WORKSHOP

STATE WATER RESOURCES CONTROL BOARD

STATE OF CALIFORNIA

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Subject: ***Review of Water Quality Standards for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary***

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Held in
Resources Building
Sacramento, California

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Tuesday, June 14, 1994
10:00 a.m.

VOLUME III

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A P P E A R A N C E S

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BARBARA LEIDIGH, Senior Counsel

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TUESDAY, JUNE 14, 1994, 10:00 A.M.

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MR. CAFFREY: Good morning and welcome to this third workshop on Bay-Delta standards.

My name is John Caffrey, Chairman of the State Water Resources Control Board.

Let the record show that we have a full Board present.

By way of introduction at the dias in the front of the room, to your far right is our Executive Director, Mr. Walt Pettit. Then, to Mr. Pettit's right is our Board member Marc Del Piero; next to Mr. Del Piero is Board member Mary Jane Forster. To my right, your left, is Board Vice Chairman James Stubchaer, and next to Mr. Stubchaer is Board member John Brown.

Welcome to you all.

We have two very important staff members with us at the table in front of the dias, Mr. Tom Howard, our Senior Engineer on the Delta; and Barbara Leidigh, who is our Counsel for this matter.

Also, on the front row is Gail Linck, who is here to assist us.

I hope that all those wishing to speak have submitted your blue cards. I know in the past people do tend to come up when they hear something they want to

comment on. I guess that certainly is allowable, but if you think you want to speak and you are holding back now, we would appreciate the submission of a card because there are a lot of people wishing to speak today on a very important subject, and we want to make sure we have a fairly good idea of the amount of time we are going to be taking today to accommodate everybody.

A lot of people have flight arrangements that they have to keep, so with that, let me read the following statement.

This is the third of four scheduled workshops of the State Water Resources Control Board to hear comments and recommendations regarding the water quality standards for the Bay-Delta estuary.

If you intend to speak today, please fill out a blue card and give it to our staff at the front table.

As you know, the comments and recommendations received during this series of workshops will be used to prepare a draft water quality control plan. We expect to release a draft in December of 1994. About two months after the draft is released, we will hold a hearing on the draft. After the hearing, we will make whatever changes are needed and provide copies of the revised draft to the interested parties, and then, hold a Board meeting to considerer it for adoption.

The procedures for today's workshop are described in the notice for today. Additional copies of the notice are available from staff.

This workshop and the workshop in July will be informal and today we want to hear from the parties on the key issues specified for this workshop. Each party will have 20 minutes for an oral presentation. A party may be represented by one or several speakers. If a party needs additional time, the party's representative may request additional time at the beginning of the presentation.

Please explain why the additional time is necessary.

If we are not able to provide you all the time that you think you need, we encourage you to submit your presentation in writing. We would only limit you out of respect for the needs of other participants.

In the interest of time, we ask that parties avoid reiterating details already presented by other parties whenever possible and simply indicate agreement. Alternatively, parties with the same interests are welcome and encouraged to make joint presentations.

We will also accept and we encourage written comments. You need to provide the Board and staff 20 copies of any written comments and recommendations, and make copies available to the other parties who are here

today.

A court reporter is present and will prepare a transcript. If you desire a copy of the transcript, you must make arrangements with the court reporter.

There will be no sworn testimony or cross-examination of the parties, but the Board members and staff may ask clarifying questions.

I do have a number of cards today. When I finish the statement, I will read off the order that they are in so you can get an idea of when you might be called upon to speak.

We also have other days scheduled, including tomorrow. We will have to see how things proceed today. We also have this evening available. I am not sure I am inclined to go into the evening if we have a number of speakers yet to go by today's end, and we might just go over to tomorrow.

In any event, we will keep you apprised as we proceed through the day as to what the schedule looks like in terms of the progress we are making. We will try to accommodate you in every way we can.

Key issues today:

A. What factors, excluding diversions, contribute to the decline of fish and wildlife resources dependent on the Bay-Delta estuary?

B. What modifications have the State Water Project and the Central Valley Project made to their operations to protect endangered species and other species of concern?

C. What effect do upstream water projects, other than the Central Valley Project and State Water Project, have on the fish and wildlife resources of the Bay-Delta estuary?

D. What are the status and trends of biological resources in the Bay-Delta estuary?

Other key issues will be discussed at the final workshop in July. Today's notice listed the subjects we plan to discuss in July.

With regard to the order in which we will call the parties, we will first call elected officials of State, Federal and local governments; and secondly, representatives of State, Federal and local agencies; and third, all others in the order that your speaker card was submitted to staff, unless you have special time constraints which you have noted on your speaker card.

We do have a few that have time constraints and we will do what we can to accommodate you as the day goes on.

I do want to say again that the Board very much encourages the parties to work together to try and build whatever consensus they can.

I have repeated this now in the other two workshops and I do want to say that we do hear that several of you are working together to try and develop alternatives for the Board to consider, and that has been somewhat obvious in your presentations and we appreciate that very much.

That completes today's statement.

Do any of the Board members wish to add anything to what I have said?

Mr. Howard, I believe you were going to give us a synopsis like you gave us last time, which was very helpful in our workshop.

Good morning, sir.

MR. HOWARD: Good morning. My name is Tom Howard. I am an engineer in the Delta program, and as Chairman Caffrey said, I would like to briefly synthesize what I heard anyway at the last workshop.

On May 16, the Board held its second workshop to review the Bay-Delta standards. The workshop identified three key issues for discussion. The first key issue requested comments on the principal ESA issues that the Board should consider during this review.

Based on the oral comments received at the workshop, there was consensus among the participants that the Board should take a multispecies approach to adopting fish and wildlife standards for the estuary. Some of the

participants expressed the opinion that such an approach should be comprehensive and should consider the requirements of the biological opinions for winter-run chinook salmon and Delta smelt. Other participants stated that the Board should not adopt the requirements of the biological opinions as State water quality standards because this would eliminate what flexibility the projects presently have to negotiate changes in the Endangered Species Act requirements.

Of course, even if the requirements in the biological opinions are not included in the draft plan, a true multispecies approach would provide some protection for the endangered species.

Lastly, it was suggested that the Board carefully consider the water supply impacts of the Endangered Species Act requirements when developing new draft standards.

The second issue requested input on the effects of diversions throughout the Bay-Delta estuary. Comments by the workshop participants generally fell into two categories.

First, some participants believe that the impacts associated with diversions are largely attributable to the Central Valley Project and the State Water Project. Therefore, they believed the Board should focus its

attention on these two projects.

The second group of participants believed that there's a great deal of uncertainty about the relative effects of the project and non-project diversions and the Board should consider non-project diversions during this review.

Of particular concern is the large number of unscreened and inadequately screened diversions throughout the watershed.

Lastly, some participants expressed concern about the relative impacts of diversions in comparison to other factors such as introduced species, fishing pressure and pollutant loads. That's actually a subject of discussion for this workshop and we would hope that we will hear some more about that issue.

The third key issue solicited comments on what methods the Board should use to analyze the water supply environmental effects of alternative standards. Workship participants suggested the use of numerous models, including operation models such as DWRSIM and PROSIM, Delta SOS, Daily SOS and EBMUDSIM model for the Mokelumne River.

Fisheries models that were recommended included a couple of models from the Department of Fish and Game -- its striped bass model and a range of estuarine fisheries

models that they have developed.

Also recommended were the U. S. Fish and Wildlife Service's salmon smolt survival model and the California chinook salmon population model.

Lastly, a recommendation was made that the Board should analyze the hydro-power effects of alternative standards.

I would like to point out that two of the participants, the Northern California Power Agency and the Department of Water Resources, have offered to run their respective operations and power models for the Board in this analysis of the potential standards, and staff has begun discussions with these people to take advantage of these offers.

The last comment I would like to make is that some of the participants suggested that meetings be held to help the parties formulate their recommendations on alternative standards and perhaps develop consensus among the interest groups.

I would like to inform the Board that staff has been attending meetings on these issues and staff will continue to be available upon the request of participants to provide any help that we can.

This concludes my comments regarding the May workshop. Are there any questions from the Board?

MR. CAFFREY: Thank you very much, Mr. Howard.

Are there questions from Board members of Mr. Howard at this time?

MR. STUBCHAER: A good summary.

MR. CAFFREY: A good summary, thank you very much.

Mr. Pettit, did you wish to make any comments?

MR. PETTIT: Thanks, Mr. Chairman, I would just emphasize the last comment that Mr. Howard made.

As you recall at the last workshop, several of the parties requested that the Board take a more proactive role in attempting to forge a consensus between the various parties, and I think at this point a Board-mandated task force or committee would probably not only be untimely, but probably would not necessarily be productive, so we are not proposing to set up any formal process like that.

However, given the Board's instruction, we are certainly willing to meet with the parties and help facilitate agreements as much as we possibly can.

We are going to have to try and walk the line, I think, between helping and getting in the way, and sometimes that seems to be a fairly fine line. So, we would offer help if any of the parties have any specific ways in which they think we can assist facilitating agreements and providing information, and we would

certainly appreciate hearing from you.

You could contact anyone of the staff or Board members and we will attempt to follow up.

I think the only caveat I would put on that is bear in mind Mr. Howard is running on a pretty low budget operation at this time.

That's all, Mr. Chairman.

MR. CAFFREY: I appreciate your comments, Mr. Pettit.

I want to reiterate what you said. We, as Board members, since we are presiding in this matter, it's not advisable for us to be meeting and discussing the details of any kind of a consensus agreement, but I heard Mr. Pettit say that he is available, he and his staff are available if you wish to contact him, and presumably, you would be contacting him hopefully as groups of individuals that may be in the process of building consensus.

So, we appreciate that and we will see what that brings us.

I am now going to quickly read the list of the stack of cards I have to give you an idea of where you are in the list, so to speak. This is the order that we will take people unless we get some kind of emergency situation where somebody has to request that they be put someplace else in the order:

Perry Hergesell, Dave Anderson, Roger Patterson, Jim Feider, Fred Schneiter, Richard Ferreira, Dave Whitridge, and then we will have a coordinated or joint presentation from the following: Lyle Hoag, Tom Berliner, Laura King, Steve Arakawa -- that would be the group. Then, we have Cliff Schulz, Sandra Dunn, Chris Horsley, Richard Golb, Jim Chatigny, David Guy and Dr. Russell Brown.

If you submitted a card and I didn't read it, please let us know right away.

Anything else from the Board members before we begin with the cards?

All right. Perry Hergesell. Good to see you again, sir.

MR. HERGESELL: Good morning, Mr. Caffrey and Board and staff.

For the record, my name is Perry Hergesell. I am Chief of the Bay-Delta Special Water Projects Division in Stockton.

Today Dick Daniel from our Environmental Services Division is also here.

I will make a presentation and he will be available with me to respond to any questions you may have on various aspects of our presentation.

In that process I plan to take just a few minutes

today to summarize our comments regarding the four issues of interest that were noticed for today's workshop, and that is because we provided you with a fairly lengthy written response and you can refer to that for the needed details that might be there.

MR. CAFFREY: For the record, Mr. Hergesell, just for the record, I don't believe you mentioned you are with the Department of Fish and Game. I think you mentioned everything else, and for those in the audience that may not know you, I wanted them to know that.

Please, as you come up, identify yourselves and the organization that you are serving.

Go ahead.

MR. HERGESELL: I am with the Department of Fish and Game.

The first issue deals with, as you have noticed, what factors other than diversions, contribute to the decline of fish and wildlife resources in the estuary, and in our submittal we suggested there are probably at least five factors that are sometimes considered important, or at least contributing to the declines or possibly inhibiting recovery of those resources.

And the first of those is the introduced species which you heard some reference to in Tom's presentation earlier on.

Our assessment is simply stated, and that is that introductions have caused some major changes in the fish fauna of the estuary, particularly in the freshwater portions of the system. The most obvious effects have occurred due to introductions in the 19th century, probably from 1850 on, and those were associated with introduction of oysters and other species that were brought in from the East Coast.

The introductions since 1950, however, have caused substantial changes in the aquatic invertebrates and have established large populations of several species of smaller fish, but in looking at the data they have not coincided with the principal declines in other fish populations. Hence, the bottom line from our perspective is that there is not a strong empirical case for recent introductions being a principal cause of decline in species such as striped bass and Delta smelt.

But, on the other hand, there is some uncertainty both as to the effects these introductions may have had on some species and as to whether the introductions may make recovery of previously abundant species more difficult.

The second factor which we talk about in our presentation is food limitation. While many biologists suggest or suspect that food limitations may have played some role in the decline of fish populations, particularly

striped bass, our position is that while some degree of limitation probably exists, there is no direct evidence of starvation that has been found. There have been some studies funded by the University of California to look into that, but as of today there is no evidence that shows starvation is an issue.

The third factor is toxicity. We believe there is some clear evidence of some harm from toxics and this fact warrants more effective management, but we feel that the overall consequences of this harm cannot be estimated.

Further, given the major pollutant abatement action that your Board has been involved in during the last 20 years and some evidence of lessening effect of pollution, we find it difficult to believe that pollutants are a principal cause of the widespread decline in fishery resources which has occurred in the last 20 or so years.

A fourth factor is legal harvest. Undoubtedly, legal harvest decreases the number of spawning adults and the average age of those adults, but the real question is whether harvest inhibits the population's ability to maintain itself or, in fact, is responsible for observed changes in abundance.

In every case where harvest rates have been measured for fish populations that inhabit the Bay and Delta system, no evidence was found indicating that the

rates were either excessive or were primarily responsible for recent declines in fish stocks.

And just for some anecdotal information, you can look at other species that are not harvested in the system and see if they declined substantially at the same time. Look at the Delta smelt, splittail and longfin smelt. They are not necessarily harvested in any way and they have certainly declined coincidentally with the other species that are harvested.

The fifth factor we will mention today before moving on is illegal harvest. We have investigated the principal questions of illegal take in the Delta of salmon and striped bass and have concluded, at least for salmon, illegal take does not have a significant effect on resources as a whole.

However, the data indicates that the illegal take of striped bass very likely reduces the population of adult fish. It seems unlikely, however, that a legal harvest of sublegal bass in itself is the dominant factor causing the decline in adult bass abundance since 1969.

The second issue we have no comment on today regarding the water project effects and the biological opinions. The water people can address those issues for you.

The next issue that is of concern to us on today's

agenda is issue 3, the effects of upstream water projects.

First of all, we want to make the point that fisheries habitat in the tributaries to the Delta is of vital importance to the efforts to restore the health of the Bay and the Delta, or the estuary itself, and that over time water development on these tributaries has affected the fishery habitat in a number of ways.

First of all, it has resulted in modifications to flows, it has resulted in the loss of upstream holding, spawning and rearing habitat. It has increased water temperatures to lethal levels in some cases, and it has increased mortality at the diversion structures due to entrainment through unscreened or poorly screened diversions.

And as a result of all this, actions to improve fishery habitat, including increased instream flows in the tributaries, are an essential part of the overall restoration of the estuary.

In recognition of this, our Department has prepared an action plan which includes today's recommendations for habitat restoration measures, and we have provided that as part of our testimony today.

The most important recommendations are the proposed increases in instream flow and the temperature criteria for different rivers.

Our exhibit also provides some graphic presentations of these needs for various streams and river courses, and I would ask you to look at those. They are very nice, three dimensional depictions of present-day standards, and what we would propose to have for those streams.

A basic premise for our position is that in order to restore the ecosystem to some semblance of its former productivity, we need to look at the system as a whole, and in our opinion, part of this look would require you or your Board or your staff to develop a methodology to require diverters, other than the State Water Project and the Central Valley Project, to provide a fair-share portion of Delta outflow.

We have provided some suggestions regarding such methods in previous testimony and these methods include the designation of a volume of storage in each reservoir over a certain size for use in meeting Delta standards, and it includes the development of models to determine if and when additional flows are needed to protect the Bay-Delta estuary, and then, from those models we feel one would be able to assign additional outflow requirements for the various tributaries based on the ratio of unimpaired flows in the various watersheds.

That's a very quick description of that and there's

more detail in there, and we can certainly respond to that at the end of my presentation if you are interested.

Finally, issue 4, status and trends of biological resources of the estuary. This provides most of our written presentation.

In previous phases of these proceedings we have provided updates and status and trends of organisms. In today's submission we again provide approximately 40 pages of text and figures that update that information.

All I will say about that information is that taken as a whole it seems to show that the ability of the estuary to maintain consistent levels of abundant species has been altered over the years. Our treatment deals with organisms spanning different phytoplankton to salmon, and the preponderance of the data show a downward trend in abundance of these organisms during the last ten to fifteen years.

For specifics, I encourage you to look at our submission. Even if you can only scan the figures that we provided, I think that alone will give you a sense of conditions in the estuary.

That's, really, all I wanted to say. We want to be very brief, and as I say, Dick is here to answer any questions you have on upriver issues and I can answer questions on the other issues.

MR. CAFFREY: Thank you, Mr. Hergesell.

Do the Board members have any questions at this time? Staff?

Thank you, sir. We appreciate your being here.

David Anderson. Good morning.

MR. ANDERSON: Good morning, Mr. Chairman and members of the Board.

My name is David Anderson and I am with the Department of Water Resources.

Our presentation today will be in two parts. I will present the first part in summary fashion which addresses basically issues 1 and 3, and Ed Winkler will provide some comments on issue No. 2. This may take longer than 20 minutes, so I hope the Board will find that to be okay. We will try not to take too much longer. Ed has some interesting and important things to say on No. 2.

MR. CAFFREY: We will be the judge of that, Mr. Anderson.

MR. ANDERSON: I'm sure you will.

MR. CAFFREY: Let me say, having risked being a little too facetious, unless there is objection from fellow Board members, I would be inclined to give you 30 minutes because you are making a two-person presentation, and we are interested in what the project, as well as

others have to say, so please try to keep it within the 30 minutes.

MR. ANDERSON: Thanks very much.

As to issue No. 4, we aren't going to be presenting any specific information. We haven't seen what the Department of Fish and Game has provided you, but otherwise, we know that the Bay-Delta Oversight Council is putting out some information on the status and trends of biological resources in the estuary, and also, we will be commending to you later on the work we did in 1992 and submitted to the Board as DWR Exhibit No. 30 for the interim hearing that was part of the D-1630 process.

MR. DEL PIERO: Mr. Anderson, is that all in our records of the D-1630 hearings?

MR. ANDERSON: Yes, it is.

We think it is very appropriate, obviously, that the Board is looking at other factors other than Delta diversions. We think it is also appropriate for the Board to be looking at Delta diversions as one of the primary things that is both controllable and under Board jurisdiction.

Nonetheless, these other factors are extremely important in the Board's planning program. Whether they are ultimately the subject of direct Board regulation or not, they do serve to define in great measure the

reasonableness of the objectives in terms of conditions that the Board will, in fact, be establishing in the process for water use, including Delta diversions.

Water 1(a) says that if dramatically curbing water usage yields only a small benefit or small increase in abundance because other factors that are not under the Board's jurisdiction are controlling, then we may be concluding that severe regulation is not reasonable, or that if these other factors are themselves controllable by others and are more cost effective from an economic, environmental and social point of view, then perhaps it is best to do those than to regulate or add an increment of water regulation.

In addition, the comprehensive view which I think the Board is forming here is very important in forming the basis for some comprehensive plan for the State that puts all planning, management and regulatory options on the table.

At a minimum, the role of water use regulation may be more clearly seen in the context of a broader policy program for the Delta.

The Board's first issue asked specifically about all the other factors, factors other than diversions in the estuary that affect fish and wildlife.

As I said just a few moments ago, we do offer to

the Board and commend to it rereading the WRINT DWR 30 that was prepared by Dr. Brown in the summer of 1992 and presented to the Board. It contains a thorough summary of both project related impacts and impacts of other factors such as introduced species, changes in food chain, pollutants, unscreened diversions, and adverse upstream and downstrewam conditions.

I think it is important to see project impacts, including diversions, in the context of other factors that may be affecting Delta biological resources.

For purposes of brevity, I am only going to go through the list of these other factors and make a few brief comments. I assume that others, as Fish and Game has, others will be commenting in more detail upon these non-diversion factors.

The first point is introduced species. It is a truism that the Delta is a highly modified biological system. In March of 1992, we presented information to the Board at a hearing held, and I will preface this by saying that probably the best sampler in the Delta was by the fish salvage facilities at the State and Federal export pumps, and in 1992 we reported to the Board that our 1991 composition of species showed that of the species that were sampled that were salvaged there at the State facilities, 96 percent were specimens from introduced

species. Only 4 percent were native species, and 98 percent at the Federal facilities.

We are talking about a system which has undergone, as Perry was indicating, substantial modification over the years, and it is this system, this species composition with this pervasive influence of exotic species that is the system that the Board is looking at to protect through its mechanisms, and properly so.

The other point that Perry also talked about was that species composition may affect the efficacy of the measures the Board may be looking at in terms of recovery.

So, we think introduced species is a very important topic.

Further modification has occurred in the system in terms of nutrient loading at the bottom of the food chain.

The past hundred years of building dams, levees, diking and filling wetlands has reduced the loading of land derived detritus which is thought to be an important source of nutrients, a primary nutrient source for the estuary.

In addition, over the past 40 years reduced floating organic waste through waste treatment have also taken away what might have been an important nutrient source at the base of the estuary's food chain.

Reports that have been recently done for Chesapeake

Bay, but studies have not been done here yet, suggest that detritus in sewage outfall is being considered as a possible source of the cause of the striped bass declines on the East Coast.

On upstream conditions, I will simply say that the things upstream that are obviously influencing species most in the estuary influence anadromous fish, salmon and steelhead. Other than that, it is the reduction or the depletion of flows, the development that has occurred over the last 40 years upstream, both in terms of direct diversion and storage projects.

We reported on that, introduced some evidence to the Environmental Protection Agency in our comments on this proposed rule, and we made that evidence available to the Board also.

Climatic conditions: The two major climatic conditions that affect the estuary are drought and flood. Particularly important when we look back upon the decade of the eighties, we had one of the most severe droughts in our history, I guess the most severe, fluctuated by two years of extreme high water, flood events, 1983 and 1986. 1983 was the wettest year on record; 1986, in terms of flood control, taxed the system in February more than any event in history.

When we later on considered the issue of declines,

what constitutes decline, simply responding to climatic events, I think we cannot forget we have had a very unique experience over the last 10 or 12 years of a very dry period with a couple of extreme floods, following what is generally considered to be one of the wettest periods of record and probably beneficial for the Bay-Delta biota.

Then, there's levee systems, there's harvests that Perry spoke of, too, both legal and illegal, and we think there's some evidence that the illegal take is quite substantial, although, as we point out in our remarks, it's the kind of thing that is not really susceptible to any sort of precise quantification.

As to the legal harvest of fish, I think we have to note that the harvest rate tends to have a greater and greater impact on fish and game species as population increases and other sources of biological stress on species increase.

A high percentage of harvest may be tolerable when other factors influencing biological resources are not at reduced levels. But over time that's going to change with increasing population growth and development and greater demand placed upon resources.

What may have been a perfectly healthy harvest rate when there were 10 million Californians may not be the same when now there are 30 million Californians, and the

pressures that that kind of population brings to bear upon the resources of the estuary.

Pollutants is our last item and, of course, the first thing we notice, as Perry did, is that the control of pollutants is one of the Board's primary functions under its various authorities to regulate waste discharge.

During the 1630 hearings the toxicity of urban and agricultural runoff and toxicity in agricultural drains was newly raised and studies done, I believe, under both the Board and the Regional Board auspices, and in particular, I am given to understand that the pesticide Diazinon has been implicated as having acute effects on organisms practically everwhere in the rivers and the estuaries.

What we would like to do since this is a matter of direct Board interest and authority, is to request that the Board staff report on these things in this forum, not necessarily today but perhaps at the next hearing, or at some workshop convened for that purpose to tell us what the latest news is on the effect of toxics in the estuary and in the river system.

Having noted these several categories of factors that affect Bay-Delta biological resources, I note that we have rephrased the issue from factors that cause the decline of Bay-Delta resources and we have done that on

purpose. We do think that when people talk about declines, it does serve to focus people's attention and spur them to action and take note of serious important problems, and that's good, but in terms of predicting structuring the manner in which we are going to go about addressing these problems, we think it is an unfortunate formulation.

To begin with, I think it starts to suggest there is some sort of uniform or homogeneous decline that has been occurring from a common starting point and having a common contour, and I don't think that's true; and the second thing and the main point, is that it misdirects our attention from asking what today is affecting those resources, biological resources in the estuary, and what today may be done to afford reasonable protection for them. That may or may not have something to do with what may have caused them to decline at some point in the past.

We talked about the lack of homogeneity of the decline. What we were asking the Board to do is look at the individual species and see how they have behaved and not to indulge in some sort of general over-arching view on this until it has looked at these things.

Some say the decline has occurred since the late 60s to the early 1970s. That's one of the rationales that the EPA has used for picking that period.

I note in my comments that adult striped bass did not decline until after 1977. I think that ought to be modified to say Fish and Game has presented evidence that there was a first-level decline starting about 1969. I think, again, Perry Hergesell referred to that and we would accept it.

Certainly, there was another blip in the decline after 1977. We think the population has been relatively stable for the last dozen years.

But now, the Delta smelt didn't decline until 1982. Is this the same decline as we have observed for striped bass? On Delta smelt some say the period since 1982 has been one of general smelt decline while others look at the same abundance indices and say, no, the smelt have been increasing since 1985, and yet, others will take a look at it and note the extreme variability in smelt populations and say there is no trend. I think there is a lot of judgment in the formulation of this concept of decline.

I think what is important for the Board to do is to be looking at what is beneficial in the biological resources in the estuary, take a look at the things that are affecting them and influencing them today and determine what may reasonably be done to better that situation.

The second problem with asking about the causes of

decline is that we don't think it is necessarily relevant. What is relevant, as I have just said, is what is today adversely affecting the viability of fish and wildlife populations. What today limits the population may have nothing to do with what might have caused it to decline.

Moreover, there may exist many options for addressing a problem irrespective of what caused that problem and they all should be investigated.

People talk about, using the metaphor, you enter a room by one door does not mean that you have to leave it by the same door. There may be various other ways of approaching the problem, especially when you consider that this thing is moving, that the estuary is constantly changing.

The last point I would make is focusing on the decline has a further drawback. Declines which have several material causes may not be evidence or may not occur until the last cause has been applied, has matured. It may then seem like the last cause was the only cause, whereas, in reality it is merely the one that sparks the decline. I think this seems fairly common sense in an estuary in which we have many factors at play. One would suspect when change occurs many factors are responsible.

More importantly, we think this viewpoint, harking back to what I think is the central issue for the Board,

it does not help us to make the one important decision we have to make, which is irrespective of chronology, which happened first or which happened second, how do we choose as a matter of public policy among the several factors that may together affect the estuary's biological resources even as we balance the control of these factors against the need for greater protection of instream uses.

That ends my comments. I would like to turn the mike over to Ed Winkler.

MR. CAFFREY: Thank you, Mr. Anderson.

Good morning, Mr. Winkler.

MR. WINKLER: Good morning, Mr. Chairman and Board members.

I am Ed Winkler. I am with the Department of Water Resources, Division of Operation and Maintenance.

I am here today to discuss question 2, which is, what modifications has the State Water Project and Central Valley Project made to their operations to protect endangered species and other species of concern.

As I am sure you are all aware, there have been a host of new federal regulations put in place the last two years to protect the endangered winter-run chinook salmon and the threatened Delta smelt. I will briefly describe these regulations from the two key biological opinions; that would be the National Marine Fisheries Service

biological opinion to protect winter-run salmon and the U. S. Fish and Wildlife Service opinion for Delta smelt.

I will then discuss the major operational ramifications experienced over the last two years, and I will then present the water supply impacts that the projects have experienced.

Now, starting with the first slide, I will go over what the criteria are currently. I will start with 1994, since that's what we are dealing with currently. This is Figure 2 in your handout package and this is the colored version.

Let me, first, just describe the graphics. Across the top are the months of the year and on the left side you will see the various criteria that we have to operate to, and let me just note that these are only the Delta criteria, the key Delta criteria. There are other criteria upstream such as water temperature and the Red Bluff diversion dam operations, for example, that I won't be covering, but these are the main Delta operational criteria.

You will notice there are two colored bars on the chart. The red bars indicate criteria for protection of winter-run salmon, and the blue or purple are the measures to protect the Delta smelt.

Now, starting with winter-run salmon, you will

notice the first criteria there is really no direct export limitation for winter-run salmon. I have put it in this category. It is actually an indirect export limit due to the take limit. The projects can take no more than one percent of the out-migrating population of winter-run smolts. This year that number was 905 and in 1992 it was 2700 fish, and that limit applies between the months of October and May.

The next criteria for winter run would be the operation of the Delta cross channel. The cross channel must be closed between February and April, and it can be closed between October and January depending on whether or not winter run are detected in the upper Sacramento or even the lower Sacramento River.

And the final criteria on winter run would be the QWEST index, which is the flow index of the lower San Joaquin River. That index is to be no less than zero between the months of February and April, and it is to be no less than minus 2,000 cfs between November and January.

And keep in mind that the zero cfs also between February and April is coincident with the cross channel closure that, in effect, is essentially an export limit in the way they work hydraulically.

Going on to Delta smelt, the Delta smelt take limit covers all the months of the year. It is kind of a

complicated table to go over. It is included in your package as an addendum to Figure 2.

I will just briefly tell you that the limit that we are currently operating to is 755 fish on a 14-day running average. That will cover us through June and then July it will depend on a monitoring survey. That's how it works as you go through the year.

North Bay Aqueduct has a limit on it. You can't pump more than 65 cfs when smelt are present in the vicinity. There's a minimum daily Delta outflow standard between February and June. It varies between 6800 and 12,000 cfs. A certain number of days you have to meet this depending on the year type.

This year, for example, we had to meet 6800 for 40 days and the 12,000 for 180 days.

And lastly, there is criteria on the San Joaquin River at Vernalis. It is related to the Delta outflow criteria. A certain percentage of the outflow criteria has to be met by Vernalis flow. And there's also an April and May pulse flow that's required on the San Joaquin.

Okay, the next slide, please.

I will just briefly mention the 1993 criteria. I don't want to confuse this too much. For winter run the criteria are essentially identical except for the take limit. The winter run opinion is a long-term take. That

is the only thing that varies with the winter run.

With Delta smelt there's several differences. The key ones are, in '93 we had a QWEST criteria that covered May through August of '93, and the Delta smelt take criteria in 1993 only covered May through July, whereas now we have an all-year take.

There are several other differences and I would refer you to the package if you want more details.

So, what are the operational ramifications for the projects? We have listed several of these points on page 18 and I will go over them briefly, but just to start with, the main impact is that the projects are less reliable in delivering water supplies.

The first point I would like to make is that carryover storage will be lower on average in the upstream reservoirs such as Oroville and Shasta. This is due to the additional releases required for Delta outflow and this incurs a greater risk as we go into an extended drought. This is riskier for project contractors as well as for meeting environmental needs.

The second point is that deliveries to our contractors on average will be lower and in a minute I will give some specific numbers for 1993 and 1994.

The third point is that there is less operational flexibility. We now have very limited windows of

opportunity for pumping water out of the Delta. Historically you could depend on the high flow months, December through April, to fill your southern storage reservoirs. Now, due to the take problems and the take limits that are out there in these months, we have to depend on the late summer and fall much more.

The fourth point is that because of that, there are now limited opportunities for water transfers. The projects are having to meet their essential needs in the late summer and fall, and that leaves less operational capacity to do water transfers, as well as in the late summer and fall there are take limits for Delta smelt. So, it is a big unknown as to what we can pump.

The fifth point is that the coordinated operation between the State and Federal projects is much more difficult. The new rules are not covered by the existing coordinated operations agreement and we find situations where responsibilities are undefined as to who meets what standard.

And lastly, our ability, the project's ability to meet future increased demands has been severely impacted. In fact, the feasibility of the future South Delta storage reservoirs and water-banking programs is now questionable because of the limited pumping opportunities. In fact, it is quite difficult right now just to fill the existing

storage.

So, how does this all translate into water supply impacts?

Let's look at the next figure, please. This would be Figure 3 from your handout package.

Talking about 1993 first of all. We went back and reoperated the project as though the endangered species matters did not exist and assuming that only D-1485 were in place. I will explain the graph first.

Along the X axis are the months of the year, and you will notice it only goes through June. That is because in July through December there were no impacts. So, that's why we have just shown the months where there were impacts.

On the Y axis are the units in thousands of acre-feet of impact. You will notice that there are two different colored bars, a purple bar and an orange bar. The purple would be the pumping capacity foregone.

Let me define this term. That would be the maximum potential water reallocated from project uses to Delta outflow.

Now, the orange bars are the actual 1993 water supply impacts, or that water that would have been used by the State and Federal contractors or stored in the absence of the Endangered Species Act.

Now, the difference between the two bars, you will notice, like, for example, in March there is a large difference. That difference represents the lost pumping capacity that in future years could have been used to fill additional south of Delta storage or to meet additional future needs projects.

Now, the 1993 total capacity foregone was about one million acre-feet and the total combined impact which would be the sum of the orange bars was about 600,000 acre-feet, and the February through April impacts were mainly due to QWEST and the winter-run take limit. In May through June, we were limited by Delta smelt take.

Okay, the next overhead, please.

This would be Figure 4 from the handout. It covers the 1994 water supply impacts. We have not yet calculated the actual water supply impact. We will do that at the end of the year. That is a more involved process, but we do have the capacity foregone calculation through May and that totals to 1.3 million acre-feet. In preliminary calculations, it looks as though this year there will definitely be more than 600,000 acre-feet of actual impact. We just don't know the exact number, but it will be more than 600,000.

So, just to summarize, the answer to the question, you know, there have been many modifications imposed on

the projects due to the Endangered Species Act. The main overall impact is lower reliability of project supplies.

As I mentioned, in 1993, the projects took about a 600,000 acre-foot hit. In 1994, it will be greater than that. Flexibility has been reduced. There are fewer windows of opportunity for pumping, limited opportunity for water transfers, feasibility of future South Delta banking projects now jeopardized, and overall a great deal of uncertainty.

I was going to mention that the current situation at the Banks pumping plant, it's in my motes here, as of yesterday morning was at three percent of capacity due to Delta smelt take, and the Tracy pumping plant was at 15 percent. But, as of midnight last night we had to shut it down to zero at Banks due to the smelt take.

I hope that gives you a flavor for what we are dealing with, not day to day but hour to hour, with the take limits and various criteria. It's quite a challenge.

I would be happy to answer any questions.

MR. CAFFREY: Thank you, Mr. Winkler and Mr. Anderson.

Are there questions by Board members? Nothing at this time. Staff?

Mr. Howard.

MR. HOWARD: During March it looks like the

projects have been pumping at minimum capacity and right now I understand they are being controlled by the Delta smelt take limit.

Is there any indication that there will be any relief for this in the future and what would be the impact if the Delta smelt take continued to restrict pumping throughout the summer?

MR. WINKLER: Well, we wouldn't be able to meet our project needs, quite simply. Right now we have very limited ability to meet the South Bay Aqueduct needs. They have limited storage along there.

So, when you say contractors, it varies along the way. South Bay would be most imminently impacted if we have to continue to shut down. In this process, you know, it's a back-and-forth thing. We enter consultation with the Fish and Wildlife Service and regroup and try to figure out what to do, and in the last couple of weeks we have gone through a couple of iterations on this, and I would hope we could reach a reasonable solution for the summer as well.

But I guess the one thing I just want to drive home is that it is just very difficult to plan operations and plan some level of deliveries given you never know when the fish are going to show up or whether this is just a bumper crop situation, and these take limits have been

really difficult to deal with.

MR. HOWARD: Assuming the projects can't come back up in Delta pumping, will the Department of Water Resources be able to meet its contractual obligations this year south of the Delta?

MR. WINKLER: No, we won't be able to meet our approved deliveries.

MR. HOWARD: Thank you.

MR. CAFFREY: Other questions?

Mr. Pettit.

MR. PETTIT: When you refer to the capacity of the Delta, the Banks plant, Mr. Winkler, were you referring to the capacity including the new pumps?

MR. WINKLER: Now the capacity foregone, that calculation would include -- we would back down to whatever D-1485 controlled at. So, for example, in May, the limit at Banks is 3,000 cubic feet per second and if we are limited by the ESA to, say, 1,000 cfs, that calculation would be that there's 2,000 cfs of capacity foregone. It wouldn't go all the way to the physical plant capacity, it would just go to the next limit of control.

MR. PETTIT: What is the present physical capacity of Banks?

MR. WINKLER: Ten thousand three hundred.

MR. PETTIT: That includes all four pumps?

MR. WINKLER: Right.

MR. CAFFREY: All right. Does that conclude your presentation?

MR. WINKLER: Yes.

MR. CAFFREY: Thank you both very much for being here. We appreciate it.

Next we have Roger Patterson. Good morning, Mr. Patterson.

Mr. Patterson is the Regional Director for the Bureau of Reclamation. He is here this morning representing Club Fed.

Good morning, sir -- oh, you have others with you.

Gentleman, if you would like to sit at the table for your presentation, there is a mike there and you are welcome to do that.

MR. PATTERSON: I decided after that last presentation I needed to bring up reinforcements to cover any questions you may have.

Mr. Chairman and members of the Board, Mr. Pettit, I am Roger Patterson. I am the Regional Director of the Bureau of Reclamation here in Sacramento.

The two gentlemen I have with me; first of all, I think you know Mr. Patrick Wright. Patrick Wright is with Region 9 in San Francisco with EPA, and Wayne White is the

State Supervisor for the Fish and Wildlife Service for the State of California.

MR. CAFFREY: Welcome, gentlemen.

MR. PATTERSON: We are glad to be here.

I would also point out that we have well situated in the audience a number of members of our staff from the various Club Fed agencies and I would like you to know that we have had people here during the previous two workshops. In a fairly nondescript way, we took copious notes and they provided a briefing to all of us that were not in attendance the following Tuesday by conference calls, so we are very interested in what the Board is doing and appreciate the opportunity to be here.

MR. CAFFREY: We are aware that your staff people have been here, Mr. Patterson, and other staff people from the other members of Club Fed. We do know that you are following what we are doing and we appreciate that, and we appreciate your current and future cooperation.

MR. PATTERSON: Okay. Let me just make a few of the major points we want to make and then we will all be available to answer questions.

First of all, on the first point, what factors, excluding diversions, contribute to the decline of fish and wildlife resources in the Bay-Delta estuary? Certainly, we believe there are a number of factors and

what I would like to do is mention a few of those that we believe are most important.

First, I would mention water quality and habitat modification, which is definitely a factor that has a potential to adversely affect fish and wildlife resources in the estuary. We point out that contaminants derived from both natural sources and domestic activities have had adverse impacts to the biological resources in a number of locations, including the estuary.

These natural sources include soils that are naturally laden with relatively high levels of elements such as copper, zinc, selenium, and boron, to name a few.

Also, domestic activities will have detrimental effects which would include untreated urban runoff that contain hydrocarbons, treatment plant effluent, industrial discharges, and agricultural drainage containing elevated levels of pesticides, herbicides, and fertilizers.

It was mentioned by the Department of Fish and Game and others, we believe, that exotic species that have been introduced, both knowingly and accidentally, have had adverse impacts on species food chain and habitat. We know that several of those exotic species are known to prey upon the native fishery.

Also, exotics such as the Asiatic clam are known for their capability to strip the biomass out of a water

column in short order.

I also would like to point out habitat modifications related to various construction activities may also have adverse effects on estuarine species. These would include things such as levee construction and dredging that have a potential to modify habitat complexity and diversity through loss of shallow water habitat, vegetation, and reduced riparian-shaded aquatic habitat.

The second major issue that was raised was what modifications have the State Water Project and the Central Valley Project made to their operations to protect endangered species and other species of concern? We would note that the three issues specifically identified were operational changes, water supply impacts and effect on target species.

I think you just had a very good explanation of some of the major changes in operation that the two projects are making to protect the two principal species, which is the winter-run chinook salmon, and also, the Delta smelt.

It was mentioned that there are a couple of other things not talked about in the Delta. Let me just summarize quickly that the major changes are in the area of storage limitations, which is critical for temperature

control, particularly for our operation below Shasta and Keswick Dams on the Sacramento River. Transport and habitat flows, as you saw, are part of these operational changes.

Also, changes in the way the Bureau of Reclamation is operating Red Bluff diversion dam, which is operated in a way to improve passage of migrating fish on the Sacramento River by leaving the gates out of the water for much longer periods of time during the year.

I would point out the change in the operation of the Delta cross channel gates, which you saw. Export curtailments are a part of the operation now as well as take limits, which you heard were specifically identified for both of these species.

Both the Central Valley Project and the State Water Project supply south of the Delta have experienced reductions in supply due in part to these operational constraints.

We do believe that several of the measures required by the biological opinions have been beneficial to the targeted species through improved habitat conditions and reduced levels of entrainment. However, to better understand the effects on targeted species, we continue to explore improvements to monitoring techniques and alternative methods to minimize adverse impacts on all

beneficial uses.

I would point out that the specifics of the operation of both projects to meet endangered species are contained in biological assessments and biological opinions which have been issued by both the National Marine Fisheries Service and the Fish and Wildlife Service. I believe we have made copies of all of those documents available to the staff. If not, you are welcome to have additional copies. They are fairly large and fairly extensive in their explanation.

The next point is, what effect do upstream water projects other than the Central Valley Project and State Water Project have on the fish and wildlife resources of the Bay-Delta estuary? There are a number of points we would like to make there.

First of all, even though the magnitude may vary, we believe it is safe to say that upstream water projects do have an effect on the biological resources that have to be somewhat analogous to those of the Central Valley Project and the State Water Project. These would include things such as entrainment and flow reductions that result in habitat modification.

Project operations, both upstream and within the estuary, need to contribute an equitable share to resolve Delta problems in some kind of balanced and reasonable

manner.

The last point we would make on item No. 4, what are the status and trends of biological resources in the Bay-Delta estuary, and we have really not had an opportunity to look at the information that was provided to you by Fish and Game, but I think we would agree that the general trend for native anadromous species and resident native fish has been declining.

We would also agree that trends for some of the exotic species such as the Asiatic clam have actually been proliferating.

In summary, the federal agencies that make up Club Fed are certainly supportive of the Board's efforts in the proceedings, and we appreciate the fact that the Board is considering factors beyond the fresh flows and diversions such as drainage and exotic species that require special management strategies necessary for the restoration of the Bay-Delta resources.

We believe that standards that recognize the CVP and SWP limitations and incorporate flexible options are a necessity to maximizing benefits to competing needs.

Project operations and practices, both upstream and within the Delta, need to contribute their equitable share to resolve Delta problems in a balanced and reasonable manner.

The Central Valley Project Improvement Act identified several non-flow measures to improve conditions for fishery resources. These include things such as the Shasta temperature control device, spawning gravel replenishment and strategically located barriers which should be considered in the Board's deliberations. We believe that these should also be taken into account in any deliberations.

Finally, we would like to point out that we believe that the development and implementation of a comprehensive ecosystem plan is required to address long-standing Bay-Delta issues.

With that, we would be happy to address any questions that you may have.

MR. CAFFREY: Mr. Stubchaer.

MR. STUBCHAER: Are any members of Club Fed studying the effects of the exotic species that you mentioned to try and quantify the impacts?

MR. WHITE: Only in a general sense. There are no specific studies that I am aware of. I think the Department of Water Resources pointed out there's a lot of exotics and that is part of our problem. We have problems of exotics in numerous places of aquatic ecosystems and finding the right tool to take care of a very specific introduced species is a difficult task.

MR. STUBCHAER: Will you have any advice to give to this Board on how we could address these exotic species problems other than throwing water at the desirable species?

MR. WHITE: Mr. Stubchaer, that's a very good question. You can ask us to look very closely at it and develop a specific tool that will take care of some of the key problems.

MR. WRIGHT: I do think there is a section in the San Francisco estuary project about a conservation management plan on exotic species. I can't recall the details. Perhaps some other members of the audience can in future presentations. I believe there is a general blueprint there that the Board members and staff might want to take a look at.

MR. CAFFREY: Anything else from other Board members? Mr. Brown?

MR. BROWN: The Central Valley Project Improvement Act, in their list of options for water diverted to environmental needs, is looking at options to replace those quantities of water back into the Central Valley Project; are they not?

MR. PATTERSON: Yes, that is correct, Mr. Brown.

And part of being able to do that, to replace the water that's been dedicated principally for fish and

wildlife means that we have to take an intermediate step and then actually quantify what additional water needs we are going to have for fish and wildlife beyond what has been dedicated in the Central Valley Project Improvement Act.

That process is under way. It is kind of part and parcel of a plan that is being developed by the Department of the Interior, and then all of that becomes a subject of where do we find the water and how do we replace it.

MR. CAFFREY: I don't know to whom to direct this question, and I will precede it by saying you can correct me if I misconstrue what I heard you say, Mr. Patterson.

You seemed to be expressing a concern earlier in your presentation about what I call the potential pitting of one species against another. You were talking about the effect on your ability to recapture storage because, if I heard correctly, the Delta smelt requirements therefore affecting temperature, and perhaps I am reading a lot into what you said, but perhaps the ability then to be of assistance to the winter-run salmon when you require cold water to be released; do you think that Club Fed is going to be able to develop a -- and I am going back to the term shelf life -- ecosystem approach that will take a broader look at the Delta and all the species so we are not running the risk of pitting one species against

another.

This is something that concerns me very greatly. We try to develop these standards with some assurance that we can do something together that allows this broader approach to work.

Maybe I answered my own question.

Forgive me, but would you care to comment on that? It bothers me a lot?

MR. PATTERSON: It is an important issue and it's one that we have talked about a lot among the federal agencies, and I think to answer your question, can it be done; I think, yes, it can be done.

We have managed so far, I think, to be able to meet the needs of the various species which, as you point out particularly during very dry times, the need for temperature control, which takes a certain amount of storage retained upstream, could be pulled out on the other end by the need for outflow requirements specifically required for smelt.

We have managed to make those work together even in a year like this, which is one of the driest years that we have had, but fortunately, we had some storage coming into the year and we benefited by that.

We know that this is something that is essential to any long-term solution that we are going to have and we

think it can be done, and as EPA deliberates on how to handle the standards that they are working on under the Clean Water Act, this is something that we have on the table for discussion, and I don't know if anyone wants to add anything, but we are well aware of it.

We know that's key to having success. And I believe we can make it fit, I believe, as long as we understand that in certain years we may have to go into adaptive management, which is essentially what we have done this year to manage to meet all the needs at the same time.

But it is important and there is good reason to be concerned about it.

MR. CAFFREY: It is so essential to reliability. There's that word *reliability,* that maybe we didn't hear that word too much the first couple of years I was on this Board, but the next year it was the predominant word and I think, again, the buzz word that we are using, shelf life, is so critical to reliability.

Whatever plan that we are able to jointly develop with EPA, it is going to be for naught if we don't figure out a way to interpret the ESA with a broad ecosystem approach that doesn't pit species against each other.

I appreciate your effort in that area. I know you are trying to solve that problem. We certainly endorse

your efforts and wait with great anticipation for the answer.

Ms. Forster has a question.

MS. FORSTER: Roger, would you explain again what you mean by adaptive management?

MR. PATTERSON: Adaptive management is sort of make it up as you go. Actually, the concept is embodied in these biological opinions I talked about and it's essentially to recognize up front that we don't know everything and cannot specify out for years ahead exactly how things are going to work and provide for conditions when we have essentially not enough water to go around, to pull together all of the right people from the various agencies, and that's what we are doing, the State and Federal agencies, and decide what kind of fine tuning needs to be made to meet those conditions.

That's what we have done this year for the winter run. That's what we are doing right now for the Delta smelt, and it is making the decisions current on the best data that you have, which I think is essential that that is a part of any plan.

We all want reliability and to have a shelf life, but I believe any plan we have is going to have to provide for this kind of situation when you are going to have to get the right people together and make decisions as to how

to navigate through those sort of difficult times.

Otherwise, what you do is you leave resources on the table that aren't going to be best utilized under those conditions.

MS. FORSTER: Do you see any trend when you do this kind of exercise? How are people going to plan if you make it up as you go? I mean, do you have ranges? I know the past couple of years you have been developing how to do these better, but do you think by the time we get ready to do standards and you get ready to do standards, that we will have a formula that people can understand for water planning, I mean for farmers to plan, for cities to know a little firmer?

MR. PATTERSON: I think we can and I think what this amounts to is we can get to the point where we can have a reliable expectation of what's going to happen, and then, when we get into these crunch times, it's getting together to make sure we can navigate through this and meet that reliability that we put out there as opposed to having sort of an automatic pilot and we find out people cannot rely on that.

That's where I think we need to strive to get. Yes, you can rely on it but it is still going to take some management. We can't just turn it on and let it run.

MR. WHITE: I think a very good example of adaptive

management, which just happened in the last couple of weeks, is working together between the agencies. Where one facility has the higher degree of take than the other, we simply flip-flop the pumping from one to the other, so it is, as Mr. Winkler points out, a day to day and hour to hour, on how the operations of the projects are going.

MR. WRIGHT: I would just add, too, the shelf life issue has obviously been one that has been a key one for EPA trying to put together a set of standards that we think would be meaningful for the foreseeable future.

The way that we have chosen to try to do that is to focus on a multiple-species approach to habitat protection, so the evidence seems to suggest that protecting habitat conditions is necessary to protecting the species.

What we don't know is whether or not that will be sufficient to restore these species, but hopefully, we will know after the standards are implemented about a reasonable period of time the extent to which those habitat measures need to be supplemented by other measures, either through the Central Valley Project Improvement Act, through Board action, whatever.

But certainly, if that does happen, it should give water users more certainty to the extent that they should know for the foreseeable future that increased flows

shouldn't be necessary even if, say, additional declines are to occur, that we have taken care of habitat conditions, at least to the best of our knowledge in this phase, and we could move on to a long-range planning effort to deal with the other factors, both in the short term through CPIA and in the long term through this joint State/Federal process we are trying to develop.

That's the goal. Whether or not we can pull that off is going to be challenged, obviously.

MR. STUBCHAER: Mr. Wright, if we don't know the effect of the exotic species, how do we know that habitat restoration is even a possible goal? How do you know it is even possible to do?

MR. WRIGHT: That's a good question. Certainly, the evidence suggests, for instance, that the location of the two parts per thousand salinity line and/or increased flows explains a significant amount of variability in the species of the estuary. Even in the face of all the exotic species that have come in during the past decade, it's been the conclusion of a wide range of groups that focusing on the measures that will improve habitat conditions in Suisun Bay will help.

All that data is based on the past. One never knows in the future whether or not there will be new exotics, new conditions out there, and that's why you need

to have an adaptive management program, why you need to have a triennial review process in your standards so that they are flexible so you can make changes.

MR. STUBCHAER: I was focusing on the difference between restore and improve on the habitat. I think you used the word *restore* earlier and now you said *improvement*. We can improve. Whether we can restore is an open question.

MR. CAFFREY: Any other questions of the gentlemen?

Mr. Howard.

MR. HOWARD: I have a question for Mr. White. The fact that the Delta smelt take limit is curtailing pumping right now, it implies to me that there is a substantial population of Delta smelt in the Central Delta. It also appears that the pumps won't be able to operate until those Delta smelt move away from the pumps.

Is there any reason to believe that they will, in fact, move, and if they don't, does the U. S. Fish and Wildlife Service have any idea how this all might shake out in the long run?

MR. WHITE: This a several part question. The ecological studies program is currently doing their trawl studies. We are trying to get that information so we can get several things; one, abundance; and two, distribution.

If, in fact, we have high abundance and

distribution away from the pumps, then we can look at the opportunities in the reinitiation of consultation to modify the level of take.

The problem associated with that is, as you pointed out, are Delta smelt starting to move down? We thought they were starting to move down. One of the unknown factors of this is the other diversions within the Delta. How much water is being drawn out the Delta to stop any flow through the Delta to move them away from the influence of the pumps down to the confluence of the two river?

That's the objective in that biological opinion. That's what we were trying to do.

We have another management team meeting after we get the results from the distribution study and a report from the technical team to see if there is opportunity to modify the incidental take approach that we have in the biological opinion today, we are dealing with those questions and trying to get to the answer and do it quickly because we will have fresh data in the next few weeks.

MR. CAFFREY: Are there other questions, Tom?

MR. HOWARD: No, that was all.

MR. CAFFREY: Mr. Patterson, Mr. White and Mr. Wright, thank you very much. We appreciate your

continuing attendance and perseverance.

Mr. Feider, Area Manager for the Western Area Power Administration.

MR. FEIDER: Good morning, Mr. Chairman and members, my name is Jim Feider, Area Manager for the Western Area Power Administration.

The Western Area Power Administration was established in December, 1977, as part of the Department of Energy Organization Act. Western's mission is to repay the federal power investment by marketing the Central Valley Project power at the lowest possible rates consistent with sound business principles.

Sacramento area markets approximately 1,480 megawatts of firm federal power to 77 wholesale customers in Northern and Central California. Western's preference customers include irrigation districts, utility districts, municipalities, cooperatives, military and federal research installations, and the State of California penal and educational institutions.

The Central Valley Project power system has a maximum installed capacity of approximately 2 million kilowatts. Average annual generation is approximately 4.7 billion kilowatt hours. Average annual power sales to Western's customers is over 200 million dollars.

At the May 16, 1994, workshop, Western emphasized

the need to consider all impacts of the Bay-Delta decisions, including those impacting hydroelectric power generation of the Central Valley Project.

This morning I would like to comment on issue No. 2, which is, what modifications have the State Water Project and the Central Valley Project made to their operations to protect endangered species and other species of concern?

The U. S. Bureau of Reclamation has operational control of the Central Valley Project reservoirs. Western, through Reclamation, has realized impacts to power generation at the Shasta Dam due to cold water bypasses of the penstocks of Shasta Dam for protection of the winter-run chinook salmon. Because of this action, Western has had to purchase power from other sources to make up for the loss of generation due to the Shasta Dam bypasses.

The Shasta bypass releases are designed to provide cooler water temperatures to help protect salmon eggs and emerging fry in a 28-mile stretch of the river below Keswick Dam where salmon spawn.

If air temperatures rise, releases of cold water are required. Most of the bypasses relate to the winter run, but some of the October, November and December bypasses benefit the fall-run chinook salmon.

The replacement energies due to the Shasta bypasses have cost over 31 million dollars starting in 1987 through September of 1993. Replacement power not only has resulted in additional cost but has required power generation to be increased from other sources, primarily fossil-fuel generation.

I am providing a table of those costs for the record in my written comments, but I would also add that if we added to this year's bypasses as forecasted by the Bureau, we are talking about in the ten-to-fifteen million dollars, which brings the total costs to date well over 40 million dollars.

Western looks forward to the start of construction of the Shasta temperature control device later this year so that the bypasses can be eliminated by the fall of 1996.

Also, as part of temperature control, Reclamation has initiated the Trinity Dam bypasses. The Trinity bypasses cause cold water to be diverted through the low level outlets at Trinity Dam instead of through the penstocks bypassing power generation. These bypasses are used for temperature control of Lewiston Lake and the Trinity River below Lewiston Lake.

In addition to the bypasses at Shasta and Trinity, Reclamation has made operational changes to Central Valley

Project reservoirs in part to maximize their ability to control water temperature for endangered species protection. These changes have shifted Central Valley Project generation patterns and consequently have changed western's requirements for firming energy.

Western would like to see these operational changes made on a more predictable basis. I might also note that based on earlier comments that any reduced operational flexibility of the reservoirs and any associated reduced carryover storage also impacts reliability of the power supply and our ability to meet our customers' contractual needs.

As I have indicated to you today, the Western Area Power Administration and its preference power customers have been impacted by the modifications to Central Valley Project operations to protect endangered species, both in the Sacramento River and the Trinity River basin through added costs to purchase power. Western is very interested in these proceedings and believes the total power impact of the proposed alternatives needs to be studied.

Western supports the need for standards to protect endangered species in the San Francisco/San Joaquin-Sacramento River Delta and upstream rivers and tributaries.

At the same time, Western hopes whatever standards the Board adopts through this process will be based on sound biological science that leads to the most cost effective approach to a solution.

We agree with many here today that a balanced approach be taken for determining a long-term plan for the Delta.

Thank you, I would be happy to answer any questions.

MR. CAFFREY: Thank you, Mr. Feider.

Any questions from Board members of Mr. Feider?

Mr. Brown.

MR. BROWN: The 31 million dollars of power from Shasta that you have to purchase, where did you buy that power?

MR. FEIDER: Well, it is primarily out of the Pacific Northwest.

MR. BROWN: From Montana or someplace else?

MR. FEIDER: We buy power from about six different utilities on a long-term basis and several of the other utilities that are buying power right now from Pacific Power and Light, has a large coal-based generation resource for buying power from other utilities.

We occasionally buy power from Montana Power Company, occasionally from B. C. Hydro out of Canada. Any

that we can't get in from the northwest, we make up from our accounting procedures we have with Pacific Gas & Electric Company, so some of it also comes from them.

MR. BROWN: What percentage of that would be fossil fuel power?

MR. FEIDER: A little over 50 percent, I think about 56 percent of our purchased power comes from fossil fuel. It is hard to tie it directly to the bypasses themselves, but I would have to speculate that a larger percentage would be fossil fuel, probably more like 80 to 90 percent.

MR. BROWN: On the Trinity Dam bypass, how much power have you lost?

MR. FEIDER: It's about a little under 4 million dollars worth. Those were incurred in 1991, '92 and '93.

MR. BROWN: Thank you.

MR. CAFFREY: Mr. Stubchaer.

MR. STUBCHAER: You seem to have been working with the Bureau of Reclamation in ways to fund the variable intakes for the hydro station so you don't have to bypass water below Keswick?

MR. FEIDER: We have spent a considerable amount of effort trying to work with the Bureau and their funding process through the Congress to facilitate the construction of that project, and Western and its

customers are very supportive of moving forward with the temperature control device.

MR. STUBCHAER: Is there any discussion of having a surcharge on the power to pay for the costs of the needed facilities?

MR. FEIDER: Well, right now the Bureau is picking up part of the costs through the restoration fund that in part will go towards the temperature control device. But at this point, there are no active discussions on any further surcharges.

MR. STUBCHAER: It seems to me from the figures you have given us it wouldn't take very long and you could avoid purchasing power and you could pay for the control devices.

MR. FEIDER: That's true.

MR. STUBCHAER: Thank you.

MR. CAFFREY: Mr. Del Piero.

MR. DEL PIERO: You indicated you lost 4 million dollars on the Trinity bypass.

MR. FEIDER: That is correct.

MR. DEL PIERO: How much of that cost did you pass on to your consumers when you had increments of purchased price added onto the kilowatt hours when you sold it?

MR. FEIDER: The costs for Trinity does get passed on to the power consumers. The costs for Shasta at this

point in time are not being passed on. They are being written off as taxpayer expense from the United States taxpayers.

MR. DEL PIERO: Let me suggest to you when operating utilities everything is a taxpayer expense. In fact, when power is available, would it not be possible to add the increment that would normally be passed on to the consumer if you were out on the open market purchasing power to generate the money necessary to do the temperature control?

MR. FEIDER: Well, I am not sure I understand your question.

MR. DEL PIERO: You sell purchased power for more than you sell power generated at Trinity; is that not correct?

MR. FEIDER: What we do is we blend our purchase power cost with the other Central Valley Project generation costs and we sell basically at one price.

MR. DEL PIERO: So there is no impact in terms of the 4 million dollars lost that you are talking about then?

MR. FEIDER: We have to take that increased expense and we blend it in with our power rates on a year-to-year basis.

MR. DEL PIERO: What is that impact in terms of

kilowatt hour cost actually?

MR. FEIDER: In our rate base it amounts to about half a mill per kilowatt hour.

MR. DEL PIERO: Half a mill.

One last question -- given the fact a significant portion of the problem that presents itself in terms of the State water system is a result of declining species currently listed under the ESA, wouldn't it seem appropriate that the federal agency that might have some contribution to the decline might do something to construct facilities that would alleviate a portion of that problem?

I am not picking on you. I think I am picking on your boss's boss -- in your opinion.

MR. FEIDER: Well, if you were implying that the power operation has contributed to the decline of the species, I don't believe that to be the case. There are a lot of factors that are influencing what has gone on and what we are suggesting here is that by having the facilities in place to prevent those bypasses; in other words, construct a temperature control device, we believe that power can be generated and still achieve the temperature regimes that are desirable.

MR. DEL PIERO: I don't want to get into an argument as to how much spawning gravel was lost when the

power projects were installed. We will talk about that at some other time.

MR. STUBCHAER: I just had a comment on the same issue. During our deliberations on D-1630, we were asked to think about having a surcharge on water diversions to help pay for the cost of facilities, one of which was the temperature control device at Shasta.

It appears that it would be far more equitable to put that on the power costs. It is such a huge amount of money and such a low percentage of the cost that that would be fairer than putting it on the water diverters.

That's just a comment. You don't have to respond.

MR. CAFFREY: It was Mr. Stubchaer that I think at our last workshop asked one of your -- I presume one of your staff, whether or not you had been invited or, in fact, requested to become a member of Club Fed. The answer was they had not been invited, but I think it might be a good idea for you and your agency to consider joining that group in their deliberations as to how to solve the problem. I think you have input they should be aware of.

MR. FEIDER: I appreciate that and we do desire to joint the Club Fed group.

MR. CAFFREY: We will put in a good word for you.

Mr. Howard, do you have any questions?

MR. HOWARD: No.

MR. CAFFREY: Mr. Brown has been patiently waiting. I apologize.

MR. BROWN: Thank you, Mr. Chairman.

I understood that WAPA developed about 200 million dollars a year in energy?

MR. FEIDER: Our annual revenues are a little over 200 million dollars a year, yes.

MR. BROWN: How much do you sell your power for?

MR. FEIDER: It's approximately three cents per kilowatt hour.

MR. BROWN: And who are the main purchasers of the power?

MR. FEIDER: The municipal utilities of Northern California that I mentioned, some of which are here to testify this morning. For example, Sacramento Municipal Utility District is our largest customer. Some of the other larger communities include Palo Alto, City of Redding, Santa Clara, City of Roseville; and then, on the irrigation district side our biggest irrigation district is Arvin-Edison. The second one would be Westlands and the third would be Glenn-Colusa Irrigation District.

On the federal side we serve power to the Air Force bases like McClellan and Travis. We serve power to Navy installations like Mare Island, NASA-Ames down in the Bay Area as well as the Department of Energy labs at

Livermore-Berkeley.

MR. BROWN: If I figured this right, the power went up half a mill approximately.

MR. FEIDER: Because of the Trinity bypasses.

MR. BROWN: So, you are up from three cents to --

MR. FEIDER: Our current rate is about three cents. What we do is we take those increased operating expenses and the next year they are blended in.

MR. BROWN: So that would make it 3.5 cents?

MR. FEIDER: Not 3-1/2 cents, 3.05 cents.

MR. CAFFREY: Thank you.

Anything from staff?

MR. HOWARD: No.

MR. CAFFREY: Mr. Feider, thank you very much. We appreciate your being here.

We are going to break for lunch as close to noon as we can. Let's hear from Mr. Schneiter, Mayor of the City of Ukiah. Good to see you again, sir.

MAYOR SCHNEITER: Good morning, Mr. Chairman and Board members, I am Fred Schneiter, currently the chair of the Northern California Power Agency.

I am pleased, once again, to have the opportunity to present comments to the Board's third workshop on Bay-Delta water quality standards.

My comments are presented on behalf of Northern

California Power Agency. In preparing them, we have worked closely with Western Area Power Administration and other municipal electric utilities, including Sacramento Municipal Utility District.

NCPA, the organization I represent, is a nonprofit, California joint action agency whose membership consists of 11 municipal electric utilities, Plumas-Sierra Rural Electric Cooperative, Turlock Irrigation District and Truckee-Donner Public Utility District.

NCPA's members collectively supply electric power to over 600,000 residential and business consumers throughout Northern California.

The largest share of this power is produced by the Federal Central Valley Project and marketed by Western Area Power Administration to NCPA members and other preferential customers in Northern California. In addition, several NCPA members own and operate hydroelectric facilities located elsewhere in and surrounding the Central Valley.

As I noted at the Board's last workshop on May 16, hydroelectric generation is an extremely valuable resource that makes important contributions to the economy and environment of Northern California. Clean, renewable hydroelectric energy is the third largest source of electricity in Northern California, behind only natural gas and nuclear power generation.

The Central Valley Project produced 3.5 billion kilowatt hours of hydroelectric power in fiscal year 1993, equivalent to the annual energy consumption of 450,000 Northern California homes.

Central Valley Project power users make a major contribution to the Federal Government. In addition to annual O&M costs, Central Valley Project power customers are responsible for repaying 560 million dollars of Central Valley Project construction costs, roughly 20 percent of the total cost of constructing Central Valley Project facilities. These facilities provide multifaceted benefits to the California economy.

In addition, Central Valley Project power users will contribute nearly 8 million dollars toward the fish and wildlife restoration measures authorized by the Central Valley Project Improvement Act in fiscal year 1994. These funds support environmental measures that will provide important benefits to the aquatic resources of the Bay-Delta. Restoration fund surcharges on Central Valley Project power users will be temporarily doubled in fiscal year 1995 to make up for expected deficiencies in payments by water users and permit other vital fish and wildlife improvement work to begin.

Preserving the economic and environmental benefits of Central Valley Project hydroelectric power is critical

to the continued vitality of Northern California. Therefore, we strongly believe that the Board should adopt an integrated approach that balances the many uses of this key watershed, including its use for power generation.

Within this context, I would like to comment on the first three questions posed in the Board's notice for this workshop.

First, what are the factors that have contributed to the decline of the fish and wildlife resources of the Bay-Delta?

The consensus of the experts is that many factors, both within the Bay-Delta and in upstream areas, have contributed to the decline of fish and wildlife resources. These factors include flows into and out of the Bay-Delta system, deterioration of fish-rearing habitats and food resources, thermal and chemical pollution and predation and competition from stocked fishes and introduced species.

The drought conditions experienced in six of the last seven years, including the present critically dry year, have exacerbated the effects of these factors on the aquatic resources of the Bay-Delta.

NCPA's members support the efforts of the Board to develop water quality standards that address the fish and wildlife problems of the Bay-Delta, and are willing to participate in the development of these standards. We

recognize that the standards may require changes in hydropower operations. These changes, however, should be part of an integrated, balanced approach that preserves the value of Central Valley Project hydroelectric power generation to the maximum extent possible.

The Board's second question is: How have CVP operations been changed to improve fisheries in the Bay-Delta and protect endangered species?

As pointed out in the comments by Western Area Power Administration, significant changes have been made in Central Valley Project operations to enhance fish and wildlife resources and protect endangered species. These changes have been costly to the CVP and SWP power customers.

Since 1987, for example, the Bureau of Reclamation has been bypassing the power generation facilities at Shasta Dam in an effort to protect winter-run chinook salmon, a federally endangered species.

These releases are intended to provide the necessary flows and water temperatures during critical spawning and migration periods. In the last seven years the releases have reduced hydropower generation at Shasta by 1.2 billion kilowatt hours.

While we leave it to the experts to assess the benefit of the bypass at the Shasta facilities, we know for

sure that the cost impact of this mode of operation has been 30 million dollars.

Restrictions have also been placed on diversions from the Trinity River into the Sacramento River to meet temperature requirements, significantly reducing power generation from the Judge Carr, Spring Creek and Keswick power plants, and imposing further revenue losses on Western.

These examples indicate the impacts Central Valley Project power users have already experienced in support of measures to enhance fish and wildlife resources in the Central Valley and the Bay-Delta.

Other projects may have contributed to problems with the fisheries, as has the factors that I mentioned earlier, including pollution and outflows from thermal power plants being operated in the Bay-Delta. The Board needs to understand, assess and address all of these factors in shaping a solution to environmental problems in the Bay-Delta.

In summary, NCPA encourages the Board to address the full range of factors that have affected the aquatic resources of the Bay-Delta estuary. Protection of these resources requires an integrated approach that balances the needs of all users of this vital watershed, including purchasers of Central Valley Project hydroelectric

generation.

The Board should also provide project operators maximum flexibility in implementing the adopted water quality standards. Central Valley Project power users plan to meet with other parties in the hope of contributing to a consensus on an integrated approach to the problems of the Bay-Delta. We hope to have something positive to report from these efforts at the Board's next workshop in July.

That concludes my prepared statement.

Are there any questions?

MR. CAFFREY: Thank you, Mayor Schneiter.

Any questions from Board members? Staff?

Thank you, sir. Good to see you again.

MAYOR SCHNEITER: Thank you.

MR. CAFFREY: We will hear now from Mr. Ferreira from Sacramento Municipal Utility District.

Good morning, sir.

MR. FERREIRA: Good morning, Chairman Caffrey and members of the Board.

My name is Richard Ferreira and I am Assistant General Manager and Chief Engineer of the Sacramento Municipal Utility District, commonly referred to as SMUD.

I know it is the wishes that I conclude by noon, so I will try to keep my remarks in that time frame.

I appreciate the opportunity to be here today to

provide some input as you consider future possible standard changes for the Delta.

I think a few comments about SMUD, and then, I would like to address the issue of upstream water projects.

SMUD is a California municipal utility district which was established in 1923. It is the fifth largest publicly owned system in the United States. It serves over 450,000 customers throughout the Sacramento County with a population of 1.2 million residents.

About one-third of our load here in Sacramento is met by our native hydroelectric generation on the American River, which you are familiar with, 660 megawatts. The project was built in 1971. It captures the winter and spring runoff, holds the water in storage to meet the summer peaks here in Sacramento, principally to meet the summer air conditioning load as you are all familiar with.

Another significant portion which Jim Feider addressed this morning is that in the Central Valley Project SMUD is the single largest customer of the Central Valley Project currently purchasing 460 megawatts of hydroelectric capability from the Central Valley Project.

Therefore, if you add both our hydroelectric generation and our share of the Central Valley Project, the hydro resources supplies about 50 percent of the peaking capacity for Sacramento County.

Today I would like to focus my comments on the issue of what effect do upstream water projects other than the Central Valley Project and the State Water Project have on the fish and wildlife resources of the Bay-Delta estuary.

As I mentioned, SMUD is a peaking utility primarily during the June through September months. The impacts of our release pattern on the Delta are modified by reregulation provided by the Folsom Reservoir. Power operations do not divert any water for consumptive purposes or prevent water from reaching the Delta.

The ability to use this resource, however, may be constrained by standards which the Board is presently contemplating.

The District must carry over enough water during the summer months each year to meet our load. You mentioned reliability of the water system. I am sure you are familiar with the reliability of trying to meet the electric system here in Sacramento. Enough water has to be stored each spring in order to meet the summer peak loads, plus being able to meet the following year's load.

The planning cycle of a utility is at least a two- to three-year planning standard that we must meet.

Increasing spring reservoir releases would reduce summer storage levels and have a significant impact on

SMUD's hydroelectric power production.

Without adequate water storage in our reservoirs, SMUD could not meet its utility obligation to match generation to load or would incur significant financial costs in maintaining electrical service during peak load periods, assuming adequate or suitable replacement generation, in fact, could be developed.

Because of the unique and critical role that the upper American River project plays in terms of SMUD's dependable capacity, system reliability and system regulation, upper American River power generation, in my view, cannot be replaced by simply going out and buying replacement power whether it is in the Northwest, as Mr. Feider indicated, to supplement generation or even here in Sacramento County in order to get the necessary approval to build replacement generation whether it's gas fired -- whether it is gas powered or co-generation. We simply don't have enough room in the air basin in Sacramento County to continue to build any more power plants.

SMUD is succeeding in creating one of the most clean and diverse resources mix, and relying on hydroelectric generation is really the key in the success of being able to develop a more sustainable energy future.

A clean and more diverse power supply system will meet the electric needs of Sacramento County well into the

21st century. The cornerstone of SMUD's aggressive resource plan is an energy efficiency and advanced and renewable resource program which reduces inefficiency and overall consumption of energy in our service area.

In order to be able to build renewable resources such as wind, which has a variability, in order to be able to go forward with biomass resources, whether it goes forward with solar resources, again, because of the variability, the hydro resource is what really firms it up. It wraps around and allows us to meet our goal minute by minute.

Energy efficiency, which is our resource of first option, we are investing more than any utility in the United States in energy efficiency. We are currently investing 8 percent of our revenues in energy efficiency. This amounts to about 60 million dollars a year.

But it makes sense for us to go out and invest in saving kilowatt hours in one residence and use that energy to supply the next residence that moves into the County, than it is to go out and build another gas-fired generation plant. So, it makes business sense, it makes economic sense, and, in fact, it does a lot to clear up the air here in Sacramento County and provides the jobs which we all know is very critical in today's market.

Our goal is to save 650 megawatts by the end of the

decade in energy efficiency and renewable resources.

In 1991, the SMUD Board decided to develop 350 to 400 megawatts of advanced and renewable capacity to come on line by the year 2000. The capacity will be made possible through improvements in renewable and other advanced generation technologies, and improvements in energy efficiency and energy management technologies.

In order to have the widest array of possible resource options, our advanced and renewable resource development plan continues to develop and continues to depend upon the long-term certainty of hydroelectric resources on the American River.

New power plants that I mentioned that are being developed here in Sacramento County will provide some relief. We are able to proceed with this resource plan, however, in large measure because of the regulating capacity that exists in hydro facilities. Constraints on the American River operation may jeopardize our ability to aggressively pursue this plan.

In addition, there will be substantial environmental costs from burning fossil fuels or using other air-polluting technologies to generate the replacement electricity compared to the existing hydroelectric plants that emit no air pollutants.

It would also jeopardize our commitment to the

President's goal on climate control to reduce greenhouse emissions by the year 2000.

Because the upper American River project is upstream of Folsom Reservoir, as I mentioned, it is highly speculative at this point to predict the impact of modifying our operation, water releases on downstream water users. Flows downstream from the upper American River project are significantly modified by Folsom Reservoir and other downstream users over which the District has no control.

Consequently, before any conclusions could be drawn about the costs and benefits of modifying water releases, a comprehensive study of the costs and benefits of such a modification would need to be looked at carefully, separating out the impacts of hydro operations on the Delta from the impacts of Folsom Dam.

In conclusion, SMUD shares the objectives of the State Water Resources Control Board in trying to preserve and enhance the water supply and water quality of the Bay-Delta estuary. We are, however, concerned that policies this Board adopts may have significant adverse impacts on SMUD's ability to perform its utility responsibilities, as well as severe economic, energy and environmental impacts on SMUD and the entire Sacramento valley region.

I would like to thank you for the opportunity to

appear here today.

I would like to make a comment on a couple of questions that were raised earlier and some comments by Mr. Jim Feider in terms of whether or not the power users can continue to absorb additional cost.

There's about 50 million dollars a year that will be dedicated for the Central Valley Project Improvement Act enhancement. Thirty million dollars of that will be paid for by the water and power beneficiaries. Power beneficiaries such as SMUD will be picking up about 30 million dollars of that. SMUD will be paying 7 million dollars each year for the improvements.

The cost of power, as Mr. Feider indicated, is about three cents per kilowatt hour. There is, however, an upper limit to the ability of being able to pay for such a resource. Today you can go out in the marketplace and build gas-fired cogeneration in the three-cent or three-and-a-half-cent range.

So, to continue to add costs on the power side, the ability to economically be able to use that resource becomes questionable.

Also, currently the President of the CPUC has proposed restructuring the electric utility industry in terms of performance-based pricing and promoting a more competitive environment. In my view, this is going to

result in more competition and reduce the price even further to the extent that energy prices are going to get down to three cents and possibly even lower in the near future.

This is a concern that we have. Again, we support the efforts. In fact, we modified their operation in the past for major recreational benefits and fishery program we have on our system, and we support the Board in taking a look at reasonable standards that will provide greater benefits to the Bay-Delta system.

So, with those remarks, I would be happy to answer any questions if the Board has any.

MR. CAFFREY: Thank you, Mr. Ferreira.

Are there questions by Board members?

MR. STUBCHAER: Could you provide information to our staff on the economic effects of shifting the power generation from the peak months to the non-peak months so that could be considered by our economic staff in evaluating the cost of potential measures we might take?

MR. FERREIRA: I would be happy to provide that information.

Let me make a comment. By shifting the generation from the summer months to non-summer months means that; number one, the power has to be replaced. There's two things in terms of hydroelectric power. One is

hydroelectric power can be changed instantaneously to meet the change in load, and if you go to a gas-fired generation and other forms of generation, it doesn't respond as quickly.

So, you are not changing a like resource for a like resource.

The other comment I would make, as I commented earlier, if you try to permit and license power plants in Sacramento valley, you are familiar with the air basin. Sacramento is the dirtiest city in the United States in terms of emissions. A great part of that comes from the tailpipe emissions, but in order to get approvals to build new gas-fired generation in Sacramento County, you have to go out and get offsets, air emission offsets. Offsets are really drying up.

We have acquired a number of offsets, but we believe there needs to be enough room in the air basin to provide growth. If we use all the offsets available for growth for power plant emissions, we simply don't have enough room for new businesses to move here to Sacramento County.

So, we can go out and attempt to sight new power plants, but quite frankly, it's going to be difficult to obtain those emission offsets.

MR. STUBCHAER: That really wasn't my question.

The question was the economic information that you could supply would include all those factors that you mention, and that's not to say what this Board may or may not do wouldn't necessarily affect your power generation capability during the summer months, but it could be a factor in determining whether or not we would do it if we knew what the economic effects would be.

MR. FERREIRA: We can provide that information. The caveat is we could provide that information, but it is on a hypothetical basis, assuming we get the necessary approval to build additional generation. We would be happy to supply that information.

MR. CAFFREY: You can qualify it in any way you feel appropriate.

MR. STUBCHAER: The other comment had to do with the remarks on your earlier statement about adding to the power cost.

If you are already paying 30 million dollars for replacement power from Shasta, somebody is paying it. Maybe the taxpayer is paying it, which doesn't sound quite fair, but anyway, if that's being paid, then it wouldn't be an increase in cost to put that money into a temperature device so that you can use peaking power at Shasta, which would have the benefits of hydro power that you mentioned.

MR. FERREIRA: Absolutely, and I agree with you

wholeheartedly, and we support that.

MR. DEL PIERO: Is it reasonable to assume in the event you ended up being shorted in terms of power because of additional water releases, that you would go out and build a cogeneration plant? Is it more realistic in terms of the grid that services the Western or Northwestern United States? Would you go out and buy on-the-spot market?

One of the things I used to do, we used to run a power plant and I don't think everybody else on the Board has done that, but the representation that is being left with people who don't know much about power systems, if you don't have power from your current sources, you are going to have to go out and build cogeneration plants.

That's not true. I don't think you mean to leave the representation with the Board; do you?

MR. FERREIRA: In the short run, you go out in the marketplace and try to replace the power. In the long run, from a planning basis, you don't want to rely on the uncertainty in the market place to supply electricity.

In fact, what we are planning to do in 1996 is to go out in the market and issue requests for proposals to supply SMUD 150 megawatts of renewable resources from any category.

We went out with a competitive process in 1988 in

order to develop the gas-fired generation that is being built here in Sacramento County today.

We want to plan on building and owning our own generation as much as possible in order to fix in the cost and provide certainty. There would still be an amount that you would still rely on the market for, but it would depend upon what we think the availability is of the long-term availability for future changes between the Northwest and California in the Southwest.

MR. DEL PIERO: Do you buy contract power now on the spot market?

MR. FERREIRA: Yes, we do.

MR. DEL PIERO: Do you have long-term contracts for the purchase of power not generated within your basin?

MR. FERREIRA: The longest term contract we have is to the year 1999.

MR. DEL PIERO: What was the term in that contract?

MR. FERREIRA: Ten years.

MR. DEL PIERO: So, in terms of realistic expectations, I mean contracts you purchase for out-of-area power are not something that gets turned on or off on a daily or weekly, or for that matter, yearly basis? They are long-term contracts within the planning cycle that is used by your utility for guaranteeing power delivery to your long-term customers?

MR. FERREIRA: Well, yes and no. From the standpoint of the short-term contracts, it was because of the closure of the nuclear power plant SMUD had to replace 50 percent of its resources. Because of the oversupply in the excess capacity within the market, it made sense for us to go shopping and buy power for ten years to allow us time to get a resource plan and replace it with more efficient gas-powered generation.

The power we are buying today is being supplied by utilities I would call old tea pots, which are very inefficient.

We are building some of the cleanest, more efficient plants, and it makes sense on the long-term basis of 20 years to build that type of facility and not to rely upon the short-term market, and continue to buy coal-fired generation or old, inefficient gas-powered generation.

We are interested in building the cleanest reliable resource mix for Sacramento County.

MR. DEL PIERO: I don't doubt that for a moment. That is not the point I am making.

The point I am making in terms of what we are talking about here are the monthly variations in terms of releases of water. What you are talking about is 20-year resource planning for a public utility. The two issues are decidedly different and that's the point I am getting to

here.

We had a very long conversation with Mr. Patterson from the U. S. Bureau of Reclamation talking about how he is making it up as he goes along, literally modifying their operation on a daily basis in attempting to deal with the issues that we have to deal with that are literally daily, weekly issues, not five or even ten or twenty-year issues.

The point that I am making, and I would hope that you would not leave this Board with that impression, that daily or weekly, or even monthly modifications of releases from reservoirs may, in fact, have temporary impacts on your power supply, are not going to do significant long-term damage to your ability to deliver service to your customers.

Long-term modifications of water releases may, in fact, do that, but at this point, no one is capable of guaranteeing releases on a weekly basis, let alone over five or ten years.

That's what the Chairman keeps talking about in terms of shelf life.

MR. FERREIRA: As a matter of fact, we carry a prudent amount of reserves within our system to cover some short-term fluctuations. That is the reason why we are interested in building additional transmission access so that we can interconnect with other utilities in order to

be able to adjust short-term uncertainties that we have to deal with on an annual operating plan.

MR. DEL PIERO: Are you currently negotiating any contracts to replace that power being lost by 1999?

MR. FERREIRA: Our plan is to replace it by building four gas-fired generation power plants here in Sacramento County. One is Campbell Soup and Proctor & Gamble and so forth.

MR. DEL PIERO: Have you got a contract for the natural gas?

MR. FERREIRA: We have a contract for some pipeline capacity to Canada. We don't have any contract for buying gas reserves because it makes more sense to stay in the short-term market right now than it is to go on to contract for long-term gas supplies.

But we have a portfolio that includes reserves, some exploration development and some slot market purchases, but the next block in terms of replacing those contracts is the Northwest power, and as I mentioned, which is critical from the standpoint of this discussion here today, is to start building some renewable resources which are wind and solar.

MR. DEL PIERO: Thank you.

MR. CAFFREY: Mr. Brown.

MR. BROWN: My question has been answered.

MR. CAFFREY: Anything from staff?

All right, thank you very much, Mr. Ferreira. It has been very interesting, and let me just say that when we return at 1:30, we will hear first from Mr. Dave Whitridge.

Thank you all very much.

(Noon recess)

TUESDAY, JUNE 14, 1994, 1:30 P.M.

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MR. CAFFREY: Please take your seats and we will resume the workshop.

We will start with Dave Whitridge.

Before Mr. Whitridge begins his presentation, let me say I have one request from somebody that has a flight to catch, Michael Jackson, representing California Sportfishing Protection Alliance. I will get him in for the seven minutes he has requested before three o'clock. That's the time he has to leave, so we will keep an eye on that situation.

Good afternoon, Mr. Whitridge.

MR. WHITRIDGE: Good afternoon. I am David Whitridge and I am here today on behalf of the South Delta Water Agency.

Probably as the first speaker in the afternoon, I should tell some sort of water joke to make sure everybody is awake, but I have been told if you tell them before the wrong audience, they are likely to come true, so I pass on that.

MR. DEL PIERO: The Chairman keeps a proprietary interest in all jokes.

MR. WHITRIDGE: What I have done, I have passed out 20 copies of our statement and what I have done for this

particular workshop is to copy some representative exhibits which we have submitted during the Bay-Delta proceedings, and I don't intend today to go through those in detail with the limited nature of this hearing and nonevidentiary hearing, but I just included them and I will refer to some of them to show the Board they are a sampling of what we have submitted in the past on the effects of the upstream diversions.

And certainly, if any more detail were desired on any of these, the staff could refer to the transcript where those particular exhibits were introduced and they are discussed in detail.

As I say, my main focus today will be on the effect of other upstream diversions and in regard to the South Delta that relates to the San Joaquin system, which is an historic water supply for the South Delta.

Since about 1950, the inflow of the San Joaquin River to the Delta has been, and still is being greatly reduced. There are long periods when there is no net outflow from the river to the Central Delta and I have given you a copy of exhibits in regard to that.

This causes stagnant water reaches with loss of salinity control and inadequate dissolved oxygen for fish as well.

Another problem is the over-appropriation of the

stream system. Upstream appropriative rights granted by the State Board often exceed the total yield of the river system. This is particularly true in dry years when it is most detrimental. Also, direct diversion rights are based on diversion amounts rather than on consumptive uses and appropriators, therefore, are able to keep increasing their consumptive use of the water they divert with the consequent reduction in return flows, which is very important for downstream users now at certain times when we become largely dependent on return flows as part of our inflow.

Some upstream appropriators may feel that by saving consumed water they can transfer this water without any analysis of its effect on reducing the flow downstream, but we are having considerable problems as a result of conservation and consumptive use.

Exports from the Tuolumne River to the Bay Area have increased substantially over the last 40 years. We have included one exhibit which shows the effect of just routing a very small part of these diversions through the Delta in a dry year such as 1977.

Appropriators on the tributaries with junior water rights have not been required to bypass sufficient unimpaired flows to protect senior water rights and natural channel depletions in the San Joaquin River and Southern

Delta.

We are attempting to get the Board to address this problem and we hope they will look at it some more. We have submitted a petition in that regard.

The net effect of the Central Valley Project operations alone is to reduce river flow upstream of Vernalis by about 130,000 acre-feet in dry years and 560,000 acre-feet in below normal years. I have attached some exhibits to that and these derive largely from the June 1990 joint reports done by the South Delta Water Agency and the CVP on the effects of the Central Valley Project upon the Southern Delta water supply.

The substantial increase in river salinity is caused primarily by CVP operations as opposed to reductions in flow.

The June 1980 report indicated that the average increase in salt load at Vernalis attributable to the CVP during the period examined in the report was 102,000 tons in

dry years and 129,000 tons in normal years. Later updated studies have indicated that a very large majority of the more recent level of salt load in the spring and summer months is attributable to the CVP, and that the CVP service area introduces about 30,000 tons of salt per month into the river in those months when flows are typically low.

This salt load which drains from the portion of the CVP service area that lies within the San Joaquin watershed results from the importation of salt in the water imported via the Delta-Mendota Canal and the application of that water to Westside lands.

I have also attached an exhibit which shows that that amount of input of salt load is now over one million tons a year through the DMC and into the valley.

Although the CVP has contributed substantially to flow reduction in the San Joaquin River, it's not clearly the only cause of that reduction and it is not an increasing cause as some of the other upstream diversions are at this point.

The CVP salt load has impacted agriculture along the main stem in the South Delta, but it is not clear what effect it has had on each of the various aspects of the ecology in and along the river. We don't know whether the impact of reduced flows on the resident fishery is as great as the impact of the recent proliferation of non-native aquatic plants, for example. Higher flows would help somewhat to control these plants, but not in oxbows and other backwaters. Massive hyacinth growths have impeded migration to and from salmon spawning beds.

It is also not clear to what extent increased salinity and any increase in toxicities would be a problem

to the fishery if the flow were not reduced. The lack of flow might be less serious for some species if there were a channel maintenance program. There is no such program, and the elevation of the river bottom from Vernalis to Paradise Cut has been raised by sedimentation during recent decades from below low tide levels to above low tide level.

In summary, there has been a major deterioration in the flow and quality of the San Joaquin River during the last 40 years. The deterioration in flow is continuing due to increasing consumptive use of water by other diverters, but the CVP impact is remaining fairly constant and the SWP is not a significant cause.

Introduced aquatic plants and fish have multiplied rapidly.

We are also concerned that any proposed shift in the season of releases of flows to save migrant species may further exacerbate the inadequate flow and quality of the river's Delta inflow in summer months, and may foster even more pervasive growth of non-native aquatic plants.

In regard to the question on the issue of effect of non-native species, we discussed that somewhat in the April workshop and I won't repeat all of that.

What I have done here is basically given you a copy of a draft briefing paper of May, 1994, by the Bay-Delta Oversight Council on the effect of introduced fish and

wildlife and plants in the Bay and estuary. I think it is a pretty good summary. It's a draft and it is now out for public review and I think it should be useful for the Board just in listing and enumerating the various non-native species in the Delta and their effect on fish and so forth.

I have also attached a memorandum by Alex Hildebrand and Stan Barnes that was not done for any particular organization, just done by those two as individuals, but Alex could not be here today and asked me to provide it to the Board.

It basically looks at policy approaches, things that should be addressed before attempting to impose new Delta standards such as the overcommitted water yield, the introduction of non-native species and so on.

So, that's all I have. I would be glad to answer any questions the Board might have.

MR. CAFFREY: Thank you very much, Mr. Whitridge.

Any questions from Board members? Mr. Stubchaer.

MR. STUBCHAER: I believe you are the first speaker that's really mentioned non-native plants as opposed to fish and other types of animals.

And just looking at the paper you presented from BDOC, they mentioned water hyacinths. Are there others that you are aware of?

MR. WHITRIDGE: I believe hydrilla is another one.

I am not an expert on non-native plants, but I believe that was the other one that is mentioned as well. That's on page 10.

MR. STUBCHAER: In the BDOC document?

MR. WHITRIDGE: In the BDOC document, right.

MR. STUBCHAER: And then, parrot feather and water primrose, whatever those are.

MR. WHITRIDGE: But those cause significant problems for agricultural diverters. They are pretty thick and I think they cause problems for migrating fish as well.

MR. CAFFREY: Any other questions? Staff?

Thank you very much, Dave.

I am going to take one presenter out of turn right now. I apologize to Mr. Hoag and his group.

Michael Jackson has a plane to catch and I think now is as good a time as any. Mr. Jackson, good afternoon, sir.

MR. JACKSON: Good afternoon, sir. Thank you very much for helping me with my schedule. I will try to be brief.

The California Sportfishing Protection Alliance has submitted a proposal for dealing with the water problems in dry and critically dry years. What it does, we think, is fairly allocate the burden between all upstream water users. It indicates by lake, by reservoir and by

diversion, which diversions would pay the price. What it does is, it will generate somewhere around three million acre-feet of water in critically dry years and additional inflow into the Delta.

Now, we are not indicating that's going to be necessary, but we wanted to use a number large enough that dealt with DWR's projections as to what their problems were going to be under Club Fed standards. We support the standards.

We believe we ought to not be nonsensical and go back through this again and again while industry and agriculture and municipal users and the environment itself suffer from lack of action.

So, we are assuming the following things: That the DWR is correct and that they need at least two million acre-feet of water in additional water in critically dry years, and that Club Fed is correct in what the standards need to be.

Assuming those things, we would propose that in critically dry years all water storage reservoirs release an additional ten percent of flow for Delta inflow. We believe that in dry years five percent should be released. These numbers generate easily the amount of water in additional inflow that is necessary for complete and whole diversions out of the Delta in dry and critically dry years

if you assume that Club Fed is correct in the standards and that DWR is correct in the water costs.

We think everybody in the state should pay it. We believe that you should take a fisheries look at the delivery schedule. It would be very important to us that you deliver the water from the upper reservoirs after Labor Day because that would then take into account the recreation uses in the Sierra and other upland areas.

The delivery from the lower reservoirs, the regulating reservoir on each tributary to the Delta, could be handled on the daily basis that Club Fed was talking about in terms of when to call the water down.

What it does is it gives a certain amount of certainty to upstream water users because they know that they will not lose more than ten percent of storage or diversion in any critically dry year. In dry years their hit will be limited to five percent.

Some of that water should be paid for by the State Water Project and the Central Valley Project users as transfer water, but it would be part of the main pumping water.

It simply could be done in order to transfer the cost of the drought year water contribution to the urban water users, who have more money than water.

The farmers probably and the environment, if we did

every technical fix we could do, we might well have as much water as we need, but we need money to pay for the fix, the screens.

That was one of the best parts of D-1630, I thought, was that the urban water users acknowledged the fact that they had money for the problem.

I thought, Mr. Stubchaer, you did a wonderful job of pointing out the cost on the hydro bill. The water and power bill is where to pay for the fixes that we need in the delivery system to take care of fish.

It seems to us that you can design a much more correct way of doing it than we have. We are very limited in terms of having no computer skills, we just have a couple of guys sitting in a room with pencils and an old-fashioned way of doing it.

But it does show, I think that we don't need peripheral canals, we don't need to require DWR to go further in debt. We don't need to balance the problem -- the law is that if you followed it theoretically, the State Water Project would be kicked out of the Delta, and that's relatively unacceptable.

We have to find some way to make the 800 billion dollar economy in California more certain and if water can play a role, then we need to do that.

So, this is a proposal that can be modified. It

can be balanced between inflow and export, but in reality if you read the legal basis for what we are saying, which I find in MWD's legal analysis, since they are much better lawyers than I am, you have the authority to do this. Judge Racanelli told you to do this. We have been fiddling around for ten years not doing this. Let's do this. Let's take Club Fed's standards and DWR's water projections and find a way to all contribute and then let's have the urban water users, and the urban power users and people like me, pay it on our bills.

Thank you very much.

MR. CAFFREY: Thank you, Mr. Jackson.

Any questions from the Board members?

You stunned us.

Mr. Brown.

MR. BROWN: Mr. Jackson, the 35 million acre-feet of water used annually within the state, you are suggesting that we taken ten percent of that and divert it toward the additional environmental needs in the Delta?

MR. JACKSON: Yes, I think in the long run that's the only way that we are going to be able to set up an economic system that works over enough years. We can haggle back and forth about whether or not these environmental laws are right or wrong, but we do need to meet them.

To me, it is simply sort of a law and order issue, and that if we once surrender to the law and decide to obey it, that what we will get out of that is that people can make economic investments based upon the fact that we are going to follow it.

One of the problems with D-1485 is that it never was enforced and there's a lot of us who believe that it is hard to enter into any kind of good-faith agreement process to all work in the interest of the State when the laws don't mean much.

So, I guess what I am saying is that we do have a little more risk in the water storage and the carryover, but we have a lot less risk in the standards shifting and changing and being talked around, and I think we have got to do something about making the investments in the non-agricultural portion of the economy more certain.

I mean, after all, agriculture is very important but it is only 17 billion dollars. The whole economy is 800 billion dollars, and it seems to me that we need to take some steps to make at least the urban part of the State Water Project and the Central Valley Project certain.

MR. BROWN: Thank you.

MR. CAFFREY: Mr. Pettit has a question, Mr. Jackson.

MR. PETTIT: One clarification just for my benefit.

Are you suggesting that we apply operational rules throughout the basin as a substitute for the numerical targets in the Delta itself?

MR. JACKSON: Yes, sir, that's essentially how I am suggesting it. I mean, you are going to be guided by the biological reality of meeting all of the standards that Club Fed and DWR pointed out that they are meeting now.

MR. PETTIT: I guess that gets to the point, will there still be numerical standards in the Delta that somebody would have to meet?

MR. JACKSON: Yes, I believe there would be.

MR. PETTIT: If we followed your suggestion and there were numerical standards in the Delta, whether it be EPA's 2,000 parts or whatever it be, and the operators upstream made the releases in accordance with your suggestion and some modification, and we still didn't meet the numbers in the Delta, who would be on the hook?

MR. JACKSON: Well, I presume we would still all be on the hook. The idea is we need to spread the hook. I need to be caught in this hook and so do the rest of the people in California, not just the Central Valley Project and the State Water Project.

MR. PETTIT: So, does the Board then issue an enforcement order against everybody?

MR. JACKSON: Under Article X, Section 2, the

public trust and the wonderful legal analysis of MWD, I think you can do that.

MR. PETTIT: Thank you.

MR. CAFFREY: Anything else of Mr. Jackson?

Thank you, Mr. Jackson.

MR. JACKSON: Thank you.

MR. CAFFREY: Mr. Hoag, good afternoon.

MR. HOAG: Good afternoon.

MR. CAFFREY: I have a number of cards that were submitted. I am not clear whether it is in sequence or a joint presentation. I have you and Dudley Riser and Tom Berliner, Laura King, Steve Arakawa on one card, and Tom Berliner on another and Laura King on another.

MR. HOAG: Let me explain.

MR. CAFFREY: You are representing different groups, I take it?

MR. HOAG: That is correct. I am the first of four presentations from the urban interests. We thought it would be of most value to you if we went in sequence, and so we made that request.

So, each of us will take our time. I assume that doesn't mean each of us have five minutes since there are four of us. Each of us will make a different presentation. We have coordinated this enough to avoid a lot of overrun.

MR. CAFFREY: The time requests are modest except

for your opening, which is 20 minutes. The rest are around half that much time, so we will just treat it in that fashion as a sequential presentation. We will take them in the order I read this.

Why don't you begin, Mr. Hoag. It is nice to see you.

MR. HOAG: Thank you. I represent the California Urban Water Agency. CUWA is an organization of the 11 largest urban water purveyors in California. Our members serve about two-thirds of the State's 32 million population. This group has joined to work on water policy issues that are of common concern to all the major urban water providers.

Number one on that list of interests and concerns of this group is water supply reliability. There is the R word again. It comes up and it truly is the paramount concern of these folks.

In working on that issue, we believe that the long-term solution to Delta issues is the single largest factor influencing state-wide urban water supply reliability. So, we give it a lot of our concern and resources and energy.

I would like to, together with Dr. Dudley Riser, who is the consulting biologist to the California Urban Water Agencies, to address key issues Nos. 1 and 4 in the invitation that you sent out.

I would like to start by just making a comment, kind of an overview comment on issue No. 1, the other factors that contribute, and then pass the baton to Dr. Riser to summarize some of the additional results of a recent four-month intensive survey, a review that we did mainly on the EPA standards proposal in the December-through-March period, and much of that work is, of course, directly applicable to this proceeding, and we are pleased to be able to bring the value of that plus additional ongoing work to this proceeding.

That was the body of work, you probably have seen the pile of reports, some 800 pages, that resulted in what has been called the urban alternative, which essentially is the statement of support for much of what EPA proposed with some significant proposed modifications and refinements, most of which have been well received by the large majority of the interest groups concerned with this proceeding as well as the EPA proceeding, and we feel good about the contribution that we were able to make in that form, and we continue to work on that.

As a matter of fact, we now have an ongoing review of much of that work jointly with several of the environmental organizations, so we are trying, as you asked, to get out there and try to reach consensus on either total parts of this package or individual issues as

we see the importance to do so.

Let me go to this issue No. 1, the question of other factors. We found, first of all, that the abundance of estuarine species is positively correlated with salinity, with the so-called X2 location, the two parts per thousand salinity.

In brief, that correlation is strong enough to justify support of a salinity-based standard which, of course, means outflow-based standard because X2 and outflow are very closely correlated.

But the other thing we found in that work was that the correlation with X2 is very strong and does not explain all of the variations that are going on. In other words, it demonstrates that the other factors out there in the estuary are collectively very very important.

We were able to demonstrate a somewhat weaker correlation of abundance with X2 than came out of the original San Francisco estuary report upon which the X2 standard was abased.

Nonetheless, the strength of that correlation is there and it is strong enough to lead us to support the basic EPA approach, but also, to conclude that the importance of the other factors is demonstrable, and what is not clear at this point, and I think you have found that from all the testimony that has occurred, is that nobody

has been able to sort of separate out all those other factors. You have heard virtually the same list of factors from everyone that has testified, and to ascribe relative importance to each and every one of those it is a very difficult job.

We started to do some of that kind of work in our earlier review and we simply didn't have the time or resource to do it. As a result, the California Urban Water Agencies Board has just approved an extension, sort of a phase 2 of that scientific work with a budget of somewhere around three-quarters of a million dollars devoted solely to this question, trying to do a better job of sorting out the impact or the relative importance of those other factors.

This work is just getting under way. Some of it will be done, some of it will be providing results during the remainder of this year, but much of it will not. It is not an easy problem. It is not going to come to resolution in a short period of time. We don't expect to have easy pat answers to all these questions during that period.

We also did during that work some correlations with other factors, food supply, et cetera, and found strengths of those correlations that led us to the same conclusion and that is that although salinity is important, the other factors are very important and require further work.

The results of the work done earlier led us to some recommendations to your Board and they are mainly that we recommend that as you put together the standard, that that standard explicitly recognize the importance of these other factors.

You will not have precise or clear-cut results on each of them, but they must be recognized and there must a program on how to continue the further definition of their importance and how to deal with them to remedy the effects that they cause.

We believe that the State Board and the Regional Board have the power to deal with many of those other factors, the pollutant toxics issue, entrainment, nutrient, et cetera, going down the list. Some of them you do not have and we urge you to use your strong influence with the other State and Federal agencies to achieve early and aggressive progress on those other factors whether it be fishing or dredging, or whatever it is.

We will continue to be a part of this process. We will continue our scientific work on these issues. We will be pleased to come back when we have additional findings and report to you, and what I would like to do with the remaining time here is to ask Dr. Dudley Riser to give you just a little further overview of some of the technical results from our first effort.

Dr. Riser.

DR. RISER: Good afternoon.

MR. CAFFREY: Good afternoon, Dr. Riser.

DR. RISER: I do have a few overheads I may be able to use during my presentation.

MR. CAFFREY: Go right ahead.

DR. RISER: As Lyle has mentioned, my name is Dudley Riser and I am a fishery scientist and a technical consultant to the California Urban Water Agencies.

For the past four months I have been involved with a number of other technical representatives taking a very close look and review of the proposed EPA salinity standards. We reviewed this in the context of two different components; one of them being the specifics behind the standards themselves, as well as the biological basis behind the standards. That's very important from a fisheries and aquatic ecosystem perspective.

That is, we asked the simple question, do the statistics that were used in the analysis or in the development of the standards, do they support the same conclusions that the EPA came up with. That was question No. 1.

Question No. 2 was, do we believe that the standards as proposed will achieve the desired effects that the EPA is putting forward, that being the restoration of

much of the ecosystem.

Those were the two fundamental questions that we were addressing.

As Lyle mentioned, the results of our efforts were synthesized into a series of 12 volumes that stood about this high which we did make available to the State Board and to other interested parties.

We have continued from the technical perspective the ongoing dialogue with various State and Federal agencies as a continuation of the technical discussions and as a continuation of the work that we started four months ago.

The results of the analysis that we conducted have led us to the conclusion that from a technical side, the standards with some modification are a very important step in the overall return of the estuary back to historical or some time frame element.

However, the analysis also led us to conclude that the likelihood of a single parameter for a single standard focused on salinity is very unlikely of achieving that goal given the myriad of other factors that we know are operating in the system.

Despite the fact that we have heard some discussion today that other researchers have put forward, the other factor as being secondary impacts or having somewhat of a

relationship to abundance, for the most part the work that we have reviewed to date has been largely qualitative in nature, not a quantitative analysis has been completed, and I would say a lot of it is based upon professional judgment.

One of the California Urban Water Agencies' technical document that we put forward actually addressed, and I have it here today, it's reference No. 6 of the 12 documents -- this document was a synthesis of what we identified as being the major factors and what other researchers have been putting forward as being other factors that are influencing the ecosystem, which is why I am here today.

I would like to briefly summarize what the major conclusions were based upon this analysis.

If I could have the first overhead.

We have heard today a number of other discussion points dealing with the other factors, and it goes without saying that the ecosystem of the Bay-Delta is very complex. There's many different factors that are influencing the system. I won't go through each one of these. Some of these are common, in fact, the majority of these are common to other presenters here today, things such as land reclamation, food production, overharvest, exploitation, and the one that's come up several times, species

introductions, introduced species, exotics.

It is fundamental in any ecosystem that these particular factors, what we might call limiting factors, be identified, and to the extent possible, quantified so that you can then develop realistic management plans and remediation or restoration plans so that the entire system can be restored to some level.

In the interest of time, however, I would like to just refer you to the written statement that we have put forward instead of going through each and every one of these issues.

I would like to go to the second, the major conclusions, and I think that you have heard this articulated today several times, the other factors we believe strongly are influencing the Bay-Delta ecosystem. It's not to say that outflow, diversions, et cetera, are not a factor.

We agree with that, as Lyle has mentioned, but we also know that these other factors are operating and we feel strongly from a technical side that these must be addressed in parallel with the water quality standards and, in fact, as I mentioned earlier, it is very likely that the standards alone will not restore the ecosystem to the desired levels.

I think there are too many unknowns or uncertainties

with respect, if you take introduced species alone, to predict how the system is going to respond to one particular parameter.

May I have the next overhead.

Lyle touched briefly on the evidence that we have put forward, that leads us to this conclusion. I would say, first of all, it is the results of our analysis, the results of the four months and summarization that we put forward in reference No. 6, the actual work that we developed.

No. 2, Lyle mentioned also, although the X2 versus the abundance relationship do explain some of the variability, there is a large portion that remains unexplained, again suggesting that there may be other factors.

And then, kind of in an exploratory fashion, as Lyle mentioned, we did not have a lot of time to complete our analysis, but we did do some exploratory statistical work and we did come up with direct correlations of certain factors versus abundance that were as strong in some cases as what X2 is, again suggesting these other factors are influencing.

Then, finally, we heard reference to several discussions today, the BDOC documents on introduced species, there has been some recent publications by Jassby,

et al., that have also pointed out the fact that we must consider every component in the system in order to allow the restoration of the ecosystem.

If I could have the next overhead --

MR. STUBCHAER: Could I have a question on this?

MR. CAFFREY: Yes.

MR. STUBCHAER: Was the data that you analyzed the same data which EPA analyzed or which the estuary project analyzed?

DR. RISER: Yes, it was.

MR. STUBCHAER: Was there a difference in the method of analysis?

DR. RISER: We used a Pearson correlation coefficient and we made some comparisons between different parameters. We did find some species responding to the X2 relationship similar to EPA. We extended a little further and looked at some other factors in making correlations and found some very strong correlations, and particularly those related to food production.

MR. STUBCHAER: You used a different distribution than they used?

DR. RISER: We used different parameters in comparing. We didn't limit it to just looking at X2. We started to compile other parameters and then run correlations between the same data sets, the same abundance

information from the fisheries or invertebrates perspective, but looking at other parameters to see what relative correlations we could find.

MR. STUBCHAER: And what was the correlation coefficient or the R squared so-called in terms of item 2, or what range did you have?

DR. RISER: In terms of item 2?

MR. STUBCHAER: Yes. The variance or the unexplained variance between X2 and the abundance relationships.

DR. RISER: As I recall, and I don't recall all of the correlations, but it seems to be in the range of .3.

MR. STUBCHAER: .3?

DR. RISER: Right.

MR. STUBCHAER: Just for the record, one is perfect and zero is no correlation?

DR. RISER: Correct. So, as to the correlations, there's a great deal of unexplained variance that remains in the X2 versus abundance relationships, and again, part of the analysis that Lyle mentioned, too, with respect to the further analysis that we want to do, is attempting to seek out more of the cause/effect relationships between these other factors that are operating in the system and the abundance of various parameters.

MR. STUBCHAER: Thank you.

MR. CAFFREY: Please proceed.

DR. RISER: The work plan that we have for proceeding with this type of analysis, Lyle mentioned that we are looking at a budget, that CUWA is looking at a budget of around three-quarters of a million dollars. This is very conceptual at this point in time, but in essence, what we intend to do from a technical perspective is to compile and review data.

We know that there's a tremendous number of data bases that exist that contain valuable information that just has not been looked at in any sort of quantitative fashion in attempting to gather all of these other factors together.

We want to attempt to determine the relative impacts of these factors so that we can begin to possibly actually assigning a percent contribution determining what relative impact we have relative to pollution or introduced species or land reclamation -- what sort of contribution do these factors make.

And then, of course, the most important component that will come out of this will be the prioritization of the impacts relative to the restoration plans.

MS. FORSTER: May I ask a question? Lyle said this wouldn't be done by the end of the year. How long do you anticipate it is going to take you to do that study that

you just had on the screen?

DR. RISER: We are looking at probably realistically, from my perspective, a couple of years worth of time that is going to be required in order to really get an understanding of all these different components. It is not something you can do in a two-month period, two- or three-month period. It is going to take a longer time frame and it is going to take a cooperative effort, and that's what is very instrumental to this whole process. This can't be done by any single entity. It has to be a joint effort and it has to bring together both the State and Federal agencies personnel and other entities that have been involved in the system to more or less endorse this effort that's going to be put forward.

MS. FORSTER: I don't want to interrupt your flow, but you might want to think about this. When you are done, either you or Lyle, or one of the team, may give us a presentation. I need to know a little more clearly what your expectations are from the State Board staff.

I mean, if you can't do it in two or three months, but you want it to be considered in the plan that the State Board develops, how do you think it is supposed to look?

You know, I am sitting here thinking how are we going to be able to do it, and you are admitting it is so hard to do, and you are putting all these resources into

it. It will be helpful to know your expectations or how you would
-- I don't want to repeat myself -- your vision of how it would appear in our document.

DR. RISER: I think what we are talking about right now is from the technical side of things. I am speaking as a fisheries biologist now. In looking at the problems that we have identified and reviewed in the Bay system, what we are saying is that flow-outflow, yes, that is a concern. Salinity is a concern. We are saying that that is one of the problems, one of the factors, and what we are saying is that's not the only problem.

And recognizing that the time constraints that the Board has may not flow directly in with the time frame that the scientific community might be able to answer or address those types of questions, is a problem. There is no question about that.

I think, however, that the message, at least that I am conveying, that I would like to convey, is that we need to proceed and that the Board should consider that this is not just a single standard, but should be viewed in the context of, you know, three months time from now, but let's look at it more wholistically, and even if we have to implement some measures that you know are going to down the pathway of two years or a year and a half when we get more

answers, be receptive to the results of those measures or the results of that analysis at that time.

Perhaps if I can move along to the next two slides or the next two overheads, there are a few recommendations that we do have that might give a little better perspective on this. If I can shift over to status and trends, this is issue No. 4, just briefly: The results of the CUWA analysis generally concur with those that were done in the ISP that came out of the ISP documents in the San Francisco estuary project; that is, we believe there are long-term declines in certain species abundance.

However, I would say that the degree of certainty that we attribute to any particular factor probably differs somewhat than that which has been communicated in other reports. That is, we are uncertain in a lot of cases what is really causing these declines. Outflow, again, is a contributor, but it is not the only contributor. We would be recommending that these causes for declines do need to be addressed. They include not only water quality standards, but other factors.

Then, the last overhead, specific to the status and trends review that was completed, we did find and wish to make some recommendations, technical recommendations, regarding our conclusions.

No. 1 pertains to the refinement of existing survey

programs. Some of the species, individual species that are being reviewed and evaluated, the sampling programs or survey programs that are presently in place, are not sufficient, in our opinion, to sample those particular species, and we would urge some consideration be given to refining those programs to more appropriately sample and accurately portray the species abundance.

MR. DEL PIERO: The methodology currently being used is the best that current wisdom seems to think is possible. How does one achieve what your goal is?

DR. RISER: What you need to do is evaluate; in other words, from a fishery perspective, certain species are going to be more vulnerable to given year types than other species are. Some fish are schooling fish, other fish are not schooling fish, and the results of the detail or the technical analysis that we completed leads us to the conclusion that some species, and the case in point might be the Sacramento splittail which inhabits shallow water habitat, under the existing survey program you are simply missing those species because you are not sampling that particular type of habitat, at least for certain programs that are under way.

So, we are simply pointing to the need to reconsider and re-evaluate some of these survey programs so that we can more accurately depict the species abundance.

MR. DEL PIERO: Is that going to be forwarded to the Fish and Game people?

DR. RISER: Yes, it is.

MR. DEL PIERO: Because the same thing is done by the Department of Fish and Game.

DR. RISER: We have had some technical discussions with the California Department of Fish and Game.

Another recommendation I think that is fundamental that I have not heard yet communicated here today is the development of a monitoring program. We need to have almost a continuous feedback because of all the uncertainties that we do have in implementing any standard and allowing any sort of restoration or recovery option that we might implement.

We need to have very tightly developed monitoring programs, statistically valid monitoring programs, programs that, in my opinion, are based specific, Bay-Delta specific and not what I would call agency specific, so I think that's very critical.

And finally, a program of development, and I did hear this alluded to in earlier testimony, the development of a multispecies ecosystem management program.

This particular program goes directly to the complexity of the system. It goes to the fact that we are dealing with multispecies, multilocations, multiple

problems and the complexity of the whole system has to be approached in a wholistic fashion, and the California Urban Water Agencies and the tentative work that we have done today strongly supports that type of approach be conducted.

With that, I will open it up for questions.

MR. CAFFREY: Ms. Forster.

MS. FORSTER: I have two questions. Do we have a copy of what you had up there in our handout?

DR. RISER: No, you do not. We can make that available.

MS. FORSTER: I believe we should each receive one.

And the second question I have follows up on your last comment. Some of the things that you are recommending sound wonderful. Do you have prototypes, do you have a sample of what you think would make a good multispecies management program?

DR. RISER: There are other HCPs, habitat conservation plans, multispecies conservation plans that have been developed. They are relatively new. I would say relatively new in the sense of being the last three to four years. But there are some prototypes that can be put forward, yes.

MR. HOAG: As a timely answer to Ms. Forster's question, there is a working group for ad hoc who right now is in the process of preparing an outline of what is an HCP

in this case, what will it do, what are the goals, what are the components and how do you implement such a plan, and it is just coming together for internal review and very shortly it will be out and we will be pleased to contribute it to you as well.

May I jump back and be sure Ms. Forster's earlier question is answered because I think we have a fairly focused and clear answer to the question of what do you do given the complexity and time required to deal with some of these.

It is true that you will not have all the answers on the other factors thing between now and December. We do not want you to slow down in your standard-setting process. You have a schedule, it's the right one, you need to stay on it.

We believe that you can proceed with water quality standards, and in the broader context of those standards include the components of the comprehensive plans which include other factors, include time tables for that work, include how they will come back into the standards process, for example, in your triennial review process, and we don't believe it is appropriate or necessary for you to alter the water quality standard process simply because there are pieces of the puzzle like this one that are not going to be resolved between now and December.

Now, there's a parallel comment to that and it goes to the question of how do you set salinity or outflow standards without having all the pieces of the puzzle worked out.

We do not believe that the setting of a level of protection for purposes of this standard is a product of a total balancing process simply because you cannot do a total balancing while, indeed, some of these components of a comprehensive habitat conservation plan are being worked out, and that's why in the Urban alternative we support the level of protection based on an historic benchmark. Essentially it goes to the antidegradation approach which, of course, since the time you first deliberated and since we came out with that, the Supreme Court of the United States has also further endorsed and supported, so you cannot include all of the so-called other factors solution in your December standard setting, except in a non-numerical way, and that's what we are recommending.

MR. CAFFREY: Thank you, Mr. Hoag and Dr. Riser.

Other questions from members? Nothing from staff?

MR. BROWN: I really like your approach on this. I think that while we have some targets set for the end of the year, nevertheless, your approach and this information will be very helpful in the dynamics of this problem as we progress throughout. Thank you.

MR. CAFFREY: Now, we will have a joint presentation from Tom Berliner, Laura King and Steve Arakawa, representing the Bay-Delta Urban Coalition.

Good afternoon. I see Tom Berliner is not with you.

Please identify yourselves for the record.

MS. KING: I am Laura King with East Bay Municipal Utility District.

MR. ARAKAWA: I am Steve Arakawa from Metropolitan Water District.

MR. BUCK: I am Byron Buck from the San Diego County Water Authority.

MS. KING: We would like to start our panel with a statement on behalf of the Bay-Delta Urban Coalition and I am going to read that statement. You should all have copies and I would like to just say by way of explanation, that the organization here, Mr. Chairman, as you alluded to, that we are sort of in the process of trying to get these groups to all come together, and it is an unwieldy process.

This statement we had hoped to be delivered formally by CUWA, but because it is a new position, we weren't able to do that.

The Urban Coalition is sort of a shifting organization. From one workshop to the next you will see

different members listed at the bottom, and that reflects availability of people to review drafts as much as particular policy stances by different districts. I hope you won't read too much into who is on the list and who isn't on the list at this point.

Today's statement is being presented on behalf of the Alameda County Water District, Central Coast Water Authority, Coachella Valley Water District, East Bay MUD, Municipal Water District of Orange County, Metropolitan Water District of Southern California, Public Utilities Commission of the City and County of San Francisco, San Diego County Water Authority and Santa Clara Valley Water District.

And as we mentioned in the footnote, this position does not necessarily reflect all of the views of all of those different districts.

So, with that introduction, I would like to read this statement:

For this hearing, the State Water Resources Control Board has requested comments concerning the impact of upstream diversions on the Delta. Specifically, the Water Board asks: What effect do upstream water projects, other than the CVP and SWP, have on the fish and wildlife resources of the Bay-Delta estuary?

The Urban Coalition offers the following

observations:

The State Water Project and the Central Valley Project together have been the subject of studies to understand their impacts on the Delta and upstream environments. These studies, costing tens of millions of dollars, have not resulted in a precise quantification of the relative impacts of the projects.

Diversions and related actions by the projects are among the sources of human impacts on the Delta. Operations by other diverters, both large and small, have also affected the Delta system. Further, activities such as urban and agricultural development, fishing, pollution and others have also had adverse effects. Projects and non-project upstream storage facilities have offsetting positive impacts on the Delta and its tributaries as well.

During times of low flow, particularly during droughts, the flow releases from upstream reservoirs provide water for a multiplicity of beneficial uses in the Delta and on its tributary rivers.

To date, the studies of the impacts of the non-project water users have focused primarily on localized impacts or on the effect of pollutant discharges on fish and wildlife. The impacts of non-project diversions and other activities on the Delta have been described conceptually, but there has not yet been any effort to

quantify the impacts. It is our understanding that Mr. Arakawa will be undertaking an effort to develop a quantification of those impacts as part of this research effort that Mr. Hoag was referring to.

The quantification of impacts on the Delta by all diversions will be complex and time consuming. However, the Water Board should not wait until there is scientific quantification of each water diverter's or water user's effect on the system before it issues a decision regarding levels of protection and allocation of responsibility for the health of the Delta's ecosystem.

Rather, the Water Board should adopt an allocation method that reasonably and rationally allocates responsibilities with due regard to existing scientific analysis, public policy and legal principles.

The Water Board's decision should include an allocation that recognizes that diversions, entrainment, return flows and all other activities that result from the use of water have some impact, at least incrementally, on the Delta and fish and wildlife that rely on it for their habitat.

The decision should also give due regard to fundamental issues such as water rights seniority, type and relative benefit of use, and other factors to determine an allocation plan that will best protect the public's

interest in making the fullest beneficial use of the State's water.

In addition to the allocation of responsibility for Delta protection, the Water Board must include reasonable and practicable means for diverters to meet their responsibilities through alternative means. To this end, the Urban Coalition endorses and supports the development of a program of mitigation credits to allow responsible parties to meet their obligations either directly as assigned by the Water Board, or indirectly by substituting a mitigation credit in lieu of their assigned responsibility.

Mitigation credits may take many forms, including the payment of money to a fund that would purchase water from willing sellers, or the foregoing of a release of water from the responsible party's system in exchange for the release of water from other sources.

As knowledge increases about the relationship of non-water activities to the protection of fish and wildlife, non-water related alternatives, such as physical habitat restoration, should be available as mitigation credits. The concept of mitigation credits and the inclusion of non-water alternatives to promote fish and wildlife restoration is integral to any overall, comprehensive plan to provide Delta protection.

And that concludes the statement of the Urban

Coalition on this matter. I don't know if Mr. Berliner has joined us yet or not.

MR. CAFFREY: I haven't seen him. No, he is not in the audience.

MS. KING: What I would like to do is make some additional comments on behalf of East Bay MUD on that issue, and also, the first issue in the workshop notice. The first question was the question of other factors besides flows or lack of flows that are contributing to the decline of the estuary, and I would just like to begin by commenting that clearly other factors besides diversions are contributing to the decline.

I think we have heard a number of people say that today and I think one thing that is really different today than it has been in the past is that there is more of a consensus that while there are other factors that are causing problems, that doesn't mean that we shouldn't be addressing the flow issue now.

And I think what you are hearing, at least from the urban communities, is that we would like to see you do what you can to address those other factors in a timely fashion as well as dealing with the flows, and I hope that we will be able to come back with some more specific ideas regarding which of those factors might be addressed in the water standards to be proposed in December.

We wanted to contribute some information on two other factors that we have looked at on the East Bay Municipal Utility District system on the Mokelumne River, specifically predation by introduced species and poaching.

I was interested to hear this morning's speaker say that he did not think that predation by striped bass was a real problem for salmon population as a whole. We did have an experience last year in May of 1993 where we received reports of striped bass sightings in the lower Mokelumne and cooperated with a study with the Department of Fish and Game to look at striped bass predation on out-migrating juvenile salmon, and the results from that study suggest that striped bass predation losses ranged from 11 to 51 percent of the total in-river smolt production.

So, in that particular time, there was a fairly significant impact.

MR. DEL PIERO: Excuse me. How do you have a finding that it ranges from 11 to 51 percent? What criteria do you use that would result in a conclusion like that?

MS. KING: The range reflected -- part of it was based on what they actually counted in the striped bass that they opened up and part of it was projected based on how many striped bass they thought were in the area, and that explains the range.

MR. DEL PIERO: What is the value of that estimate if you have got a 40 percent point spread as to what you think the impact is?

MS. KING: I think that the value is it is a one-time sample, and so I don't want to try to make too much out of this. The value is to show that at this particular time there was significant, even if it was just 11 percent, there was significant striped bass predation going on of the salmon smolts.

MR. DEL PIERO: How many smolts came down the river at this time.

MS. KING: How many smolts came down the river in 1994?

MR. DEL PIERO: Yes. What is your estimate of the number of the smolt population that came down the Mokelumne during the presence of the striped bass?

MS. KING: In 1993, the number was 20,000 to 90,000 fish. That is the range.

MR. DEL PIERO: The reason I am asking is I am trying to figure out based on the percentage what the impact of 11 percent is.

MS. KING: I'm sorry, I don't have the figure before me of what the total was. The 51 percent, I have the number of fish that that percentage represents, which was 20,000 to 90,000 fish, so that would mean -- 180,000.

MR. DEL PIERO: That's a big range.

MS. KING: It is a big range. I don't dispute that. The more detailed information about how that range was developed is in the back of our comments that you have there.

MR. DEL PIERO: Okay.

MS. KING: Poaching has also taken a significant toll on the Mokelumne River salmon in dry years. As much as 50 percent of the salmon migrating into the Mokelumne to spawn are lost to poaching in dry years.

We would also like to make some comments on the third issue, the role of upstream non-project diversions. I had hoped to piggy-back on what Mr. Berliner was going to say about that because I think he's got some very interesting ideas. They are more specific than what I have to offer and I think it makes more sense to let him go next, so I will yield.

MR. CAFFREY: Good afternoon. Welcome, Mr. Berliner.

MR. BERLINER: I am appearing today on behalf of San Francisco Public Utilities Commission. San Francisco, as the Board is well aware, is a member of the California Urban Water Agencies and joins in the previous statement submitted by CUWA as well as statements by the Bay-Delta Urban Coalition, and we support both of their statements

today.

In supporting those statements, I do want to make it clear that the San Francisco Public Utilities Commission has not enacted a formal endorsement of any particular method for resolving Bay-Delta problems but we are supportive of working towards solutions and of San Francisco being part of that effort.

Also, I want to make it clear I am going to propose a conceptual solution today, but in proposing it, it is no more than a proposal. It is not something that San Francisco is willing to sign on the dotted line because this proposal is far from ready for that. It's an invitation for exploration and discussion. We are not waiving any of our legal rights which we have set before the Board in prior proceedings and which have been the subject of some further briefing today by various parties.

Specific reference to San Francisco's legal position would be the legal brief of the Public Utilities Commission in the interim water rights proceeding.

A comment about the upstream diversions of San Francisco: As the Board well knows, we are one of the older diverters in the state. Our facilities predate most of the large reservoirs that have been built in either the San Joaquin or Sacramento basins.

There has yet to be any specific linkage between

San Francisco's operations and problems in the Delta. Nevertheless, we are very sensitive to the fact that the Delta is in need of an immediate fix and that San Francisco can play a role in that fix.

In looking to projects beyond the State and Federal projects, which we think the Board must do and eventually will do, the Board is going to have to keep in mind that there are significant differences in the effects of upstream operations and those are going to have to be taken into account in any Delta solution.

Any decision by the Board which seeks to allocate responsibility for water quality objectives and flow requirements, is going to have to give due regard to factors such as water rights, seniority, priority of use, benefits and detriments associated with each water user's activities, et cetera.

They are also going to have to recognize positive impacts that come from various projects, particularly the use of carryover storage to meet flow requirements during times of low flow.

The proposal that we are offering today is one that has been discussed briefly in the Bay-Delta Urban Coalition submittal to the Board. It is briefed rather fully in San Francisco's testimony and I won't repeat all of it here today.

What we are proposing is a three-tiered approach. The first two tiers are inextricably linked. The third tier, which we call mitigation credits, is a concept that could be applied no matter what decision the Board makes in eventually allocating responsibility to meet Delta requirements.

In the first tier we propose that the Board establish a benchmark against which to measure parties' responsibility for Delta protection. The Board will have to figure out a way to do that. There are a number of concepts that can be used and I will get into those in a minute.

The second tier will require the Board to adjust the benchmark consistent with factors related to the water users' seniority, priority, and a number of other factors which are listed in our testimony.

In the first tier, the benchmark must be adjusted by the factors in the second tier in order to legally allocate responsibility. The Board cannot ignore the well established criteria of California water law and the long line of cases that discuss at great length the issues that I have already mentioned.

The Board cannot simply allocate based on an across-the-board formula, but must adjust each user's responsibility in relation to their legal rights and the

identified factors.

Concerning the first tier, the creation of the base, the first step to develop an equitable division of responsibility for compliance with water quality standards is the identification of the one or more physical parameters that best relate to the specific water quality standards. For instance, regarding the provision of outflow for compliance with an X2 water quality requirement, the base parameter would be streamflow and the factors that affect Delta outflow.

Another example would be water quality objectives for the San Joaquin River. In this instance, the cause of the parameter is agricultural drainage. Therefore, drainage discharges should be the parameter used to establish responsibility.

Once the base parameter has been identified, the appropriate community of water users that have an effect on the meeting of the water quality standards must be identified.

In the instance of X2, for example, all water users that affect outflow may be required to share responsibility.

Net depletion from the Bay-Delta watershed of each user may be the appropriate parameter to initially base a user's responsibility for X2 outflow. The community of

water users that deplete the water resources should be responsible. This would include surface water diverters that are tributary to the Bay-Delta watershed, in-Delta water users and groundwater users that tap aguifers that are hydraulically connected to the surface waters of the Bay-Delta watershed.

This community of water users also includes entities that deplete Bay-Delta outflow by evaporation losses from reservoirs, such as power utilities.

The second tier is where the Board must adjust the base amount consistent with legal, physical and public interest allocation factors. The allocation factors are conceptual in nature at this time. A relative impact assessment or multiplier formula would be attached to each of the factors in creating the equation for Delta responsibility. Further, it is likely that the Board would have to exercise its judgment in the application of certain of these factors to further the public interest.

The factors are numerous. I will mention a few: Seniority of right, priority of use, area of origin, timing of diversions, storage releases for public trust uses, conservation, drought management, rationing, reclamation and reuse.

On the flip side, there are issues such as entrainment, reverse flows, pollution, timing of

diversions, the nexus between upstream action and impact on Delta fish and wildlife, impact on upstream biological resources with significance to the Delta, impact on drinking water quality, impact of disinfection by-products, temperature increases, destruction of wetlands, destruction of riparian habitat, et cetera.

The third tier involves the establishment of mitigation credits. As I said before, the concept of mitigation credits can apply in any Delta solution. That was discussed briefly by CUWA in its comments to D-1630.

This important component of the allocation factors equation is the reality that under certain circumstances it will be unreasonable to require a water user to directly meet all or a portion of its responsibility for Delta protection with actions such as the release of water, cessation of diversion or groundwater pumping, and yet, the Delta will be in no less need of protection.

Mitigation credits are proposed which will allow a water user to meet its responsibility for Delta protection by providing that protection through alternative means in lieu of the requirement otherwise imposed.

Generally, mitigation credits should be available to any type of water user. Urban water users and agricultural water users could avail themselves of the mitigation credits program to meet their obligations,

provided credits are available and the appropriate regulatory authority deems it reasonable to allow the user to substitute a mitigation credit.

It is imperative, therefore, that any program that is established provide clear guidance so that the parties understand how the mitigation credits will apply and can plan accordingly.

The mitigation credits program should be consistent with an overall multispecies protection plan developed for the Bay-Delta watershed. Some examples would include:

Provision of water from another source in lieu of a required reservoir release;

Cessation of pumping in one location in exchange for pumping elsewhere;

The payment of money to a fund for the purchase of water;

The creation of wetlands or other environmentally beneficial projects in exchange for the otherwise mandated action; again based upon a finding of equivalent benefit to fish and wildlife.

This implementation proposal has been designed as a conceptual framework for allocating responsibility to meet Delta protection requirements. We look forward to working with the Board and other water users to refine this

proposal during the weeks and months ahead. We think that through discussion perhaps a program can be developed which will provide ultimately the solution to the Bay-Delta, and we invite discussion and conference.

Thank you.

MR. CAFFREY: Thank you, Mr. Berliner.

Does Mr. Arakawa have a presentation? We will probably wait until the end to ask questions.

MS. KING: I would just like to add a couple of specific comments to Mr. Berliner's presentation.

As I said, I think what he has proposed here is very worthy of consideration and East Bay MUD and San Francisco have consultants talking about this and trying to figure out how you would work the devil out of the detail, and so I hope that this is something that we can come back to you again with more detailed approaches on.

There are two points that I wanted to call to your attention in our written comments that are related to this. The first is the importance of bringing in all of the non-project diverters and not just focusing on, for example, the reservoirs or the big diverters.

In the case of East Bay MUD, we did some analysis for the Mokelumne River management hearings and in that case even if we doubled our instream flows in the Mokelumne, which would have a very severe supply impact for

us to do that, that would make less than a one percent increase in the Delta inflows.

So, we are not saying, don't touch us, but we are saying that you have to touch everybody and I think that this kind of approach is really the only way that we are going to get to where we need to be with all of this.

The second point that I would just like to emphasize, one of the factors that Tom mentioned is efficiency of

use --

MR. CAFFREY: Ms. King, Mr. Brown has a question.

MR. BROWN: You made a statement that you touched everybody, everybody meaning people who have access to and through the Delta, or everybody throughout the state?

MS. KING: To and through the Delta.

MR. BROWN: Okay.

MS. KING: The second point that I just wanted to emphasize is the need to look very hard at the efficiency of water use. East Bay MUD, like many of the other urban districts, has a very strong conservation/reclamation program and to the extent that we have already developed that program or have plans to further develop it, we are essentially squeezing the most out of the system that we possibly can, and that is going to affect our ability to make a contribution, and I think that you are going to need

to look at everybody's programs in this area and make some comparisons of their relative efforts, and with that, I will turn it over to the rest of the panel.

MR. CAFFREY: Mr. Arakawa.

MR. ARAKAWA: Thank you, Mr. Chairman and members.

My name is Steve Arakawa and I work for the Metropolitan Water District of Southern California.

We are here today to express complete support for the comments that were provided to you from the California Urban Water Agencies on issues Nos. 1 and 4 of your agenda today.

We also fully support the comments of the Urban Coalition that were just presented and described to you on issue No. 3.

The purpose of our brief comments today is intended to support these comments, and also, to provide some further elaboration with regard to issue No. 3.

We do not have any comments to provide to you on issue No. 2.

Regarding issue No. 3, the impact of upstream water projects, our first point is that we believe that all uses of water in the Bay-Delta watershed affect the ecosystem in some way, in some manner. This includes diversion of flow from upstream tributaries and rivers, it includes entrainment of fish, it includes polluted return flows and

discharges, temperature impacts, loss of riparian habitat and wetlands, and alteration of the natural Delta environment.

The magnitude of the impacts caused by specific water users obviously will vary, but each has at least an incremental impact on the environment as well as a cumulative impact on the ecosystem as a whole.

For this reason, it is not equitable nor sound policy, we believe, to require only the State and Federal water projects to bear the entire burden of protecting the Bay-Delta's resources.

The second point that we would like to make is that the State Board has broad expansive authority to regulate water uses to protect the environment. These authorities are contained in California's Water Code and the State Constitution. A broad exercise of that authority is particularly appropriate and required in the Bay-Delta context because of its critical importance to the State and the people and the economy.

In exercising its authority, the State Board should identify the localized impacts of upstream water users and require mitigation of those impacts. Further, the State Board must identify and allocate an equitable share of mitigating the more generalized impacts of diversion and use of water.

This would include participation in achieving an estuarine habitat standard. It is one that was described to you by the Urban Coalition in previous workshops. The above point should not be interpreted to mean that the water rights priority system should be disregarded. Metropolitan does believe, however, that the administration of water rights must occur within the context of fundamental, constitutional and statutory public policies.

This means that all the water users may be regulated to insure that the water resources of the state be put to beneficial use to the fullest extent capable in the interest of the people and public welfare, and it must determine whether it would be reasonable to condition uses to meet competing beneficial uses and needs within the state.

Finally, Metropolitan believes that the concept outlined by the Urban Coalition for establishing mitigation responsibilities deserves serious consideration by the State Water Resources Control Board.

Such an approach would provide a basis for allocating responsibility until more precise quantification and allocation is available.

That concludes my prepared remarks. I did want to add at least one other remark.

In earlier discussions Mr. Stubchaer had referred

to the exotic species issue and posed the question if we don't know the effects of exotic species, then how do we know whether habitat restoration can be attained, and I think that those types of questions as they relate to exotic species and toxics, and other types of factors, are things that many of us out here are struggling with.

How do we determine whether we are at what we are aiming at, whether we are at the targets that we are establishing, and I don't know if I have the complete answer to your question, but what I would say is I think what we are talking about is an approach whereby the impacts of exotic species are quantified to the extent they can be.

The California Urban Water Agencies studies would provide a way of getting at some of that information, and there is a need to look at not only that, but impacts of other factors such as pollution, toxics, urban runoff, in order to determine whether we are achieving the goals or the objectives that we have set out.

What that means is that any comprehensive approach has got to include consideration of these other factors and that the estuarine habitat standard or the water quality standards and flow requirements that are before this Board are one part of the comprehensive plan, but would need to include some of these other factors such as exotic species,

and to the degree possible determine what kinds of impacts they are having on fisheries.

And that concludes my remarks.

MR. CAFFREY: Mr. Stubchaer.

MR. STUBCHAER: Thank you for your comments.

I think we all recognize that this plan is not going to be a static document. It is going to be dynamic and the studies you are referring to are not going to be completed in time for the December goal, that we will consider them when they become available, and when we have the triennial review if nothing else.

So, it will have to be a living document.

MR. DEL PIERO: That's what they said about D-1485.

MR. STUBCHAER: But we are a different Board now.

MR. CAFFREY: Did Mr. Buck have a presentation?

MR. BUCK: No, we don't have an independent statement. We are here in support of CUWA and the Coalition.

MR. CAFFREY: Thank you.

Other questions by Board members of the panel?

Anything from staff?

Thank you all very much. We appreciate your input. We will take to heart what you have told us and look forward to your further input.

Next is Mr. Schulz. While Mr. Schulz is on the way

up, I would say that we are going to adjourn for the day at four o'clock and then we will resume tomorrow in our own hearing room across the street in the Water Resources Control Board building at 9:30. Those that we did not get to today will be first tomorrow morning and anybody else that may sign up for tomorrow.

All right, Mr. Schulz.

MR. SCHULZ: Good afternoon. I am Cliff Schulz and I am here today by myself representing Kern County Water Agency. Mr. Schuster wasn't able to make it this afternoon and a member in the audience, therefore, asked me to speak twice as fast, but Alice bribed me so I won't.

I want to address --

MR. DEL PIERO: Can you?

MR. SCHULZ: I want to address key issues 1 and 3 briefly this afternoon, if I may.

Our presentation will be a lot shorter than that of the urban agencies because we propose to present most of the detailed information on this topic in July.

So, considering how we should respond to this key issue, we decided we should not at this workshop provide you with specific terms, conditions or recommendations for what we define as non-flow and diversion-related measures that the Board should consider as part of its overall plan.

Our specific recommendations in this area will be

provided in July as part of a total package so that the flow and non-flow elements can be seen in the context of our entire proposal.

For this workshop, I would like to briefly outline the approach we believe the Board should take to the non-flow and diversion issues.

MS. FORSTER: Excuse me, do we have a handout from you?

MR. SCHULZ: No, I have something that I wrote last night on my computer at home and I have marked the heck out of it.

MR. DEL PIERO: We will get a finished copy later on then?

MR. SCHULZ: Yes, right. One never knows what they are going to say until they get up here.

Your notice asked for comments relating to factors *excluding diversions* that have contributed to the *decline* in species, and we know that you, therefore, intentionally phrased it to exclude at this workshop consideration of nonflow related actions that may be needed to mitigate the impact of water diversions that take place in the Delta.

We have a general reaction to the way the issue is structured. First, while knowing the cause of the decline may be relevant to your process, knowing the historical cause may not provide you with the data needed to find out

how to cure the problem. This is a little bit similar to what Mr. Anderson said about going in one door of a room does not mean necessarily that you have to go out the same door.

So, we are looking now at 1994 and we think that the primary focus of this Board should not necessarily be on historical causes but on the current best cure.

Therefore, in Kern's consideration of Delta fishery issues and what we have been trying to get ready for July, we intend to focus on potential actions that you can take to protect the fishery resources and to divide those actions into two categories, those that reduce the yield to the various water supply projects which we define as flow and diversion related actions, and those that might be taken to improve the fishery resources while avoiding adverse impacts on water supplies.

The first category or action, such as increased outflow, pumping on occasions, cross channel gate closure, et cetera, all those actions cost water and given California's extreme water shortage should be minimized to the extent possible.

In the second category or action, such as screening, barrier programs, fishing regulations, toxic controls and similar actions, to the extent they can raise the level of the fishery population, will enhance the level of

protection that can be provided by reasonable flow and diversion controls alone.

So, Kern's primary response to this key issue is that the Board should focus its attention, both on flows and diversion and on actions that it can directly take or recommend to other appropriate agencies.

I was very happy to see in your notice that you are going to consider items that are beyond your authority and that you could make recommendations to other agencies. We think that's very important. We think the Board has a lot of power in this area to influence others, and it should.

We recognize that flow and diversion regulations will be critical to the solution of the Delta problems, and our statement should not be viewed as a retreat from that position, but we do believe that to the extent that some of the fishery problems can be solved without impacting water supplies, all Californians will be better off.

Kern, in July and we hope joined by others and the coalitions that everybody has been talking about, will be presenting a package of nonflow and diversion actions which may include recommendations for screening, barriers, predation reduction, improvement in fish handling at the State and Federal pumping plants, increased poaching controls, modified angling regulations, dredging restrictions, improved toxic controls, improvement of

shallow area habitat, exotic species control and similar suggestions.

These will be provided in conjunction with our flow and diversion recommendations and at that time we will end up explaining the biological situation of each proposed action.

I suspect that next month 20 minutes is probably not going to be adequate for a lot of people and I bet you we go more than the number of days we have been going to date.

MR. DEL PIERO: You know, this is not like we have not been through this before. I understand that next month's issues are going to be pretty significant.

Everyone understands also that we have given everyone, I think, at least 60 days' advanced notice. The vast majority of the comments appropriate to be made to the Board, I am sure, can be reduced to writing so the Board members can have the benefit of seeing them somewhat in advance, since I think all of us anticipate some lively discussions next month.

It might be a tad more accommodating to receive the briefs two or three days in advance rather than receiving them on the day of the hearing, and then be obliged to try and thumb through them during the course of the presentations.

MR. SCHULZ: That is a point well taken.

MR. DEL PIERO: The purpose of the hearings is to have some modicum of order so the decision makers ultimately can assimilate the information in an equally orderly fashion, and a free for all is not something the Board is particularly interested in realizing.

MR. SCHULZ: I agree with that completely.

MR. DEL PIERO: I'm sure you do.

MR. SCHULZ: By the way, with respect to the toxic control which is on my list of items, Dave Anderson this morning suggested a possible workshop maybe after all these are done where we talk a little bit about toxics, and I want to emphasize that again because, for example, your Central Valley Water Quality Control Board, I believe, has been doing a lot of work on the toxic effects on fish of certain things that are going on in the rivers, the Diazinon question and things like that, the rice herbicides, et cetera.

And I do think that that is a topic that warrants possible further consideration in a workshop session. So, I would like to second what Mr. Anderson said this morning in this respect.

With respect also to this first key issue, I would like to talk a little bit about something that Perry Hergesell of the Department of Fish and Game said at the

last workshop. This is a quote from Alice's good transcript. He said at the May proceeding: *All things considered, we feel that it is not really reasonable to conclude that these additional diversions have caused the decline in the estuary,* and he was talking about non-State and Federal project diversions.

As I heard him this morning, I think what he said last time is still applicable to these nonflow and diversion related measures.

You notice I said 'caused,' not 'contributed,' but they have not caused the declines in the estuary since the mid-1960s, and we feel in light of that the focus should be on the recovery and maintenance of the estuary's fisheries and that needs to be on the water project operations.

I don't know if this actually represents Fish and Game's official policy, but Kern would be disappointed if it did, for in the context of this key issue it seems to be saying that it is not necessary to focus on poaching, or harvest regulations or screening Delta diversions for they are not State and Federal project related, and these, in his opinion, do not *cause* the recent declines in the fisheries.

Kern urges you to ignore this advice and focus on all actions that can improve fishery resources.

The advice is bad policy and we also think it would

be bad law. The fact that poaching or under-regulated fishing or unscreened diversions did not noticeably impact fish populations 35 years ago does not mean those same practices and regulations are reasonable and should be allowed to continue when California's population has doubled and the resulting competition for water has dramatically increased.

Judicial decision after judicial decision in California has ruled that a particular water use practice that may have been reasonable in the past may become unreasonable when times change and the demand for water increases. You have the Joslin case, the Forni case, any number of other significant cases in which this Board has been involved.

It is not a violation of a water user's water rights priority to demand his diversion and use practice be improved to make water available for the State as a whole.

As Tom Clark stated at the April workshop, Kern continues to support the area of origin laws and water rights priority that those laws provide.

Kern does not support the continuance of archaic water use practices or fishing regulations, or whatever that do not reflect the needs of society in 1994.

Therefore, Kern's July workshop recommendations will include actions that are not just focused on the State

and Federal projects, but include a broad group of actions which are needed to fully protect fish and to protect the State's water supplies.

Before moving on to key issue No. 3, I want to bring up a side bar on the fact that we have been talking a lot today about these nondiversion related actions that might be taken. There's another group out there that's working on these, and that's a group that was formed as part of the Endangered Species Act Delta smelt process. There is a native fish recovery team and in the recovery process on the Delta smelt they decided to go beyond the smelt and take a look at, I believe, seven native species and that group, although they haven't finished yet, the information I have is that there is now an internal draft that lists a whole series of actions of both flow related and nonflow related, structural and nonstructural, dredging and poaching and fishing regulations, and everything else, and they are rated, you know, from how effective they are for each of the species and how easy they would be implemented.

MR. DEL PIERO: Is this group?

MR. SCHULZ: Yes, and it has representatives of the Fish and Wildlife Service and EPA and the Department of Water Resources, and I think there are about a dozen biologists, or something like that. They spent a great

deal of time. I know they are not done, but they are getting close to where they are making a rather comprehensive list of things that they feel could be done, how easy they would be to accomplish and what impacts they would have on various species.

I think getting information from them would be helpful.

MR. DEL PIERO: I think I know what this group is. Is this the group that was put together to try and stem the tide of future listings?

MR. SCHULZ: In part. It is also the Delta smelt recovery program under ESA, but they have also stated that one of their goals is to attempt to avoid future listings, but they have spent a fair amount of time trying to come up with a list of potential actions, and they may be a source of information to this Board.

Briefly, on key issue No. 3, Kern knows that upstream water projects also have impacts on fish species that use the Bay-Delta system and in general they can be categorized in two areas; impacts on migratory species and impacts on Delta resident species.

For migratory species, many of these projects have great impacts. Locally constructed dams and diversion works have isolated salmon from their historical spawning areas, forcing them downstream where water temperatures are

a much greater problem.

Further, entrainment in numerous river diversions do occur. Levees and channelization have eliminated shallow areas, shallow water edge habitat which is important to young salmon, and also, to other species.

But some of these upstream problems could be addressed, increased populations of adult salmon might be capable of being sustained without significant impacts on water supplies by trying to cure all of the problems just in the Delta.

For resident fish the impact of upstream projects is their effect on flow in and out of the Delta as has been stated previously.

Again, with the area of origin laws in mind, those laws do not protect upstream water users from having to share in providing necessary Bay-Delta flows at times when the CVP and SWP are not impacting natural flows in the system.

I am not asking that upstream water users mitigate for the effect of diversion activities, but if the State and Federal projects are not storing natural flow, if they are not diverting natural flow in a particular summer month and there still is not enough outflow to protect the Delta species, then I think there is a direct impact of these other upstream diversions, which it would be appropriate to

handle without violating priority or area of origin laws.

So, we do believe that they have an obligation to mitigate their direct impacts. We continue to believe that and we think that's fully consistent with the area of origin and other priority concepts that we have talked about today.

That concludes my presentation.

MR. CAFFREY: Thank you, Mr. Schulz.

Before I go to the possibility of questions from the Board members, let me say I certainly agree with Mr. Del Piero about the value to the Board members and our staff to get copies of your presentation, or your comments, or background paper in advance of the workshop. That is helpful. I know it is difficult with the schedule that we are on, but to the extent you can do that, we appreciate it.

With regard to the two concerns you have expressed, I have been inclined as the Chair to be flexible when people ask for additional time. We are dealing with some very complicated subjects, and certainly, next probably in some ways will be more complicated than some of the others we have dealt with.

So, I would be inclined to give more time, as I have, with people that make that request. We will look at that next month. We probably have our notice out or about

to go out, the July notice. Even though it says 20 minutes, it does not mean that we are going to stifle you. We have four days scheduled for that proceeding in July, and to the extent that we have to use any portion or all of those four days, we will use them to get the information we need.

I want you to be assured that we will be that flexible.

Furthermore, with regard to the question of additional workshops, we only have the four scheduled. I am not going to close off the possibility of the need for an additional workshop, if that situation presents itself and proves to be a significant need.

One thing we are concerned about is that our time is very limited. We are going to produce our plan in December. We are going to stay on that schedule, and at some point in time we have to close off the proceedings so that we can physically produce that document, but I am not going to close off the possibility of additional workshops if we do have to do that.

MR. SCHULZ: If you have heard screams in the night, it has been our consultants that we have been putting under tremendous pressure to try and get a product by July. All of them have said that in July this is going to be a living, breathing document that we will be changing

almost on a monthly basis.

We strongly suspect we will have better data, more definitive recommendations, you know, as the summer and fall move along, so I think that's something we can deal with in July probably in a little more detail, but it would not surprise me if all of us wanted to say we should have another one at some time a couple of months after July while you are working on the document.

MR. CAFFREY: I am going to look at my attorney, Barbara Leidigh, when I say that next thing, but the process we are using now, which is quasi-legislative and is more open than the adjudicatory process, and I think that when July comes and goes, in that period following July there will be ample opportunity for you to provide additional information or updated information, certainly on a daily basis to the staff, and while there may not be more workshops or many more workshops after that, that door will not slam shut on you, so it is a living, breathing, ongoing process and we recognize that it will continue to be after we come forward with our draft plan, too, so as has been iterated a number of times here today, we appreciate your concern.

We are not insensitive to it, but we do have to meet our deadline. We will be as flexible as we possibly can.

MR. SCHULZ: We want you to meet your deadline.

MR. CAFFREY: Are there questions from the Board members?

Anything from staff?

MR. DEL PIERO: Only one comment. Have you read the Department of Water Resources presentation for today?

MR. SCHULZ: I read it this morning.

MR. DEL PIERO: You saw the reference to the Kern water bank?

MR. SCHULZ: Yes. We are very concerned about things such as the Kern water bank and the limitations on pumping windows, and things of that type.

MR. CAFFREY: Thank you, Mr. Schulz.

Sandra Dunn.

MS. DUNN: I am Sandra Dunn. I am appearing here today on behalf of Glenn-Colusa Irrigation District.

Before I begin my remarks, I would just like to support Cliff's statement in terms of perhaps the Board needing another workshop. I think the people who have been participating in these workshops have all taken the Chairman's remarks very seriously, that we should try to develop coalitions, and I think on any given day there's probably three more coalitions that have formed and developed, and there has been a lot of coordination --

MR. DEL PIERO: How many have fallen apart?

MS. DUNN: They are still trying to all blend together, and so as a consequence, I think it's been somewhat difficult for any group to come before the Board up to this point in time and say that they have a solution to the Delta problems.

And I think those coalitions are going to continue to have to work through some of the differences of opinion, and so, I would encourage the Board to perhaps agree to have additional workshops after the July workshop.

Most of the matters that the Board had included on their workshop have been addressed by other parties, but I do want to address one issue that is of critical concern to Glenn-Colusa Irrigation District, and that is the issue of effects of upstream developments on the fish and wildlife resources of the Bay-Delta estuary.

We are not exactly clear, really, what that means and what the extent of the Board's inquiry is with regard to this question, and perhaps my following comments will make it clear.

I think Perry Hergesell today said and talked about the importance of the tributaries to the fishery resources of the Delta.

Everybody knows that the upstream areas are where most of the anadromous fish start their life cycle, so as a consequence of that, the upstream projects no doubt have an

effect on the fish and wildlife resources of the Delta.

That is somewhat different, however, than saying that they affect beneficial uses of Delta waters, and as a consequence of that maybe somewhat esoteric difference, I am not sure that the Board's notice has listed some of the evidence that needs to be presented in terms of upstream projects. Depending on whether or not the focus of the Board's analytical work is really crucial in terms of whether or not we are going to provide into the record the direct effects of GCID's diversions on salmon, or whether or not it is a flow issue, and I think that so far the evidence has been somewhat sketchy on what the actual upstream effects are.

We don't want people to go away from this proceeding and think that those upstream impacts have been ignored by the State and Federal regulatory authorities. GCID's diversions, for one, have gotten a great deal of attention by the fishery agencies and we would be glad to provide the State Water Resources Control Board with mountains of information with regard to what GCID is doing in terms of their direct impact on the fishery resources.

Assuming, however, that the State Board's question is really focused that it should be on the effect of upstream projects on beneficial uses of Delta waters, there really hasn't been very much evidence presented that these

upstream diversions resulted in adverse impacts. Most of the Sacramento Valley diversions, like GCID's diversions, are direct diversions. There is no storage related component involved in that.

How these diversions affect flow within the Delta really hasn't been demonstrated. In fact, there is a substantial amount of return flow as a result of GCID's operations that actually contribute to Delta outflow.

When all of these things are looked at and reviewed, we don't believe that there is a net adverse effect on the Delta beneficial uses. If there is a problem with respect to Delta outflow, then we think that the State of California has a system of laws that should be put into place to determine whose responsibility it is to meet that Delta outflow.

In the case of GCID water entitlements are based on pre-1914 water rights and as a consequence, we don't believe that GCID's diversions by legal right can be causing an adverse effect on the Delta until all junior diverters have been stopped and the injury is still occurring.

In addition, the State Board has to take into consideration the area of origin statutes. All of these statutes have a direct and significant relevance to the implementation of whatever standards the State Board

decides to adopt.

The State law provides that only water that is surplus to the needs of the area of origin may be exported. As a consequence, to the extent water is needed for Delta outflow, it must first be taken from water surplus to the needs of the area of origin.

Finally, in looking at upstream projects in the context of Bay-Delta issues, there is an implication that beneficial uses in the Bay-Delta are to be provided with some kind of priority over beneficial uses of Sacramento River water.

We would like to point out that in GCID there are three wildlife refuges that exist and that water is provided for from GCID. In addition, there is a great deal of private land that has been used for wetland and for wildlife purposes, and we think that those wildlife and beneficial uses have to be balanced against the beneficial uses within the Delta.

MR. CAFFREY: Thank you, Ms. Dunn.

Are there questions from Board members? Staff?

Thank you very much.

Richard Golb.

MR. GOLB: Mr. Chairman, I, too, admit I am guilty of not providing in advance a copy of my testimony. I have made a number of changes today and I will get that to you

soon.

MR. CAFFREY: Thank you very much.

I should point out it is not a requirement, but it certainly helps us a great deal if you do give us copies.

MR. GOLB: I will. I want you to be able to read it as well, so I will remember.

My name is Richard Golb, and I am the Executive Director of the Northern California Water Association. We represent approximately 45 agricultural water districts, water companies and landowners in the Sacramento Valley encompassing over 600,000 acres of farmland.

In the interest of time, I will summarize my remarks, and again, then provide a full copy of my statement to staff and Board members.

What I would like to do this afternoon is focus my remarks on the third question posed in the workshop notice: What effect do upstream water projects have on the fish and wildlife resources of the Bay-Delta estuary?

Since all anadromous fish species begin their life upstream of the Delta, it's obviously likely and quite possible that upstream projects and diversions may have some effect upon the fish and wildlife resources in the Delta.

And clearly, there have been some upstream projects that have had negative effects upon species which pass

through the Delta such as the winter-run salmon.

The project that has had possibly the single greatest impact and negative effect would be the Red Bluff diversion dam located in Redding, California.

As the Board members may well know, several years ago the National Marine Fisheries Service estimated that up to 50 percent of the juvenile winter run that were out-migrating through the Red Bluff diversion dam were lost to predation by squawfish.

This problem is now being addressed. Actions to remedy the situation include leaving the dam's gates open from November to May of each year as well as structural improvements to the dam itself.

But aside from Red Bluff, we believe overall that upstream agricultural diversions are now or have had in the past not necessarily a significant impact on the fish and wildlife resources that live in or pass through the Bay-Delta. Many of the agricultural diverters in Northern California have been diverting water from the Sacramento River and its tributaries since the early 1900s. Some of these diversions date back, as Sandra just said a moment ago, to the 1800s in the case of Glenn-Colusa Irrigation District..

Again, there are cases where specific diversions have problems with certain fish species such as the winter

run, but we would argue these are unique and, in fact, isolated cases that have received a great deal of attention by both State and Federal agencies, particularly those species under the Endangered Species Act.

One other point, diverting from my notes, several years ago Congress addressed this issue in a different context and many of the concerns that were raised today about temperature, flow and other problems, loss of habitat on the Sacramento River and in the Bay-Delta were somewhat addressed.

As you all know, the Central Valley Project Improvement Act includes a 50 million dollar restoration fund, includes a number of measures, I believe over 15 or 20, to address some of the very concerns that were raised today, including 800,000 acre-feet of outflow for the Delta.

Some of those who testified earlier today indicated that Northern California agricultural diversions have had adverse effects on the resources of the Bay-Delta, and I would like to respond to some of those issues.

While there are over 300 unscreened diversions in the Sacramento, and I believe 1800 in the Delta, it is not known what the cumulative or individual effect, if any, these diversions have had on the fishery.

The National Marine Fisheries Service, in the

February 12, 1993 biological opinion for the operation of the Federal Central Valley Project and the State Water Project, stated that unscreened diversions are only *suspected* to be a significant cumulative impact.

Even assuming that there is a problem, there is still no reliable empirical data that clearly identify which of the diversions are significantly harming the fishery. Despite this uncertainty, there are now five different State and Federal fish-screening programs directed at diversions on the Sacramento River.

Each of these programs operates independently from one another and in all likelihood are not in the best possible interests of the water users or the fishery.

Also, today in both written and verbal comments which were submitted, there was concern expressed regarding pesticide residues in the Delta.

From the Northern perspective the predominant crop, of course, is rice, and although many continue to criticize the runoff from this particular commodity, these comments are outdated. Rice-field runoff was, in fact, a serious problem in the 1970s and early 1980s.

In response to the problem, the Central Valley Regional Water Quality Control Board, the rice industry, and others developed a rice pesticide control program. This program has been characterized by William Crooks,

Executive Officer of the Regional Board, *as one of the most successful water quality control programs in the United States.* The results of the program are impressive.

In 1982, the total pesticide load to the Sacramento River attributable directly to rice-field runoff was roughly 40,000 pounds. By 1992, that number had fallen to 178 pounds, a reduction of over 99 percent.

Stated another way, in 1982, monitoring showed rice pesticide residues at Rio Vista as high as 12 parts per billion. During the 1993 monitoring, ten years later, rice pesticide residues were virtually undetectable at all locations down river of the I Street Bridge.

We believe that the virtual elimination of rice pesticide residues in the Delta has effectively eliminated the potential adverse effects for Delta fisheries from pesticide residues.

MR. DEL PIERO: Excuse me. Am I correct in assuming that you don't think a comprehensive analysis of the pesticide impact on anadromous species is appropriate?

MR. GOLB: Quite the contrary. I think it is quite appropriate. I just believe reading the comments that were submitted and given verbally today was that there was criticism and concern about rice pesticides, and based on the Central Valley Regional Water Quality Control Board's own results, they *ain't* there.

MR. DEL PIERO: Do you have an opinion about Diazinon?

MR. GOLB: That, I believe, is not used by the rice industry.

MR. DEL PIERO: What I am asking is, do you have a particular opinion about Diazinon?

MR. GOLB: I don't know enough about it. I would be happy to get one to you.

MR. DEL PIERO: Thank you.

MR. GOLB: Mr. Chairman, earlier today you indicated your concern about one of the potential unfortunate effects that could come out of this process in terms of pitting one species against another.

We agree with you wholeheartedly. In fact, we would go a step further -- we are greatly concerned about pitting one ecosystem against another ecosystem, in this case the ecosystem of the Bay-Delta against other areas of the state, particularly the Sacramento Valley.

Upstream diversions do provide significant benefit to wildlife species. As you well know, the rice habitat program has been very successful in providing habitat for migratory waterfowl, and over 100 different wildlife species, including 21 which are listed as threatened or endangered, or are a special status species of the United States and the State of California.

In addition, in a June 6 press release by Ducks Unlimited, they stated that during the spring of 1983, the Point Reyes Bird Observatory biologists counted over 400,000 birds in the Sacramento Valley, including 41 percent of these birds on rice fields.

In November of last year, still in this press release, rice fields held nearly 70 percent of the shore birds and 85 percent of one particular species. This is just one example of the beneficial use of water and the benefits in wildlife habitat and species in the Sacramento Valley.

Finally, in terms of recommendations for the Board, I would encourage the Board to consider all potential causes of the decline of certain species in the Bay-Delta.

I agree with the comments expressed earlier this morning by the Department of Water Resources that the Board should consider a comprehensive plan.

The problem you are struggling with is not a simple one and the solutions won't be either. As part of the comprehensive plan, I would urge the Board to consider the following:

Regarding fish screens in the Sacramento River, the Board should support a proposal we submitted to the National Marine Fisheries Service earlier this year, that the government agencies should implement a single fish

screen program which screens only those diversions shown to be significantly harming the fishery.

This would allow all governmental agencies, State and Federal, to combine their technological expertise, to consolidate the resources and bring those all to bear to better protect the fishery. In other words, let's focus all the State and Federal resources on those diversions that are having an effect. Let's target those and let's focus on that.

MR. CAFFREY: Mr. Del Piero.

MR. DEL PIERO: In terms of financing, do you want to get on the record what your recommendation is in terms of financing the fish screens?

MR. GOLB: Well, early this morning, I believe Roger Patterson from the Bureau made a comment to the effect that diversions upstream maybe a bigger problem if they were downstream. If that is the case, and I don't know that it is, I have yet to see any scientific data supporting that, and I will be talking to Roger about that soon.

We would like to see equal commitment. If the regulatory zeal is there, there should be a matching financial equivalent. I believe right now in terms of Federal programs, both for fiscal '95 and '96, there is only about a million dollars that's been allocated for fish

screens.

These fish screens can run as high as $10,000 per cfs. It is very costly and if the fishery is suffering because of inappropriate screens or lack of screens, and it is going to be addressed, then there should be a financial commitment.

MR. DEL PIERO: The next question: Are your members prepared to allow access to their diversions to determine whether or not they are contributing to the problem?

MR. GOLB: I believe if there is one program and the goals and objectives are articulated clearly, and there was faith and trust, yes; but there is a real concern today, Mr. Del Piero, and the concern is that government touches everything in our country and it harms everything it touches.

MR. DEL PIERO: I understand that completely. I guess the point is you indicated to us that the issue we are addressing is very complex.

MR. GOLB: Yes.

MR. DEL PIERO: Let me suggest to you no one knows that more definitively than the five members of this Board, and the answers to my last two questions just indicate exactly how complex it is.

We oftentimes, all of us, collectively, regardless

of our respective positions, can recognize what the potential solutions are. It's the path to those solutions that's oftentimes obscured.

MR. GOLB: I appreciate that. I think if you look at the history of the Sacramento Valley agriculture, the responsibility they have taken to eliminate pesticide residues, to conserve water, to create habitat for wildlife, those measures are very costly. The rice pesticide reduction program has been calculated to cost up to $15 per acre by the Regional Board, which is 7.5 million dollars annually.

So, you know, Sacramento Valley interests have gone to extreme lengths both in terms of effect and financial --

MR. DEL PIERO: Please understand I am not criticizing. I'm pointing out what a number of people have been telling us over the last three or four days of public hearings since the process started, that our job is very complex and the issues that are confronting us oftentimes would cause us not necessarily to be in agreement with all the people that are making presentations.

It's a very difficult situation for us to find ourselves in, and please understand this Board holds the rice industry for their efforts in terms of eliminating pesticides in very high regard at this point because they have made a tremendous effort, and that is echoed by a

great many people around the state.

The point is that in terms of effectively dealing with the issue, a degree of cooperation is necessary, more than simply an identification of the solution. The course by which one achieves that or gets to that solution has to also be identified.

MR. GOLB: I think the people in the Sacramento Valley would willingly be cooperative as long as they understood the process.

May I continue, Mr. Chairman?

MR. CAFFREY: Certainly.

MR. GOLB: Along the line of recommendation, the Board should also recognize and provide credit for the tremendous restoration efforts and habitat values provided for and undertaken in the Sacramento Valley.

I told you a moment ago about the significant costs that are borne to achieve the pesticide residue reductions in the Sacramento River and others.

Finally, I would like to close with this: We are seriously concerned about the lack of hard and sound science that seems to be guiding many of the proposals that have come forward today. This lack of biological science, also about what is happening in the Delta, concerns us regarding what the true goals and objectives are regarding water quality standards.

I wish some of the folks that testified earlier were still here today because I am still trying to figure out what biological reality is or what adaptive management is. I haven't heard those phrases before and it seems to me what is happening in this instance is that some of these ideas are not coming forward and we don't know what they mean.

This is probably best, to follow up on what Sandra said a moment ago, this is best felt in terms of the concerns about the area of origin protections, and those State statutes and those laws that deal with counties and watersheds of origin.

As you well know, prior to building both the State and Federal projects, the U. S. Government and the State of California made an oft-repeated promise to the communities of the north. That promise basically, which was subsequently incorporated into State law, was a concession to the north in exchange for support for the project. The area of origin laws really were the cornerstone necessary to achieve consensus to build the State and Federal projects.

I was heartened to hear Cliff Schulz say that Kern County does support the area of origin laws. I am hopeful more people will and I would simply encourage the Board to consider the intent and relevance of these laws as they

work to develop water quality standards for the Bay-Delta.

MR. CAFFREY: Thank you very much.

Before you go, Mr. Brown has a question.

MR. BROWN: Mr. Golb, if I understand your concern -- let me state it back to you to see if we are in agreement here. The rice industry certainly has done considerable in recent years to make improvements in their operations and to improve the environmental habitat within your area.

Your concern, as I heard it, is that you have made these efforts and you are wondering if there is going to be credit for these prior efforts when it comes time for everybody to make a contribution.

I was wondering how those who have made such credits might relate to those who haven't.

MR. GOLB: Mr. Brown, I think that is partially it.

One of the concerns is that, as I understand it, this process and this workshop today is to determine whether or not on the third question upstream diversions have had a biological negative effect upon the biological resources of the Bay-Delta, and we believe that in a cumulative overall framework they have not in an overall sense.

We also believe that, yes -- the simple answer is yes. Those folks that have gone to tremendous financial

cost and effort to basically clean up their own act should receive credit for this process; because they are not part of the problem in a cumulative sense, we don't believe they should be held accountable.

MR. CAFFREY: Mr. Del Piero.

MR. DEL PIERO: Mr. Brown, it's sort of like when there is a drought, some responsible people cut back on their consumptive water use, and then government comes in and implements a water conservation plan and cuts back on the amount of water that they are currently using as opposed to what they were using historically, so that they get penalized for being good stewards.

MR. BROWN: This is a very important issue Mr. Golb bring up.

MR. DEL PIERO: I have an appreciation for it, having operated under a similar type situation in the county. That's a quite well made valid point.

MR. GOLB: Thank you.

MR. CAFFREY: Any other questions of Mr. Golb?

MR. BROWN: Do you have suggestions on how to determine which diversions from the river are unscreened -- how that issue should be addressed? How would you determine which ones should be screened?

MR. GOLB: We are looking for the path, too. We have submitted detailed comments to the National Marine

Fisheries Service, which is the agency through the Department of Commerce, which has come out with the latest requirement to require all diversions to be screened; and the basic approach that we have set forth, Mr. Brown, is that there ought to be one program. We ought to find through scientific empirical testing which of those diversions are taking fish, significant amounts of fish.

From that point we should then bring all the focus to bear from all, both State and Federal agencies, on those diversions and allow the landowners' assistance to screen their diversions so they are no longer part of the problem.

MR. BROWN: Is this something that maybe your industry could police and recommend like they did in the pesticides and herbicides?

MR. GOLB: I think they would, with the appropriate support from the State and Federal agencies, welcome that. And I will be happy to get a copy of our comments to you and the other Board members.

MR. BROWN: Thank you.

MR. CAFFREY: All right, thank you, Mr. Golb. It was good to see you and congratulations on your recent appointment as Director.

I think that we will adjourn now, and let me just announce who we will have tomorrow. We are pretty close to four o'clock and we will start at 9:30 in our own hearing

room across the street. We will start with Dr. Russ Brown, followed by Jim Chatigny, David Guy, Kevin O'Brien, Alan Lilly, and then any new sign-ups will follow the names I have read in that order.

Thank you all very much for attending. We will see you tomorrow morning at 9:30.

(Evening recess)