someone is in charge of long-term O&M or monitoring of the project.
Q So, I take it, sir, that in comparison with the cost of creating habitat by raising the lake, you have not taken into account the cost of loss of water to the City of Los Angeles; is that right?
A No, when I gave my answer I believe I didn't make it a direct comparison with the cost to the lake level rising. I talked about how absolutely expensive that it was.
MS. GOLDSMITH: I have no other questions.
MR. DEL PIERO: Thank you very much.
Mr. Roos-Collins. He disappeared.
MR. DODGE: He doesn't have any questions of this panel.
MR. THOMAS: I am sure he would appreciate that. He always does.
MR. DEL PIERO: When Valentine is done with this questions, we will take a break.
MR. VALENTINE: Which won't take but just a few moments.

RECROSS-EXAMINATION

by MR. VALENTINE:

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Q Dr. Reid, you testified just a few minutes ago that if Mr. Dombrowski were going to exaggerate the type of waterfowl he was seeing at Mono Lake, he wouldn't exaggerate the numbers of ruddy ducks and shovelers. Instead, he would exaggerate pintails, for example.

Can you explain why that is?

DR. REID: A Have you ever eaten a ruddy duck and shoveler from the alkali flats?

Q Once.

A That's the exact answer (laughter). The palatability of these birds is not necessarily as great as the palatability of birds that would be found in the riparian habitat along the edge such as mallards and pintails.

Likewise, and to some degree, there are hunters which have specific interest in specific species. There are some hunters which really like to go after and are very good at hunting green-winged teal. Other hunters like to hunt diving ducks.

Q Also for you Dr. Reid, you were asked questions about the Owens River and the Owens Valley. Are you aware that since the diversions by the Los Angeles Department of Water and Power began in 1913, 50 river miles of the lower Owens River have dried up?

A I am aware of that.

Q Are you further aware that once 60,000 acres of

Owens Lake has also been desiccated?
A I don't know what the acreage was, but I know Owens Lake was desiccated.
Q Are you aware that in the 1970s the Los Angeles Department of Water and Power began an expensive program of groundwater pumping in the Owens Valley?
A I knew there was some groundwater pumping, but I didn't know it was Los Angeles and didn't know the extent.
Q Are you aware that the combination of all these activities has resulted in extensive loss of wetlands and seasonal wetlands in the Owens Valley?
A No, I know the Owens Valley has been greatly degraded by man's activities and I know that these types of losses, as I mentioned in relation to the Canadian prairies, are not what we should call permanent in that if we can restore some water conditions into seasonal habitats, we can restore these types of habitat.
Q And finally, are you aware of the magnitude of what we hope is a temporary loss off seasonal wetlands in the Owens Valley?
A I have read it is very substantial.
Q In the vicinity of as much as 60,000 acres?
A I did not know the acreage.
MR. VALENTINE: Thank you, I have no further questions.

MR. DEL PIERO: Thank you very much, Mr. Valentine.
Do we have a lot of questions on the part of staff?
MR. CANADAY: A few.
MR. DEL PIERO: Let's continue. I thought Mr. Valentine's examination would take longer.
Mr. Frink.
MR. FRINK: I will pass.
MR. DEL PIERO: Mr. Satkowski.
MR. SATKOWSKI: No questions.
MR. DEL PIERO: Mr. Smith.
MR. SMITH: No questions.
MR. DEL PIERO: Mr. Herrera.
MR. HERRERA: I have no questions.
MR. DEL PIERO: Mr. Canaday.

E-X-A-M-I-N-A-T-I-O-N

by MR. CANADAY:
Q This is for Dr. Reid. We have talked a lot about waterfowl, but we haven't talked about shore birds too much, and I am not talking about the phalaropes and ear grebes that have been testified to earlier, but with the development or the rise of the lake we would also expect a concomitant increase in shore bird habitat as well as waterfowl habitat; is that correct?
DR. REID: A My background in shore bird management relates to seasonal flood habitat, and so, my answer will be

in reference to those seasonally flooded habitats that would be created and what we would expect to see for shore birds is that in those lagoonal habitats behind those berms that Dr. Stine drew yesterday, we would expect to see some shallow habitat there that would be conducive to shore bird usage.

We would also see creation of shallow habitat along the lake shore, along those areas by the Deltas.

Q What about the areas as the lake rises where what we have now are dry wetlands that you testified to earlier that are wetted only in the springtime and in the summer are dry. What would you expect if those became wetted, would they have increased value?

A Right, and remember that most of the shore bird migration in the fall is much earlier than what we typically see for waterfowl, with shore birds returning from the Arctic beginning as early as July, extending in good numbers in August and September, versus waterfowl which are really beginning the movement in September and really concentrating in the lake in October and November.

Q Dr. Stine, when asked earlier about Mill Creek water rights, you didn't know all the different water rights and you haven't investigated all the different water rights there, whether some of those are federally decreed or are permits issued by this Board; is that correct?

DR. STINE: A That is true, and every time I think I do understand it, I learn some little nuance that throws the whole thing into chaos in my mind, so it is complex and it goes way back and it involves lots of different agencies and entities.

Q Dr. Reid, you mentioned the cost of scrapes and you provided testimony about that, but whether it was on an interim basis or permanent basis, developing these kinds of habitat, if the Department of Water and Power were, in fact, provided the equipment and the labor, and under the direction of technical experts, that would reduce the cost significantly; wouldn't it?

DR. REID: A Yes, it would.

Q Finally for Dr. Stine, the two slides that you showed of the bottom lands that showed the crust beds, what would you estimate the depth of those areas were, the water depths

DR. STINE: A We can go back and reoccupy those sites today. There is some wind-blown sand and silt in there, but when we scrape away the wind-blown sand and silt, we come up --

MR. THOMAS: Objection. There may be some ambiguity there with the historic slides. If you want to put them up and make sure we are talking about the same set of documents --

MR. CANADAY: I think Dr. Stine and I understand, but if you want to put them up so the rest of you --

MR. DODGE: It may be 205 and 207.

MR. THOMAS: That's my recollection.

DR. STINE: A This is in NAS/MLC Exhibit 205, and we can go back and reoccupy this area. I assume this was the area you were talking about, Mr. Canaday?

MR. CANADAY: Q Yes.

A We can go back and reoccupy this very area today, kick away the sand and the silt, and what we see is this scene and it's very much like what we find around the other channels.

We have riffles that are anywhere from six inches to perhaps a foot deep, something like that, and then holes, ponds off to the side that are anywhere from two to as much as in some cases four feet deep.

Q So, these are easily recognizable?

A Well, the question of reoccupation bears not so much on the depth of the channels as it does on the extent to which these channels are stranded above the existing channel.

In the case of this particular area, there is some stranding. It is probably four to five feet here, I believe something like that, in this particular area.

Now, whether or not that is considered easy, I suppose is someone else's --

Q But it is do-able?
A It is do-able, certainly.
MR. THOMAS: Again, that last slide number was what?
A The last slide, the reoccupation was in NAS/MLC 206.
MR. DEL PIERO: Okay. Mr. Thomas, do you wish to make an offer?
MR. THOMAS: We were going to wait until the end of the case.
MR. DODGE: I have an offer to make. I would like to offer the National Audubon Society and Mono Lake Committee Exhibit 1, which is the written testimony of Dr. Reid.
MR. DEL PIERO: Any objection?
MR. ROOS-COLLINS: No objection.
MR. DEL PIERO: It will be entered into the record.
Gentlemen, thank you very much for your time.
Who is on next, Ms. Cahill?
MS. CAHILL: We will revisit the Lee Vining and Rush fish panel.
MR. DEL PIERO: We will do that at 25 after 10.
(Recess)
MR. DEL PIERO: This hearing will come to order.
MS. CAHILL: We have brought back the panel of experts on the Rush and Lee Vining Creek studies because their testimony was not completed last week.

Last week Mr. Birmingham had asked for a copy in writing of Dr. Kondolf's refinements of his original testimony, and we said we would provide it to him, and we have.

We also have copies for Board staff and that would be DFG Exhibit 168.

Because p had not seen that writing before, we have actually brought Dr. Kondolf, even though we had finished with him last week, he was available today and in light of the fact that we have now produced the written report, we have asked him to sit on the panel again.

And, as I recall, Mr. Birmingham had 20 minutes of examination left.

MR. DEL PIERO: As I recall, that is correct.

MR. BIRMINGHAM: Before I begin my 20 minutes, Ms. Cahill did give me a copy or had given to me a copy of the analysis prepared by Dr. Kondolf and it was given to me approximately half an hour ago.

I have not had a chance to read it and I am not prepared to cross-examine Dr. Kondolf at this time.

MR. DEL PIERO: When would you be prepared?

MR. BIRMINGHAM: Perhaps this afternoon.

MR. DEL PIERO: Fine. How long would you anticipate you will take?

MR. BIRMINGHAM: My cross-examination -- I was given

20 minutes and I am going to try --
MR. DEL PIERO: It's more than you had, I think --
MR. BIRMINGHAM: This is my second 20 minutes. Actually, this will be my third 20 minutes. This is my second at application for extension.
MR. DEL PIERO: Actually, it is a little more than that because I granted you an additional five minutes before that, so I think the total comes to about an hour and ten minutes.
MR. BIRMINGHAM: I was looking for some of the Department of Fish and Game exhibits that were here last week and I was unable to find them, particularly the flow charts.
Mr. Smith, do you know where those are?
MR. SMITH: The last time I saw them they were in the storage room here.
MR. DEL PIERO: What are you looking for, Mr. Birmingham? Perhaps Mr. Herrera can assist you?
MR. BIRMINGHAM: The flow charts, the recommended flows.
MR. DEL PIERO: Maybe counsel for the Department -- do you have them over there?
Dr. Kondolf, why don't you anticipate being back here right after lunch and I will grant Mr. Birmingham an additional five minutes to cross-examine you on those

issues, and that will be the end of it, Mr. Birmingham.
MR. BIRMINGHAM: Okay. I have placed ten copies of a letter at Mr. Canaday's desk and what I would like to do is I would like to have this letter marked next in order, and I am going to give a copy of this letter to Mr. Smith if I hear no objection.

RECROSS-EXAMINATION

by MR. BIRMINGHAM:

Q Mr. Smith, I am handing you what purports to be a letter dated January 12, 1993, and this is going to be marked LADWP exhibit next in order.

MR. FRINK: Exhibit 97.

MR. BIRMINGHAM: Q Marked for identification as LADWP Exhibit 97.

Do you recognize the letter identified as LADWP Exhibit 97?

MR. SMITH: A It has my signature on it as the person who sent the letter. I haven't read it in its entirety. I believe it is a letter that I sent.

Q It is a letter that you sent to Randal Neudeck of the Department of Water and Power?

A That's correct.

Q And is the subject of this letter flows in Rush Creek?

A May I have a moment to read it?

00060

Q Have you had a chance to review LADWP Exhibit 97?
A Mostly, yes.
Q Is it correct this is a letter that deals with flows in Rush Creek?
A Yes.
Q Now, I would like to draw your attention to the last paragraph on the first page of LADWP Exhibit 97. There's a sentence that starts: Brown trout deposit their eggs in gravels during the fail and fry emerge in the following spring.
Is that correct?
A Correct.
Q Is that your understanding of when brown trout spawn in Rush Creek?
A Yes.
Q And then, it says: In Rush Creek emergence is usually completed by the end of April.
Is that your understanding?
A That is my general understanding, yes.
Q When you say brown trout deposit their eggs in gravels during the fall and fry emerge the following spring, that means spawning brown trout deposit their eggs beginning in September and complete depositing their eggs in October, and then those fry emerge in April; is that correct?
MS. CAHILL: Objection, compound.

MR. BIRMINGHAM: I will withdraw the question.
Q The eggs are deposited in September and October in Rush Creek?
A No, that is not correct. Fail, as I suggested here, was just a general term. The spawning period in Rush Creek is more in the order of latter part of October, November and December.
Q Now, further on, the last sentence on this page, page 1 of LADWP Exhibit 97, and goes on to the next page says: Available evidence, Beak 1991, indicates that Rush Creek streamflows near about 60 cfs begin to mobilize spawnable sized gravels.
This suggests that if proposed releases were to occur, and those are proposed releases in excess of 60 cfs; is that correct, Mr. Smith?
MR. SMITH: A That's my understanding, yes.
Q If the proposed releases were to occur, Rush Creek spawnable substrate could begin to move. This movement could adversely affect brown trout eggs and alevin survival, which in turn could adversely affect the size of the 1992 year class.
Now, that's what the letter says; is that correct, Mr. Smith?
A Yes.
Q Is the opinion expressed in this letter, that flows

in excess of 60 cfs during the spawning season would have an adverse effect on spawning success?
A That's not what I meant by this. If that's what one concludes from that, that's an incorrect conclusion.
Q It says, doesn't it, that streamflows near about 60 cfs begin to mobilize spawnable size gravel? It says that; is that correct?
A That's correct.
Q Is that your opinion?
A Yes.
Q Then, it says this movement; that is, the movement of spawnable size gravel; is that right?
A Correct.
Q This movement could adversely affect brown trout egg and alevin survival, which could in turn adversely affect the size of the 1992 year class.
A Correct.
Q Doesn't that mean, in your opinion, that the movement of this spawnable sized gravel could adversely affect spawning success?
A What was meant there -- to answer your question directly, I can understand how one could conclude what you are stating from what was read. What was meant there was one needs to be careful during and after the spawning period. If eggs are deposited in gravels at a particular

flow, if the flow varies from that substantially, that could have an adverse effect on your survival, egg and alevin survival.

If the eggs were deposited in a 60 cfs flow and the flows were increased to 70, 80 or 90 cfs, for example, that would alter the hydraulics and the dynamics of the stream and could mobilize the bed which could lead to poor survival.

Q So, what you meant to say was that a change in streamflow could result in the movement of gravel?

A Yes.

Q Now, the Beak Report doesn't say a change in flow, it says flows of 60 cfs can move gravel; isn't that right? That's what the Beak Report says?

A It says around 60 cfs spawning sized gravels begin to become mobilized.

Q As that spawnable sized gravel moves over a recently emerged egg, is that movement likely to have or could it have what you have determined an adverse effect on the egg?

A I'm sorry, Mr. Birmingham, I was distracted when you began your question.

Q Well, if spawnable sized gravel moves at 60 cfs, would the movement of that spawnable sized gravel over brown trout eggs have an adverse effect on the eggs?

A Perhaps -- that's a very --

Q This is a biological question.
A Okay. If we divorce, or separate the whether or not gravels would move at a particular flow, there is the potential to damage the eggs if gravels move or if there are sediments that become deposited in the redds.
Perhaps Dr. Kondolf could add something to this also.
Q My question is a biological question. I am going to ask you to assume that at 60 cfs spawnable sized gravel moves. Make that assumption. Is it correct that the movement of spawnable sized gravel will have an adverse effect on eggs deposited in the stream?
A Not necessarily. I would have to say no.
DR. KONDOLF: A I would like to clarify something.
Q Are you a biologist?
A No, I am not.
MR. DODGE: I would like some clarification of the ground rules here. Historically, if a member of the panel wishes to address the question, that's been allowed.
Now, I think we either have to accept that as a ground rule or not.
Mr. Smith wanted Dr. Kondolf to answer. Dr. Kondolf indicated he has a contribution.
What are the ground rules under this situation?
MR. BIRMINGHAM: May I address that? If I state a

hypothetical question based on biology, I would like to have that question answered and I don't think Dr. Kondolf is qualified to answer that question.

If, on redirect or recross by one of the other parties, they want to ask Dr. Kondolf if the assumptions are correct, they are certainly free to ask Dr. Kondolf that question on redirect. Dr. Kondolf is not qualified to answer the questions based upon the biology, and I don't want to lose my time by having Dr. Kondolf provide an answer that isn't responsive to my question.

MR. DEL PIERO: I am going to overrule the objection.

Mr. Smith, do you know the answer to the question? Answer it as best you can. When you have answered to the fullest of your capabilities, please let me know.

MR. SMITH: I thought I had, but I am willing to try again.

MR. DEL PIERO: Mr. Birmingham, do you want to repeat the question?

MR. BIRMINGHAM: I think Mr. Smith did answer the question. He said in his opinion, no, it would not.

MR. DEL PIERO: Fine, proceed.

MR. BIRMINGHAM: Q That was your answer; wasn't it?

MR. DEL PIERO: Mr. Smith, is that your answer?

A One time he asked the question and I said yes, and

he rephrased the question in another order and I said no. I tried to respond to his questions as phrased. Frankly, I am a bit confused, and there is a compounding factor here, and I tried to explain that at the beginning of my response, that being that one has to assume that the fish are depositing their eggs in an area that will be affected adversely by a flow of 60 cfs in Mr. Birmingham's question, and the situation, as a biologist, is that a fish would typically not deposit its eggs in a location that is being adversely affected, i.e., gravel movement.

And consequently, if fish would not deposit its eggs in an area that is being mobilized by flows of 60 cfs, the conditions are not proper for incubation and survival.

So fish wouldn't select that, the fish would actually deposit its eggs in a location that is more suitable for survival, and so I am having difficulty with Mr. Birmingham's question, knowing that as a biologist.

MR. BIRMINGHAM: Q Just so we make sure the record is clear, I am asking you to assume, Mr. Smith, that spawnable sized gravel --

MR. DEL PIERO: That's probably an inappropriate question. Read the balance of the letter. The balance of the letter is characterized in the entire last paragraph, not as a statement but as a question. They are asking the Department of Water and Power for information.

MR. BIRMINGHAM: Well, let me ask a question.
The letter then has now been identified as LADWP Exhibit 97, and at this point I would move its admission.
MR. DEL PIERO: Any objection?
MR. DODGE: None.
MS. CAHILL: No.
MR. DEL PIERO: SO ordered.
MR. BIRMINGHAM: Q Does the letter reflect the opinion you held on January 12, 1993?
A Based on the information I had available to me.
Q During questions on redirect there were some questions asked of you, Mr. Smith, regarding use of regional curves. Do you recall Ms. Cahill asking you those questions?
A Yes, in general.
Q Now, what I would like to do is I would like to compare DFG Exhibit 53, page 4, with the comparable Smith and Aceituno preference curves. Do you have a copy of Exhibit 53 in front of you?
A I am sorry, could you identify 53?
Q It is correct; isn't it, that Exhibit 53 is the Rush Creek IFIM report?
A Is that Volume II?
Q Yes, Volume II.
A Yes, I have a copy of pages 4 and 5.

Q Now, on page 4, those are brown trout juvenile preference curves; is that correct?
A That's correct.
Q And on page 4, these are site specific preference curves that were developed on Rush Creek; is that correct?
A That's correct.
Q Now, Smith and Aceituno in 1987 was introduced, I believe, as an exhibit by reference by the Department of Fish and Game; is that correct?
MS. CAHILL: I believe that's DFG 115.
A I do not have it before me.
MR. DEL PIERO: He does not have it in front of him.
MR. BIRMINGHAM: Q I will give him my copy.
Is it correct that the Smith and Aceituno Report contains regional preference curves?
A That's correct.
Q Now, on page 57 of the Smith and Aceituno Report, there are preference curves for brown trout juveniles; is that correct?
A Page 57, yes.
Q I'm sorry, page 57.
A Well, the graphics are on page 57 but what I term XY coordinates on page 56.
Q Now comparing the brown trout juvenile preference curves on page 4 of DFG Exhibit 53 with page 57 of the Smith

and Aceituno Report, you would conclude, wouldn't you, that the use of the brown trout juvenile curves contained in Smith and Aceituno would not be appropriate for use in Rush Creek?
A No.
Q Did the IFIM report prepared for upper Owens River consider the use of Smith and Aceituno?
A Yes.
Q And it is correct in that report they concluded that Smith and Aceituno couldn't be used on the upper Owens; isn't that right?
A Yes. I believe they concluded on site would be better.
Q Do you have a copy of that report in front of you, Mr. Smith?
A No, I do not.
Q It's been identified as DFG Exhibit 55 -- I'm sorry, that is a misstatement.
A I have a copy of it now, Volume I.
Q May I look at your Volume I, please?
A Certainly.
Q I am operating here from memory, so you will have to forgive me.
MS. CAHILL: That's DFG 62.
MR. BIRMINGHAM: Thank you.

Q I am going to read your copy of this, if I may. I am looking at page 76 of DFG Exhibit 62; is that correct, Mr. Smith?

MS. CAHILL: Is that Volume I?

MR. BIRMINGHAM: Yes, it is.

Q Is that correct, Mr. Smith?

A You are looking at Volume I, page 76.

Q Now it says on this page --

MS. CAHILL: Do you need another copy of that?

MR. BIRMINGHAM: If you have another copy. Thank you.

Q Now it says on page 76: Comparison of the upper Owens River site specific depth and velocity curves to data from Smith and Aceituno, 1987, indicated that many upper Owens River criteria differ from the Smith and Aceituno, 1987; is that correct?

A Correct.

Q And then, in the next paragraph it gives a number of factors that may contribute to disparity between Smith and Aceituno and those developed on the upper Owens River; is that correct?

A Yes.

Q Okay, and it says that the upper Owens River is significantly larger and has a lower gradient than other Eastern Sierra streams sampled by Smith and Aceituno; is

that correct?
A Yes.
Q And that's given as one of the reasons why the use of Smith and Aceituno on the upper Owens River would be inappropriate; is that correct?
A I believe so. If you could point me to where you are reading specifically -- I haven't caught up with you yet.
Q I am looking at the second full paragraph on page 76 that starts out: A number of factors may be contributing to the disparity between Smith and Aceituno, 1987 curves and those developed on the upper Owens River, most of which relate to differences in available habitat. The upper Owens River is significantly larger and has a lower gradient than other Eastern Sierra streams sampled by Smith and Aceituno.
Is that correct?
A Yes. And that refers to the differences in the available habitat, micro-habitat.
Q Isn't it correct that the lower portion of Rush Creek has a lower gradient than the other Eastern Sierra streams?
A I can't say because I am not familiar with all the others. I'm sure there are differences and I'm sure there are similarities.
Q Let's concentrate on Rush Creek below the Narrows as

it existed in 1987.
A That's what I was referring to.
Q Rush Creek below the Narrows has a lower gradient than the Eastern Sierra streams you sampled in preparation of Smith and Aceituno, 1987; isn't that right, Mr. Smith?
A No. If I may expand on that.
Q Well, you have answered my question. If some explanation is required, please go ahead, but if you have answered my question, then we can move on.
A When you asked your question about other Eastern Sierra streams, as I stated earlier, there are some similarities and some dissimilarities between sections of other streams and Rush Creek downstream of the Narrows.
So, if you ask a categorical question, I have to respond categorically.
Q Well, let's just talk about the typical streams you sampled for preparation of the Smith and Aceituno, 1987. Would they have a steeper gradient than the portion of Rush Creek below the Narrows?
A Again, in some places, yes; and in some places, no.
Q And is Rush Creek a bigger stream than the typical stream that you sampled for preparation of the Smith and Aceituno, 1987?
A I don't know the flow regimes of all the streams, so I really can't respond to that.

Q Actually, I do have a question of you, Mr. Payne. I started to ask you a question before about MANSQ, and then I didn't finish it.

MANSQ was used for preparation of the Lee Vining IFIM Report; is that correct?

A No, it is not correct.

Q Now, I would like to refer a moment to the testimony of Darrell Wong, who stated the position of the Department of Fish and Game according to Mr. Thomas, as the Department of Fish and Game witness.

Paragraph 9 of Mr. Wong's testimony, and this is paragraph 9 towards the bottom of the page. It says: The IFIM results generally provide a potential range of in-channel flows which characterize trout habitat during non-winter conditions.

MR. SMITH: A I'm sorry, was that question directed to me?

Q It is directed to anyone. Is it correct, and again, I will state it is paragraph 9 of Mr. Wong's testimony, DFG Exhibit 1, which states: The IFIM results generally provide a potential range of in-channel flows which characterize trout habitat during non-winter conditions.

Is that a correct reading of his testimony?

A It appears to be, but I didn't read it in its entirety. I was trying to keep up with you.

Q Let me give you the page, Mr. Smith, and ask you to read it in its entirety.
A I'm sorry, Mr. Birmingham. I hate to show my age, but that's in a zone where I have trouble in seeing. I apologize for that.
Q Do you have a copy of the testimony in front of you?
A Yes, I do.
Q I understand the problems with age, so don't apologize for that, but it states at the bottom of paragraph 9 of Mr. Wong's testimony --
A You can't understand --
Q Well, you know, I wear contacts and I have reading glasses which I refuse to wear, and I pay the price.
But again, looking at paragraph 9 it states: The IFIM results generally provide a potential range of in-channel flows which characterize trout habitat during non-winter conditions.
A Correct.
Q Is that what his testimony states?
A Yes.
Q Now, I would like to look at the Lee Vining Creek IFIM Report. This is Volume I, page 167. Actually, we probably should start at page 163, at the bottom of the page It states with respect to the recommended streamflow regime during the winter months, instream ice accumulation,

winter refugia habitat and water availability as well as aquatic habitat/streamflow relationships should be considered. Results of the instream ice element of this investigation suggests that the existing condition of Lee Vining Creek, streamflows of about 15 cfs would involve less risk to aquatic resources and habitat from instream ice accumulation than would substantially higher streamflows.

However, aquatic habitat for brown trout is substantially reduced at such low streamflow.

Now, I would like to ask the question, and this may be for anyone, when it says, however, aquatic habitat for brown trout is substantially reduced at such low streamflow, that statement is based upon IFIM results; isn't it?

A Perhaps I should ask Dr. Li to respond to that question.

DR. LI: A Yes, it is based on weighted usable area.

Q Thank you. And is it correct, Dr. Li, that in your opinion, during winter conditions streamflows of approximately 15 cfs in Lee Vining Creek would involve less risk to brown trout?

A That is in relation to anchor ice, and that's true.

Q Mr. Payne, during your examination last week, you referred to a paper that you presented to the American Fisheries Society. Would it be possible for us to obtain a

copy of that paper?
MR. PAYNE: A Yes, certainly.
Q Do you have a copy of it with you today?
A No, I don't.
Q Would you be willing to send it to Dr. Hardy at Utah State University and bill me for the cost of overnighting it to him?
A Sure.
Q Thank you. I would appreciate that.
MR. HERRERA: Your time has elapsed.
MR. BIRMINGHAM: I would make an application for an additional five minutes and the basis for that is that during the --
MR. DODGE: Mr. Del Piero, it was carved in granite at the last session that he would not apply for extra time. Nevertheless, we don't object (laughter).
MR. BIRMINGHAM: It will probably take me less than five minutes.
MR. DEL PIERO: Granted.
MR. BIRMINGHAM: Thank you.
Q There were some references to some results in the Rush Creek IFIM that weren't reported in the Department of Fish and Game Report. I believe, Mr. Christophel, you testified to some runs that were not reported in the result of the Rush Creek IFIM Report.

MR. CHRISTOPHEL: A If you are referring to the weighted usable area/discharge relationship, the extrapolation above 100 cubic feet per second, that is correct.

Q They are not reported. Would it be possible, and I will ask this of the Chair and opposing counsel, would it be possible for us to get copies of the final calibrated production data decks for all cross-sections and final fish curve libraries that were used to generate results in the final reports?

MR. DEL PIERO: No, you can't, because I wouldn't be able to read it.

Are those, in fact, available?

MS. CAHILL: I would really need to talk to the experts and I believe it is inappropriate to be asking for that data at this point when these reports have been available for so long.

DR. LI: A It involves roughly 160 or so data decks. It's been some five years since I have seen these, Mr. Birmingham. It is probably possible, but it would take time to get it organized in a presentable form.

MR. BIRMINGHAM: Q Do you have them on computer disks?

A Each of the transects is on a separate floppy disk and I believe the fish files for each are with each transect. It is a matter of accounting for all of the

transects. They have been in storage for some time. I don't know how complete the library is.

MR. BIRMINGHAM: My only comment is during the presentation of our case we tried to be as accommodating as possible to provide any data that were needed to analyze the results of our reports.

In this picture situation, we have had testimony related to simulations that aren't contained in the report and --

MR. DEL PIERO: That's correct. They aren't contained in the report, so they aren't in the evidentiary record. It came out during cross-examination they had done subsequent work, but beyond that coming out during the course of the examination, there is nothing in the record that would indicate --

MR. BIRMINGHAM: But review of these data decks would give us an opportunity to look at the results that actually are reported, and you may recall, Mr. Del Piero, I had early on asked for some data, and your response was it would be appropriate for me to ask for data during the presentation of that witness's testimony, and at this point, I would like to make a request.

If the Department of Fish and Game does not want to provide it to us -- of course, it would be at our expense.

MS. CAHILL: If it is at your expense, we can

determine what is available and attempt to accommodate it.
MR. DODGE: Let me just say so there is no doubt of our position, that these extrapolations are in the record. They may not be in the written IFIM studies, but they have been testified to by this panel.
MS. CAHILL: We could make available to you now the extrapolation up to at least 250 and the numbers that went with that particular simulation.
MR. DEL PIERO: Mr. Birmingham, you and Ms. Cahill get together after the next break or during the next break and arrange for whatever information transfer the two of you deem appropriate, and come back and advise me on the record what's going to transpire.
MR. BIRMINGHAM: Okay. I have just one final question.
Q The Rush Creek IFIM was conducted in 1987. That's not my question. Isn't it correct that the Rush Creek IFIM assumes the flow conditions that existed in Walker and Parker Creeks at the time the study was conducted?
DR. LI: A Yes.
Q So, if there were no flows in Walker and Parker Creeks at the time the IFIM study was conducted, then the flow recommendations which are contained in the report assume no contribution from Walker and Parker?
A Yes.

Q Thank you very much.
MR. DEL PIERO: Thank you very much, Mr. Birmingham.
MR. BIRMINGHAM: Thank you, Mr. Del Piero, for indulging me with the additional time.
MR. DEL PIERO: Five minutes with Dr. Kondolf right after we get back from lunch and, Mr. Birmingham, no extensions on that.
MR. BIRMINGHAM: Thank you very much.
MR. DEL PIERO: Mr. Dodge.

RECROSS-EXAMINATION

by MR. DODGE:
Q Dr. Li, when last you and I were talking about the effects of rewatering the Rush Creek bottom lands and I tried to elicit from you whether that would likely under a hypothetical IFIM call for more water, less water, or the same amount of water, or whether you could tell me, and you basically testified in summarizing your testimony that you really couldn't say.
Let me ask you a slightly different question. Let's assume hypothetically that approximately, let's say, 5,000 linear feet of now dry Rush Creek channels were rewatered, would you agree that that rewatering would likely increase the weighted usable area in Rush Creek?
DR. LI: A Yes, it would.
Q And why is that?

A You have more area and more lineal feet which will give you more estimated area.
Q Now, does that fact that you would have more area have any effect on your answer as to whether additional flows would be necessary?
A It would depend upon the shape of the unmeasured channel how that would turn out. The situation there is you look in terms of the pattern of weighted usable area with discharge to determine that, and whether that would change the existing pattern, you wouldn't know until you take those measurements.
Q Okay. Mr. Vorster, you were asked yesterday about how the Department of Fish and Game recommended flows in lower Rush Creek related to what was found historically in the bottom lands.
Do you recall those questions?
MR. VORSTER: A Yes, I do.
Q Let me ask you to take a look at the Trihey Report which I believe is a Cal Trout exhibit, and I will see if I can find the number. I think it is Cal Trout 15.
MS. CAHILL: It is also DFG 129.
MR. DODGE: Q Let me ask you to take a look at the portion of Cal Trout Exhibit 15 that I have put in front of you, and ask you whether you can elaborate on your answer?
A Yes. I think if you compare what's in Cal Trout 15

and DFG 129 for, let's say, the average year, which is 1937-38, starting in April of 1937 through March of 1938, and look at the mean monthly hydrographs that are presented in that exhibit, there's no page number associated with it, but it is after page 4-8.

Q Is that the second foldout after page 4-8?

A Yes, that is the second foldout.

Q It represents again what sort of a year?

A It represents about a normal year.

Q A normal prediversion year?

A Right.

Q All right, go ahead.

A The runoff available to Rush Creek was close to the average. I plotted the mean monthly hydrographs, the mean monthly flows by reach in Rush Creek, and if you compare the flows and this includes the effect of irrigation diversions, for example, in Reach 2, in Reach 3-B and 3-C, and then the effect of the increasing spring flow and some contributions from Walker and Parker Creeks downstream, you can compare the mean monthly flow in 1937, a normal year, with the Fish and Game recommendations and see that they are fairly similar to the normal-year recommendations.

Obviously, they are not exactly the same, the distribution is slightly different, but there's an increase in the flow in the snow-melt period of May, June and July,

similar to the normal-year recommendation made on Fish and Game Exhibit 52.

The only main difference is when you get downstream in the bottom lands you have somewhat more flow in the fall and winter months than I think is in the current Fish and Game recommendations.

Q You mean somewhat more flow historically?

A Historically, that's correct.

Q And again, you are telling us that this comparison includes the historical irrigation; correct?

A That's correct. It's an analysis of what the flows were to the best of our ability to reconstruct what the flows were reach by reach taking in account the gains and losses, either artificial or natural.

I would point out that in the bottom lands -- well, along all the reaches, that the flow in the June-July period in the historic condition is somewhat higher than 100 cfs. I think it gets up to about 177 cfs on a mean monthly basis, but we also hear that there would be some flushing flow recommendation in Rush Creek on top of the flows that are shown in DFG Exhibit 52.

So, that's why I say there's a rough similarity between the two.

Q And this, again, is a comparison between the Department of Fish and Game recommendations and the flows in

the Rush Creek bottom lands?
A Correct, although you can see that in the other reaches there were flows throughout the year, not quite as great as in the bottom lands because of the irrigation diversions, but the flows in the other reaches also had a similar pattern, and in many of the months similar magnitude. It is in the bottom lands where you saw the greatest amount of flow in Rush Creek during the historical period.
Q Mr. Payne, you reminded me that I was the cause for bringing you back here, so I do have a couple of questions for you. You talked about an extrapolation from 100 cfs to 250 cfs, and you said this was 2.5 times the measured flow and that this was a general rule.
Can you expand on that testimony? What do you mean by general rule?
MR. PAYNE: A I didn't make the testimony regarding the hundred cubic feet per second extrapolation with 250. That was in the Beak instream flow study, which I did not participate in.
Would you like to rephrase the question in that context?
Q Well, let's assume hypothetically that the maximum flow that Beak saw when it did an IFIM was 100 cfs. Is it reasonable to do an extrapolation to 250 cfs?

A Yes.
Q Is there a general rule that up to about 2.5 times you can make an extrapolation and thereafter not?
A The manual says that given proper calibration, and this is also backed up by my own experience, that you can take an extrapolation upwards two and a half times the high flow, but that is not a rigid upper limit. Given certain criteria that you look at carefully, you can go beyond that.
If those criteria are not being met, it may not be wise to go even that far.
Q Now, am I right that we have in this proceeding, if I am counting them right, three IFIM studies, one on Lee Vining Creek and two on Rush Creek.
Is that right, Mr. Smith?
MR. SMITH: A One on Lee Vining, one on Rush Creek by the Department of Fish and Game, and one on Rush Creek by E. A. Engineering Science and Technology, so that is correct.
Q So, on Lee Vining Creek there is only one IFIM that's in evidence, and that is yours?
A That's correct.
Q And on the Rush Creek, the flows for your IFIM were taken at what levels?
A The flows generally at 15, 20, 80 and 100 cfs?
A And the Beak IFIM that's been presented by the

Department of Water and Power, the flow was what?
A I believe it was around 19 cfs.
Q Mr. Payne, would you agree with me that if the Beak IFIM were taken at 19 cfs, that you would have a problem extrapolating weighted usable area under the Beak IFIM at flows greater than 47 cfs?
MR. BIRMINGHAM: Mr. Del Piero, I don't want to be uncooperative, but I think he means E. A.
A Mr. Dodge, I think I misspoke or misunderstood. I was a little confused there. Beak and E. A. used the same hydraulic data set. The data were selected by Beak consultants. Then, E. A. took the hydraulic data and calibrated their own model and developed their --
MR. DODGE: Q So, E. A. had the same hydraulic data at 100 cfs?
A That's correct.
Q All right.
A Sorry for the confusion.
MR. BIRMINGHAM: And we have no objection if Mr. Dodge wants an additional five minutes.
MR. DEL PIERO: Thank you, Mr. Birmingham.
MR. DODGE: Q Dr. Li, do you support the Smith and Aceituno curves for use on Rush Creek?
DR. LI: A Yes. In our fish abundance assessment, we developed a relationship between weighted usable area and

abundance of brown trout, and the correlation coefficient for that relationship is .73, which is high.
Q Now, let me ask you the same sort of questions Mr. Birmingham was asking Mr. Smith.
Would you take a look at page 76 of the upper Owens River IFIM, which sets out the reasons why the Smith and Aceituno curves were not used on the upper Owens River. Have you read that before, sir?
A No.
Q Well, I will read the sentence Mr. Birmingham read: The upper Owens River is significantly larger and has a lower gradient than other Eastern Sierra Nevada streams sampled by Smith and Aceituno in 1987.
Then, I would like you to read out loud the rest of the paragraph which Mr. Birmingham did not read.
A Okay. I am reading from the middle of the third paragraph on page 76: There are fewer mid-channel flow obstructions which create sheer zones in areas of reduced velocity. The upper Owens substrates are dominantly sand and gravel in contrast to the gravel and cobble dominating nature in the high gradient streams in the area. The channel is wider and meanders more than other Eastern Sierra streams. Riparian vegetation that could provide overhead out-of-water cover is virtually non-existent. All of these factors create different hydraulic conditions that likely

contribute to differences in habitat preference among the same sized and species of fish.
Q I ask you, sir, are those the sorts of differences which indicate to you that EBASCO made a reasonable assessment in not using the Smith and Aceituno curves?
A Yes.
Q Do you agree with that, Mr. Smith?
MR. SMITH: A Yes, I do.
Q Now, we had some testimony about E. A.'s suitability criteria of zero for depths in excess of three feet.
Dr. Li, do you agree that's biologically realistic?
DR. LI: A I do not agree it is realistic.
Q Do you have any understanding about how the use of that criterion might affect E. A.'s output in the IFIM?
A The use of those curves would reduce the amount of estimated weighted usable area by discharge and would probably change the peak of those relationships to a low-flow level.
Q Mr. Canaday asked a series of questions about criteria for keeping the fishery in good condition and, Mr. Payne, you gave some criteria, and then Dr. Li gave some criteria and he added winter refuge and flood refuge, which were not on your list, Mr. Payne.
Would you agree those are important criteria?
MR. PAYNE: A Yes.

Q What do we mean in practical terms by winter refuge and flood refuge? In other words, what sort of habitat provides those?

DR. LI: A Is it fair for me to answer that?

Q Sure.

A In both cases you are looking at deep pools in general. Deep pool areas have slower velocity, areas where there is some resistance to wide fluctuations in water surface elevations.

Q So, it is basically pool habitat; isn't it?

A Yes, sir.

Q Just a couple more lines of questions. Can you do an IFIM on a dry creek?

A It takes an awful lot of creativity to do that.

Q Now, there were a series of questions last time and I want to make sure I understand the panel's answer, a series of questions as to whether Department of Fish and Game recommended flows alone would re-establish pre-1940 conditions.

Now. I believe, Dr. Li, you testified no; correct?

Let me back up. The IFIM that's the basis of your recommendations was not done on an historical creek; was it?

A No, it was not.

Q It was done on the 1987 creek?

A That's correct.

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Q And the IFIM does not purport to measure the relationship between flow and habitat in the historical creek; correct?
A That's correct.
Q Okay. So, does it follow from that, that the recommended flows alone do not re-establish prediversion conditions?
A That's correct.
Q Does anyone disagree with that on the panel?
MR. SMITH: A The recommended flows are a good starting point.
Q But you would agree the recommended flows by themselves without a restoration program would not re-establish prediversion conditions?
A I am not a geomorphic specialist. It is my understanding from a geomorphological perspective, the answer to your question is no.
Q The answer is yes, it would not re-establish?
A Yes, that is correct, it would not within a reasonable time frame.
MR. VORSTER: A I would just say hydrologically if there was more flow, for example, in the bottom lands, considerably more flow in the bottom lands, that normally we are talking about 1937 had considerably more flow, about 20,000 acre-feet more flow than is in the Department of Fish

and Game Exhibit 52 recommendations for normal-year flows, so hydrologically it is a start, but it is not there in the bottom lands?
Q One final question, first, to Mr. Smith and then to Dr. Kondolf.
What question exactly did you want Dr. Kondolf to answer, Mr. Smith, if you can recall?
MR. SMITH: A What we asked Dr. Kondolf to do was to develop channel flushing and maintenance flow recommendations for Rush Creek.
Q Well, we had a series of questions by Mr. Birmingham about the effects of flows in excess of 60 cfs on gravel beginning to move and the questions related to whether that movement might have an adverse effect on eggs.
Is there some specific point you wanted Dr. Kondolf to address?
A I wanted him to provide input into that.
Q Dr. Kondolf, do you have any input?
MR. BIRMINGHAM: Objection, calls for a narrative.
MR. DEL PIERO: I am going to overrule it because the question was invited by Mr. Birmingham.
MR. BIRMINGHAM: I am not sure I invited it.
MR. DEL PIERO: I am.
MR. BIRMINGHAM: What I was going to say was that I am not sure I invited an objectionable question. If Mr.

Dodge wanted to ask a non-objectionable question, I certainly would invite that, but I am going to sit down and let Mr. Dodge --

MR. DODGE: This reminds me of one of the world's great lines from HUD which I will not repeat on the record.

DR. KONDOLF: A Well, the sediment transport that was done for the Rush Creek study, I was not involved in, but that sediment transport model was an attempt to provide a first-cut estimate of sediment transport, and in terms of the actual field observations, that's a reasonable approach, but sediment transport models are a very crude approximation of a complex reality, and while the model is okay for a first cut, if actual field observations are available, then that's far better.

The model results indicate gravel movement at 60 cfs, so that the channel would become unstable at 100 cfs.

So, we have some observations of the channel and the channel has not become unstable at 100 cfs. There is no really good information on gravel movement from natural gravel deposits at flows of 60 cfs and higher.

Basically, in order to do that you have to establish some sort of base-line monitoring so you can tell if the gravels are moving, and that hasn't been done.

There are a few observations such as the Trihey and Associates have injected gravels at a couple of points, and

one point was in the downstream end of the return ditch, and those gravels were put in there with the intent that they would stay and be used for spawning downstream of that site near the Shepherd's Camp.

They injected gravels in sites in the channel where they expected that the flows would remobilize the gravels and distribute them to natural depositional sites downstream.

And the flows we have experienced since then, 80 to 160 cfs, have remobilized many of those gravels, but that does not address the question of whether natural deposits would be mobilized at flows over 60 cfs.

My judgment, based on these bits of evidence, is that a flow of 160 cfs probably would start to turn the gravels over.

Q One hundred sixty cfs?

A Yes.

Q How about 60 cfs?

A I would very much doubt that and, in fact, I was also on Rush Creek during control releases of 60 cfs, and I also sampled some bedload at 100 cfs in 1987, and I didn't get any gravel in my sampler. So, I would doubt that it is moving at 60 cfs, and this is not the result of a proper systematic study of gravel mobility, but these are observations and what I interpret from them.

Q You would expect minimal movement at 100 cfs?
A I wouldn't expect movement that would be so deleterious that we would lose gravels, that gravels would be transported wholesale, no. The gravels may start to turn over at that point.
MR. DODGE: No further questions. Thank you.
MR. DEL PIERO: Thank you very much.
Mr. Roos-Collins.
RECROSS-EXAMINATION
by MR. ROOS-COLLINS:
Q Good morning, panel.
Mr. Smith, my first line of questions is directed to you, although other panel members are welcome to answer if you have anything to add to Mr. Smith's answers.
Last week Mr. Birmingham asked you, Mr. Smith, about the statement in Cal Trout 2 that the Department of Fish and Game has special expertise in determining the flow regime necessary to re-establish the historic fisheries in Rush and Lee Vining Creeks.
Do you recall those questions?
MR. SMITH: A In general.
Q Have you read Cal Trout 2?
A It has been some time since I read it in its entirety, but I have read it, yes.
Q Let me ask you to assume that Cal Trout 2, on page

198, refers to a declaration of John Turner of the Department of Fish and Game to the effect that IFIMs are an appropriate technique for determining the flow regime to re-establish the historic fishery.

Do you concur that the IFIM in general is an appropriate technique for determining the flow regime to re-establish the historic fishery in these creeks?

A The IFIM provides a good starting point.

Q Do you agree with the expression better mousetrap?

A Yes.

Q Do you know of a better mousetrap than IFIM to determine the flow regime to bring back the historic fishery in these creeks?

A Not right offhand, no.

Q Mr. Birmingham asked you several questions last week about the Department's engagement of consultants to undertake the IFIM studies for Rush and Lee Vining Creeks.

Do you recall those questions?

A Again, in general.

Q What was your responsibility with respect to supervision of those consultants in their undertaking of these studies?

A I developed the basic study plan, the request for proposal, advertising for study proposals from respective contractors, participated in contractor selection, I

designed the implementation of the studies and data compilation analysis to a certain degree, and then report and review evaluation analysis.
Q Last week I asked you whether the IFIM studies for Rush and Lee Vining Creeks are consistent with the Department of Fish and Game's guidance for IFIM studies. You answered yes.
That is your opinion?
A Yes.
Q Let me turn now to a line of questions which Mr. Dodge picked up this morning regarding the transects used in the IFIM studies for Rush and Lee Vining Creeks. The transects used in those studies were taken in the existing channels; right?
A That's correct.
Q Have you analyzed whether the IFIM results are applicable to the historic channels which exist in Lee Vining Creek?
A The work that Aquatic Systems Research did in evaluating the habitat restoration activity projects on Lee Vining Creek indicate that the IFIM results are applicable to the restored conditions on Lee Vining Creek.
Q Do you have Department of Fish and Game Exhibit 54 in front of you?
A Which is it? I have spent so many years thinking of

these reports as Volume I and Volume II on specific streams that I lost track of using exhibit numbers.
Yes, I have Lee Vining Creek Volume I.
Q Last week you and I discussed Figure 6 on page 25 of that report.
A I recall.
Q Let me read you a statement from page 24: The return of spring flow to the abandoned historical channels in Reach 5 would nor affect the weighted usable area/ streamflow relationships in the existing channel.
That's the final full paragraph on --
A Yes.
Q In the preceding paragraph there is discussion to the effect that resultant decisions likely would be consistent for the existing and for the historical channels once reoccupied.
Do you see that discussion?
A No.
Q The last sentence of the preceding paragraph.
A The last sentence -- all right.
Q So, Mr. Smith, it is your opinion that at least for Reach 5 of Lee Vining Creek the flow recommendations made for the existing channel are applicable as well to the historic channels once reoccupied?
A If I may have a moment to read this very rapidly.

Q Please do.
A Could I ask you to rephrase your question, please?
Q Mr. Smith, is it your opinion that the relationship between weighted usable area and flow for the existing channel of Reach 5 also applies to the historic channel once reoccupied in Reach 5?
A There is that possibility given the information presented in Figure 6.
Q Do you have any reason to believe that the weighted usable area to flow relationship for any part, any reach of Lee Vining Creek's existing channel would not be equally applicable to the historic channels when reoccupied through the restoration program?
A I am afraid that I do not have a good answer for you, Mr. Roos-Collins. I can refer you to the last paragraph on page 24, the last sentence where it states: The return of streamflow to the abandoned channels would provide a greater variety of habitat than the existing channel and likely would increase the amount of habitat available for all brown trout life stages, assuming sufficient water is available to be distributed among the multiple channels.
And I agree with that statement.
Q Mr. Smith, let's return then to Figure 6. Figure 6 shows to me at least that the amplitude in the relationship

between weighted usable area and flow may change when historic channels are reopened, but the relationship itself remains more or less the same.

Is that your understanding of Figure 6 as well?

A This Figure 6 applies to the existing channel, the work that was done in the existing channel in Lee Vining Creek Reach 5. That changed the amplitude of weighted usable area/discharge relationship, but not the actual relationship.

Q So, restoration in Reach 5 of Lee Vining Creek changed the amplitude but not the relationship of weighted usable area to flow?

A Yes.

Q Thank you. I made that more difficult, Mr. Smith, than it is.

Let me turn now to a related subject, which is the flow regime used in the IFIM studies. Lee Vining Creek Report Volume I, page 160, the first paragraph states: These hydraulic conditions represent the streamflow which would occur in lower Lee Vining Creek in the absence of diversions to the aqueduct, but accounts for SCE hydro-electric generating operations.

Is that your opinion?

A That is my opinion, yes.

Q So, would it be correct to say that the flow regime

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used in the Lee Vining Creek IFIM is that impaired regime which existed in 1941 before Los Angeles began operations of the water supply and diversion system?
A That's my understanding.
Q Let me ask you to turn now to Department of Fish and Game Exhibit 52, which is Volume I of the Rush Creek IFIM Report. Page 103, first full paragraph states: The historic base-line hydrology used to develop projected habitat conditions represents the hydrology of lower Rush Creek as it enters the study area as influenced by the operation of three reservoirs in the upper watershed of Rush Creek by SCE's hydroelectric power generation. While this hydrology is not representative of pristine unimpaired flows in lower Rush Creek, it is representative of hydrologic conditions at the time diversions began by Los Angeles Department of Water and Power in 1941.
Is that your opinion?
A That is my opinion, yes.
Q You heard Mr. Dodge's questions to Mr. Vorster this morning about the rough similarity between the Department's flow recommendations on the one hand and the median flows in these streams on the other?
A Yes.
Q Let me ask you to turn to page 109 of the Rush Creek IFIM Report, Volume I. Does Figure 48 compare median flow

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on the one hand with the Department's flow recommendation on the other?
A Yes, it compares the median flows for water years petitioned to dry, normal and wet hydrologic conditions, and it compares the median flows for each of those hydrologic years, if you will, with the Department's recommendations with the exception that this graphic reflects the 60 cfs cap.
Q Let's focus on the chart showing a normal year. Leaving aside the months of May through August where peak flows occurred, would you agree that the Department's flow recommendation roughly tracks median flow?
A Yes.
Q And the Department, in turn, is recommending channel maintenance flows that would occur during the months that we omitted from our prior questions; is that correct?
A Yes. Also for those months that you omitted in your prior questions. If you increased these flows to reflect the Department's recommendations, you will see that there is a similarity in the Department's flows and the flows during those months.
Q So, if Figure 8 were amended to include 100 cfs fish flow for certain months and the channel maintenance flows, is it your opinion that the Department's overflow recommendation closely tracks the median flow that existed

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prior to the beginning of the operation of Los Angeles' water supply system?
A I believe you misspoke. I think you said Figure 8. This is Figure 48.
Q Excuse me.
A Yes, in my opinion, it would more closely track the median hydrologic conditions for normal water years.
Q Let's turn now to the Lee Vining Creek Report, Volume I, Figure 66 on page 165.

Do you have that figure in front of you?
A Yes, I do.
Q Figure 66 shows median flow and the Department's flow recommendation for Lee Vining Creek; is that correct?
A That's correct.
Q Let's shorten this line of questions. Incorporating the Department's channel maintenance flow into Figure 66, is it your opinion that the Department's overall flow recommendation roughly tracks the median flow that existed before Los Angeles began operation of the water supply system?
A There is a general tracking for the months of May, June and July. There wouldn't be as much flow going down the streams as under the Department's recommendation, as is demonstrated here by the median flow, but there would be a general tracking of that.
The flows, beginning in August and extending through

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April of the following year, would be precisely the median flow, so the natural flow, the flow that reaches the Los Angeles Department of Water and Power diversion facilities on Lee Vining Creek would become the Department's recommended flows.

So the tracking would be precise.

Q Thank you. Let me ask you now about page 108 of the Rush Creek IFIM Report, Volume I. The last two sentences on that page read: It is envisioned that the IFIM recommended flows and habitat restoration activities would complement each other. The recommended flow regime was developed to maintain Rush Creek's brown trout habitat and populations, and the habitat restoration activities are intended to establish equivalent pre-1941 habitats and conditions which benefited brown trout.

Is that your opinion?

A Yes.

Q Do you hold that opinion as well for Lee Vining Creek?

A Yes, I do.

Q Let me ask you now about the operation of Southern California Edison's hydroelectric facilities on Rush and Lee Vining Creeks. Are you familiar with the Federal Energy Regulatory Commission's October 21, 1993, letter to Mr. Boyd Gibbons, the Director of the Department of Fish and Game,

regarding SCE's facilities on Lee Vining Creek?
A No, I have not been involved in that process.
Q So, you would also not be familiar with the Department's December 2, 1993, response to the Federal Energy Regulatory Commission?
A That's correct.
If I may revisit your question on the last sentence on page 108, Rush Creek Report, where it says the habitat restoration activities are intended to re-establish equivalent pre-1941 habitats and conditions, I would insert there not only equivalent, but pre-1941 conditions, so it would be an and/or situation.
Q Mr. Smith, returning to my question about Southern California Edison facilities, who in the Department of Fish and Game would be familiar with the correspondence to which I referred?
A I believe Darrell Wong of our Bishop staff may be the best person to respond to those questions.
MR. ROOS-COLLINS: Could I have one minute to confer with Ms. Cahill?
MR. DEL PIERO: Yes.
MR. ROOS-COLLINS: Mr. Del Piero, I would request permission to recall Mr. Wong for the very limited purpose of laying the foundation for the two letters to which I just referred regarding SCE's operations.

MR. BIRMINGHAM: May I confer with Mr. Roos-Collins?
MR. DEL PIERO: Yes.
MR. BIRMINGHAM: Mr. Del Piero, if those letters to which Mr. Roos-Collins is referring are on Federal Energy Regulatory Commission letterhead and Department of Fish and Game letterhead, I have no objection to their being identified and admitted if Mr. Roos-Collins represents that they are copies he obtained from those agencies in the regular course of business.
MR. ROOS-COLLINS: I represent I obtained these copies from the Department of Fish and Game.
MR. DEL PIERO: Do you wish to have them numbered?
MR. ROOS-COLLINS: I do. The letter from the Federal Energy Regulatory Commission to Mr. Gibbons dated October 21 will be the next in order.
MR. SMITH: It will be 28.
MR. ROOS-COLLINS: That's No. 28.
And the December 2, 1993, memorandum from the Department of Fish and Game to Mr. Shumway would be Cal Trout No. 29.
I thank Mr. Birmingham for his cooperation in the introduction of these exhibits.
Q Mr. Smith, on page 170 of the Lee Vining Creek IFIM Report, Volume I, it states: There must be better ongoing coordination between SCE and LADWP operations.

Is that your recommendation for Lee Vining Creek?
MR. SMITH: A That's my recommendation, yes.
Q Do you have the same recommendation for Rush Creek?
A Yes, I do.
Q Thank you.
My next question is for Mr. Payne and then Dr. Kondolf.
Do you have DFG Exhibit 168, your December 12, 1992, paper on flushing flow recommendations before you?
DR. KONDOLF: A Yes, I do.
Q On page 2 you recommend that flushing flow recommendations serve objectives which you then specify as flushing fine sediments from gravels maintaining loose gravel texture, permitting the channel to develop more complex bed topography and produce inundation of developing floodplains.
Is that correct?
A That's correct.
Q And it is your opinion that the flow recommendations you have made in this paper would serve those objectives for Rush Creek?
A It is my opinion that these recommendations are likely to achieve those objectives, but that it's essential to monitor. We don't actually have the sort of information that can tell you for sure that these particular flows would

accomplish these objectives, so I am proposing a set of flushing flows and then strongly recommending that we monitor to see if the objectives are achieved.
Q Mr. Smith, do you concur that monitoring should be done to assess the effects of flushing flows in Rush Creek?
MR. SMITH: A Yes, I do.
Q Dr. Kondolf, have you prepared a summary of your flushing flow recommendations by creek in this proceeding?
DR. KONDOLF: A I believe Mr. Smith has a sheet that summarizes all the flushing flows.
MR. SMITH: A Yes.
MR. ROOS-COLLINS: Is the Department prepared to introduce this summary as an exhibit?
MS. CAHILL: I believe so. If Mr. Smith believes it is the Department's recommendations, we would offer it as DFG 170.
MR. DEL PIERO: Is that the right number?
MR. SMITH: 169.
MS. CAHILL: Let's make it 170. We have something else we may have already premarked.
MR. ROOS-COLLINS: Q Dr. Kondolf, does DFG Exhibit 170 accurately summarize your recommendations for flushing flows in the four creeks at issue in this proceeding?
MR. SMITH: A I would like to clarify one thing on this page. It states water year at the head of one column

and it should be runoff year.
Q With that clarification, Dr. Kondolf, does DFG 170 accurately state your recommendations for flushing flows in the four creeks at issue in this proceeding?
A I developed this page and I developed it based on information in the various reports and the report from Dr. Kondolf.
Q Mr. Smith, does DFG Exhibit 170 accurately state the Department of Fish and Game's recommendations for flushing flows for the four creeks at issue in this proceeding?
A Yes.
Q Dr. Kondolf, let's return now to an issue which Mr. Birmingham discussed with you last week, namely, the recruitment of gravel into Rush Creek. We began by reading a sentence from pages 4, continuing on to 5 of DFG Exhibit 168, which is your December 12 paper on flushing flow recommendations for Rush Creek.
You state: Despite the lack of base-line data on channel adjustment between 1920-1940, geomorphic principles suggest that channel form in 1940 was largely inherited from natural flow conditions.
Is that your opinion?
DR. KONDOLF: A Yes.
Q Do you have any opinion about the presence of gravel in Rush Creek below Grant Dam prior to the commencement of

the operation of Los Angeles' water supply system?
A Well, I am not aware -- again, Dr. Stine might be better able to answer some of this specifically. I am not aware of information on exactly what the distribution of gravel was in the channel in 1940.

However, there were sources of gravel to the channel downstream of Grant Lake Dam. There were a couple of places where Rush Creek was eroding very steep banks in essentially a V-shaped valley for much of that reach, particularly below the dam above the old ditch intake, and even farther downstream from there, and then, again, downstream of Highway 395 down to the Narrows essentially, and then there's another spot right below the Narrows where the channel was impinging on the right bank, so all these sites would be sources of gravel to the channel of Rush Creek directly.

Q Before Los Angeles began the operation of its water system --

MR. DEL PIERO: Your time has elapsed.

MR. ROOS-COLLINS: I would ask for 20 minutes to complete cross-examination.

MR. DEL PIERO: We will take that up after lunch. One-fifteen, ladies and gentlemen.

(Noon recess)

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TUESDAY, DECEMBER 14, 1993, 1:15 P.M.

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MR. DEL PIERO: Ladies and gentlemen, this hearing will again come to order.

Mr. Roos-Collins, when last we left you had requested 20 minutes additional time. It is granted. Proceed.

MR. ROOS-COLLINS: Q Dr. Kondolf, at the conclusion of the morning session we were discussing groundwater recruitment into Rush Creek. You testified last week that Grant Lake Dam blocked passage of gravel from upper Rush Creek; is that correct?

DR. KONDOLF: A That's correct.

Q Did that condition exist before Los Angeles began the operation of its water supply system in the 1940s?

A Yes, I believe so, based on the size of the natural Grant Lake. Based on Scott Stine's historical observations of that, it appears that that lake would have been something like 1500 feet in length, that gravel would not have passed through from the upper reaches through the lake into the downstream reaches.

Q Let me ask you now about how the gravel recruitment potential in Rush Creek below Grant Lake Dam may have changed since 1941. Let's begin with Reach 1, the stretch between Old Grant Dam and the A Ditch diversion.

A Again, I will convey what I understand of this, and also, refer you to Dr. Stine for a more complete understanding of the situation.

But directly below Grant Dam Rush Creek goes through essentially a V-shaped channel so that when high flows pass through that channel they would have undercut the side slopes and induced sloughing of the banks and delivery of gravel to the channel in that reach.

Since that channel is now dry, this obviously is no longer happening.

Q So, whatever gravel recruitment potential may exist in Reach 1, it is not available for spawning purposes?

A That's correct.

Q You are familiar with Dr. Stine's opinion as expressed in Cal Trout 13, September 1992 Report on Rush Creek, that the natural bed of Reach 1 is composed of cobbles and gravels?

A Yes.

Q Let's turn now to Reach 5, the bottom lands. Let me read you a passage from this same exhibit, page 27: Gravels of the size that were once abundant in Rush Creek below the Narrows now compose the bed along less than 20 percent of the channel. The bed of Reach 5 is composed primarily of materials too large to function as spawning sediments.

Is it your opinion that the gravel recruitment

potential of Reach 5 as it is today is less than it was before Los Angeles commenced the operation of its water supply system?
A Based on Dr. Stine's observation that the channel formerly impinged upon a very steep right bank which was composed of gravel and was delivering gravel in the 1930s, for example, and that the channel no longer follows that course, then that certainly has been one major decrease in gravel supply to Reach 5.
Q Do you have an opinion how rewatering of Reach 1 and the now dry historic channels in Reach 5 would affect gravel recruitment in Rush Creek?
A To the extent that they would cause these banks to be undercut in Reach 1 and thereby deliver gravel, and likewise, if the historic channel in Reach 5 that impinged upon the right bank, if that were rewatered, I would expect those would increase gravel recruitment to the channel.
Q Thank you
Mr. Smith, let's return to fish flows. This morning you and I discussed how the IFIM results would apply after restoration of Lee Vining and Rush Creeks.
Do you recall that discussion?
MR. SMITH: A Yes.
Q I think I muddied the water in the course of my questions, so let me attempt to clarify.

When we discussed Figure 6 and the Lee Vining Creek IFIM Report, did you understand me to assume that a previously dry channel in Reach 5 of Lee Vining Creek had been rewatered?

A I believe that was the thrust of your question, yes.

Q It's correct; isn't it, that the restoration undertaken in Reach 5 consists of developing pools, not rewatering a previously dry channel? Is that correct?

A I believe so, yes.

Q It is your opinion, however, that the flow recommendation applicable to the existing channel before restoration is applicable to that same channel after restoration?

A Based on the evidence in the report, yes.

Q And it is your understanding that the restoration of Reach 5 of Lee Vining Creek was intended to make it more like the channel which existed before Los Angeles began diversions in 1941?

A That is my understanding.

Q Thank you.

Mr. Payne, were you present when I introduced Cal Trout Exhibits 17 through 20 consisting of correspondence by the Department of Fish and Game, the State Water Resources Control Board, the U. S. Department of the Interior and the Federal Energy Regulatory Commission about E. A's IFIM study

for Clavey River?
MR. PAYNE: A No, I was not present at that time.
Q Let me show you those exhibits and ask if you are familiar with them?
A Yes, I have seen these letters before.
Q Mr. Payne, you serve as a consultant to my law firm, the Natural Heritage Institute, in connection with the Federal Energy Regulatory Commission for the Clavey River project; don't you?
A Yes, I do.
Q And in that capacity, did you undertake an analysis of the IFIM model which E. A. used in this proceeding?
A Yes.
MR. ROOS-COLLINS: I ask this be marked as next in order. It is a January 18, 1993, letter from Tom Payne to the Secretary of the Federal Energy Regulatory Commission, and I believe that's Cal Trout 30.
MR. SMITH: That is correct.
MR. ROOS-COLLINS: Q Mr. Payne, let me show you Cal Trout 30 while I distribute it to counsel.
Mr. Payne, this is your letter to the Federal Energy Regulatory Commission regarding the fish flows study undertaken by E. A. for the Clavey River project; isn't it?
A Yes, it is.
Q On page 2 of this letter, the first full paragraph,

you state: Our review found that the hydraulic model used by E. A. for the instream flow study is not the same as the original model developed by the Fish and Wildlife Service. In 1983 E. A. reprogrammed PHABSIM for run on their own minicomputer and that is what was actually used on the Clavey River. Internal differences in model construction prevent the E. A. model from calculating results identical to the Fish and Wildlife Service.

That is your opinion about the IFIM model used by E. A. in the Clavey River project?

A Yes, it is.

Q Is it your opinion that the model used by E. A. produces results which are materially different than those which would be produced by a model consistent with the Fish and Wildlife Service protocols in that proceeding?

A In certain instances it can be materially different, yes.

Q And the remainder of Cal Trout 30 describes the differences which you identified in the Clavey River project proceedings; is that correct?

A Yes, there are specific examples of how their model can diverge from the official U. S. Fish and Wildlife Service model?

A Now you previously testified that you have not reviewed E. A.'s flow study for Rush Creek; is that correct?

A Other than seeing the report, I have not done an extensive review on it, no.
Q Would you recommend that this Board evaluate that flow study for Rush Creek very carefully to determine whether it is consistent with Fish and Wildlife Service and Department of Fish and Game guidance?
A Given the potential for difference in the cases that I have identified and in the additional capability of the models that have been utilized, as I understand in the Rush Creek instance, then I would recommend that the Board do a review of that to determine if the results are consistent with Fish and Wildlife, yes.
MR. ROOS-COLLINS: Thank you. No further questions.
MR. DEL PIERO: Thank you very much.
Mr. Birmingham, you have five minutes.

FURTHER RECROSS-EXAMINATION

by MR. BIRMINGHAM:
Q Dr. Kondolf, DFG Exhibit 168, Development of Flushing Flow Recommendations for Lower Rush Creek Mono Basin, California, this is a document you prepared. It is dated December 12, 1993.
DR. KONDOLF: A That's correct.
Q Now this analysis, I believe, that is reported in Department of Fish and Game 168 is an analysis that you recommended in the written testimony submitted in connection

with this proceeding, and that written testimony is Department of Fish and Game Exhibit 11; is that correct?
A I can't say for sure what the exhibit is, but if you say so, I am sure that is correct.
Q Well, the analysis contained in DFG 168 is an analysis that you recommended be prepared in your written testimony to this proceeding; is that correct?
A That's correct, yes.
Q Specifically in paragraph 15 you stated as follows, and I am reading from your written testimony: I recommend that a flood frequency analysis be conducted on daily flow records for Rush Creek at dam site (inflow to Grant Lake) to determine the flows with return period of 1.5 to 2.0 years (as an annual maximum mean daily flow).
Was that your testimony?
A I believe so. If you don't mind, I would like to get a copy of my testimony.
Q Certainly. Let me give you the page from which I read. This is paragraph 15 from your written testimony.
Did I accurately read your written testimony?
A I believe so.
Q Now, the analysis that's contained in DFG 168 is, in fact, the analysis that you recommended be prepared in the first sentence of paragraph 15 of your written testimony?
A Yes, it is.

If I could add one thing. In that sentence I implied that the analysis should be done for conditions with impairment by SCE reservoirs, and when I completed my report, which is DFG 168, I also conducted the analysis for natural conditions as well.

Q Now, you recommended in your written testimony an analysis of flows that were impaired by Southern California Edison; is that correct?

A That's correct.

Q And the reason you did that is that that is what existed in 1940?

A Those are the hydrologic conditions that existed in 1940.

Q Now, when you did the analysis that you recommend in paragraph 15 of your testimony, you came up with the proposed flushing flow of 190 cfs; isn't that correct?

A When I averaged the 1.5 two-year flows, that came up with 190 cfs.

Q So, in response to my question, the answer is yes?

A Well, no, the average of those two flows, and there is no reason why one has to take an arithmetic average, but that is what I did. If you average the Q 1.5 and Q 2, you get 190, and based on that, I rounded it up to 200 saying that from this flushing flow analysis I would say 200 cfs.

Q The 190 that you arrived at by performing the

arithmetic averaging that you testified to, that 190 cfs, in your opinion, would that flushing flow provide the type of sediment transport which flushing flows are designed to perform as outlined in your testimony?
A Again, I should repeat that we don't have enough data at this point to specify a flushing flow with precision that will achieve those objectives, but based on the available information, I think 190 cfs or 200 cfs would probably serve for sediment maintenance function of a flushing flow.
Q Now, the written analysis that's contained in DFG 168 proposes a reduction in flow in the descending limb of ten percent; is that correct?
A That's correct, no more than 10 percent.
Q That is over a 24-hour period?
A Right.
Q Now, have you examined the hydrologic data for 1993 for Rush Creek?
A I have some of that information, yes.
Q Now, isn't it correct, Dr. Kondolf, that the flows into Grant Lake Dam site, flows on which you based your analysis, that sometimes the daily fluctuation in those flows in 1993 was as much as 40 percent?
A I would have to see the records to say that.
Q I think I have the records here. What I will do, I

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would like to have this marked next in order.
Dr. Kondolf, what I am showing you is a graph which shows, which I will represent to you contains the 1993 daily hydrograph for Rush Creek Dam site, and I see that you are conferring with Mr. Vorster, who may be able to answer this question as well.
From your memory and your review of the 1993 daily flow data, does it appear that this graph which would be LADWP 98, accurately reflects the data?
A If you could show me the actual mean daily values tabulated, I could probably tell you quite quickly.
Q Can we take a moment to get that data, Mr. Del Piero?
MR. DEL PIERO: Certainly.
MR. BIRMINGHAM: Q I am handing you, Dr. Kondolf, a report from the LADWP Aqueduct Division that has the mean daily discharges in cubic feet per second for flows at the dam site and have you seen that document before?
A Yes, the one version of this I have goes up through August, I think, not September and October.
Q Now, isn't it correct, Dr. Kondolf, that -- well, first, the pending question is, does LADWP 98 accurately reflect the data on flows at the dam site for 1993?
A Well, there are a lot of data points here. If you are asking me to verify that each one plotted on here is

correct, I can't do that. I imagine you are interested in this one particular peak, and it looks to be roughly correct.

MR. HERRERA: Your time has expired.

MR. BIRMINGHAM: One more question?

MR. DEL PIERO: One more question.

MR. BIRMINGHAM: Q Dr. Kondolf, isn't it correct in July of 1993, there were daily fluctuation flows into Grant Lake in a descending limb of approximately 40 percent?

A Without computing it myself, it looks like there would have been drop of about that magnitude from July 12 to 13, and this peak reflects when Edison began spilling and when they stopped spilling.

MR. BIRMINGHAM: Thank you.

MR. DEL PIERO: Thank you very much.

Ms. Scoonover, are you next?

MS. SCOONOVER: Yes.

MR. BIRMINGHAM: I will make this data available to any opposing counsel that may have question about it.

MR. DEL PIERO: Mr. Dodge.

MR. DODGE: I thought we were asking question of Dr. Kondolf?

MR. DEL PIERO: No, only Mr. Birmingham Was asking questions of Dr. Kondolf.

MR. DODGE: I got Exhibit 168 the same time he did.

MR. DEL PIERO: But you didn't complain about it. Did you have additional questions?

MR. DODGE: I have a couple of additional questions.

MR. DEL PIERO: I am sorry, I didn't realize that.

Ms. Scoonover, do you mind very much if Mr. Dodge goes ahead?

MS. SCOONOVER: No, by all means, go ahead.

MR. DEL PIERO: Mr. Dodge, why don't you go ahead and ask your five minutes worth of questions.

Anyone else? It would be nice to know.

FURTHER RECROSS-EXAMINATION

by MR. DODGE:

Q Dr. Kondolf, you testified that your flushing flows are based on the control flows; that is, Southern California Edison control flows, into Rush Creek as opposed to the natural flows; correct?

DR. KONDOLF: A Actually, my flushing flows are based on both. I originally developed my numbers based strictly on the control flows as prepared by Edison, and then I also computed it for the natural conditions, so my final flow regime would account for channel maintenance as well as sediment maintenance. It is slightly more than the Q 2 under the impaired condition, but considerably less than Q 2 under the unimpaired conditions.

Q Your final recommendations are closely based on the

impaired conditions; aren't they?
A That's true, yes.
Q Would you agree that reasonable experts in your field could disagree as to whether to use the natural flows or the impaired flows as the basis?
A Yes.
Q So, it would be reasonable to use either approach; correct?
A Yes. There would be arguments in favor of either one.
Q Now, hypothetically had you used the natural flows as the basis for your proposed flushing flows, how would that have changed your recommendation?
A Well, if I went strictly with the arithmetic average of Q 1.5 and Q 2 under natural conditions, it would have been on the order of 450 cfs.
Q For how many days?
A I would have to work on that a little bit as far as the duration.
Q Would the duration be the same as under your existing recommendation?
A Probably not. I am not sure. I would have to look at that. It might be shorter.
MR. DODGE: That's all I have. Thank you.
MR. DEL PIERO: Thank you very much, Mr. Dodge.

Anyone else on this matter?
Ms. Scoonover. If you would like an additional five minutes tacked on --
MS. SCOONOVER: Mr. Dodge shortened my questions considerably.

RECROSS-EXAMINATION

by MS. SCOONOVER:

Q I have a few questions for you, Dr. Kondolf. I believe you testified that the flushing flows that you recommend would serve both a sediment maintenance function as well as a channel maintenance function. Can you describe the distinction?

DR. KONDOLF: A The sediment maintenance would involve turning the gravels over and flushing fine sediments from them to maintain gravel quality, and also, by turning them over it should help maintain a loose texture to the gravel.

The channel maintenance function on Rush Creek, I think the most important aspects of that are causing a more complex bed topography to develop and to inundate the floodplains that are now developing along the stream and allow overbank sediments to deposit on them and to build new floodplains that are adjusted to the current channel.

Q You also testified, I believe, that on the descending limb you would recommend ramping rates of no more

than ten percent from the previous day's flows. Can you describe or explain to me the significance of the ten percent on the descending limb?
A Ten percent is just an approximate number, but the significance of limiting flushing flows on the descending limb is to avoid stranding fish.
Another point which Dr. Beschta made in his testimony that in some years the descending limb should be slow enough so that the roots of seedling willows, are able to grow downward at the same rate as the water table is declining, and so he recommended that in some years the descending limb be slow enough to permit that to happen, and then the other factor is you need the ramping rates slow enough to prevent a sudden drop in water and a positive hydraulic gradient or steep gradient from the banks to the channel causing sloughing, and it is my opinion, in looking at the record and also based on the published recommendation by Hill, et al., that ten percent is a reasonable maximum ramping rate.
Q Ten percent is your maximum then?
A Yes, it would certainly be okay to ramp it down more slowly.
Q I think it was Mr. Wong who testified earlier that ten percent should be a guideline that could be modified.
Is it your testimony then that ten percent is a

maximum or that ten percent is again a maximum guideline but could be modified from that?
A I would think if sites were to be monitored and it could be determined that no ill effects were to result from somewhat higher ramping rates than those, they should certainly be considered. In the absence of that kind of information, I think it would be prudent to be reasonably conservative and use the ten percent figure.
Q And the rising limb is treated somewhat differently in the testimony, I believe?
A Well, I have recommended that ten percent be used for the rising limb as well. But there it is certainly less important to limit the ramping rates, and so a higher rate could certainly be considered.
MS. SCOONOVER: Thank you. That's all.
MR. DEL PIERO: Thank you very much.
Mr. Haselton.
RECROSS-EXAMINATION
by MR. HASELTON:
Q Dr. Kondolf, I have this one-page California Department of Fish and Game Minimum Channel Maintenance Flushing Streamflows, Mono Lake Basin Streams Flushing Upper Owens River.
MR. HERRERA: That's DFG 170.
MR. HASELTON: Q That's a summary that you

prepared?
DR. KONDOLF: A Gary Smith prepared that.
Q Then, I guess my questions are of you.
Mr. Smith, two questions. Under the horizontal category, upper Owens River, there is a statement that says: No specific channel maintenance/flushing streamflow requirement...
My question is, am I to interpret your comment regarding the upper Owens River that there's no need to ramp flows out of East Portal?
MR. SMITH: A No, that specifically dealt with the flushing or channel maintenance flow requirements. I did not conclude that the ramping requirements on water exported through the Mono Craters Tunnel into the upper Owens River -- that was not intended to be included in this at all. There should be ramping if water is exported through Mono Craters Tunnel.
If there is a change in flow of a reasonable magnitude, that flow should occur with ramping requirements.
Q Dr. Kondolf, I think this question is for you. You are a geomorphologist; correct?
DR. KONDOLF: A That's right.
Q And I am going to probably ask a question that's been asked three or four different ways, so excuse me if it appears to be redundant.

Are you familiar with the upper Owens River?
A Yes.
Q You are familiar it is a spring-fed river?
A Yes.
Q And that it is different in a geomorphological, and also, hydrological sense from Rush Creek? Rush Creek is an eastern snow-melt stream?
A Yes.
Q Noting that, in their prediversion condition, which water course would more likely have a ten percent or less rate of change in flow on a day-to-day basis?
A In other words, which stream would probably experience the more gradual change in flow under natural conditions?
Q Yes.
A I would expect that the upper Owens River would experience the more gradual changes.
MR. HASELTON: Thanks, Doctor.
MR. DEL PIERO: Thank you very much.
That's it except for you, Mr. Frink.

E X A M I N A T I O N

by MR. FRINK:
Q I just have a single question and I don't believe it's been answered, although I did miss a portion of the hearing.

Has the Department of Fish and Game proposed ramping rates at all for the upper Owens River?

MR. SMITH: A They are not included -- when you say ramping rates, I assume you are talking about water being exported through the Mono Craters Tunnel to the upper Owens?

Q Yes. It's not a concern with flushing flows, it is if there were to be a change in the rate of export of Mono Basin water into the upper Owens River, has the Department proposed a ramping rate that should apply in that case?

A Not that I am aware of other than my statement to Mr. Haselton a moment ago that ramping should occur when there is a flow change in the flow of water coming out of Mono Craters Tunnel.

And based on the limited evidence I have, I would say something in the order of ten percent over the 24-hour period.

Q Has the Department done any specific analysis on ramping in the upper Owens River?

A No, we haven't. No, I don't believe so. You might want to ask that question of the upper Owens River panel which is coming on next, I believe, just to be sure.

MR. FRINK: I believe that's all the question I have.

MR. DEL PIERO: All right. Mr. Satkowski.

E X A N I N A T I O N

00130
by MR. SATKOWSKI:
Q Dr. Kondolf, I have a question in regard to your Exhibit 168, your Table 1.
In the column labeled Alternative Year Classes in the Wet Category, you recommend two days at 300 cfs with three days ramping, then ten days at 200 cfs; is that correct?
DR. KONDOLF: A That's correct.
Q Is that ramping rate in this recommendation a ten-percent per day?
A Yes.
Q Is it possible to go from 300 cfs to 200 cfs in three days with a ten percent ramping rate?
A Basically, there would be three days that would be in between 200 and 300 cfs. You would start at 300 and then wind up at 200 on the fourth or fifth day, depending on how you defined it. You would go 300, then 270, then it would be about 243, and then you dropped to about 219 and then about 200 roughly.
Q Is it your testimony you cannot drop down to 200 cfs from 300 cfs in three days, that you would need more than three 24-hour periods?
A Well, there would be three days in between 300 and 200 in which you had a main daily flow that was less than 300 but more than 200.

Q So, you would need a part of another day in order to reach your 200 cfs requirement; is that correct?
A Okay. Well, yes, I guess you would reach it on the fourth day.
Q So, I guess my question is, is your ten percent ramping a firm recommendation or is it a guideline, or do you propose that we change the three days of ramping to four days of ramping?
A It still appears to me that you would have three days that would be in between 300 and 200. There would be three days with a mean daily flow in between 300 and 200.
Q Okay. Well, that's fine.
A I think it is a semantic thing actually.
Q Mr. Birmingham asked you about LADWP 98, which is the draft of the daily hydrograph at Rush Creek, and on this hydrograph there seems to be a large, I assume, storm event in July; is that correct?
A I assumed that was just snow melt.
Q I see. Do large storm events happen often -- I know that's a vague term, but let me just ask, do they happen on Rush Creek?
A Let me put that question to Dr. Vorster.
DR. VORSTER: A When you say storm events, do you mean like a thunderstorm on top of a snow-melt event that would cause a rapid rise?

Q Let's try that.
A There's several types of storm events identified in these watersheds, and starting with that, yes, you can get a fairly rapid rise if you have a thunderstorm in July on top of the snow melt. We have seen rapid rises on Lee Vining Creek from just a rainfall event like in December of '64.
Also, I think in September in '82 there was a rapid rise due to a big storm. Most of our rises are snow-melt rises.
Q Do you believe it's possible for the Los Angeles Department of Water and Power to reach the ten percent ramping requirement of some of these storm events or other types of events that occur? Is it operationally possible to do that based on your knowledge of the system?
A If the reservoirs on Rush and Lee Vining Creeks were not spilling, it would obviously be possible because presumably those reservoirs would be able to capture the runoff. If they were spilling, it would be a little more problematic, in fact, in July of '84 there was a thunderstorm on top of a snow-melt event.
SCE was filling Lee Vining Creek. They raised their gates all of a sudden and there was a sudden increase, and I don't think they were able to give DWP enough warning that that was occurring.
Generally, SCE and DWP do try to communicate when

there's sudden flow changes. To the extent that SCE knows there is going to be a sudden flow change and DWP is also aware of it, they try to respond and coordinate their operations.

Q If the reservoir on Lee Vining Creek was filling, then, Dr. Kondolf, would you propose that this ten percent ramping requirement be a guideline at that moment, if it is not operationally possible to meet the requirement?

DR. KONDOLF: A No, I certainly wouldn't. Then, certainly nature takes over.

DR. VORSTER: A On Lee Vining Creek they don't have Grant Lake to regulate the storage. On Rush Creek they have Grant Lake where they have total control over what they want to release into the Rush return channels.

DR. KONDOLF: A Can you repeat your question? I may have misunderstood.

Q I believe my question was that on Lee Vining Creek if the reservoir was spilling, would you recommend that the ten percent ramping rate be, say, relaxed because in that event Los Angeles could not control the amount of water running down the creek?

MR. SMITH: A If you cannot control, I think it would be reasonable to relax the ten percent, but I think there is a need for close coordination with SCE and the DWP and the facility operators.

Q Would the same be true for Walker and Parker Creeks,

if there wasn't any control, I guess, there's a small control there, but --
A I am not intimately familiar with their facilities on Walker Creek and how the water comes out and goes through, over or around the facilities.
Perhaps Mr. Vorster would be better suited to respond to these question.
DR. VORSTER: A On Lee Vining Creek, the Department of Water and Power could divert some of these high flows if it was a desire to try and have some control over these flows that were coming from the Edison facilities. There is some control.

In other words, it is a question of whether or not Fish and Game feels that it is necessary to slow the rise of Lee Vining Creek into the lower Lee Vining Creek channel. There is some possibility of some control.
DR. KONDOLF: A Since there is less control on Lee Vining, then I would certainly see relaxing the ten percent more there. On Rush Creek, the size of the reservoir permits a lot more control.
DR. VORSTER: A Obviously, if Grant is spilling, you don't have that control.
Q Earlier Mr. Roos-Collins introduced Cal Trout 28, which is a letter from the Federal Energy Regulatory Commission to the California Department of Fish and Game

dated October 21, 1993.
Do you recall that letter?
MR. SMITH: A I think that question earlier was directed to Mr. Payne.
Q Mr. Payne, with the help of the rest of the panel, if necessary, do you recall that letter?
MR. PAYNE: A From the Federal Energy Regulatory Commission to whom?
Q To Boyd Gibbons, the Director of the California Department of Fish and Game, dated October 21, 1993.
MR. ROOS-COLLINS: I believe Mr. Smith misunderstood the question.
MS. CAHILL: I don't think I recognize which letter he referred to.
MR. SMITH: A Could I see a copy of that letter?
(After examining the letter) I should respond to this. The question was directed to me, I believe, by Mr. Roos-Collins, and he asked if I had seen this letter, and my response to him was, I don't believe I have seen it; and then, he subsequently asked who in the Department would have dealt with it or words to that effect, and I believe Mr. Wong in our Bishop office is more familiar with this than I am.
Q The reason I asked the question is that on the second page of this letter there is a discussion of the flow

variation and in the first full paragraph it says: We believe that, and this is now from the Federal Energy Regulatory Commission, we believe that limiting flow fluctuations in Lee Vining Creek below Saddleback Dam to protect brown and brook trout redds and eggs is warranted, but your recommendation to limit flow variation to plus or minus ten percent of the existing flow from October 15 to April 1 is beyond the operational control of Southern California Edison given the magnitude of natural storm events and need for periodic emergency dam release, our recommendation that flow variation be limited to plus or minus ten cubic feet per second from the average daily flow is within Southern California Edison's operational control limits, and then it goes on.

My question is, if we have, say, the reservoir on Lee Vining spilling, would you have any preference as to whether you would prefer a ten percent ramping rate, if this is what this paragraph is talking about, versus going to a flow rate such as plus or minus ten cubic feet per second?

That's sort of an open-ended question, I know.

MR. SMITH: A I would like to respond to your question in part and then I would like to ask Mr. Vorster to respond additionally.

I am unfamiliar with Southern California Edison's operational constraints and limits, and then I would point

out that this letter refers to SCE Company's limits rather than LADWP's limits.

And I stand by my statement of a moment ago, that there is a need for coordinated management of the systems, including SCE and DWP's controlability of constraints and options.

And the ten percent ramping rate, as Dr. Kondolf testified is a good starting point and should be monitored. And if the evidence collected later on supports allowing a greater ramping rate, then I think we should consider it at that time.

Q Just one last question. Have you ever considered going to a constant streamflow rate instead of ramping rates per day?

A When you say constant, what do you mean?

Q Let me rephrase that. Have you considered for this hearing making any sort of recommendation using a streamflow rate change, for example, plus or minus ten cfs versus going to a ten percent change of the existing flow?

A Well, to answer your question directly, no. The reason why is if you have a flow in the stream, say, that's 20 cfs and if you change the streamflow by ten cfs, you have an instantaneous change, so to speak, of 50 percent.

On the other hand, if you have 250 or 200 cfs in the stream and you change it ten cubic feet per second, you are

changing your streamflow less than five percent, and the impacts of a straight cfs change, if you will, is much greater at a lower flow than it is at a higher flow.

MR. SATKOWSKI: Thank you.

MR. DEL PIERO: Mr. Smith.

E X A M I N A T I O N

by MR. SMITH:

Q A couple of brief question, I think first for Dr. Kondolf.

In earlier testimony, Dr. Beschta mentioned something about a device for transporting sediment on Lee Vining. Perhaps you were not here when that was discussed.

Have you contemplated something like that? He didn't give any specifics, but would you like to elaborate on something like that?

DR. KONDOLF: A Was he talking about some sort of sediment pass-through system to the Lee Vining Creek diversion?

Q I believe so.

A This general sort of approach is something that is being utilized in a number of alpine rivers in Europe, but we haven't done it much in North America, but the notion of trying to allow sediment to pass through a reservoir, I think that Dr. Beschta may have been talking about some sort of bypass that wouldn't actually go through the pond but

simply route it around the end.
Is that right?
Q He didn't really elaborate. I just wondered if you had an independent opinion yourself.
A Well, coming up with a way to manage the Lee Vining Creek diversion pond so that one could pass sediments through it at high flow, I think that would be a good idea, and it may be small enough that if the existing sluice gates or some enlarged sluice gates could be opened during the flood, then the pond would simply act like the river and pass sediment on through.
Usually you get into problems with sluicing sediments from reservoirs when the sediments are allowed to collect during the high flows and then at low flows the gates are opened and the fine sediment is released downstream, but to the extent that we can make reservoirs act more like the natural river, the better I think it is, so I don't know the details of what Dr. Beschta was proposing, and I can't even recall if I made any general

recommendations to look into this sort of strategy in our Lee Vining Report, but I think it would be a good idea.
Unfortunately, I don't have the specific recommendations.
You could certainly model sediment transport through the reservoir with different sorts of gates.

Q One other question. I think it would be for any of you.

We have heard varying degrees of testimony on restoration, moving cobbles and moving gravels and such as that. Do any of you have strong feelings about the actual movement, perhaps with machinery, of sediments, of cobbles, of gravels around? Do you think the Board should recommend a great deal of that, very little of that, where practical with just manual crews?

Any one of you could address that.

DR. LI: A I have got a few notions on that, Dr. Smith. It depends -- on the one hand, there have been arguments made that since sheep have been taken off the streams and that water is flowing, that the streams will be able to heal themselves. I think the assumption that is missing in that case is that at some point prior to the streams recovering their banks to be stable enough to resist their high flow, you are going to get uncontrolled flows.

In that case, I suspect what will happen is any progress toward recovery of the bank system will have been delayed somewhat depending on the local damage it sustains.

So that it becomes a question of if it is important to maintain constant progress toward a recovery of the systems, then I think some level of restoration needs to occur, and those specifically in the realm of bank integrity

would be my emphasis.
In terms of other rates of recovery, certainly the flow schedule that Fish and Game has been recommending will allow longer durations of moderate level flows for the streams, in essence, to be able to create habitat even in the absence of higher flows.
It's my personal preference that whatever restoration activities occur be done so as to mimic natural changes as much as possible.
I tend not to be a big fan of engineering solutions.
MR. SMITH: Mr. Smith, were you also asking should any active restoration work be accomplished by hand or by heavy equipment? Was that part of your question?

Q It was a question for all of those aspects. How do you personally feel, how do you professionally feel about that kind of restoration.
DR. SMITH: A From the Department's perspective, I think there are opportunities for hand-labor restoration treatments, if you will, as well as heavy equipment restoration. We encourage natural restoration and support natural restoration of the system, but we think there is need for active intervention also.
Whether intervention is accomplished by hand crews or heavy equipment, I think each treatment should be considered on a day-by-day basis. Most certainly, we want

to minimize any impacts that might occur from the use of crews or heavy equipment.

MR. SMITH: Thank you.

MR. DEL PIERO: Thank you very much.

Mr. Herrera.

MR. HERRERA: I have no questions.

MR. DEL PIERO: Mr. Canaday.

E X A M I N A T I O N

by MR. CANADAY:

Q Mr. Smith, following up on Dr. Smith's questions, in your earlier testimony you were asked questions about what beyond the Fish and Game flow recommendations are necessary to restore the conditions for the benefit of the fishery, and you said that the DFG recommendations are a good start.

What did you mean by a good start?

MR. SMITH: A By a good start, I believe the Department's streamflows along with the channel maintenance flows will provide some of the dynamics needed for that system to begin natural restoration.

I think there are other activities, if you will, that need to be accomplished. For example, I believe the abandoned channels need to be examined and where possible we need to restore and rewater abandoned channels.

Q Both streams?

A Each stream. With respect to Rush Creek downstream

of Grant Dam, I believe there's an opportunity and a need to rewater that currently dry section. I think the streams need to have sufficient water quality, water temperature, water volume, if you will, depth, velocity, features of that type to move towards restoration of pre-1941 conditions.
Q But still part of this particular equation of good start is time; isn't it?
A Most definitely.
Q So that you are not for the Department advocating a position of trying to achieve some sort of restoration overnight. You acknowledge this is going to take time?
A Oh, I think that time is a major requirement in the restoration of these streams as well as the hydraulics and the other features.
Q Just to make sure that I understand the Department's position, Mr. Smith, is that the management preference is for adult trout and particularly brown trout in Lee Vining Creek and Rush Creek; is that correct?
A That is correct.
Q You have been asked questions about preference curves, the Smith and Aceituno curves?
A Correct.
Q Would you agree with me that the Smith and Aceituno curves are what we would call a composite generated preference curve for many different streams in the Eastern

Sierra?
A Yes. Mr. Aceituno and I looked at 18 different streams in the Eastern Sierra and the purpose of this study was to develop, as you said, a composite data set or habitat criteria set applicable for streams in the Eastern Sierra.
Q Dr. Li, have you ever collected preference criteria?
DR. LI: A Yes, I have.
Q I have a hypothetical for you. Would you as a professional collecting preference data to generate preference curves, would you sample that data or sample the fish preference at only one flow and a particularly low flow?
A No. You tend to get a result that favors your weighted usable area being peaked at that flow.
Q And are there any other biases that you create?
A There would be a tendency to. If one isn't careful, one can oversample in different kinds of habitats. You have to be very careful that you don't change your level of effort to create bias within that to favor pools or runs over riffles, or vice versa.
Q And under this hypothetical question, if you were to be asked if you had a choice of a composite type preference curve or preference curve that was selected under a limited flow regime, and you were asked to design a study, which one would you choose?

A If I had to sample under limited conditions, I would probably favor the composite simply because they are more robust and would reflect a wider range of hydraulic conditions.
Q Mr. Christophel, would you agree or disagree with that?
MR. CHRISTOPHEL: A I would agree with that.
Q Mr. Payne?
MR. PAYNE: A Yes, in general, I would agree with that. I would want to look carefully at the study designs of the two respective sets of criteria.
Q As well?
A Yes.
Q Mr. Smith, you have talked about things that you would like from the Department's perspective to see done and you mentioned a rewatering of, I believe, upper Rush Creek from the existing Grant Dam to the return channel; is that correct?
MR. SMITH: A Yes.
Q Have those recommendations been specifically provided to the State Water Board?
A I don't believe we have made specific recommendations in writing.
Q Are you going to rely then in part on the planning team that's been developing recommendations for Rush and Lee

Vining Creeks?
A In part.
MR. CANADAY: That's all I have.
MR. DEL PIERO: Thank you very much.
MR. SMITH: (Witness) Mr. Del Piero, Mr. Vorster wanted to respond to Mr. Satkowski's question directed to me earlier, and he has not yet had an opportunity.
Would it be okay if he responded at this point?
MR. DEL PIERO: Sure.
DR. VORSTER: A I just wanted to clarify on this 10 percent change that I know having worked with the Department of Water and Power and Southern California Edison on developing ramping criteria for the restoration program, we were using at the time 25 percent change. There was flexibility.
We recognize we have to be flexible within the constraints of the release facilities when we are ramping from a really low flow up to a moderate flow.
For example, if you are going from 20 cfs and you get a 10 percent change, you would only be up to 22 cfs. The valve changes may not be that precise, so we work within that and allow perhaps up to a 25 cfs change.
The 10 percent change Dr. Kondolf was talking about focused on the ramping you would like to see on the high flow, especially on the recession limb.

The ramping criteria from low flows up to still fairly low flows are a different matter. I know working with SCE and DWP and Fish and Game, I think there's a lot of flexibility recognized given the valve constraints.

MR. SATKOWSKI: Mr. Del Piero, I have one point or question I did forget to ask of Dr. Kondolf.

MR. DEL PIERO: Okay.

E X A M I N A T I O N

by MR. SATKOWSKI:

Q I guess Mr. Smith can answer this, too. This is in regard to the runoff year definitions.

The other day I asked about those definitions. It appears, Dr. Kondolf, that you are now proposing for Rush Creek that we, that the Board, go with five different type classifications; is that correct?

DR. KONDOLF: A I am proposing two alternatives, one of which would be five different year classes; yes, that is correct.

Q Two alternatives?

A I'm sorry, I missed that. One alternative is my original year classes which broke the years up into thirds, but since that doesn't fit well into the existing definition of wet, dry and normal, which are based on 20 percentiles, I proposed this alternative which does fit into that.

Q Is Fish and Game recommending -- I believe this

would be a question for Mr. Smith -- recommending that the Board develop year-type criteria for each specific stream or for the Mono Basin as a whole using maybe the major streams Within the Mono Basin?

MR. SMITH: A Each stream should be considered independently with respect to water year type.

MR. SATKOWSKI: Thank you.

MR. DEL PIERO: Thank you very much. That's it, gentlemen.

Mr. Dodge.

MR. DODGE: If this panel is finished, I had a procedural matter.

MR. DEL PIERO: This panel is finished.

MR. DODGE: I would normally call Dr. Stine on tufa probably around Thursday morning, and Ms. Scoonover has suggested that he be paneled with the ranger, David Carle, to which I have no objection. I am not supporting it, but I have no objection.

And I just think we ought to resolve that because I understand Mr. Carle is in the Eastern Sierra and needs to make travel plans.

MR. DEL PIERO: I understand. How many people would be on that particular panel?

MS. SCOONOVER: Two; Dr. Stine and Ranger Carle.

MR. DEL PIERO: Mr. Birmingham, do you want to

reiterate your objection as of this morning so I can rule on it?

MR. BIRMINGHAM: Well, if what State Lands is asking is to present its case out of order, then they should petition the Board to do that and the Board can rule on it.

The only objection that I raised this morning was today is the first day we have had notice of this request and it puts us at a disadvantage in preparing cross-examination that we anticipated doing next week.

MR. DEL PIERO: I am going to rule -- yes, sir.

MR. ROOS-COLLINS: Mr. Del Piero, I request we discuss this specific proposal on the merits in the context of the broader context of the scheduling.

MR. DEL PIERO: We are going to discuss at least for the moment the broader issue also.

MR. BIRMINGHAM: We think, Mr. Del Piero -- may I take a moment and talk with my opposing counsel about the broader issue and maybe this would be a good time to take a recess while the next panel sets up.

MR. DEL PIERO: We can do that. You need to be aware, however, that Board considerations fall into this also. I am pointing that out before we take a break.

MR. DODGE: I didn't hear that.

MR. DEL PIERO: We are going to take a break for ten minutes.

Mr. Birmingham has this burning issue he wants to discuss.

MR. DODGE: You mentioned something about what the Board was doing. I didn't hear that.

MR. DEL PIERO: The Board's considerations in terms of balancing the hearing schedule, and I point that out just so everyone understands that this is not a vacuum.

We will be in recess for ten minutes.

(Recess)

MR. DEL PIERO: We are back in session, ladies and gentlemen.

Where are we?

MR. BIRMINGHAM: Mr. Del Piero, I guess I am the designated spokesperson, but during the recess counsel for all of the parties that are present today got together, and we discussed at some length some concerns that I think are shared by all of us, and we recognize that there are institutional reasons for the State Board to want to conclude this hearing as quickly as it can.

But from the perspective of the Department of Water and Power and I think from the perspective of the other parties that are involved, this is a case which involves very significant complex issues, and conducting the hearing so that we are going late into the evening every night to try and finish the case before Christmas is something that

is very difficult and probably is not going to accomplish the goal.

I think that there is a consensus that if we were to work every day between now and Christmas for long periods, we would not finish the case. There is a feeling among, I believe, counsel for the parties that it's unlikely that we will finish all of the cases in chief of all the parties by Christmas, and when we consider the potential rebuttal, it is extremely unlikely that the case will be finished before Christmas or even the New Year.

Now, Ms. Scoonover has made what under any other circumstances would be a very reasonable request, and that is that she be allowed to present Ranger Carle out of order.

My only objection is based on the fact that between now and the time she proposes to call Ranger Carle, if I am going to sleep, there is not very many hours for me to review his testimony and prepare cross-examination.

What we would like to propose as a group is that we continue to move along as quickly as we can conducting the hearing from early in the morning until early evening, but take a reasonable evening recess so that we can prepare, and then conduct the hearings through the 22nd, and then allow people who have planned vacations to take their vacations during the week between Christmas and New Year's, and then resume with the hearing at the beginning of the year and

move as expeditiously as we can to conclude it so that the Board can then look to other very important issues that are going to confront the Board in the near future.

But our case is being affected by the pace that has been set and the hours that we are attempting to keep. Parties are combining witnesses on different subjects. It limits our ability to cross-examine them.

And the Hearing Officer has shown us great leniency in extending the time period and we appreciate that, but it does present a problem and I hope that you can understand that.

So, that's our proposal and I do think that we all feel the same way and we have discussed it with the staff, and we know staff doesn't control anything around here, Mr. Frink points that out to us frequently, but it is something that I am not sure how staff feels about it, but it is a concern for us not only in terms of our own comfort and well-being, but for the Department of Water and Power and the presentation of its case.

MS. SCOONOVER: Mr. Del Piero, my concern is similar but on a little different vein. Aside from the fact that I have personal holiday plans, as you are well aware, my concern is as a representative of two of the smaller parties in the hearing, that the smaller parties be afforded an opportunity to present their cases and to do it in an

orderly fashion.

I think it is going to be difficult for anyone and the Forest Service is already on record as pointing this out to be able to marshal their witnesses between the Christmas and New Year holidays, and to present their cases orderly in the way they would normally wish to do, so on behalf of one of the representatives of a couple of the smaller parties, we would simply request an opportunity to present our case orderly and combining them in panels with others, if that works out, but with some idea of what the schedule is going to be over the next two weeks to plan for and make travel arrangements and to allow others adequate time to prepare for our witnesses.

MR. DEL PIERO: Mr. Dodge.

MR. DODGE: We support some of what Mr. Birmingham said. I think that there is something to the idea that if you go late into the night it is very hard to prepare for the next day, and indeed, I personally have some doubts as to, assuming that -- and as I do, the witnesses have something to say that is important, then I am concerned about the efficacy of going night after night late.

That is not to say we shouldn't do it occasionally.

I am also concerned, and this is mostly based on rumor, but I understand that the Department of Water and Power has a substantial rebuttal case, and if that's so, and

if the Board is going to offer the same deference to a rebuttal case that it has to a case in chief, then realistically this is not going to be done by the end of 1993.

So, I mean, that's a concern and I guess the question is, if that's so, why are we going at this pace?

One point where I don't agree with Mr. Birmingham is that I believe that we ought to make an effort to work between Christmas and New Year's, assuming that witnesses can be available, I think that the attorneys ought to be available, and if that were necessary to finish everyone's case in chief, then I would certainly support that.

One thing that comes to mind, although Mr. Birmingham did not state it directly, one solution that comes to mind is to try to get everyone's case in chief into evidence and then take a fairly substantial break.

MR. ROOS-COLLINS: Mr. Del Piero, let me begin by thanking Mr. Birmingham for having the courage to present our joint position regarding these schedules for this hearing.

I am like Mr. Dodge, I believe that it was almost entirely accurate and it is a summary of our joint position.

Let me add my personal circumstances which I previously apprised you of. As of the 22nd, I will be away from California on Christmas vacation.

MR. DEL PIERO: When do you return?

MR. ROOS-COLLINS: On the 29th. Ms. Koehler will also be absent starting the 21st, although she is willing to change her plan and depart on the 22nd, if Cal Trout must present some part of its case on the 21st.

Short of changing our holiday plans, which take both Ms. Koehler and me away from California from the 22nd through the 29th, we will not be present for the week after Christmas or the 22nd.

MR. DEL PIERO: Are your witnesses available prior to the 22nd?

MR. ROOS-COLLINS: I have checked with most of them and most of them are available this week.

MR. DEL PIERO: Or by Wednesday of next week?

MR. ROOS-COLLINS: Or Monday or Tuesday of next week. Having pled my personal case, let me make a substantive recommendation to you respectfully for the continuance of this hearing.

I would recommend, as I have on several occasions, that this Board modify its procedures so as to expedite the conclusion of this hearing.

I would specifically recommend that you allow an extension of the 20 minutes granted to any person on cross-examination, not on the general showing which we have all made since this hearing began, but instead, on the basis of

a very specific showing that some matter which is important to the Board deserves further attention from that attorney. Absent such a specific showing, no extension would be granted.

That procedure would enforce discipline on all of us, including me that we have hoped for but not, in fact, achieved so far in this hearing.

I also would recommend that you specify before the rebuttal testimony begins what issues are of greatest concern to the Board. Clearly, that would focus our testimony considerably.

Thirdly, I would recommend that you set very firm limits on the presentation of rebuttal testimony, both in terms of the issues I just discussed and in terms of time so that we can conclude the rebuttal testimony in a more expedited way than we did our cases in chief.

Thank you.

MR. DEL PIERO: Thank you very much.

Ms. Cahill.

MS. CAHILL: On this subject or with the panel?

MR. DEL PIERO: On this subject.

MS. CAHILL: I have nothing to add to what has been said.

MR. DEL PIERO: Mr. Thomas.

MR. THOMAS: I think we will pass, having the last

panel in front of you.
MR. DEL PIERO: Mr. Dodge.
MR. DODGE: It seems to me quite unfair, and particularly unfair to Los Angeles to change the rules on 20 minutes at this point on a extension of time on a lot of issues, and candidly, they are facing several parties, and I don't think that's fair.
MR. DEL PIERO: Mr. Birmingham.
MR. BIRMINGHAM: In response to what Mr. Dodge said about our position, the Department of Water and Power certainly is willing to work during the week between Christmas and New Year's. I personally have no plans.
Mr. Pollak has no plans and our witnesses --
MR. DEL PIERO: That's not what he said to me.
MR. POLLAK: Mr. Del Piero, I have no plans as of a minute ago (laughter).
MR. DEL PIERO: Changed your mind, okay. I am wrong.
MR. BIRMINGHAM: The Forest Service, I did see a letter from the Forest Service and it outlined the problem its witnesses have, and I know the holiday is a period when many many people make arrangements to travel and being with their families, and fortunately, my family is very close and so it doesn't require time to be with them during that period, but my suggestion was not for our personal benefit

or the benefit of the Department because we are willing to proceed during that week, but I know there are many people whose plans are different.

And given that the Board isn't going to be able to make a decision in this case until the final Environmental Impact Report is certified, which is some months down the road, in terms of this case, and I recognize that there are many other issues confronting the State Board that are of great importance to the State, but in terms of this case, there isn't a need to finish it immediately.

MR. DEL PIERO: Ms. Scoonover.

MS. SCOONOVER: One more quick comment. I have spoken to the Great Basin Air Pollution Control District, and Air Resources Board, and a few others of the parties who are not represented today, and they all have checked with their witnesses and are having difficulties assuring that witnesses will be present the week between Christmas and New Year's. They were all under the impression since they have not seen the notice yet, that it was not going to happen.

I think some of them would be surprised to hear Mr. Dodge and Mr. Birmingham will be here, and I think since it is now down to the lower end of the food chain, we are all to be presenting our cases now, and those parties may be seriously affected in their ability to present their case.

MR. ROOS-COLLINS: Mr. Del Piero, Mr. Dodge does

have a fine nose for fairness. If my proposal regarding limiting cross-examination might in any way be perceived as unfair to Los Angeles, then I recommend that you apply that to the rebuttal case only.

MR. DEL PIERO: Is everybody done?

Well, I am going to tell you what my inclination is. I have got to talk to my Board members. I will tell you what my inclination is and I will tell you what I am going to propose to them, and that doesn't necessarily mean they are going to buy it, but I will tell you what I propose.

We have six days after today before we break before Christmas for the holiday, Wednesday, Thursday, Friday of this week; Monday, Tuesday and Wednesday of next week; am I correct, six days?

Fish and Game is done today.

Mr. Dodge, how many days do you anticipate putting on your case?

I need to point out for the record that, albeit Mr. Birmingham has been concerned about the lateness of the hour of the hearings, the fact of the matter is we have only gone past seven o'clock, I think, one night, so inasmuch as this has been going on for two months --

MR. BIRMINGHAM: It's two or three nights, Mr. Del Piero.

MR. DEL PIERO: I think we only went past ten

o'clock --
MR. DODGE: Well, you know, with all the normal caveats, and I wish Mr. Flinn were here -- we have various witnesses who have been designated politicians or whatever, and I hope you have read that stuff, and I am calling --
MR. DEL PIERO: I always read the comments of politicians.
MR. DODGE: I am calling Mr. Flinn to see how many of those people are going to show up, but basically, our case --
MR. DEL PIERO: That doesn't necessitate a response.
MR. BIRMINGHAM: There is a serious procedural issue that's raised with respect to the proposed testimony of the Commissioner of the Bureau of Reclamation, Mr. Beard, and Congressman George Miller, neither of whom submitted written testimony.
And so, although I would love the opportunity to cross-examine Mr. Beard and Mr. Miller, I don't know that they have any testimony to submit.
MR. DODGE: I am just trying to respond. If the case goes as I want it to go, I am trying to respond as to how long it is going to take and if Mr. Birmingham can shortcut it, it won't take as long.
We are going to have Mr. Vorster whose testimony, depending on the cross-examination, I would estimate at half

a day. I believe that we are going to have -- it is one or two panels of economists -- two panels, water supply and economists, two panels I am told.

We have Dr. Stine, who I believe is going to be combined with Ranger Carle on tufa. I would expect that to take half a day or a little more.

We have Tom's panel, as you know, which I would expect to take two-thirds of a day.

And then finally, we in Cal Trout in some way that I am not totally aware of, will present a panel of the planning team folks, Woody Trihey, Jean Baldrige and Carl Mesick, and I would expect that to be a day.

And then, Scott Stine has very brief testimony on visual matters and I think -- don't hold me to it, but I think that's the sum and substance of our testimony except for the political sorts.

MR. DEL PIERO: Ms. Scoonover, do you have other witnesses?

MS. SCOONOVER: For the State Lands, just the two witnesses.

MR. DEL PIERO: Mr. Roos-Collins.

MR. ROOS-COLLINS: We anticipate that our remaining witnesses will all testify during the Mono Lake Committee's case in chief.

MR. DEL PIERO: I pointed out we have six days. I

also pointed out regularly throughout the best part of the last two weeks to everyone to anticipate going into the evenings this week and through the last day before Christmas.

If we can get done with the direct testimony for all parties by the 22nd, it seems to me that it would appropriate to take a break.

I will ask the Board members whether or not they are willing to do that. It strikes me that if we are to do that and we take a break between Christmas and New Year's, it might be appropriate to take a two-week break so that we would begin again the second week of January, and if we are to begin the second week of January in terms of rebuttal, Mr. Roos-Collins, great minds move in the same direction because I had anticipated placing a limit on petitions for extension of time during the rebuttal phase of this hearing.

At this point in time, I am inclined to indicate to you that obviously this is all subject to approval by my colleagues, and that extensions will be granted only for a very specific showing of good cause as to why that extension is necessary.

Now, again, this is only as to the rebuttal portion of the case and won't apply during the balance of the direct testimony.

That is not to say I am not going to grant it, but

Mr. Birmingham's well worn justification for extensions that has been used frequently and liberally by all of you isn't necessarily going to cut it during the rebuttal phase.

And I am going to talk to the Board members, it probably wont' be today, but I will try to do it tomorrow morning and at the latest by tomorrow afternoon and see whether or not they are willing to buy into that.

I anticipate that if we do this, we will be successful, and I am willing to make this representation to my Board members so that everyone understands in this room that we will be successful in completing the rebuttal phase of this process within ten working days after we begin again in January, which means we will be done the third week in January, the third week, the last Friday.

If anybody has any heartburn with that, before I go and talk to the members of the Board, I want to hear about it.

Mr. Birmingham.

MR. BIRMINGHAM: I have no heartburn with what you have said, but --

MR. DEL PIERO: Does that sound reasonable?

MR. BIRMINGHAM: The reason that I stood up was after the Mono Lake/National Audubon Society and Cal Trout conclude their case, Ms. Scoonover would present the case on behalf of her clients, or will have done so before probably

next Tuesday, but it sounds as if Mr. Dodge's case probably would take at least until next Monday. We would then have four or five additional parties to present their cases in pretty short order.

MR. DEL PIERO: Which four or five?

MR. BIRMINGHAM: Great Basin Unified Air Pollution Control District, California Air Resources Board, EPA has presented their case, the State Regional Water Quality Control Board -- they have not presented any evidence.

MR. DEL PIERO: I don't think they are going to make a presentation.

MR. BIRMINGHAM: And we have the Sierra Club. We also have Mr. Haselton and associates on behalf of Mr. Arcularius.

MR. HASELTON: We have only Mr. Arcularius.

MR. BIRMINGHAM: The U. S. Fish and Wildlife Service has to present its case, and the Forest Service.

MS. SCOONOVER: Metropolitan Water District.

MR. DEL PIERO: Mr. Quinn is not going to be available. I've already discussed this with Mr. Stubchaer, so I can give you relative certainty that we are going to take care of Mr. Quinn probably through a deposition sometime after the first of the year.

MR. BIRMINGHAM: So, actually, it is in excess of five additional parties that would have to present their

cases in two days, and I wonder about the ability to complete the presentation of that evidence within that two-day period.

MR. DODGE: I have a general recollection that the Forest Service had a slough of people.

MR. BIRMINGHAM: It has a number of witnesses.

MR. DEL PIERO: One panel.

MR. CANADAY: The Forest Service has two witnesses. They would be willing to panel if there was a tufa panel.

Dennis Martin, who is the Forest Supervisor, all he needs is notice is my understanding. He is on the east side.

The one witness I do know whose availability is in question is Luci McKee.

MR. DEL PIERO: Is she here?

MR. CANADAY: No, she is back east.

MR. DEL PIERO: And she is one that is not available between Christmas and --

MS. SCOONOVER: That is my understanding.

MR. DEL PIERO: Is she available this week?

MR. CANADAY: I am not sure.

MS. MANDELBAUM: I believe she is already out of town, I have been told.

MR. FRINK: Mr. Del Piero, in order that our record is complete and Mr. Gibbons is confident I relayed his

communication, we have received a letter from the Forest Service's attorney advising us that in the absence of being notified of additional hearing dates until relatively recently, that he does not believe, and that may have changed in the case of individual witnesses, but his letter stated that most or all of their witnesses would be unavailable through the end of the year.

I don't have the letter in front of me, but that was the gist of it.

I know Jim has talked to some of the witnesses and they as individuals have indicated they would be available, but I did want to get on the record Mr. Gibbons' letter.

MR. DEL PIERO: I appreciate that. I appreciate the fact he has not been here so he hasn't had the opportunity of hearing the announcement that we were going to have additional days.

MR. DODGE: I just had a question. Mr. Canaday mentioned tufa witnesses. Are you suggesting that this person join the panel?

MR. CANADAY: I am notifying you of their availability to participate.

MR. DODGE: Do you know who this person is?

MR. CANADAY: Nancy Upham and their landscape architect individual who intends to testify on tufa issues for the Forest Service.

MR. BIRMINGHAM: Ms. Upham was not listed as a witness of the Forest Service on visual and recreational issues. The proposed subject of her testimony was policy and the Management Plan.

MR. CANADAY: But that goes to the tufa issue of lake levels and impacting the visual resources under which the scenic area is managed.

MR. DODGE: I don't have any objection to their joining the panel if someone can find me a copy of their testimony.

MS. SCOONOVER: I have some concern in that this panel is leaning more and more towards tufa only, and the Department of Parks and Recreation and the State Lands Commission have interests much broader then tufa issues.

MR. DEL PIERO: Don't be concerned lest that is somehow going to focus everyone's attention on tufa because it is not. I recognize there are other issues involved. You articulated your concern. It is not a concern for me. It won't be a concern for the Board. We can take care of that during the course of the testimony.

I need to notify Mr. Gipsman.

MR. FRINK: About what?

MR. DEL PIERO: About having his witnesses here.

MR. FRINK: Next week?

MR. DEL PIERO: Yes.

MS. SCOONOVER: He is planning on being here starting Thursday morning.

MR. DODGE: He has a tufa witness. I am just taking Mr. Canaday's word for it.

Can we encourage that person to be here?

MR. DEL PIERO: Mr. Canaday, will you notify them --

MR. CANADAY: What day?

MR. DODGE: We don't have a ruling yet. What we are trying to do is Thursday morning.

MR. DEL PIERO: I anticipate that.

I am sorry, Mr. Birmingham, coffee and no-doze work effectively for some, my sterling personality may be enough to keep us all the way; if not, my apologies, but it is not that I haven't stated it frequently enough over the course of the last two or three weeks that we were going into the night this week and next week in order to try and at least get the direct testimony portion of this done within the time line that the Board laid out originally, and I would point out it has been the representation of both the Governor of the State of California and the Mayor of the City of Los Angeles -- both of those gentlemen indicated that the Board was going to have the hearing done on this matter by the end of this year to the assembled media for the largest metropolitan area on the face of the earth and I am going to try and do my best to at least achieve one

portion of that stated goal.

MR. BIRMINGHAM: Mr. Del Piero, unfortunately the Mayor of the City of Los Angeles frequently does many things without consulting with the attorneys representing the Department of Water and Power.

But I prepared based upon what the Hearing Officer said last week to cross-examine the witnesses of the Department of Fish and Game, Mono Lake Committee and those individuals Mr. Roos-Collins said would be presented with the Mono Lake Committee witnesses.

This, again, is the first day I have heard about the tufa panel, however we want to designate it, and I am not prepared to cross-examine State Lands or Parks witnesses. I am prepared to cross-examine Dr. Stine, not Ranger Carle.

I will make every effort to prepare to cross-examine the witnesses from the Forest Service, but I want to say that this is the first that we have heard of the change in order of presentation and all we can do is try. We will make every effort.

MR. DEL PIERO: Mr. Birmingham, I appreciate your effort and I know as well as everyone else in this room knows that this process has been going on not for days or weeks or months, but years.

Had this process gone more quickly, and I am probably to blame for that for having been as accommodating

to all of the requests and of all of the witnesses that have been presented, we would have arrived at the point during the course of the presentation of the individual party's cases where State Lands would probably be on by now and the representatives of the Los Angeles Department of Water and Power would have been obliged to have prepared to cross-examine those witnesses.

It is a process, and the speed by which this process has been going on is not necessarily easily controlled by any of us. So, we have to all try to accommodate the situation as best we can.

Sometimes things move very quickly as now. Sometimes, as was the case with certain witnesses on economics, things move very slowly, Mr. Birmingham, as I am sure you know very well.

Okay, we have a panel. Ms. Cahill, let's go.

MS. CAHILL: You have to basically mentally divide this panel. We are going to be dealing with Walker and Parker, which are two of the Mono Basin tributaries which logically combine themselves after Rush and Lee Vining complete the Mono Basin presentation, and then, we also have all of the Owens River, Owens Valley issues. We have the upper Owens River, Crowley Lake, middle Owens River.

The reason why these people are combined in addition to speed is that EBASCO did the reports on Walker, Parker

and the upper Owens, and so the EBASCO representatives would have been involved in both of those basins in any case.

I would just very briefly like to remind the Hearing Officer that in its opening statement the Department of Fish and Game indicated that it was perfectly appropriate for the Board to look at Owens River to the extent it is affected by Mono Basin water rights at issue here, but we don't believe this to be the appropriate proceeding to actually set flows, particularly in the middle Owens River.

I would like to introduce the panelists. We have Gary Wolff from RCE. He was subcontractor to EBASCO on the three streams.

Next to him is Dr. Richard Sitts. He was Project Manager for EBASCO of those studies.

Gary Smith will be sitting on this panel in case there are questions regarding the Department of Fish and Game. He will have no additional direct presentation.

Next to him is Curtis Milliron, who is an employee of the Department who will speak on Crowley Lake issues.

And finally, Steven Parmenter, also from the Department, will speak on middle Owens River.

I would like to begin with Dr. Sitts. He is the only one of these witnesses who has any kind of a lengthy presentation at all. Two of them will simply incorporate their testimony. One other has a very short presentation.

None of them have been sworn.
(Whereupon the witnesses were sworn.)
RICHARD M. SITTS,
having been sworn, testified as follows:
DIRECT EXAMINATION
by MS. CAHILL:
Q Dr. Sitts, we will begin with you. Would you please state your name and spell it for the record?
A I am Richard Sitts, S-i-t-t-s.
Q And where are you employed, Dr. Sitts?
A I am employed by EBASCO Environmental and work in their Sacramento office.
Q And have you had opportunity to examine DFG Exhibit 17?
A Yes, I have.
Q And is that your testimony regarding Walker and Parker and South Parker Creeks?
A Yes, it is.
Q And have you had the opportunity to examine Department of Fish and Game Exhibit 25?
A Yes, I have.
Q And is that your testimony with regard to the upper Owens River?
A Yes.
Q Do you have corrections to make to that testimony?

A Yes, I do. They are the errata that you have.
Q With the changes indicated on this errata sheet, are Exhibit DFG 17 and 25 true and correct copies of your testimony in this matter?
A Yes.
MR. BIRMINGHAM: I wonder if we could identify the errata sheet that has been passed out by the Department of Fish and Game as DFG Exhibit 17-A?
MS. CAHILL: I was about to ask staff how they would like to do that.
MR. DEL PIERO: Exhibit 17-A for this errata.
MR. SATKOWSKI: I have it.
MR. DEL PIERO: Done.
MS. CAHILL: Q Dr. Sitts, have you also had an opportunity to review DFG Exhibits 56 through 63?
A Yes, I have.
Q And are those reports for projects on which you were the Project Manager?
A Yes, they are.
Q And are you familiar with the DFG Exhibit 64?
A Yes.
Q And is that also a report on which you were Project Manager?
A That's correct.
Q And briefly, while we are identifying exhibits, are

you familiar with DFG Exhibit 106, which is an aerial of the upper Owens River?
A Yes.
Q And that's the one back on the board?
A Yes.
Q And do you know what year that photo was taken?
A 1944, I believe it is.
Q And DFG 107, which is covered up, do you know what that exhibit is?
A Yes.
Q Could you describe it, please?
A Yes, it's a partial mosiac of a section of upper Owens River in the summer of 1990.
Q Have you had the opportunity to review the testimony submitted by others as DFG Exhibits 26 through 47?
A Yes, I have.
Q And are the people who submitted that testimony, were they either employees or subcontractors to EBASCO in the studies on which you are going to be testifying?
A Yes.
Q And did you contact each of those persons and ask them to submit that testimony?
A Yes, I did.
Q And have you reviewed that testimony and is it correct with regard to the subject areas in which each

person worked?
A Yes.
Q Would you briefly summarize for us your education and experience?
A Certainly. I have a Bachelor's Degree in Zoology and a Master's and Ph.D. in ecology, all from the University of California at Davis.
Since 1982, I have been employed by EBASCO Environmental. I am now a supervising scientist working on a number of multidisciplinary environmental projects.
Q Would you please briefly summarize your testimony as it relates to Walker, Parker and South Parker Creeks?
A Yes. The purpose of the studies on Parker, Walker and South Parker, were to provide plans to restore and optimize degraded aquatic and riparian environments on those three creeks downstream of the conduit. Each of the streams is a tributary of Rush Creek. The creeks have been diverted completely several months annually until they were continuously rewatered beginning in October of 1990.
There were habitat degradations remaining after that rewatering which did itself improve conditions and continues to do so.
The work we undertook was multidisciplinary in nature, hydrology, geomorphology, geobiology, restoration. We did not use the instream flow incremental methodology on

those streams. The studies took place during field work and took place mainly during the summer of 1990 and some into 1991.

The recommendations that came out of the work that's in the exhibits was as follows:

To continue the court-ordered flows except with the modification of the flushing flows. In the case of Parker Creek the flushing flows now recommended were in the range of 25 to 40 cfs, and on Walker in the neighborhood of 15 to 30 cfs, and they were recommended to occur for one to four days only and to be watched and monitored during the course of that time to make sure they were not causing problems.

We also recommended constructing a bypass channel around the conduit for purposes of establishing stream continuity between reaches above and below that facility.

We also recommended removing other migration barriers for fish, highway crossings and the parshall flumes.

Further, we recommended installation of some structures into the stream to create fish habitat.

And on the stream banks we recommended revegetation of riparian areas that essentially balanced what would have been estimated to have been lost over the course of about 40 years.

Along with vegetation, we also recommended fences to

exclude livestock from the areas.

The flow regime and the related conditions we recommended be re-examined after five years, i.e., 1995, and again, perhaps five years later, and before any of the measures were implemented some review at the time would be helpful as the continuing flows are providing some ongoing restoration.

The final recommendation, I would just like to point out, is that we recommended the use of consideration of distributary channels downstream of the conduit on Parker. On Walker Creek there are old channels there. They have been identified and are readily apparent. These could be used to minimize the adverse effect of erosion in the riparian areas of the stream channel and restoration achieved by distributing the high flows that would be coming down there in the runoff period.

We recommend that this, however, happen only after the assurance that the channels can handle the capacities that are likely to come down and stream integrity is in place, and it be done on a trial basis, and if it seems to work, to continue on.

Q Dr. Sitts, would you briefly summarize your testimony with regard to the upper Owens River study.

A The upper Owens River, just briefly on some geography, this is Figure 1 in our upper Owens report. In

the insert we have Grant Lake on Rush Creek which is this point diversion into Mono Craters Tunnel which empties at East Portal into the upper Owens River.

East Portal is here. Upstream is Big Springs, a major source of water.

And then, from East Portal to Lake Crowley there's about 20 miles of stream channel. It is the area that we studied in detail.

A couple of key features are the North Ditch around Inaja, a diversion. The electrical transmission line crossing here is the beginning of the public property section of the river which extends all the way to Lake Crowley and is owned by Los Angeles.

Hot Creek comes in with three tributaries, and they come in at various points above the crossing here, which has a recreational area and the following couple of miles of channel.

That's a little geography and now to continue on, the hydrology data that we evaluated indicated that before the diversions began, there may have been an average annual flow just below East Portal in the neighborhood of 76 cfs. Over the course of the 1941-89 period, the estimate was that the average annual flow was 168 cfs. We were up 92 cfs on average for the year.

The apparent effects were erosion, widening of the

channel, straightening of the channel, cutoff meander beds, and we undertook to get a handle on what the conditions were in our effort to come forth with recommendations for streamflows for brown and rainbow trout, and plans for aquatic and riparian habitat development and management. The approach, again, was multidisciplinary. There were over a dozen specialty studies done to put this together.

We did use the instream flow incremental methodology with PHABSIM. We made most of our field observations in the summer of 1990 and some in 1991. These were at base-line flow conditions following the injunction. We were not getting export from Mono Lake Basin at the time.

The major unknown during the course of our study was the amount of water that would be available from Mono Basin, so in coming up with streamflow recommendations we took a couple of conditions and tried to give a range of expectations and some guidance on what might work best for fish in terms of export regime and timing.

The conditions we looked at were base-line conditions with no export, and then we looked at augmentation with exports, and I will just briefly cover the base-line. Base-line, typical average back to the 76 cfs, we had a substantial amount of fish habitat, and if I could show a few curves.

This is a figure from our Upper Owens River Report,

DFG Exhibit 62. We have area versus flow curves and 76, the base-line flow for brown trout here, is in the neighborhood of about a quarter of a million square feet of habitat. And for rainbows, we are also talking in the neighborhood of about a quarter of a million, three hundred thousand square feet, under base-line flow conditions, and under those conditions, continuous flow from the Portal area all the way down to the lake.

MR. DEL PIERO: You didn't model the area above the fork?

A No, our study area commences at the East Portal and extends to Lake Crowley.

We also found that the study area, East Portal to Lake Crowley, the base-line conditions were within the range that provided what we felt were clean spawning gravel-sized sediments along the surface of the stream. We felt that there were no barriers to the movement of fish between Crowley and the Portal.

The biomass of the trout we found was up around 346 or so pounds per acre in the upper reach, and declined in the lower reach, both for rainbow and brown trout.

The aquatic macrophytes, the large plants attached to the bottom of these channels like common Elodea and some of the others were a concern. We found them up to 30 percent coverage in some sections of the river and lower in

others. We felt they were cover for trout and under those conditions didn't serve as a problem.

We expected enough flow for riparian vegetation.

Under base-line there would be some above optimum temperatures for trout below Hot Creek on the warmest summer days. There were irrigation diversions under base-line conditions. And as they were at the time, they would be unscreened and there would be a loss of fish to those as well as a concurrent loss of trout habitat in the river depending upon the amount of flow diverted.

We also had some concerns about arsenic below the confluence of Hot Creek which we believe comes from natural sources in Hot Creek.

So, that's a picture of base-line conditions.

So, what about the augmentation situation? What gives the most habitat fish as our assignment was, so we started there and the top line here is the square symbols. It is greatest at about half a million acre-feet at about 250 cfs, flowing at East Portal.

MS. CAHILL: Q Dr. Sitts, which life stage is that?

A That's the adult life stage. It puts all the other life stages within 80 percent of their maximum.

MR. DEL PIERO: You targeted the adult stage?

A We discussed it more than the others, and certainly, started there. And in this case, we did go for maximum

habitat for the adult life stage.
MR. HERRERA: As you point to these various figures, will you identify them for the record?
A Yes. The top figure is Figure 42 from DFG Exhibit 62, our Upper Owens River Report. It is for brown trout.
MR. HERRERA: As you go through your presentation, identify them so it is clear in the record what you are pointing to.
A Surely, I will try to do that. We didn't recommend 250 cfs. It caused a few concerns. One was that it was indicated that above 200 or so cfs roughly we began to lose some of this clean spawning gravel that lies over the streambed. We get more erosion going on.
MR. DEL PIERO: Does that straighten out the channel?
A We will come to that.
Also, 250 tends to go overbank, not too much of a floodplain, but pasture flooding.
So, we came down 50 cfs and took a look at 200; 200 cfs in Figure 42 here puts brown trout still way up in adults in terms of the maximum. These conditions are high up on the possibility for the other life stages as well, for both brown trout and rainbow trout.
It was within optimum range for maintaining the gravel bed. It provided also flows that would keep

temperatures downstream of Hot Creek in cool conditions, optimum conditions for fish. It would also dilute some of the arsenic downstream of Hot Creek.

As I mentioned before, the average under the '41 to '89 period was about 168 cfs, so on the annual average we never even get to 200.

At that point, we took a look at taking a block of water from the Mono Lake Basin and putting it in the upper Owens and what the benefits might be to running it out in a short frame of time versus a longer, and we took a 10,000 acre-foot block. In the course of two months you would get another 80 or so cfs over that time. We would go from the base-line of 76 or so up to about 150. You would go way up the curve. You would get a lot of habitat area for that short period of time, and then after that was done, you would go back then to the bottom and there would be more advantage to spawning life stages of either species with a summer augmentation just over two months.

At 10,000 acre-feet released over ten months with an average of about 17 cfs, the increase in habitat area would occur for all life stages on a range perhaps around ten percent for all life stages, adult and spawning and so forth, and in the balance we felt that there would be some advantages to running a lower release to cultivate fish and fish habitat, and we recommended that.

In conclusion, the flow recommendations that came out of the upper Owens work were to preserve the natural in-basin supplies in the upper Owens, to minimize the diversions along the upper Owens, and to release some augmentation from Mono Basin that was rather constant over the months of the year starting about July 1, after knowing how much water might be available.

In regard to the habitat and the plans for developing it, we came up with a couple of recommendations; one, the channel straightening that you mentioned and the meander bends were cut off in a number of cases, a couple of miles of stream lost, and there we recommended that those be re-established, and we identified a couple of likely candidates to see if it would work.

We recommended trying to do structural things or reconfigurations to minimize entrainment losses in the irrigation diversions.

We tried to keep livestock and people disturbance to riparian areas to the minimum and with that come back and provide more habitat for fish and improve the fish; and then, finally, kind of maintain the improvements and keep an eye on them and adjust them accordingly.

In summary, that's our report.

MS. CAHILL: Q Dr. Sitts, before you conclude, could you take a look at the photo mosaic and tell us what

those represent?
A We are looking at a section of the upper Owens River.
MR. DEL PIERO: Mr. Arcularius's ranch?
A It's the Inaja. This image is right here where North Ditch takes off downstream from Arcularius.
MR. DEL PIERO: I flew over it. I recognize it.
A It is to portray the rather sinuous flat character of the valley and the river at this point along with the presence of operating diversions for irrigation or for bypass to keep the flows in this section low. This Inaja bypass reach here is particularly interesting because it provides some view of conditions before the diversions as this North Ditch took a lot of the surplus flow, and this channel, even though it is small didn't have any of the cutoffs.
MR. DEL PIERO: When you are flying in on the mammoth airways from Los Angeles it comes straight down the valley. You go right over the Inaja and Arcularius to the airport. The day I came up to the hearing I got to see that.
A Sometimes the more recent approaches from the air show a rather lightened band of ungrazed pasture, a very direct clear border along the stretch where they implement a program to have some exclusion of cattle in that area.

MS. CAHILL: Mr. Herrera reminds me to identify DFG Exhibit 107 for the record.

Q Dr. Sitts, do you know when that photograph was taken?

A Yes, it was taken the 1st of August, 1990.

MS. CAHILL: Thank you, Dr. Sitts.

GARY WOLFF,

having been sworn, testified as follows:

DIRECT EXAMINATION

by MS. CAHILL:

Q Mr. Wolff, would you please state your name and spell it for the record?

A Yes. Gary Wolff, W-o-l-f-f.

Q Mr. Wolff, have you had the opportunity to review DFG Exhibit 28?

A Yes, I have.

Q And is that a true and correct copy of your testimony in this matter?

A Yes, it is.

Q And have you had the opportunity to review DFG Exhibit 29?

A Yes.

Q Would you briefly summarize your qualifications for us?

A Okay. I have a Bachelor's Degree in Civil

Engineering from Colorado State University awarded in 1980. I received a Master of Science Degree in Civil Engineering in 1983 from the University of Washington, and that was with emphasis in surface water hydrology and hydraulics.

Since finishing graduate school in 1983, between 1983 and 1989, I was employed by the Simons-Li Associates, Fort Collins, Colorado, as a hydraulic engineer working on a variety of water resource projects with a particular focus on sediment transport.

From 1989 until the present, I have been employed by Resource Consultants and Engineers formerly called Water Engineering and Technology as a senior engineer, and again, my responsibilities have been in the water resources area with a particular focus on sediment transport studies.

Q Water Engineering and Technology?

A That's right, WET.

Q And was WET a subcontractor to EBASCO and the Walker River, Parker, South Parker and upper Owens River studies?

A Yes, we were.

Q Would you briefly describe the work you did on those studies.

A On each one of the streams that we studied I was responsible for the hydrologic, hydraulic and sediment transport analysis, basically the qualitative analyses that were performed. I also worked very carefully with Karen

Fisher, the project geomorphologist, and I will just say I am well aware of the work she did and I understand it.

MS. CAHILL: Thank you very much.

CURTIS MILLIRON

having been sworn, testified as follows:

DIRECT EXAMINATION

by MS. CAHILL:

Q Mr. Milliron, Would you please state your name and spell it for the record?

A My name is Curtis Milliron, M-i-l-l-i-r-o-n.

Q Mr. Milliron, have you reviewed DFG Exhibit 48?

A I have.

Q Is it a true and correct copy of your testimony?

A Yes, it is.

Q Do you have any corrections to make to it?

A No, I do not.

Q Have you reviewed DFG Exhibit 49?

A Yes, I have.

Q And is it a true and correct copy of your qualifications?

A Yes.

Q Would you please summarize your education and experience for us?

A I have a Bachelor's Degree in fishery biology from Oregon State University in 1980. I have 20 years of

experience working on fisheries management and research on both lakes, rivers, streams, and since 1984, I have been working with the California Department of Fish and Game.

Since 1986, I have been working on Crowley Reservoir, and in 1987, I took over the management of Crowley Lake Reservoir.

Q Have you had an opportunity to review DFG Exhibits 107 through 111?

A Yes, I have.

Q And are those exhibits that you submitted to accompany your testimony here?

A Yes, they are.

Q Would you please summarize your testimony?

A Crowley Lake is a fishery of great importance to the State of California and probably even more so to the residents of Southern California, who use the lake extensively throughout the six-month season.

The Department of Fish and Game manages Crowley Lake in a different way than we manage most of our other water because of its rich productivity.

First, fish are put into Crowley Lake under the management scheme called Put and Grow where we put fish in at a smaller size than we do many of our roadside waters, generally ranging from three to ten fish per pond, and we do that in either August or September. The following season

starts the last Saturday in April and anglers are generally catching fish over a pound and about 12 to 14 inches in length. So, it is a very productive system. It grows many tons of fish.

The six-month season is divided into two parts. The first three months is a catch-and-keep oriented fishery that has been with us for many years, really since the lake filled. The regulations for that fishery are five fish maybe kept each angling day. Regular regulations in terms of year restrictions apply, so it is a very liberal fishery and many tons of fish are taken each year.

The second season, or the last three months of the six-month season are regulated quite differently. This is a trophy-oriented fishery. Fish must be at least eighteen inches total length to be possessed and only two fish may be taken. Barber's hooks and other restrictive angling methods apply.

Also, in the lake there is a very popular Sacramento perch fishery. Sacramento perch are important in their own right as a popular fishery, and also, they provide large numbers of forage for large trout.

The Department, in 1989, started a round of studies that I managed to better understand the performance of the various strains of trout we plant, the growth of these fish, the catch rates, and understand the self-sustaining wild

trout population, including their migration patterns into upper Owens River.

Those studies are still ongoing and we will develop a Crowley Lake Management Plan this year from the results.

It is apparent to me that the temporary cessation of Mono Basin flows, along with California's worst drought on record, have, when taken together, had minimal impact on the Crowley Lake fisheries. Opening weekend and seasonal catch rates compare well with historic records. The growth of trout seems to be as good as it has ever been.

Our data does show, though, that the catch of trophy-sized trout as a percentage of the total catch has declined during the late season in those years when reservoir storage is greatly reduced after August, or when water storage is at very low levels.

The trophy-sized trout are still in the lake, we believe, and we are quite confident of that. However, they have just taken up residence in a different portion of the lake. Instead of being near the surface and providing top water fishery action, they are down deeper where they make their living, which makes them less available to anglers.

Therefore, I conclude and agree with the Draft EIR that a five percent reduction in Crowley Lake surface area, which is described as the worst-case scenario in the DEIR will have minimal impact to this fishery as a Whole.

The Department of Fish and Game does take the position that water stored in Crowley Lake should be managed to protect and enhance the trophy fishery. For example, maintaining stable lake levels during the aquatic vegetative growth season when combined with a minimum late season storage requirement, will result in enhancement of the trophy trout fishery.

MS. CAHILL: Thank you.

STEVEN C. PARMENTER

having been sworn, testified as follows:

DIRECT EXAMINATION

by MS. CAHILL:

Q Mr. Parmenter, would you please state your name and spell it for the record.

A Yes. My name is Steven C. Parmenter, P-a-r-m-e-n-t-e-r.

Q Mr. Parmenter, how are you currently employed?

A I am an Associate Biologist with the Department of Fish and Game.

Q And have you reviewed DFG Exhibit 50?

A Yes.

Q And is it a true and correct copy of your testimony?

A It is.

Q Do you have any changes to make?

A No.

Q Have you reviewed DFG Exhibit 51?
A Yes, I have.
Q And is it a true and correct copy of your resume'?
A It is.
Q And would you briefly summarize your education and experience for us.
A I have a Bachelor's Degree in Biology with honors from the University of California, Santa Cruz. I spent an additional year studying Limnology at the University of Uppsala in Sweden.

I have five years of technical experience in hydrology and fisheries management.

In addition to that, I served three years as Aquatic Biologist for Kings River Conservation District, San Joaquin Valley.

And I spent the last five years as a Fishery Biologist in the Bishop office of the Department of Fish and Game.
Q And what is your role with regard to the Department's wild trout program?
A Since January, '91, I have held a position specializing in the management of the more exceptional wild trout and steelhead resources in the Eastern Sierra and Southern California region. I conduct fishery investigations of management planning in concert with the local area

biologists and with the Department's statewide wild trout project in Sacramento.
Q And in that capacity, you are familiar with the middle Owens River; is that correct?
A Yes, it is one of the designated wild trout waters.
MS. CAHILL: Thank you.
MR. DEL PIERO: How was Big Bear's hearing yesterday?
A Much better than the prior ones, I would say.
MR. DEL PIERO: Sorry I missed you. It's over.
A That's the important part.
MR. DEL PIERO: This panel is being offered on behalf of the Department?
MS. CAHILL: That is correct.
MR. DEL PIERO: Mr. Birmingham -- Mr. Dodge.
MR. DODGE: Can we take a two-minute break?
MR. DEL PIERO: We can take a ten-minute break. I have two phone calls to make.
(Recess;
MR. DEL PIERO: Ladies and gentlemen, this hearing will again come to order.
I told some of you, I think I mentioned it earlier this morning, but I will state it again. We are going to break at 5:15. We will return at 7:15, which will give us a two-hour break for dinner.

MR. DODGE: On the break, Mr. Chairman, we find our schedule, our remaining major panel, and we are shooting to do that Monday morning. We have two of the three people available and we are checking on the third.

MR. DEL PIERO: Mr. Birmingham, you may proceed.

CROSS-EXAMINATION

by MR. BIRMINGHAM:

Q First, let me just make sure I get everybody straight. Mr. Wolff and Dr. Sitts, you are here testifying about three different topics; is that right?

MR. WOLFF: A Basically, three streams.

Q You prepared a study on Walker Creek; is that correct?

DR. SITTS: A That's correct.

Q Is that the study on Parker Creek?

A That is correct.

Q And a study on the upper Owens River?

A Yes.

MR. WOLFF: A Yes.

Q How many pages in the study on the upper Owens River?

DR. SITTS: A Over 200.

Q On the Walker Creek, how many pages is that study?

A We are a little over 100 on those.

Q On Walker and Parker it is about 120 for each

report; isn't it?
A That's right.
MR. BIRMINGHAM: I am making my showing so when I ask for more time.
MR. DEL PIERO: You don't have to do it for this. I only indicated that for rebuttal and the Board still has to approve that. And I am willing to acknowledge you have a major task before you and I am willing to grant you the appropriate time.
MR. BIRMINGHAM: Thank you.
Q Mr. Milliron, you said you are the Manager of the Department of Fish and Game's Crowley Lake program; is that correct?
MR. MILLIRON: A Yes, it is.
Q I would like to ask you, you said you took over that program in 1987; is that right?
A Yes'
Q I have got an article here from the Los Angeles Times. I am showing you this article from the Los Angeles Times dated October 21, 1985. Have you ever seen this article before?
A 1985, I probably have not seen that article. I have seen many articles on Crowley; this one, no.
Q There's a headline that says, one of the best kept fishing secrets, and then there is the date.

00197

MR. DEL PIERO: And they are printing it in the L. A. Times.

MR. DODGE: There is no foundation for reading the article.

MR. BIRMINGHAM: I am asking the witness a question about an opinion that's expressed in the article, and I think I am entitled to cross-examine on the basis of opinions that Mr. Milliron has expressed.

Q This is an article that appears to be about Crowley Lake; is that correct?

A It appears so.

Q There is a Department of Fish and Game biologist by the name of Darrell Wong quoted in this article. I will read his statement:

The articles says, and this is in the first column, Department of Fish and Game Biologist, Darrell Wong, himself a fly fisherman: We are talking world class fly fishing. I'm not expert, but I'm catching 18 and 19-inch brown trout with no trouble.

I am going to ask you to assume Mr. Wong said that. Would you agree with Mr. Wong that through the period of the mid-eighties Crowley Lake was a world class fly-fishing site?

A I would agree with Mr. Wong they caught fish with no trouble and I would agree that Crowley Lake was a very

desirable fishery. World class is a little nebulous, but it is certainly an impressive fishery.
Q Now, Mr. Milliron, you testified about a study that you conducted since 1989 concerning the fishing success of Crowley Lake?
A Yes.
Q And I believe it states in your testimony that since diversions were reduced, the impact on fishing success at Crowley Lake has been minimal; is that correct?
A Yes.
Q The data that you collected are data that relate to fishing success for planted trout; is that correct?
A Fishing success for all trout and for Sacramento perch as well.
Q Do you have specific data that relates to wild trout for Crowley Lake since 1989?
A There has been a collection of all trout data, so I do have data that included wild trout, and since we mark hatchery trout we can, by reference, understand the wild trout catch as well.
Q Now, is it correct that since 1989, the fishing success with respect to wild trout at Crowley Lake has declined?
A That, I don't know. It may be available within the data that has been collected, but I could not say that right

off.
Q You can't tell us what the percentage of wild trout at Crowley Lake is right now, the percentage of the fish that have been taken?
A You are going to have to be more specific, Mr. Birmingham, because there's two different seasons at Crowley. I know more about the one season where we see a lot more fish which have been marked. The second season is a lot more difficult to characterize in that sense because most of the fish, even those that are of legal size, are returned to the lake.
Q Well, let's talk about the 1992 season. You collected data in 1992, Mr. Milliron?
A Yes, we did.
Q Now with respect to the first half of the season, what was the percentage of wild trout that comprised the fish taken at Crowley Lake?
A I don't know the actual number. That's not within my direction. I can only give you a qualitative answer, and that would be, as it has been in the past, the vast majority of fish that are taken the first three months of the season are the fish that were planted the year previous by the Department of Fish and Game.
Q Now, you state that's consistent with the history of the fishery at Crowley?

00200

A Yes.
Q It is correct; isn't it, that in the mid-sixties most of the fish that were being taken at Crowley were wild trout?
A I don't believe that's correct.
Q Now you said that there has been a decline in what you refer to as the trophy trout?
A Yes.
Q I don't mean to be argumentative, is that a nebulous trout trophy?
A Trophy-size trout may be another term. We define trophy size as greater than 18 inches. Sometimes we say greater than 15. It is just a term we used to gauge from year to year either a trend, or in the case of an 18-inch size, that's the total length, it's a term used to define a legal size fish.

During the second season, and I also said that it wasn't a decline in the population as far as we can discern, but rather, a decline in the catchability of the fish or their availability to anglers.
Q Now, do you have any empirical data on which you are basing your statement that there is not a population decline?
A There is some professional judgment as well as some empirical evidence. I can get into that, if you would like.

00201

Q What are the empirical data that you have that the population of trophy-sized trout hasn't declined in Crowley Lake since 1989?

A There's a good representation of large trout in the early season catch; that is, it is either consistent or over what we have seen pre and past opening weekend surveys which is our most consistent record of data, and anglers are able to catch large fish.

We are certainly able to catch large fish with our DFG sampling methods, but the methods that anglers employ to catch those large fish has changed, and that, I believe, is in direct relation to the management of water storage at Crowley Lake.

Q Now, in your testimony you talked about some kind of a management proposal that the Department of Fish and Game has.

A No, the studies that I have been conducting since 1989 will ultimately be used to craft a Department Crowley Lake Management Plan.

Q But you haven't made that Management Plan public?

A It's in progress.

Q So the answer to my question is yes?

A It is no, it is not a public document at this time.

Q Now, let me ask you a question, Mr. Milliron, in your professional judgment, are two years of data an

adequate basis for making conclusions about the condition of a fishery under a changed flow regime?
A I would hesitate to answer that question without more information. Could you draw a clearer picture?
Q Your testimony indicates you have collected two years' worth of data about the fishery at Crowley since diversions out of Mono Basin terminated; isn't that correct?
A We have collected many years of data at Crowley since the lake has really been stocked. There's been many many years of opening weekend angler interview data. I have had an active angler interview program for the last two years which has intensified and has resulted in a season-long study.
Q But your testimony makes a comparison between the conditions that existed when water was being exported from the Mono Basin and conditions that existed at Crowley after exports from the Mono Basin were terminated; isn't that correct?
A Yes, it does.
Q And the comparison that you make is based on two years of data, 1991 and 1992?
A We had a full 1993 season which just concluded.
Q The testimony that you have submitted was based upon 1991 and 1992 data; is that correct?
A Yes.

Q Now, let me ask you again in the context of the opinions that you have expressed about the comparison in your testimony, are two years of data an adequate basis for making conclusions about the condition of the fishery under different flow regimes?

MR. DODGE: Objection, asked and answered.

MR. DEL PIERO: Overruled. Answer the question.

A In this particular instance, I believe they are, and the reason for that is because Crowley is a very productive system and it is very quick and fast reacting.

We put in a third of a million fish in August and September and by the following year the performance of those fish is well known to us. They either grow and are there to be caught, or they are not. That's an oversimplification, of course, but the turnover, the time for when we make a management move to when we get a response from that management is very rapid.

MR. BIRMINGHAM: At this point, I would make the same request I made this morning of the Department of Fish and Game, that we be provided copies of the data related to the take of wild versus planted fish at Crowley Lake in 1991 and 1992.

MR. DEL PIERO: I think the testimony was they had summaries of all types and in order to get the information on wild trout, a function had to take