BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING	)))

Staff note: Strikeouts made pursuant to Hearing Officers' Rulings

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

SIERRA HEARING ROOM

1001 I STREET

SECOND FLOOR

SACRAMENTO CALIFORNIA

PART 2

Monday, April 16, 2018

9:30 A.M.

VOLUME 29

Pages 1 - 245

Reported By: Deborah Fuqua, CSR No. 12948
(A.M. Session)
Candace Yount, CSR No. 2737
(P.M. Session)

Computerized Transcription

APPEARANCES:

CALIFORNIA WATER RESOURCES BOARD

Division of Water Rights

Board Members Present

Tam Doduc, Co-Hearing Officer:
Felicia Marcus, Chair and Co-Hearing Officer:
Dorene D'Adamo, Board Member

Staff Present

Andrew Deeringer, Staff Attorney
Conny Mitterhofer, Senior Water Resources Control Engr.
Jean McCue, Water Resources Control Engineer

PETITIONERS

For California Department of Water Resources
Tripp Mizell, Senior Attorney
Duane Morris, LLP
By: Jolie-Anne Ansley, Attorney at Law

State Water Contractors
Becky Sheehan

PROTESTANTS

Pacific Coast Federation of Fishermen's Associations and Institute for Fisheries Resources

Stephan Volker
Alexis Krieg

Cities of Folsom, Roseville, and San Juan and Sac Suburban Water Districts
Patrick Fitzgerald

(continued)

APPEARANCES (continued):

San Luis & Delta-Mendota Water Authority and Westlands Water District
Daniel O'Hanlon

Central Delta Water Agency, South Delta Water Agency (Delta agencies), Lafayette Ranch, Heritage Lands Inc., Mark Bachetti Farms, and Rudy Mussi Investments L.P.
John Herrick

California Water Research
Deirdre Des Jardins

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Monday, April 16, 2018 9:30 a.m.

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PROCEEDINGS

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CO-HEARING OFFICER DODUC: All right. It is 9:30. Welcome back to this Water Right Change Petition Hearing for the California WaterFix project.

I'm Tam Doduc. To my right is Board Chair and Co-Hearing Officer Felicia Marcus. To the Chair's right is Board Member DeeDee D'Adamo.

To my left are Andrew Deeringer and Conny Mitterhofer. We are also being assisted by Mr. Hunt today.

Since I do see some new faces, please take a moment and identify the exits closest to you -- which would be that one. In the event of an emergency, the alarm will sound, and we will evacuate using stairs not the elevators down to the first floor and meet in the park across the street. If you're not able to use the stairs, please flag down one of the safety people, and they will direct you to a protective area.

Secondly, please note that we are recording and webcasting this hearing. So as always, speak into the microphone and begin by stating your name

and affiliation for the record. Please also make sure before you begin speaking that the green light is on on the microphone.

Our court reporter is with us.

Thank you for coming back.

If you would like a copy of the transcript, before the conclusion of Part 2, please make your arrangements directly with her.

And finally and most importantly, please take a moment and make sure that all your noise-making devices are and turned to silent, vibrate, do not disturb.

All right. Housekeeping matter, Ms. Womack.

MS. WOMACK: Hi there. It's getting near the end. The end is near.

CO-HEARING OFFICER DODUC: That sounds so ominous.

MS. WOMACK: Well, it is, for some of us.

Anyway, my father of course will be coming, it looks like, Thursday. And I would ask that -- his hearing aids don't always work, so that we have hear devices and hearing systems and that it slows down for him because he's been unable to follow along two screens.

Hopefully that can happen.

And second, is there a way that we could not maybe put him after lunch or some definite area where he doesn't have to be sitting so long? Is there a consideration that could be made on Thursday?

CO-HEARING OFFICER DODUC: Unless there's any objection, we will start first with him.

MS. WOMACK: On Thursday?

CO-HEARING OFFICER DODUC: Is that okay? I don't see any objection.

MS. WOMACK: I appreciate that so much.

CO-HEARING OFFICER DODUC: All right. Any other housekeeping matter?

(No response)

CO-HEARING OFFICER DODUC: Not seeing any, welcome, Mr. Volker. Do you have an opening statement to make, Mr. Volker? You submitted a written one, but do you wish to provide one orally as well?

MR. VOLKER: Yes. Thank you very much. I will rely on the resubmitted opening statement. I think it adequately summarizes our concerns, both legal and factual.

I don't want to prolong the hearing. I want to move right into the testimony.

Today's --

CO-HEARING OFFICER DODUC: Hold on, before you do. Do estimate needing the maximum 20 minutes per witness?

MR. VOLKER: Yes, I do. However, I have a special request and one only.

One of our witnesses has a broader spectrum of experience and expertise and will be able to connect the dots to provide the necessary foundation for some of the other witnesses. And for that witness, Thomas Stokely, we request 30 minutes.

The other witnesses, by and large, will take less than the 20 minutes allotted to them in the hopes that that shifting of the time spans will better serve the public and this Board.

CO-HEARING OFFICER DODUC: That would be for your second panel?

MR. VOLKER: Yes.

CO-HEARING OFFICER DODUC: All right. At this time I ask that we --

Ms. Des Jardins, you testified already, so you don't have to do that.

But the two gentlemen, please stand and raise your right hands.

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(Witnesses sworn)

DAVID BITTS

NOAH OPPENHEIM

and

DEIRDRE DES JARDINS,

called as Panel 1 witnesses for protestant Group 38, having been first duly and previously duly sworn, were examined and testified as hereinafter set forth:

CO-HEARING OFFICER DODUC: All right, Mr. Volker.

MR. VOLKER: Yes, thank you, your Honor.

We have two witnesses in the first panel today. The first who will be speaking is David Bitts. He's the president of the Pacific Coast Federation of Fishermen's Associations. And his testimony appears in Exhibit 86, and he relies therein on exhibits that have been marked as PCFFA-131 and 132.

The next panelist will be Noah Oppenheim. He's the executive director of the PCFFA. His testimony has been marked as PCFFA-130. His qualifications appear at PCFFA-160. And his exhibits number 133 through 144, inclusive.

The third panelist in our first panel is Deirdre Des Jardins. She's the principal and chief scientist of California Water Research. She has submitted her testimony as PCFFA-161. Her qualifications have previously been introduced as PCFFA-75 and 81. And today she will be relying on Exhibits PCFFA-162 to 175 and 199 to 901 [sic], together with State Water Board Exhibits 25 through 27, 32, 31, 30 to 31 and 104.

Excuse me, I may have misspoken.

Okay. And for, lastly, Ms. Des Jardins, her Exhibits No. 162, 175, and 199 to 201.

DIRECT EXAMINATION BY MR. VOLKER

MR. VOLKER: Now, if I may move to each panelist in turn, may I ask them if the testimony that has been marked as the exhibit that I've mentioned, and I'll ask each of you in turn, beginning with Mr. Bitts.

Your testimony has been marked as PCFFA-86. Does that testimony represent your testimony? Is it true, correct, and complete?

WITNESS BITTS: Yes.

MR. VOLKER: Thank you. And do you wish to correct anything in it as of this moment?

WITNESS BITTS: No.

MR. VOLKER: Thank you.

Next, Mr. Oppenheim, we've marked your testimony as PCFFA-130. Does that testimony represent your testimony, and is it true, accurate, and complete?

WITNESS OPPENHEIM: Yes.

MR. VOLKER: And do you have any changes you wish to make to it as of this moment?

WITNESS OPPENHEIM: Yes, one change on Page 14 of my testimony. In the third to last line, please substitute "March" for the currently entered "February." That's the sole change.

MR. VOLKER: Good. Thank you very much.

And lastly, Ms. Des Jardins, you've had your testimony marked as PCFFA-161. Is that your testimony, and is it accurate, true, and complete?

WITNESS DES JARDINS: Yes.

MR. VOLKER: Do you have any changes you wish to make to that testimony at this time?

WITNESS DES JARDINS: No.

MR. VOLKER: Thank you very much.

And with that, I'll ask each of the three panelists, starting with Mr. Bitts, continuing with Mr. Oppenheim, and concluding with Ms. Des Jardins, to summarize their testimony for the panel and for

the public.

WITNESS BITTS: Good morning. Thank you for the chance to speak today. My name is Dave Bitts. I'm speaking on behalf of PCFFA and the Institute for Fisheries Resources, which is our 501(c)(3) nonprofit.

I'm a commercial salmon and crab fisherman based in Eureka. I've been fishing for over 40 years. I've had my current boat, ELMARUE, for over 30 years. It's a 45-foot wood boat that's only two years older than I am, and I'll be 70 in a couple of months.

The technology on the boat ranges from thousands of years old, which is the wood hull, to almost 21 century electronics.

On average about half my net income comes from salmon and half from crabs over time. Lately, it's been shaded a lot in favor of crabs. Almost all my income is from fishing. Fishing is what I do.

I fish for salmon alone. I run an array of up to 42 barbless hooks using six stainless cables, each with a heavy lead. The cables go up and down hydraulically. I snap the leaders on each one as the cables go down, about 18 feet apart. And there's a -- I have a way to tell when there's fish bites,

which lets me know I'm alive.

And I fool something with a brain smaller than a petite pea, which makes me feel very good about myself.

And when that happens, the line comes up, I coil the leaders until I get to the one with the fish on it. If I'm lucky, there's more than one. And I pull the fish to the boat by hand, bonk him on the back of the head, bleed him, clean him, and have him chilling in slush within an hour or less of bringing him on the boat. And I'm happy with the quality of fish I deliver after a four-day trip.

Because of the way salmon seasons are structured, most of my fishing has been done in Fort Bragg and San Francisco areas with occasional forays into Monterey Bay and points south. I'll get into season structuring pretty soon here.

I've also -- in addition to fishing, I've also represented the salmon fishing industry in several capacities. I've attended almost every salmon season setting meeting, that's March and April meetings, of the Pacific Fishery Management Council since 1986.

I represent California trollers on the Klamath Fisheries Management Council for about 15

years and on the Klamath River Task Force for about eight years, and both of those were governor's appointments.

I've become quite familiar with state and federal management of California's ocean salmon fisheries, including Central Valley issues. And as the California Troll Salmon Advisor to the Pacific Council for the past three years, I've learned more than I wanted to know about the effects of scarcity of Sacramento winter-run Chinook on salmon fisheries south of Point Arena.

I was the vice president of PCFFA for several years. In 2008, they made me president. Literally they called me outside in a meeting and stood in a circle around me and said, "You're going to be president, right?" I said, "Okay." And I'm still president.

So PCFFA's members are the commercial fishing associations in ports from Santa Barbara to Eureka. And we have associate members in Oregon, Washington, and I think in Alaska.

The members of these associations are almost all commercial fishermen, almost all owners and operators of their own generally smaller commercial fishing boats and family-scale businesses. And until

very recently most of these fishermen were salmon fishermen, at least as part of their portfolio. And the salmon fishery has gotten most of PCFFA's attention over the last 40 years.

PCFFA has two principal tasks. One is to do whatever we can to ensure robust fish populations. And the second is to ensure that our members have access to those robust populations. I'd have to say that we're not doing as well as we wish we could lately.

Okay. Oceans -- we're going to move on the to management of fisheries and how that's gone for the last few years. Ocean salmon fisheries, we catch fish from many different rivers. We can't tell in the ocean where that fish came from.

But we operate under the principle of weak stock management. And what that means is that we're constrained in order to provide adequate spawning escapement for the weakest stock in the complex of stocks that we encounter, regardless of the abundance of the other stocks.

So for California, the weak stock is usually the Klamath. Our season is designed to meet the constraints on the take of Klamath stocks. And usually we try to catch as many Sacramento fall

Chinook as we can per Klamath fish. And that's why our fisheries have been moved to the south. The farther south we fish, the higher the proportion of Sacramento fish in our catch compared to Klamath. And the farther north we fish, the stronger the proportion of Klamath fish becomes, we stay south to stay away from Klamath's.

The Sacramento fall Chinook are the bread and butter. They're the principal target stock not just for California but also for Oregon fishermen. In Oregon, something over half their catch typically is Sacramento fish. In California it's more like three quarters.

So it's bad enough when Klamath constraints drive us below Point Arena to fish, but those constraints were intensified in 1993 by the federal decision that granted half of the Yurok and Hupa tribes who live on the Klamath and Trinity rivers.

And it led -- principally it was the principal cause of the collapse of the California troll fleet from about 5,000 active boats to less than 1,000.

I don't know if we have -- do we have the testimony available? There's a picture in my testimony that I would put up on the screen on Page

5, if we could put that up on the screen. Is that feasible?

MR. VOLKER: That would be PCFFA 86 at Page 5, Figure 1.

WITNESS BITTS: Okay. This picture depicts a small portion of the boat graveyard -- there it is -- that's about a mile above the Noyo River Bouy Basin in Fort Bragg. You see boats or parts of maybe a dozen boats in the picture. I think that's only a little bit of it there.

There have been as many as 50 boats junked in that, and they are scavenged for parts by the remaining surviving boats. All those used to be productive salmon fishing boats, and obviously none of them will ever be again.

And that's an unfortunate representation of the state of the salmon fishery in recent years. So I said it's bad enough when we have to travel to avoid Klamath fish, but when our target stock, Sacramento fall Chinook suffers, we basically have nowhere to turn.

And this has happened -- it's been happening more often in recent years. We were completely closed in 2008 and '9. The predicted abundance of Sacramento fall Chinook was less than the minimum

escapement number. When we heard that coming into the 2008 season setting process, we said all right, nobody fishes this year. We don't fish; sports fishermen don't fish. The scientists wanted us to fish to get tissue samples. We said no, we can't kill one; you don't get to kill one either.

In 2010, recovery began. We had a little bit of fishing mostly above Point Arena but not much.

So that was a bad three years. And more recently, Sacramento winter-run in two successive years had 95 percent or more of their redds dewatered. And the California Department of Fish and Wildlife called for more severe constraints on fishing below Point Arena that were required by the federal Biological Opinion. That happened in 2016 and '17.

So other people are going to make the connection between the degradation of freshwater habitat and loss of adequate freshwater flows and poor survival of Sacramento fish. I'm going to focus more on what it's done to fisheries.

For six of the past ten years, the California commercial salmon fishery has been either closed or severely constrained due to poor recruitment of Sacramento fall Chinook or concern for

listed winter-run Chinook. Fishery's on its knees. Freshwater flows aren't they only factor, but they are a big one.

So unless this Board acts now to require adequate flows and carryover storage to maintain all Sacramento Chinook salmon runs, the commercial salmon fishery off California and Oregon is likely to disappear.

And to the extent that changes in the point of diversion that are the subject of this hearing would adversely affect the in-river flows that support salmon fisheries, those changes threaten the livelihood of every California and Oregon commercial salmon fisherman.

Thank you.

MR. VOLKER: Thank you. I will ask that Mr. Oppenheim then provide a summary of his testimony.

WITNESS OPPENHEIM: Thank you, Mr. Volker.

And good morning. Thank you for this opportunity.

My name is Noah Oppenheim. I'm the executive director of the Pacific Coast Federation Fishermen's Associations and the Institute for Fisheries Resources. And the testimony I have I

provide today is on behalf of those two organizations.

My testimony describes our current scientific knowledge of the finality in the relative abundance of juvenile salmon out-migrants in the lower Sacramento River and the Delta. It then discusses issues with drought years used as a baseline for this diversion hearing; the salmon migration during wet years; permit terms concerning salvage reporting; reduced salmon survival due to the reduction in flows and reverse flows; proposed flow criteria, including those at Rio Vista and the Yolo Bypass.

So we still don't know how the North Delta diversions might be operated if this project is approved. But we do know that they would be used with an untested fish screening method.

And the current proposed bypass criteria of the project will provide little protection to fall and late-fall-run Chinook salmon which, as Mr. Bitts has described, are the backbone of the West Coast salmon fishing industry and the public trust resource on which our members depend most.

We believe that the Water Board must rule

against the change in point of diversion in order to protect the beneficial use of commercial salmon fishing and preserve the public trust and minimize unreasonable impacts fish and wildlife.

According to the Biological Opinions of the WaterFix, the bypass criteria for the North Delta diversions will only be triggered by the presence of sufficient numbers of outmigrating juvenile winter-run and spring-run Chinook salmon.

This provides little protection for fall and late fall-run Chinook because they migrate at different times.

The North Delta diversions could also be particularly harmful to early outmigrating fall-run fry which don't swim as well as smolts. We believe that the NMFS BiOp greatly underestimates impacts to early outmigrating fall-run juvenile salmon.

The National Marine Fisheries Service Biological Opinion uses the period of 2012 to 2016 as a baseline for assessing impacts to these fish. And it concludes that only 3 percent of juvenile fall-run migrate as fry and that the smallest fry start appearing in April. Those fish are most vulnerable to entrainment in salvage pumps and screens.

The years from 2012 to 2016 included one of the most severe droughts in the historical record as well as several years in which Decision 1641 protective flow requirements were relaxed.

In 2014, there was a loss of temperature control below the Shasta Dam and the winter and fall-run salmon experienced lethal temperatures with extraordinarily high levels of mortality for juvenile cohorts. These are not typical years for salmon and the use of these years as a baseline is unacceptable.

(Reporter interruption)

WITNESS OPPENHEIM: The use of these baseline years is inadequate.

Sacramento troll data and salvage data show that large numbers of fall-run Chinook salmon are washed into the Delta as fry in wet years. For this reason, we believe that the National Marine Fisheries Service BiOp significantly underestimates the impacts to juvenile fall-run that migrate in winter storms as fry.

Salmon fishermen are concerned about the loss of history of the most productive years for juvenile Sacramento River Chinook salmon in the National Marine Fisheries Service BiOp.

We therefore request that the Board requires

monthly and annual reporting of raw salvage numbers and length-at-date information for salvage of Chinook salmon at all Delta diversions as a permit term.

Even with the assumptions that fall-run would mostly be larger, which we presume to be a flawed assumption, the National Marine Fisheries Service BiOp, which is Exhibit SWRCB-106, found reduced survival, and I'm going to quote, "The National Marine Fisheries Service BiOp states that the reduction in flows from the North Delta diversions would increase travel time and have an, 'adverse affect to a high proportion of rearing outmigrating fall-run Chinook juveniles." That's on Page 648.

And the National Marine Fisheries BiOp also states that reverse flows will be increased by the North Delta diversions and, "Reduce the survival probability of outmigrating smolts by moving them back upstream."

In addition, the idea that bypass flows are only required for passage of juvenile Chinook ignores the fact that juvenile Chinook salmon sometimes rear in the estuary.

Historically, this was in fact the dominant life history trait for juvenile Chinook salmon. It

may become more important if lethal thermal regimes become more prevalent upstream of the point of diversion and in Delta rearing habitats.

My testimony proposes a more holistic approach should the Board approve this petition and the project constructed and operated.

Mr. Hunt, could you please display the graph on the bottom of Page 3 of my testimony.

MR. VOLKER: That would be PCFFA-130.

WITNESS OPPENHEIM: This figure is a time series of the abundance of various lengths of salmon salvaged at diversion facilities over a long period of time, from 1995 to 2001.

This figure shows that, in years where salmon was abundant, they can be present in the Delta from January to June at high abundances and significant numbers starting November.

My testimony also shows that, when salmon are abundant, fall-run can migrate almost continuously starting in January. We're requesting that the Board require bypass and natural flows rather than having bypass flows triggered only by the presence of the two least abundant runs because we believe that these criteria would not be protective of the public trust resource that PCFFA members

depend on.

We base this on proposals by the Department of Fish and Wildlife -- or DFG at the time -- the PCFFA, and the Board's 2010 Delta Flow Criteria Informational Hearing.

The Department of Fish and Wildlife testified in the 2010 flow criteria hearing that salmon survived the best and have great abundance when flows past Rio Vista are between 20,000 and 30,000 cubic feet per second from April to June. They cited a 1987 study by the U.S. Fish and Wildlife Service. And there are plenty of other more recent studies cited as well.

You'll hear consultant for PCFFA and IFR testify that flows of 25,000 cfs as inflow at Rio Vista and outflow at Rio Vista should be required by the Board from April to June, citing the same 1987 study. These flows have clearly been needed for decades. They've not been implemented, and they should be implemented by this Board.

The Department of Fish and Wildlife also proposed minimum flows of 20,000 cfs at Rio Vista from November through March to protect outmigrating late-fall, winter, and spring-run Chinook salmon.

This would also protect up-migrating fall-run adults and fall-run outmigrants that are outmigrating early as fry.

PCFFA proposes that the Board require that the projects bypass natural flows sufficient to provide 20,000 cfs inflow at Freeport and outflow at Rio Vista from November to March and 25,000 cfs from April to June. We are not proposing that the Board require releases of stored water to sustain these flows. However, we do propose that the Board require that, if there are sufficient flows from storm or snow melt, to provide at least 20,000 cfs at Freeport and 25,000 cfs at Rio Vista, that the Board require that the projects bypass the flows. This would help restore the natural hydrograph that is needed to protect out migration and rearing of all races of juvenile Chinook, including fall-run and late-fall-run.

In addition, the Sacramento River has been cut off from a great proportion of this floodplain in the Yolo Bypass by the Fremont Weir during many water years. Studies have shown that salmon grow better in floodplains. The lower part of the Yolo Bypass is in the legal Delta. PCFFA is proposing that, as part of enacting appropriate Delta flow criteria, the Board

require that the Department of Water Resources lower the notch on the Fremont Weir and bypass sufficient flood flows to inundate the bypass.

If you can please display my testimony on Page 12 at Line 4, I'm going to quote briefly. Thank you.

We support the recommendations of American Rivers, the Bay Institute, and others in the 2010 Delta Flow Criteria proceeding, that the State Water Resources Control Board require Fremont Weir be notched to allow inundation of the Yolo Bypass at 23,100 cfs. That is Exhibit PCFFA-145, Pages 29 to 30.

These groups also recommended that storm inflows be bypassed to provide at least 35,000 cfs of flow at Verona from one to four months so that the bypass may be inundated.

We request that the Board require these flows as part of this change petition if you do approve the permit or if you don't.

If the Board decides to perform a water supply cost analysis for this proposed permit term and those water supply costs are found to be too large, we request that the Board evaluate the option recommended by Department of Fish and Wildlife of

sufficient flows to provide a minimum of 30 days of inundation of the old bypass with Fremont Weir notched past flows at 23,100 cfs.

In conclusion and for these reasons, PCFFA and IFR oppose the approval of the WaterFix project.

However, we do support amending the permits of the State Water Project and the Central Valley Project to provide flows sufficient to sustain salmon migration and rearing in the Delta. This is something that has been needed for decades to protect public trust resources on which our members depend.

PCFFA and IFR therefore request that the flow criteria described in my testimony for more protective criteria for other estuarine species be made a part of the permits for the State Water Project and Central Valley Project regardless of whether the Board approves this WaterFix project or this change petition. That concludes my summary.

CO-HEARING OFFICER DODUC: Okay.

MR. VOLKER: Thank you, Mr. Oppenheim.

If it please the Board, then, we'll move on to Ms. Des Jardins.

Ms. Des Jardins would you please summarize your testimony?

WITNESS DES JARDINS: Thank you.

My name is Deirdre Des Jardins, and I previously testified in this proceeding, my statement of qualifications is Exhibit PCFFA-75.

I wanted to note that I started collaborating with PCFFA in 2010, when I first became involved full-time and worked with them on evaluating impacts of the State Water Project and Central Valley Project, both current and planned future operations, on Chinook salmon.

And I have real concerns about the impacts of the proposed project on fall-run and late-fall-run. And one of the biggest reasons is that the operational criteria that are analyzed for this proceeding are subject to change.

My testimony quotes the National Marine Fishery Service Biological Opinion. On Page 16, it states in part, "Operational criteria identified in a CWF PA may be modified, relaxed, or removed and may no longer apply to an operation with CWF. The U.S. Fish and Wildlife Service Biological Opinion on Page 12 to 13 also states, "Agency decisions related to identifying the Final CWF operational criteria will be made in a subsequent consultation. And Reclamation and DWR have committed to analyze and further address species effects from CWF operations

at that time."

You know, for this reason, I don't think the Board can assume that any of the operational scenarios presented for this hearing will actually be the daily future operations.

You know, there is -- a particular concern is that the North Delta bypass criteria aren't finally determined. They're also proposed only to be triggered by the presence of winter and spring-run Sacramento River Chinook. Not only do fall-run migrate at different times, it's not even clear that winter and spring-run will be -- will not become instinct sometime during the operation of this project.

My testimony cites "State of the Salmonids: Status of California's Emblematic Fishes." This 2017 report, coauthored by Peter Moyle, rated both winter and spring-run as the critical concern, and gave both a high likelihood of extinction.

I think the Board needs to act immediately to ensure that adequate bypass flows and cold water pool is available to protect the winter and spring-run. But the Board must also not assume that protections for fall and late-fall Chinook salmon runs in this project and other long-term operations

will protect other species or estuary habitat.

So what should the Board be looking at? My testimony says the Board should be looking at Decision 1641. And in Decision 1641, I think the Board needs to look at controlling factors. And I did not -- we did not have the resources for anyone to do that kind of analyses. It takes some time and accessing quite a bit of data from the modeling.

But let's pull up Exhibit PCFFA -- let's look up, pull up Page 5 of my testimony, which shows a graph of the controlling factor analysis.

MR. VOLKER: That would be PCFFA-161.

WITNESS DES JARDINS: Yeah, 161, Page 5.

So these graphs were done by Armin Munevar around -- when the Wanger Biological Opinions first came out. This one is before Wanger. And this is just an example of what was controlling before Wanger.

You can see pale yellow is Delta outflow, bright -- which controls in the late spring and summer. And then you can see bright yellow is ag salinity controls in July and August. And then I believe that the pink is the export-to-inflow ratio. And you can -- which is the export limits in Decision 1641. And that controls a certain amount of time.

So let's look -- let's scroll down to the next page of my testimony, which shows there were two different -- two postings. This is Wanger scenario Alt 2, and let's scroll down a little further, Wanger Alt 3. Both of these show that after Wanger, Old and Middle River started controlling a significant percentage of the time, limiting exports in the -- in the spring months.

Let's just scroll back up to the previous one. you know, so the highest limits were in Alt 2. And this analysis would have to be redone for the No Action Alternative. But under No Action Alternative, Old and Middle River flows likely do continue to limit exports significantly. And part of the purpose of the project is to get around these limits.

But the issue also is the proponents are also proposing to exempt the North Delta diversions from the export limits in Decision 1641. And they're not proposing any bypass criteria for the Sacramento River in the permit.

The only bypass criteria that are defined are those to protect winter and spring-run. And so is there really a question about what also exempting the North Delta diversions from the export limits would do, you know, if these criteria -- if the

bypass criteria that were analyzed were changed or if those fish went extinct.

(Reporter interruption)

WITNESS DES JARDINS: If the winter and spring-run fish that trigger these protective bypass criteria went extinct sometime between now and 2050, You know, and what would that do to all the other beneficial uses in the Delta that are not tied to winter -- that are winter and spring-run.

There's other fish, Delta smelt, longfin smelt, and there's specific criteria to protect those fish. But we knows those fish are also critically endangered. So I think a broader beneficial analysis shouldn't rely on specific Endangered Species Act criteria.

Next, I'd like to point out that, when the EP- -- that neither the '95 Bay-Delta Water Quality Control Plan nor the 2006 Bay-Delta Water Quality Control Plan, nor the EIRs for either of those water quality control plans ever considered diversions in the North Delta.

And let's pull up PCFFA-166.

This is the letter from the EPA. Let's -- yeah. To -- someone may remember this -- to the EPA, to the Chair of the State Water Resources Control

Board approving the 1995 Bay-Delta Water Quality Control Plan. And let's scroll down to the bottom where it says -- no. The bottom of -- zoom in a little on Page 1.

So it says, "EPA is approving" --

(Reporter interruption)

WITNESS DES JARDINS: It states, "I am pleased," in part, "I am pleased to inform you that EPA is approving the 1995 Bay-Delta Plan as meeting the requirements of Section 303(c) of the Clean Water Act." And, "This action is based upon my determination that the '95 Bay-Delta Plan will protect the designated uses of the Bay and Delta and otherwise complies with the requirements of the Clean Water Act."

But let's go down to Page -- let's go to -- it's document Page 4.

MS. ANSLEY: I'm sorry. Could she point me to where that quote is in her testimony? I'm losing track. I do see a quote from Page 4.

CO-HEARING OFFICER DODUC: Ms. Ansley, I don't believe the microphone is on.

MS. ANSLEY: Pardon me. Jolie-Anne Ansley, Department of Water Resources.

Could she point me -- the whole passage that she just read, I'm trying to catch up. Was that in her testimony?

CO-HEARING OFFICER DODUC: Ms. Des Jardins.

WITNESS DES JARDINS: No, it wasn't.

MS. ANSLEY: And I apologize. I was looking away at the grass and thinking about my questions coming up. But I would appreciate if we stay and not read into the record additional portions of documents that are not part of her direct testimony.

WITNESS DES JARDINS: I apologize. I -- just that -- going to try and stick with this quotation. But this one, it does specifically state -- and I will pull up the staff quote from the testimony -- that EPA is highlighting certain assumptions and conclusions it made during its evaluation of the '95 Bay-Delta Plan.

MR. VOLKER: Excuse me. Could we have on the screen Page 7 of PCFFA 161. So we can find the indented block quote from which Ms. Des Jardins is quoting.

WITNESS DES JARDINS: Yeah. We can just -- this is from that page. So let's go down there.

And so --

CO-HEARING OFFICER DODUC: So, Ms. Des Jardins, let's be clear for the record that, while that specific passage that you noted earlier was not specifically cited in your testimony, your testimony does make references to PCFFA-166 and, in particular, the findings in that document.

WITNESS DES JARDINS: And then in approving the Bay-Delta Water Quality Control Plan as meeting the requirements, the EPA noted -- specifically noted that new diversions would require a new review of estuarine habitat protection measures to ensure that the beneficial uses are estuary protected.

And it specifically says, "The DWRSIM model assumed certain baseline conditions, and also assumed the present Delta configuration. If those baseline conditions change or if the configuration of the Delta changes due to changes in the location or operation of Delta control and export facilities, the estuarine habitat measures must be reviewed to assure that designated estuarine habitat uses are still receiving protection."

And I believe the WaterFix EIR/EIS has a lot of speculation about potential operating scenarios under Biological Opinions. But because these are speculative at this point and subject to change, I

don't believe they're sufficient for a basis for the Board's evaluation of whether the designated beneficial uses and estuary are protected.

So I also wanted to cite here some issues with the '95 and 2006 water quality plans that I think -- with how -- with how they were implemented, which I think should be addressed in any review of the estuarine habit beneficial use.

And I'd like to go back to the table on the top of Page 16 of my testimony. So let's scroll in a little for this.

So this is actually -- I submitted the EPA's original regulations, which are still there. And it required 133 days of X2 at west of Roe Island in wet years, 105 years above normal, 78 days below normal, and 33 days in dry years.

So the State Water Board instead enacted a different table, which was supposed to have similar -- let's go to Page 17 of my testimony -- which was supposed to have similar -- we can scroll out.

You know, this is the -- this is the X2 table, Table 4 in the current Water Quality Control Plan. But the Board also enacted something called the Port Chicago trigger, which these outflow requirements were only triggered when the EC at Port

Chicago has been below 2.64 millimhos per centimeter for the final two weeks of the preceding month. But I believe this may have led to unintended consequences as the projects appear to be holding more water back in the spring.

And I'd like to go to the graph on Page 15 of my testimony. And this was from the same 2012 presentation by American Rivers to the Board in the Bay-Delta Flow Workshop. And I was really struck by this.

Let's scroll down a little bit. But the blue line is the pre-Oroville. And you can see the natural flow. There's a huge peek in the spring. And the dashed line is pre-1994. And you can see the hydrograph is flattened significantly, but there's still -- there's still peak flows in the spring.

But then after the '95 water quality plan, you can see that there's really, on average -- this is in normal, below normal, and dry years. There's very little water released in the Feather River in the spring. And there's a significant shift to the summer.

And, you know, there's two potential reasons for this. One is to avoid triggering these increased outflows, the Port Chicago trigger, and another one

is that they allow a high -- the summer months allow a higher percentage of flows to be exported.

So, you know, this is one of the reasons that I believe that the Board's appropriate Delta flow criteria need to require both inflow at Freeport and outflow at Rio Vista. The upstream bypass requirements for the State Water Project and Central Valley Project would also be consistent with Phase 2 Bay-Delta Water Quality Control Plan update proposal of inflow-based outflow.

Finally -- I'd also like to discuss the Board's basis of that for determining the Decision 1641, which implemented the Bay-Delta Water Quality Plan, was reasonably protective of salmon.

The Board based their approval of their Joint Point of Diversion in part on modeling of survival for Chinook salmon migrating through the Delta. And I pulled those graphs up. Let's go the Page 13 of my testimony.

And let's pull out -- so these are called survival indices. And the -- if you look, they show that the fall-run survival index was, you know, roughly about 29 percent, a little below 30 percent in dry and critically dry years.

My testimony cites coded wire tag studies

that found an actual survival was about a third less, you know, somewhere around 17.5 percent to 19.5 percent.

That was in study -- coded wire tag study by Perry, et al., in December 2007 and January 2008. This is discussed in -- on Page 14 of my testimony.

Another follow-up study, the winter of 2008 to 2009, found that -- there is it is. Overall survival was 1.88, about 19 percent. You know, survival is about a third lower than predicted.

Yeah, also looked back at the 1995 Bay-Delta Water Quality Control Plan. And this modeling found that survival of migrating salmon and other species could be increased because exports during spring would be reduced.

But, you know, the trends we're seeing are not indicating that survival of outmigrating salmon has been increased. And I think the reason for the discrepancy between the predicted versus actual outcomes for salmon in the modeling for the '95 and 2006 Water Quality Control Plan needs to be examined because this was the basis, in part, for the Board determining that these plans were sufficiently protective, reasonably protective of salmon.

Finally, I'd like to discuss there was an

operations plan required under Decision 1641. The CVP and SWP currently require an operations plan that, "provides adequate protection to aquatic resources and other legal users of water for use of the Joint Point of Diversion." And the current version of that plan was submitted in 2006.

And let's pull up Exhibit PCFFA-170.

And this is -- let's go to Page 4 of the plan, which is on PDF Page 6. And I want to draw people's attention, draw the Board's attention to Condition e), says, "JPOD operations will not begin or if ongoing will cease if any of the following conditions occur." And one of them is if daily catch index of juvenile salmon at Knight's Landing and/or Sacramento troll in the Sac River is greater than or equal to 5.

And I was really struck by -- I saw this -- that this is very similar proposed criteria for the WaterFix.

But I -- I'm not seeing -- if we go to -- let's pull up PCFFA-172. And just scroll down. So I couldn't find on here any reports about this condition or whether it was being implemented or anywhere else. And if -- if we go back -- let's -- I wanted to pull up the approval letter by Tom Howard

that's Exhibit PCFFA-171. And I wanted to look at the bottom of Page 1, where it says -- there's two conditions. One is Howard said the fishery plan contained no specific criteria or procedures to monitor operation at Oroville. So the Fishery Protection Plan was only approved -- only applies to the water rights of the Bureau of Reclamation.

And then let's go to Page 2. And it notes the fishery plan is based on the requirements in the existing Biological Opinions. And it states, in part, "This Fisheries Plan Approval is conditioned on it being submitted to the Executive Director for review after any relevant BO is rescinded, amended, adopted, or revised in the future."

And as we all know, the 2004 BiOp was revised. And I found no -- no new fisheries protecting plan that's been submitted.

And when DWR requested approval to use the Bureau's point of diversion in 2017, somehow it sent a letter to DWR and the Bureau which stated in part that the 2006 Fisheries Plan needed to be updated because of the revised BO. That's Exhibit PCFFA-174.

Can we pull up Exhibit PCFFA-174, please.

So we can go down to Page 1, yeah. So in the bottom of the second paragraph, it says, "The

2006 fisheries and legal user of water operations plan needs to be updated because Biological Opinions were subsequently issued by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service in 2008 and 2009. D1641 states that the operations plan shall be submitted to the Executive Director of the State Water Board for approval at least 30 days prior to use by DWR of Tracy Pumping Plant."

(Reporter interruption)

WITNESS DES JARDINS: "Prior to the use by the DWR of Tracy Pumping Plant."

And the Executive Director denied use by DWR of the Tracy Pumping Plant based on this, and the plan was never updated.

And I'd like to go back to the graph on Page -- my testimony, Exhibit PCFFA-161, Page 11. And this is from Walter Bourez' surrebuttal testimony in Part 2.

And it shows Reclamation used the Joint Point of Diversion after the new Biological Opinions came out. In fact, it looks like in every year between 2009 and 2015, except for 2011, you know.

So this -- there was no revised plan submitted. And I raise this just to indicate the

kind of -- not to point fingers, but to just indicate the kind of institutional issues with relying on a future operational plan to protect fishes and on the Board's approval of a future plan.

You know, it's now 2018, and it's a dozen years since this was submitted in 2006. There's new Biological Opinions. There's certainly new information showing that the west coast salmon fishery has been adversely impacted. And yet -- and yet this is the state.

And, you know, for this reason, I think that the analysis by the Board of whether the water quality plan is sufficiently protective needs to be done now. And the Board needs to not rely on future biological opinions or future operational plans.

Thank you.

CO-HEARING OFFICER DODUC: Thank you, all three of you.

MR. VOLKER: Thank you. As I understand the Board's practice, we would move into evidence after all the panelists are finished.

CO-HEARING OFFICER DODUC: Yes.

Actually, after all of your witnesses are finished.

MR. VOLKER: Yes.

CO-HEARING OFFICER DODUC: All right. If you would go ahead and move over -- let me get an estimate from people for cross.

Ms. Ansley, I think I need to get new estimates from you because the panels have now been reconstituted yet again. So you're now-anticipated time for cross of this panel?

MS. ANSLEY: 20 to 30 minutes, please, for DWR.

CO-HEARING OFFICER DODUC: All right. Anyone else?

MR. FITZGERALD: Good morning, Patrick Fitzgerald --

CO-HEARING OFFICER DODUC: I'm sorry. Is the microphone on?

MR. FITZGERALD: Good morning. Patrick Fitzgerald, Bartkiewicz, Kronick & Shanahan for the Cities of Folsom, Roseville, and San Juan and Sac Suburban Water Districts.

I have a few questions, actually, just for Mr. Oppenheim, about 15 minutes.

CO-HEARING OFFICER DODUC: And that's Group 7?

MR. FITZGERALD: Yes, that's correct.

MR. KEELING: Good morning, Tom Keeling for

San Joaquin County, Protestants Group 24. I have about 10 minutes for this panel.

MR. HERRICK: John Herrick, South Delta parties, 10 to 15 minutes.

CO-HEARING OFFICER DODUC: And we received an e-mail request from Ms. Suard for 20 minutes. Hopefully she will be here in time.

All right. Let me check with the court reporter.

(Discussion off the record)

MS. ANSLEY: I have a rough outline topics, if you'd like them.

CO-HEARING OFFICER DODUC: Please.

MS. ANSLEY: I have for Mr. Bitts a little bit on his qualifications, the impacts of California WaterFix as written in his testimony, and one or two of the reports he actually cites in his testimony.

For Ms. Des Jardins, I have a couple peripheral questions on her qualifications, understanding that we have gone into that before. I then pretty much step through the topics of her testimony, asking her a couple questions about each of the subject areas of her testimony on JPOD and her reservoir release shifting.

And then for Mr. Oppenheim, I have a couple

questions on qualifications and a couple questions on statements regarding impacts of the California WaterFix.

CROSS-EXAMINATION BY MS. ANSLEY

MS. ANSLEY: Good morning, Mr. Bitts. My name is Jolie-Anne Ansley. I'm with the Department of Water Resources.

WITNESS BITTS: Good morning.

MS. ANSLEY: The NOI for PCFFA says that you are testifying here today as an expert witness; is that correct?

WITNESS BITTS: Yes.

MS. ANSLEY: And I believe that you did not submit a separate statement of qualifications, that your qualifications are only contained in your testimony; is that correct?

WITNESS BITTS: That's also correct.

MS. ANSLEY: And you are here testifying as an expert on impacts to ocean salmon fisheries from the WaterFix?

WITNESS BITTS: I'm here -- not specifically. I'm here testifying as to what has happened to the ocean salmon fishery in the recent years. WaterFix has not yet been implemented, so as of yet, it has had no impacts on the ocean salmon

fishery.

MS. ANSLEY: Let me clarify. So the NOI for PCFFA says that you are testifying here today as an expert on impacts to ocean salmon fishery from WaterFix and ongoing operations.

Would you like to clarify what you are testifying here today as an expert on?

WITNESS BITTS: I'm here testifying as an expert on fishery itself, the connections between the freshwater flows and what happens to the fishery are somewhat beyond my personal expertise.

MS. ANSLEY: I understand from your testimony, of course, which is PCFFA-86, that you are here today -- that you are a commercial salmon fisherman and that you have served in various advocacy positions in environmental organizations and trade organizations; is that correct?

WITNESS BITTS: Not as far as environmental organizations. I've been an advocate on behalf of fishermen, usually with PCFFA as a -- I also have advocated for PCFFA, but I have not advocated for environmental organizations per se.

MS. ANSLEY: Thank you for that clarification. And understanding that you obviously,

as a salmon fisherman, know a great deal about salmon, you are not a trained fisheries biologist; is that correct?

WITNESS BITTS: That is correct.

MS. ANSLEY: Nor an oceanographer?

WITNESS BITTS: Neither.

MS. ANSLEY: On Page 6 of your testimony -- do you have a copy in front of you, sir?

WITNESS BITTS: I do.

MS. ANSLEY: We can call that up. That's PCFFA-86, if everybody would like to see.

You cite a National Marine Fisheries Service 2009 technical memo titled, "What Caused The Sacramento River Fall Chinook Stock To Collapse." Do you see that on Lines 10 to 11?

WITNESS BITTS: That's Exhibit PCFFA-132, yes.

MS. ANSLEY: Thank you. And you state that the National Marine Fisheries Service found that degradation of freshwater habitat and reduction in diversity of life histories of Sacramento River Chinook were major contributing factors?

WITNESS BITTS: Yes.

MS. ANSLEY: Isn't it true the NMFS report called them likely contributing factors?

WITNESS BITTS: "Likely" is a term of art used by scientists who very seldom say -- speak in simple declarative sentences, so, yes.

MS. ANSLEY: And didn't the National Marine Fisheries Service report that you cite there also find that the approximate factor was poor oceanic conditions?

WITNESS BITTS: That report did so find. They presented that conclusion to the Pacific Fisheries Management Council once they had completed the report. And no one there believed it. I was there when this happened. I observed this colloquy, if you will, between the agency and the council.

And the -- they were -- I would say that conclusion was less respected than anything else I've seen NMFS bring to the Pacific Council in 30 years of attending those meetings.

For example, they cited that there had been an El Nino that had contributed to the collapse. And there are measurements for the strength of El Ninos. And it turned out on examination that we had had much more severe El Ninos in the recent past which had had much less calamitous effects on ocean salmon abundance than were observed in those years.

And so the likely contribution of the El

Nino cited by NMFS turned out to be not that likely, let's say.

MS. ANSLEY: And respectfully, Mr. Bitts, my question was whether -- what the conclusions of NMFS was.

WITNESS BITTS: Uh-huh.

MS. ANSLEY: You are welcome to have your attorney explore any matters that I ask you questions about further.

But I would move to strike the rest of his answer after he confirmed what was NMFS' conclusion in the 2009 report.

CO-HEARING OFFICER DODUC: Mr. Volker.

MR. VOLKER: Yes, thank you. I --

CO-HEARING OFFICER DODUC: Microphone.

MR. VOLKER: I believe that the witness's response was responsive and that the witness explained that his expertise is perhaps broader than reading a NMFS report, that his 40 years of experience, including years working with the Pacific Fisheries Management Council and its staff has provided him with an understanding of the relationship between ocean conditions and freshwater flows and the resulting impacts on the salmon fishery.

So I think if you look at this holistically, as one must, there are a number of contributing factors. And I think his testimony was most illustrative of the complexity and his command of it.

MS. ANSLEY: I would also submit that his testimony regarding the Pacific Fisheries Management Council would also constitute hearsay. And his attorney is welcome, of course, to further get Mr. Bitts' oceanography experience on ocean conditions. But my question was simply asking what the National Marine Fisheries Service hand concluded in that report. So I do think it strayed far beyond the question.

CO-HEARING OFFICER DODUC: Understood. Objection sustained; motion granted, whatever it was.

MS. ANSLEY: Mr. Bitts, you state in your testimony that the State Water Board should rule against the point of diversion change in this petition; is that correct?

WITNESS BITTS: That's not quite a yes or no.

MS. ANSLEY: Do you not state that in your testimony?

WITNESS BITTS: If we could establish that there will be no change in flesh water flows

available to salmon as a result of the WaterFix, then I will have much less objection to granting the point of diversion application.

But it's hard to see how extracting the volume of freshwater from the river that is contemplated by this change could not have an adverse affect on salmon.

MS. ANSLEY: And just to confirm, your testimony points to no evidence regarding any analysis or modeling of impacts of the California WaterFix; is that correct?

WITNESS BITTS: I am not citing evidence, no.

MS. ANSLEY: Thank you, Mr. Bitts.

My next questions are for Ms. Des Jardins. Hold on while I find my copy of your testimony.

Ms. Des Jardins, you are listed here as an expert witness today on the PCFFA NOI; is that correct?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: And you are listed as an expert in hydrology, impact analysis, beneficial use analysis, and permit and water quality control plan history; is that correct?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: You have no formal training in hydrology; is that correct?

WITNESS DES JARDINS: No, I wouldn't say that's true. I did take a class in hydrology. And flood flows are -- on the river are actually governed by Hurst-Kolmogorov statistics, which are kind of self-similarity. And when I was at Los Alamos, we looked at flood flows in the Nile and other rivers. So in addition to that, you know, there's all my experience with analyzing hydrology.

But on the Sacramento River, which was done in collaboration with other experts. So -- so, yeah, there's -- you know, there's classes, research experience, and work experience.

MS. ANSLEY: Looking at your statement of qualifications, your time at Los Alamos was when you were an undergraduate; is that correct?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: And it does not mention any modeling of the Nile River. It mentions predicting currency market trends?

WITNESS DES JARDINS: There was a large number of things that the Center for Nonlinear Studies worked on. And I didn't list everything that we looked at.

I did -- when I was an undergraduate, I got an unusual education in that I did graduate work in nonlinear dynamics and chaos theory and a summer internship at the Santa Fe Institute for Complex Systems Research and then a year of research at the Center for Nonlinear Studies.

And that was followed by a six-year fellowship, where I also worked with -- a professor, one of the four chaos pioneers from UC Santa Cruz. And we looked at other applications of chaos theory on complex systems.

So there's a pretty broad range of things I looked at when I was at Los Alamos and subsequently when I was at the Santa Fe Institute and working with Jim Crutchfield.

MS. ANSLEY: I see here the physics, and I see here the nonlinear modeling. You didn't think it was relevant to mention hydrologic experience?

WITNESS DES JARDINS: The Hurst-Kolmogorov statistics wasn't a big part of my work. If I put everything I looked at -- I'm a very prolific researcher. And if I put everything I looked at in there it would be a hundred pages. And I tried to focus on main topics.

MS. ANSLEY: You've never worked for a water

supply agency, have you?

WITNESS DES JARDINS: No.

MS. ANSLEY: And you've not worked for the Regional Water Quality Control Boards or the State Water Quality Control Boards, have you?

WITNESS DES JARDINS: No, but I've produced reports that the Board has used.

MS. ANSLEY: Are these reports the Board has commissioned and paid for?

WITNESS DES JARDINS: No.

MS. ANSLEY: Have you work for any private hydrologic consulting firms? In this hearing, we have quite a few. So I think we all understand that I mean things like CH2M Hill, ICF. I believe that PCFFA has Cannon Hydrologic. I believe -- I'm talking about private consulting firms that specialize in hydrologic modeling.

WITNESS DES JARDINS: I'm a principal at California Water Research. And I've been doing that kind of work as principal. And I haven't -- and I've been working consistently for ten years.

I haven't felt the need -- when you're somebody who's done research like I have with the top research groups in the world in your field, in several different fields, you just -- when you want

to do something, you just go start doing it. You find people to collaborate with. And you work intensively, and that's what I've done.

MS. ANSLEY: And I don't mean to cut you off. Was that answer a no to my question? I hear your explanation, but I'd like it to be clear on the record. The question --

WITNESS DES JARDINS: It's no, and I didn't believe it was necessary because I was not, you know -- I've had all of this other research experience.

MS. ANSLEY: And moving to your expertise on impact analysis and beneficial use analysis, does this expertise stem from your participation in the preparation of comments on the environmental review documents?

WITNESS DES JARDINS: It's -- I've been doing impact analysis since I first started in 2010, and it's a primary concern of both environmental fishing groups that I've collaborated with, and that's one of the primary areas where I bring my expertise in in physical sciences and modeling and ability to read and synthesize a huge variety of complex documents.

I've done it on biops, water transfers, legislation proposed changes, evaluation of EIRs,

EISs, BDCP, WaterFix, but there -- you know, there's frequently proposals, you know, as well as looking at historically, you know, what are the changes of operations, why are -- the kinds of changes that we're seeing.

So -- so that's part of it. But there's -- there's quite a lot that I've looked at over the last eight years.

MS. ANSLEY: So I believe what I heard you saying there, just to clarify my own question, is that your experience stems from your preparation of comments to the documents you listed, which would include biops, water transfers, legislation, and evaluation of EIRs?

WITNESS DES JARDINS: It would be any situation. And I listed some of the products of that. But one of the things that I worked on extensively was understanding, you know, what's happened to fish, how current project operations are impacting them, how proposed future changes are impacting them.

There were claims about what the Wanger BiOps are doing, Decision 1641, going back all the way to Decision 1995 -- Decision 1995 water quality plan, Decision 1485. I mean, there's been -- so

there is a great deal -- a lot of it is in the gray literature.

CO-HEARING OFFICER DODUC: Ms. Des Jardins.

WITNESS DES JARDINS: Yes.

CO-HEARING OFFICER DODUC: I don't mean to interrupt you.

WITNESS DES JARDINS: Yes.

CO-HEARING OFFICER DODUC: We've already spent quite an amount of time during Ms. Des Jardins' case in chief going over her qualifications.

MS. ANSLEY: That's okay. I have maybe three questions. I'm going to try and wrap this up.

WITNESS DES JARDINS: Okay.

MS. ANSLEY: That will follow this naturally.

This work for you started in 2010, I believe we've established in previous testimony; is that correct?

WITNESS DES JARDINS: Yes, yes.

MS. ANSLEY: So you were not involved in the 1995 Water Quality Control Plan proceedings or adoption?

WITNESS DES JARDINS: No. I just read all of the historical documents and talked with --

CO-HEARING OFFICER DODUC: So it was a no.

Thank you.

MS. ANSLEY: And you are not trained as a natural resource historian; is that correct?

WITNESS DES JARDINS: No, I just read everything.

MS. ANSLEY: Is it your understanding -- moving on to her testimony.

Is it your understanding that there are bypass flows -- and I believe you already testified to that earlier today -- established for the North Delta diversions?

WITNESS DES JARDINS: There is speculation about what they're going to be.

MS. ANSLEY: Is there initial operating criteria that's laid out in the Biological Assessment that is an attachment to the Biological Opinion?

WITNESS DES JARDINS: And it says they're subject to change.

MS. ANSLEY: Is that a yes to my question that there is initial operating criteria for North Delta diversion --

WITNESS DES JARDINS: I wouldn't say they're defined in the document because it says they're subject to change. There's no final specification.

MS. ANSLEY: And on Pages 2 of your

testimony, you have a section talking about the export-to-inflow ratio. This is the subject of fairly extensive testimony in Part 1 by Mr. Munevar; is that correct? You're familiar with that testimony?

WITNESS DES JARDINS: I don't recall that. And perhaps you could point to where it is.

MS. ANSLEY: Well, I don't want to bring up the transcripts from Part 1, but that was my question is I take it that you're not familiar with Mr. Munevar's testimony in Part 1 regarding --

WITNESS DES JARDINS: I don't recall that. So I don't agree necessarily that he discussed it. I did pay fairly close attention to Munevar's testimony.

MS. ANSLEY: On Page 4 of your testimony, you state that the Water Board should not assume that winter-run Chinook and spring-run Chinook evolutionary significant units will survive for the entire period of the early operations of the Cal WaterFix.

Do you see that testimony on Page 4?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: And you say during the time period that the Water Quality Control Plan update is

also in effect; is that correct?

WITNESS DES JARDINS: Yeah, or even for the period that Phase 2 update is in effect.

MS. ANSLEY: And then you recommend that the Board act immediately to ensure that there are adequate bypass flows and cold water pool availability?

WITNESS DES JARDINS: That's -- that's following the discussion of Peter Moyle's conclusion.

MS. ANSLEY: So that's on Lines 19 to 20 you say the Board should act immediately. Is that recommendation for right now, whether the WaterFix is approved or not approved?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: And so that recommendation is independent of the impacts of the California WaterFix?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: Then starting on Page 5 of your testimony, you provide as illustrative examples of modeling done by Armin Munevar in 2008, February of 2008; is that correct?

WITNESS DES JARDINS: Yeah, and it was primarily to show the -- what an export -- a controlling factor analysis.

MS. ANSLEY: And so you agree that these are not illustrative of the current Biological Opinions effect which would be the 2008 Fish and Wildlife Service and 2009 National Marine Fisheries Service BiOps?

WITNESS DES JARDINS: No. I believe these were done when they the first had the Wanger decision.

And, yes, these do need to be revised to show the current BiOps, which have been changed.

MS. ANSLEY: So we are agreeing that these pre-date the current Biological Opinions and in current --

WITNESS DES JARDINS: Yes, they were revised. This is why it's just illustrative.

MS. ANSLEY: And in Part 3 of your testimony, which begins on Page 9, this appears to be a critique of former JPOD approval under the D1641; is that correct?

WITNESS DES JARDINS: It's not just that. This is a permit term. There is -- currently D1641 requires an operations plan to protect aquatic resources. So this is a current permit term of the projects.

MS. ANSLEY: This is a critique that's

independent of the proposed California WaterFix impacts?

WITNESS DES JARDINS: I wouldn't say that either because the WaterFix potentially increases use of the JPOD.

MS. ANSLEY: Do you cite the evidence of that?

WITNESS DES JARDINS: I didn't -- I didn't discuss that specifically in my testimony, but this JPOD that -- the current modeling assumes 50/50 use of export capacity. And that means quite a lot of use of the JPOD by the Bureau.

MS. ANSLEY: And any subsequent use of JPODs would have to be approved by the Water Board; isn't that correct?

WITNESS DES JARDINS: I'm not quite sure what -- what the consideration is. I don't think JPOD has been really explicitly considered and -- in what's been submitted, both JPOD -- the conditions for -- and the conditions for use of the JPOD, that was just assumed as a baseline that the Bureau would be using -- that there would be 50/50 sharing. And as we know, that assumption may also be subject to change.

MS. ANSLEY: And starting on Page 11 of your

testimony, you talk about juvenile salmonid survival forecasts in D1641. Do you see that section?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: And you provide graphs that you say are from the Final -- FEIR for 1995 Bay-Delta Water Quality Control Plan?

WITNESS DES JARDINS: Yeah, Exhibit SWRCB-31.

MS. ANSLEY: And you say that you're not sure whether Alternative 9 was the alternative chosen?

WITNESS DES JARDINS: I believe it was because it's limited by Army Corps of Engineers PN 5820A and that's -- 5820A is what's currently governing -- governing project exports with -- there was a second -- there was some change made by that by the ACOE more recently.

MS. ANSLEY: These graphs on Page 13 of your testimony do not label the time frames for the smolt survival index, do they?

WITNESS DES JARDINS: These are -- graphs are based on water year type. And they're projected, so they're long-term averages. And they're broken down over year type.

MS. ANSLEY: And on Page 14 of your

testimony, you compared them to studies from one month in December 2007 and one month in January of 2008; is that correct?

WITNESS DES JARDINS: There were two studies I cited. That was one of them.

MS. ANSLEY: And then the next study is the winter of 2008 to 2009?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: And is the point of your conclusion that the reason for what you perceive as a discrepancy between predicted versus actual outcomes under the Water Quality Control Plan in 1995 in D1641?

WITNESS DES JARDINS: Well, these were termed "survival indices" because it was known that the modeling -- there was some critiques of the modeling. But, yeah, if you look at the survival indices as projections of percent survival, then there seems to be a discrepancy. And I think the cause of that -- and I think that's really relevant because we've got a whole bunch of layered modeling here. And, again, we don't know about this modeling either, what errors would be.

And I think there need to be a process whereby the projections of fish survival and whatever

need to be looked at after they're made.

MS. ANSLEY: You don't cite any modeling of fish survival under the California WaterFix in this section, do you?

WITNESS DES JARDINS: The fundamental principle is looking at modeling after it's done and learning about what --

MS. ANSLEY: Objection --

CO-HEARING OFFICER DODUC: Hold on.

MS. ANSLEY: You don't cite impacts of the California WaterFix on salmon survival in this section of your testimony, do you?

WITNESS DES JARDINS: Not specifically. But it is a general principle of use of modeling.

MS. ANSLEY: And I'm looking at Line 13, where you say, "The reason for the discrepancy in predicted versus actual outcomes needs to be examined." Do you see that line?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: That line is independent of the California WaterFix, isn't it?

WITNESS DES JARDINS: No, because the WaterFix uses modeling. I mean, this one is -- you know, I'm very -- I wouldn't take that in isolation. This is -- I hope that looking at past use of

modeling would inform the reliance on modeling in this proceeding. That was the whole point of this entire passage. It's not only to look at past use but also to inform it, inform this proceeding.

MS. ANSLEY: But you do not discuss the modeling in either the Biological Opinions or Biological Assessment for salmon survival, do you?

WITNESS DES JARDINS: Because -- I don't because none of the operations are defined.

MS. ANSLEY: And then --

WITNESS DES JARDINS: Or are finally determined.

MS. ANSLEY: On Page 14 of your testimony, you shift to a section regarding reservoir release shifts under 1995 Water Quality Control Plan; is that correct?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: Pages 14 to 16 of your testimony?

WITNESS DES JARDINS: Yes.

MS. ANSLEY: And, again, these are operations or a shift that is independent of the California WaterFix; is that correct?

WITNESS DES JARDINS: Uhm, I wouldn't say that exactly because the WaterFix EIR repeatedly

refers to discretionary operations by the project operators. And so this is elucidating one aspect of those discretionary operations that I think is really relevant and really isn't clear.

But, you know, so, yes, to the extent this discretionary operation is carried into the future, it will affect all future project operations. And, yes, it would affect them with or without the WaterFix.

MS. ANSLEY: But in your testimony, you don't cite any impacts from the California WaterFix nor make a connection between your critique of reservoir release shifts under the 1995 Water Control Plan -- Water Quality Control Plan and the current WaterFix; is that correct?

WITNESS DES JARDINS: I think I make it clear that these discretionary operations are likely to continue and that they impact upstream releases and inflow to Freeport and that, you know, as I said, the Final EIR repeatedly cites discretionary operations.

MS. ANSLEY: And the data you provide here predates the current Biological Opinions and is not the current regulatory environment; is that correct?

WITNESS DES JARDINS: What data?

MS. ANSLEY: I guess it would be the data that you provide from the American Rivers Group, which would be showing a pre- and post-1999 shift. Is that -- does this graph predate the 2008-2009 regulatory environment?

WITNESS DES JARDINS: Some of the post-'99 median predates it; some post dates it. The BiOps -- the BiOps for Delta operations don't specifically address upstream releases from Oroville.

MS. ANSLEY: Do you cite anything in support of your conclusion on Page 16, Lines 15 to 16, where you say, "It appears the SWP may be holding back water in Oroville in the spring to avoid the Port Chicago trigger"? Do you cite any statements by the DWR evidencing that intention?

WITNESS DES JARDINS: It's -- this is common knowledge.

CO-HEARING OFFICER DODUC: Ms. Ansley.

MS. ANSLEY: That's the end of my questions for Ms. Des Jardins.

CO-HEARING OFFICER DODUC: And how long do you anticipate for Mr. Oppenheim?

MS. ANSLEY: Ten minutes or less.

CO-HEARING OFFICER DODUC: Let's go ahead and take our break, and we will return at 11:20.

(Recess taken)

CO-HEARING OFFICER DODUC: All right. It's 11:20. We're back. And let's give DWR ten minutes to conclude its cross-examination.

MS. ANSLEY: And we have cut down a bunch of questions. So we'll move straight to Mr. Oppenheim, start with Page 8 of your testimony, which is PCFFA-130 if you have a copy of that in front of you.

WITNESS OPPENHEIM: I do.

MS. ANSLEY: Actually, it's -- I think I'm looking at the section with you. I'm just looking generally at Page 8 and 9, ending with your conclusion on 11 through 14 of Page 9. Do you see that?

WITNESS OPPENHEIM: I do.

MS. ANSLEY: So you provide your conclusion that the North Delta diversions will have an unreasonable deleterious affect on fall and late-run salmon, correct.

WITNESS OPPENHEIM: That is here in my testimony.

(Reporter interruption)

WITNESS OPPENHEIM: Yes, it appears to be reflected in my testimony.

MS. ANSLEY: And although the NMFS BiOp

acknowledged the potential for adverse effects, didn't it also conclude that the adopted 2017 proposed action and related commitments were not expected to appreciably reduce the population of ESA-listed Chinook salmon population in the Central Valley?

WITNESS OPPENHEIM: Can you point to where it might have said that?

MS. SHEEHAN: Sure. If you want to look -- what I'm looking at is -- and I'm following up with another question on non-listed species.

But what I'm looking at is SWRCB-106, which is the NFMS Biological Opinion, issued for the California WaterFix. And I specifically am looking at Page 1110, which is PDF 1114. And this is the analysis done for salmon populations in the ocean as part of the analysis for resident -- southern resident killer whales. So this is looking at availability of salmon in the ocean. Are you familiar with that section of that announcement?

CO-HEARING OFFICER DODUC: Let's wait until we pull it up, Ms. Ansley.

MS. ANSLEY: Okay. I'm sorry. The print is really small. I have a copy in front of me, but in the middle of that paragraph, there's a sentence that

says, "As a result..." Do you see that sentence? It's a little bit before halfway down that first paragraph there.

Yeah, the cursor is right next to it. Do you see that sentence? That's the sentence I'm referring to.

WITNESS OPPENHEIM: I see that sentence.

MS. ANSLEY: And were you aware that that was the conclusions of the National Marine Fishery Service in the BiOp for the WaterFix?

WITNESS OPPENHEIM: Yes, since I reviewed the Biological Opinion, I am aware that that text exists in the BiOp.

MS. ANSLEY: And then do you see the next two sentences? Is it your understanding that the National Marine Fisheries Service also concluded for non-ESA listed fall and late fall-run Chinook, that the benefits of the revised proposed action elements and commitments are also generally applicable to those populations and that NMFS concluded that there would

be -- that the overall magnitude of reduction in Chinook abundance in the ocean would be minimized? And please feel free to read it. I was just trying to paraphrase quickly. But that would be the next

two sentences.

WITNESS OPPENHEIM: I see those conclusions.

MS. ANSLEY: Thank you. And looking at Page 9 through 14 of your testimony, which is your proposed bypass flow criteria -- do you have that in front of you?

WITNESS OPPENHEIM: Yes.

MS. ANSLEY: And I believe I heard you say earlier, and I believe it's also in your testimony, that you propose these bypass criteria whether the California WaterFix is approved or not; is that correct?

WITNESS OPPENHEIM: I do because I believe these criteria would be beneficial to public trust resources.

MS. ANSLEY: Do you provide any analysis of the impacts of the California WaterFix that these are supposed to address?

WITNESS OPPENHEIM: I do not.

MS. ANSLEY: And you provide a number of bypass flow recommendations that were based on the testimony provided at that Delta Flow Criteria hearing in 2010; is that correct?

WITNESS OPPENHEIM: Yes.

MS. ANSLEY: And is it your understanding

that the Delta Flow Criteria Report issued by the Board in 2010 did not look at other beneficial uses of water supply?

WITNESS OPPENHEIM: I'm unaware of whether they did or did not.

MS. ANSLEY: So looking specifically at the bypass flow criteria that PCFFA has recommended through your testimony, have you or PCFFA provided any modeling or analysis showing impacts of the flow recommendations you provide here on either other species or water supply?

WITNESS OPPENHEIM: No.

MS. ANSLEY: That is all my questions.

I do want to large at this time a quick hearsay objection. On Page 14 of Mr. Oppenheim's testimony, he references testimony by a PCFFA consultant who is not a witness here, so we would just like to lodge a timely hearsay objection to Lines 1 through 4 of Page 14. Thank you for your time.

CO-HEARING OFFICER DODUC: So noted. Thank you, Ms. Ansley.

Mr. Fitzgerald, was it?

MR. FITZGERALD: Yes.

CO-HEARING OFFICER DODUC: Who requested 15

minutes.

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CROSS-EXAMINATION BY MR. FITZGERALD

MR. FITZGERALD: Good morning -- Mr. Oppenheim, correct?

WITNESS OPPENHEIM: Yeah, correct.

MR. FITZGERALD: Okay. I think I may have said "Oppenheim" before. Sorry about that.

WITNESS OPPENHEIM: It's a common mistake. Thank you.

MR. FITZGERALD: Clear enough.

WITNESS OPPENHEIM: Thank you.

MR. FITZGERALD: My name is Pat Fitzgerald. I represent the cities of Folsom and Roseville as well as San Juan and Sacramento Suburban Water Districts, all on the Lower American River.

I'd like to ask you a few questions about the flow requirements as well, beginning in Section 3 of your testimony. These are flow requirements you would like to see included in the amended permits of the State Water Project and Central Valley Project, correct?

WITNESS OPPENHEIM: Correct.

MR. FITZGERALD: To simplify, I'm going to refer to "the projects," if that's okay.

WITNESS OPPENHEIM: That's okay.

MR. FITZGERALD: So the first recommendation is for the State Board to adopt the bypass requirements on Table 4 on Page 12 of your testimony, correct?

WITNESS OPPENHEIM: That's correct.

MR. FITZGERALD: And then as a fall-back, you request the State Board to require the projects to bypass that, minimum of 30 days of inundation of the Yolo Bypass; is that correct?

WITNESS OPPENHEIM: That's correct, at an absolute minimum.

MR. FITZGERALD: Okay. And second, your requested flow requirement is that the projects bypass storm inflows sufficient to provide mean daily outflows at Rio Vista above 25,000 cfs from April to June in all years?

WITNESS OPPENHEIM: Correct.

MR. FITZGERALD: And then third you propose that the State Board require the projects to bypass sufficient storm flows from November through March to provide minimum flows up to 20,000 cfs inflow at Freeport and outflow at Rio Vista from November to March, correct?

WITNESS OPPENHEIM: That's correct.

MR. FITZGERALD: And, now, other than the two alternate floodplain inundation criteria that we just discussed, your proposal is for all three of these to be included as permit terms, correct?

WITNESS OPPENHEIM: Correct.

MR. FITZGERALD: And you testified today that you're not proposing releases of stored water but only bypasses of storm flows, correct?

WITNESS OPPENHEIM: That is correct.

MR. FITZGERALD: And by that, you are proposing that storm flows could not be stored in project reservoirs unless your proposed requirements are met, correct?

WITNESS OPPENHEIM: That's not reflected in my testimony.

MR. FITZGERALD: So do you have the definition of storm flows or when they would be bypassed?

WITNESS OPPENHEIM: Are you asking me to define what a storm flow is?

MR. FITZGERALD: Does your testimony provide a definition of storm flow?

WITNESS OPPENHEIM: No.

MR. FITZGERALD: Okay. Then I would like to kind of understand, then, a little bit of what the

analysis might be.

On Page 13 of your written testimony, on Line 10 you mention a water supply cost analysis for your proposed permit terms concerning the floodplain inundation criteria.

Does this mean you have not conducted any analysis of the hydrologic effects of this proposal?

WITNESS OPPENHEIM: That is correct.

MR. FITZGERALD: Are you aware of there being any analysis of this proposal?

WITNESS OPPENHEIM: I am not aware of any such analysis.

MR. FITZGERALD: So have you done any analysis of how this requirement would impact operations of project reservoirs, including Folsom Reservoir?

WITNESS OPPENHEIM: No.

MR. FITZGERALD: Are you aware of any such analysis?

WITNESS OPPENHEIM: I am unaware of any such analysis.

MR. FITZGERALD: Have you done any analysis of how this project would impact cold water pool in project reservoirs?

WITNESS OPPENHEIM: I have not conducted such analysis.

MR. FITZGERALD: Are you aware of any such analysis?

WITNESS OPPENHEIM: I am not.

MR. FITZGERALD: Finally, have you done any analysis of how this requirement would impact river temperatures, in particular the Lower American River?

WITNESS OPPENHEIM: I have not.

MR. FITZGERALD: Are you aware of any such analysis?

WITNESS OPPENHEIM: I am not.

MR. FITZGERALD: I'm sorry. I only have one more.

Have you done any analysis of whether M and I intakes on Folsom Reservoir would be dewatered in certain years if this flow requirement was put in place?

WITNESS OPPENHEIM: I have not.

MR. FITZGERALD: Nor are you aware of any such analysis?

WITNESS OPPENHEIM: I'm not.

MR. FITZGERALD: Okay. So I was just asking about your proposed floodplain inundation criteria.

But I'm safe to say, based on your responses, there has not been any analysis for your other proposals?

WITNESS OPPENHEIM: Correct.

To clarify and perhaps to head off any other questions, we have not performed any technical modeling analyses of the impacts of these proposals to any CVP or SWP average.

MR. FITZGERALD: Fair enough.

And just to clarify what you just said, does that mean you conducted no analysis for each of your proposals as well as how all of them would interact?

WITNESS OPPENHEIM: That's correct.

MR. FITZGERALD: Okay. I have no further questions.

CO-HEARING OFFICER DODUC: Thank you.

Now Mr. Herrick, followed by Mr. Keeling.

MR. HERRICK: Thank you.

CROSS-EXAMINATION BY MR. HERRICK

MR. HERRICK: John Herrick for South Delta parties. My topics are short but deal with each of the main points that the witnesses made. I won't be very long at all.

I'd like to start with Ms. Des Jardins.

Ms. Des Jardins, is it your understanding

that the petition before this Board is based upon analysis of compliance with D1641?

WITNESS DES JARDINS: It's not, really. It's based on speculation about the Biological Opinions. And I think it should be based instead on compliance with D1641.

MR. HERRICK: But would you agree that DWR's presentations analyzed the impacts from their witnesses' viewpoint based upon compliance with D1641?

WITNESS DES JARDINS: D1641 was one of the set of criteria that was assumed in the proposed operations. And -- except that they assumed the point of compliance for -- for calculating the export limits was moved to south of the new intake -- the two downstream of the new intakes, exempting the new intakes from the export limits.

MR. HERRICK: Let me try it again.

In your testimony, aren't you highlighting the fact that a provision of D1641, either with Joint Point of Diversion, has not been complied with as was required by D1641?

WITNESS DES JARDINS: Yeah, I think that operations plan, if you go back and look at the considerations was -- was, you know, one of the

primary means for ensuring that beneficial uses, both for fisheries and for legal users of water, were protected.

MR. HERRICK: And is it your testimony then that the proposals for to-be-developed operations for mitigation for fishery protection plans under the current petition might fall under the Joint Point of Diversion protections for D1641?

WITNESS DES JARDINS: Exactly. And I think there's institutional reasons that, you know, that this plan wasn't updated and doesn't really appear to be being enforced. There was an invalid one for the projects -- for the State Water Project was never submitted.

So, yeah, I think it indicates that reliance on a future plan for the WaterFix might be equally meaningless.

MR. HERRICK: Is it your opinion that the Board should first develop protections for fisheries and then after that consider approval for projects such as the current petition?

WITNESS DES JARDINS: I think, yeah, a numeric criteria in the actual permits seem to be water complied with. And those include the numeric criteria in Decision 1641.

MR. HERRICK: If I may move on to Mr. Oppenheim.

Mr. Oppenheim, are you aware that there are various existing conditions on the operations of DWR and the Bureau in operating the projects?

WITNESS OPPENHEIM: In general, yes.

MR. HERRICK: And those include such things as Biological Opinions and permit conditions and maybe other state and federal regulations?

WITNESS OPPENHEIM: Yes.

MR. HERRICK: And you were asked a few questions on cross about whether or not the NMFS Biological Opinion makes conclusions about the viability of the salmon species.

Do you recall that?

WITNESS OPPENHEIM: I recall a question about the conclusions that the Biological Opinion draws about production with respect to the salmon food stock for southern resident killer whales, yes.

MR. HERRICK: Now, if hypothetically the project results in, say, a 1 percent decrease in an endangered species that's moving towards extinction, do you think that's a good idea?

WITNESS OPPENHEIM: I don't.

MR. HERRICK: And what about a 5 percent

decrease?

WITNESS OPPENHEIM: Also a bad thing to do.

MR. HERRICK: Would you agree that the NMFS -- would you agree that NMFS is one of the fishery agencies that's been charged with protecting salmon over the past 50 years or more?

WITNESS OPPENHEIM: That is something I would agree with.

MR. HERRICK: And what has happened to the salmon populations over the past 30 years?

WITNESS OPPENHEIM: It is my understanding that the salmon populations have declined precipitously, also resulting in the decline in the availability of economic opportunity to commercial salmon harvest.

MR. HERRICK: And would you agree that there's difficulties in any sort of modeling of fishery population improvements or fishery?

CO-HEARING OFFICER DODUC: Hold on.

Ms. Ansley.

MS. ANSLEY: Oh, I didn't realize the question was over.

I was going to say it lacks foundation that this witness has the modeling expertise to discuss how difficult it is to model salmon stocks, which I

think is where that question was maybe ending.

CO-HEARING OFFICER DODUC: Mr. Herrick.

MR. HERRICK: Well, I would say that the witness has, just from his position much less his experience, is able to make comments or drop opinions on modeling results other people have produced. But I'm not going to ask him about specific modeling outputs.

CO-HEARING OFFICER DODUC: In general, in general.

Overruled.

MR. HERRICK: Do you have any confidence in the ability to accurately model fish life stages or fish populations?

WITNESS OPPENHEIM: I do have confidence in our ability to perform scientific modeling as an approximation of existing conditions.

But they're only approximations and are subject to error, uncertainty, and the incorrect inputs that we've seen over the course of the past several decades of fishery modeling performed by National Marine Fishery Service and others.

MR. HERRICK: So those modeling efforts by the fishery agencies at least have not resulted in fishery requirements that have improved the salmon

population, have they?

WITNESS OPPENHEIM: That's correct.

MR. HERRICK: So is it your testimony here -- or is it your opinion here that protective measures for the fisheries should occur before there are -- before the petition itself should be granted?

WITNESS OPPENHEIM: I believe that that's the case.

MR. HERRICK. If I may ask Mr. Bitts a question or two.

Mr. Bitts, you mentioned in your testimony a number of times that you participated in the public processes that NMFS conducts regarding salmon populations?

WITNESS BITTS: That's correct.

MR. HERRICK: And are you aware of any NMFS reports that attribute decreases in salmon populations to ocean conditions?

WITNESS BITTS: Yes.

MR. HERRICK: And would one of those ocean conditions that NMFS referenced be El Nino?

WITNESS BITTS: Yes.

MR. HERRICK: Did you participate in any discussions regarding NMFS conclusions about ocean conditions affecting fish populations?

WITNESS BITTS: Yes.

MR. HERRICK: Are you aware of any information contradicting the NMFS opinion?

WITNESS BITTS: "Contradicting" might be a strong word. I'm aware of a lot of discussion and opinion basically suggesting that NMFS over-emphasized the effects of the particular El Nino under discussion on the collapse of 2008 and '9.

MR. HERRICK: And just so we're clear, I'm asking you a question to elicit the response that was earlier stricken.

WITNESS BITTS: I thought you might be.

The -- it was the -- not unanimous but overwhelming majority opinion of the members of the Pacific Fishery Management Council that NMFS had over-emphasized the effects of that El Nino on the salmon collapse and perhaps under-emphasized the effects of freshwater habitat problems on that salmon collapse.

And I believe this was in -- memory says it was in the spring of 2011 that this discussion occurred on the floor of the Pacific Council, but memory is not as reliable as it should be.

MR. HERRICK: Are you generally aware of the

proposed facilities pursuant to the petition before the Board, in other words, the new North Delta facilities and tunnels and the intakes?

WITNESS BITTS: I am generally but not very specifically aware of that, yes.

MR. HERRICK: Would you characterize those changes as significant changes the plumbing and operations of the Delta?

WITNESS BITTS: They have to be hugely significant if we're talking about removing freshwater flows from the river and running those flows around the Delta rather than through it to the pumps. That's a huge significant change, yes.

MR. HERRICK: Do you believe that that sort of significant change should occur before new protective measures for fisheries are established?

WITNESS BITTS: No way.

MR. HERRICK: And do you believe it's in the public interest to approve this petition unless those protective measures are developed for fishery -- fisheries?

WITNESS BITTS: I believe those protective measures are long overdue in having been developed and should be developed prior to any changes in the existing system.

MR. HERRICK: With regard to fishery public trust uses, do you believe that the current regulatory scheme is protective of those fishery public trusts interests?

WITNESS BITTS: I would say it is insufficiently protective.

MR. HERRICK: Okay. My last question dealing with public interest, but is it your opinion that one should not approve significant changes to the plumbing and operations in the Delta before the fishery public trusts are better protected?

WITNESS BITTS: I agree with -- okay. I'm not quite sure how to answer that question.

I agree with that concept. I'm not quite sure how to frame that as an answer.

MR. HERRICK: That's good enough. Thank you very much.

CO-HEARING OFFICER DODUC: Thank you, Mr. Herrick. Always efficient.

Now my favorite Cal fan, Mr. Keeling.

MR. KEELING: Tom Keeling for the San Joaquin County protestants. I have a single question or chain of questions, depending on the answers, for Ms. Des Jardins about the concept of Rio Vista controlling in the fall.

I have for Mr. Bitts a follow-up on the 2007 salmon collapse and a question about updating his testimony for the current year.

CROSS-EXAMINATION BY MR. KEELING

MR. KEELING: I'll begin with Ms. Des Jardins.

Could we have PCFFA-161, Mr. Hunt, Page -- I believe it's Page 6.

Ms. Des Jardins, do you recall earlier this morning, with I believe this bar chart up, talking about how Rio Vista is controlling the fall? Do you recall that testimony?

WITNESS DES JARDINS: Yes.

MR. KEELING: My question is very simple and not, I hope, technical. What does it mean what you say Rio Vista controls?

WITNESS DES JARDINS: So basically --

CO-HEARING OFFICER DODUC: Hold on.

Ms. Ansley.

MS. ANSLEY: I'm going to object as vague and ambiguous.

These charts were provided by Ms. Des Jardins as illustrative -- for illustrative purposes. And she testified that these are not reflective of current conditions or -- so this

analysis is not reflective of current operating conditions.

So I believe his question is vague and ambiguous, framing it in the present tense like that.

CO-HEARING OFFICER DODUC: No, I understand his question is -- to Ms. Des Jardins is her understanding of her testimony and what she means when she used that phrase.

So it's not reflective of current conditions, noted. Overruled.

Please answer, Ms. Des Jardins.

WITNESS DES JARDINS: So the concept of controlling, there are, as we know, multiple -- multiple constraints on project exports.

These are, you know, what controls Delta exports.

But at any one point in time, there is generally one specific one -- one specific part of the criteria that actually is limiting exports. So if that criteria is removed or relaxed, then it would allow more exports. So that's basically the concept.

And this graph of what's controlling shows which of the Decision 1641 constraints and Biological Opinion constraints are controlling.

So that's what a controlling factor analysis is.

MR. KEELING: Thank you. And I'm not a scientist, just a poor country boy. And I'm trying to understand this stuff.

So I infer from your testimony, I hope correctly, that I think understanding this concept of, for example, Rio Vista controlling in the fall is somehow important to the Board's decision making in this proceeding. Am I right?

WITNESS DES JARDINS: I think it's incredibly important for the Board to understand, with the WaterFix and without the WaterFix, what controls exports and particularly if you're talking about removing one of the current limits, which is the export limits, what happens.

And, you know, particularly, doing that without assumptions about the Biological Opinions, which we don't know --

(Reporter interruption)

WITNESS DES JARDINS: Which have not -- the Biological Opinions which we don't know with any finality at this point.

MR. KEELING: Thank you.

Mr. Bitts, please explain to me why you

think that ocean conditions were not responsible for the 2007 salmon collapse?

WITNESS BITTS: Okay. I think it's too simple to say they were not responsible because it's always a complex of ocean and freshwater conditions that determine how productive a given brood of salmon is.

I think that the mildness -- okay. So it's the 2008 and '9 collapse somewhat bleeding into 2010, first of all.

And I think what has happened is that the El Nino that occurred at that -- or just before that time was much milder than the agency seems to think it was.

And as a fisherman on the ocean, we did not observe -- or I did not observe, my colleagues did not observe the serious El Nino effects that we have seen in other years.

For example, in 1998, we saw what appeared to us to be much more severe El Nino effects on that year's abundance of fish than we saw prior to the 2008 through '10 events. We saw -- in those years, 2006 and '7, when we were on the water, we saw more what I would call normal feed conditions and abundance, that sort of thing.

So we were not seeing, "Oh, boy. This is a catastrophe about to happen," as we have before previous El Nino and subsequent El Nino events.

MR. KEELING: When you said the agency didn't realize how mild the El Nino effect would be, which agency are you talking about?

WITNESS BITTS: That would be the National Marine Fisheries Service.

MR. KEELING: And you didn't agree with the National Marine Fish Service memo on the subject of the salmon collapse; is that correct?

WITNESS BITTS: That's correct.

MR. KEELING: Why not?

WITNESS BITTS: Well, once again, we thought that they had got the balance wrong and that they had over-blamed ocean conditions and under-blamed freshwater conditions based on what we have seen in the ocean, based on oceanographers', I think, analysis of the severity of that El Nino, where they have a numeric scale for rating El Ninos.

And this one was rated much milder than other ones that we have observed that have not had such a catastrophic effect on fish populations.

MR. KEELING: So your opinion was based on a combination of the experiences of members -- constituent members of the fishing industry and information from oceanography?

WITNESS BITTS: Yes.

MR. KEELING: Anything else?

WITNESS BITTS: That should do it.

MR. KEELING: Mr. Bitts, I believe your testimony predates the 2018 fishing season correct?

WITNESS BITTS: That's correct this testimony was prepared in November of last year.

MR. KEELING: Could you please update your testimony for us based on what you know at this point about the 2018 fishing season?

WITNESS BITTS: Yes, I'd be happy to. Thank you.

Since that time, the beginning of about the 1st of March of this year and proceeding through the two-week long meetings of Pacific Fishery Management Council, we have learned what happened last year and what we have to look forward to this year in terms of salmon populations and season.

And one of the things that happened last

year was that we had an abundance of spawners in the Sacramento River that fits right in with the collapse of 2008 and '9. There were only about 48,000 adult spawners in the river last year. There's supposed to be a minimum of 122,000. That's the minimum escapement goal in the Council's framework plan.

And what we didn't know last fall, this is the third year in a row in which the number of spawners has fallen short of the minimum escapement standard. And it triggers what is called over-fished status for that stock.

Now, over-fishing is a term of art and does not mean that the conditions of stock is a result of fishing, which in this case it was not. All these of those birth years had abundant parents. In fact, the number of parents for each of those three years was above the maximum of the escapement range in the Council's frame. Over 200,000, fish returned in each of the three years that produced less than the minimum number of escaping fish.

And in addition, in all of those years that we failed to meet the goal, fishing was constrained principally by winter-run stocks so that our take was less than it would be in a normal year.

Now, moving on to this year, because of that

shortfall and because of that over-fished condition the Council is required to do what's called a rebuilding of the stock. And one of the ways they do that is to shoot for a higher escapement target in the subsequent years than the minimum that is required so that, instead of 122,000, they're this year aiming for a return of 150,000, slightly over 150,000 spawners.

And that is a constraint on fisheries especially when the predicted abundance this year was less than a quarter of a million fish, which is very low. We like to see a half or million or more fish predicted. And, in fact, we'd like to see that many in the ocean because predictions -- we can't eat or sell predictions. We can only sell or eat what we can catch and if the prediction pans out.

So we are extremely constrained this year by that very conservative prediction and that higher than minimum escapement goal. It's left us a very -- a relatively small number of fish available to catch to the point where a season that normally begins on the 1st of May is not going to begin until the last week of July in the areas of San Francisco and Fort Bragg, which are the heart of commercial salmon fishery. And the area south of San Francisco,

Monterey, will have a total of less than 20 days fishing available to it because of the concern for Sacramento fall-run, which is our bread and butter stock. And the State of Oregon is also facing severe constraints this year.

MR. KEELING: I have just one more question.

CO-HEARING OFFICER DODUC: Where is that towel?

MR. KEELING: They were in such demand, I loaned it to a number of people.

CO-HEARING OFFICER DODUC: All right, Mr. Keeling, your one more question.

MR. KEELING: Could we put up PCFFA-86, which I believe is Mr. Bitts' testimony, at Page 7, Lines 20 through 22.

WITNESS BITTS: Right.

MR. KEELING: Mr. Bitts, earlier in your testimony -- and I believe that was at Page 2, Lines 20 through 22, you talked about seasonal restrictions due to Klamath fall Chinook escapement. And then here at Page 7, you say, "Unless the State Water Resources Control Board acts now to require adequate flows and adequate carryover storage to maintain all Sacramento River Chinook salmon runs and all life histories, the salmon fishing industry in California

and Oregon could disappear." Do you see that text?

WITNESS BITTS: Yes.

MR. KEELING: Do you believe it is also important for the salmon fishing industry in California and Oregon to have adequate flows and carryover storage in Trinity Reservoir in order to support healthy salmon runs from the Klamath-Trinity Basin?

WITNESS BITTS: Absolutely.

MR. KEELING: Why?

WITNESS BITTS: Well, because we are -- that's the stock that is usually our principal constraining stock.

Deirdre talked about the controlling rule for exports from the Delta. We have dueling and controlling weak stocks for ocean fisheries management also. And in most years, Klamath is the winner of that duel. It is the constraining stock for our fishery.

So even though most of what we catch usually comes from the Sacramento River, in order to have access to those fish, in order to have time on the water to catch those fish, we need to have abundant populations of Klamath fish, of which Trinity is a subset, in the ocean so that we can maximize our

opportunities, constrained though they are.

MR. KEELING: Thank you, Mr. Bitts.

Thank you. That's all.

CO-HEARING OFFICER DODUC: Thank you, Mr. Keeling.

Any redirect, Mr. Volker?

MR. VOLKER: Yes, just one question for Mr. Oppenheim.

REDIRECT EXAMINATION BY MR. VOLKER

MR. VOLKER: Mr. Oppenheim, on Page 14, Lines 1 through 4 of your testimony, if you could turn to that -- this is PCFFA-130. You made reference to PCFFA consultant Bill Kier. Do you recall that?

WITNESS OPPENHEIM: Yes.

MR. VOLKER: Is Mr. Bill Kier an expert in fisheries management?

WITNESS OPPENHEIM: Perhaps the foremost expert on the impacts of flow on fisheries that I'm aware of.

MR. VOLKER: Thank you. I have nothing further.

CO-HEARING OFFICER DODUC: Any recross?

(No response)

CO-HEARING OFFICER DODUC: All right. Thank

you very much.

Appreciate you being here today. And your timing is impeccable.

We will take a lunch break. And when we return at 1:00 o'clock, we will here from Panel 2, Mr. Volker.

(Whereupon, the luncheon recess was taken at 11:59 a.m.)

Monday, April 16, 2018 1:00 p.m.

PROCEEDINGS

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CO-HEARING OFFICER DODUC: All right. It is 1 o'clock. We are resuming with Mr. Volker's second panel.

I believe Mr. Stokely was here before and took the oath.

Will the other three gentlemen please rise and raise your right hand.

Thomas Stokely,
Greg Kamman,
Joshua Strange
and
Michael Belchik,

called as witnesses by the Pacific Coast Federation of Fishermen's Associations and Institute for Fisheries Resources, having been duly sworn, were examined and testified as follows:

CO-HEARING OFFICER DODUC: Thank you.

Mr. Volker, we'll put an hour and 20 minutes, 20 minutes for each witness, on the clock and you may feel free to use that amongst your witnesses.

MR. VOLKER: Great. Thank you.

CO-HEARING OFFICER DODUC: I know you said Mr. Stokely might need a little more time but the other witnesses may be a little less.

MR. VOLKER: Yes. Thank you for the accommodation.

We are presenting four witnesses in this panel:

Thomas Stokely, a Salmon and Water Policy Analyst, whose testimony appears as PCFFA-87 and qualifications have been marked as PCFFA-88. And in his testimony, he refers to Exhibits PCFFA-90 through 125, and State Water Resources Control Board Exhibits 15 through 19 and 24.

Our second witness is Greg Kamman, a Hydrologist, whose testimony has been marked as PCFFA-126. His qualifications appear at PCFFA-127. And in his testimony, he refers to Exhibits PCFFA-128 to 129, 115 and 118.

Our next witness is Dr. Joshua Strange, a Fisheries Biologist, whose testimony has been marked as PCFFA-150. His qualifications appear in PCFFA-151. And in his testimony, he relies on Exhibits PCFFA-152 through 154.

Our fourth witness is Michael Belchik. He is

the Yurok Tribe's Senior Water Quality Analyst. His testimony has been marked as PCFFA-85. And in his testimony, he refers to Exhibits PCFFA-155 to 159.

DIRECT EXAMINATION BY

MR. VOLKER: May I ask, Mr. Stokely.

WITNESS STOKELY: Yes.

MR. VOLKER: Okay. Is the testimony marked as PCFFA-87 your testimony?

WITNESS STOKELY: Yes, it is.

MR. VOLKER: Is it true, accurate and complete?

WITNESS STOKELY: It is, except there's a couple of corrections.

MR. VOLKER: Would you enumerate the corrections, please.

WITNESS STOKELY: Yes.

On Page 7, Lines 16 to 19, and also on Page 9, Lines 1 to 2, I said that the WaterFix indicated that there would be no impacts to the Trinity River.

But, actually, during the March 1st cross-examination of witness Erik Reyes, he indicated that there would be an incremental impact to storage at Trinity Lake under the dryest of years.

MR. VOLKER: Thank you.

Does that conclude your corrections?

WITNESS STOKELY: No. Actually, one other item:

Page 13, Line 4, I refer to PCFFA-119. And I already talked about that exhibit when I testified for CSPA so that would be CSPA Exhibit 358.

MR. VOLKER: Thank you.

WITNESS STOKELY: Thank you.

MR. VOLKER: Mr. Kamman, is your testimony marked as PCFFA-126 your testimony?

WITNESS KAMMAN: Yes. Yes, it is.

MR. VOLKER: And is it accurate, complete and true to the best of your knowledge?

WITNESS KAMMAN: Yes, with the exception of just some minor edits to exhibit numbers and a couple of other numbers.

MR. VOLKER: Would you provide us those corrections, please.

CO-HEARING OFFICER DODUC: And, Mr. Kamman, if you might bring the microphone closer to you --

WITNESS KAMMAN: Yes.

CO-HEARING OFFICER DODUC: -- please.

Thank you.

WITNESS KAMMAN: On Page 4, Line 24, the 127 heading starting off that sentence should be 128.

Similarly, on Page 5, Line 10, the reference

to PCFFA-127, that should also be 128.

These are all going to be very similar.

Page 6, Line 6, again, 128 in lieu of 127.

The same is true for Lines 9 and 11 on that same Page 6.

On Page 7, Line 18, the reference to PCFFA-128, that should actually be PCFFA-129.

And, finally, on Page 8, Line 15, the 18 -- at the end of that sentence, I have 1800 and 1890. Those numbers should be corrected to be 8 -- excuse me -- 1795 in lieu of the 1800, and 1800 in lieu of the 1890.

MR. VOLKER: Are those all of your corrections?

WITNESS KAMMAN: Yes.

MR. VOLKER: Thank you very much.

Our next witness is Dr. Joshua Strange, a Fisheries Biologist.

Dr. Strange, is your testimony marked as PCFFA-150 your testimony?

WITNESS STRANGE: Yes, it is.

MR. VOLKER: Is your testimony true, accurate and complete?

WITNESS STRANGE: Yes, with one correction.

On Page 7, Line 15, the words "a dryer water year designation" should be stricken. I did not mean

to imply that reservoir levels would influence water year designation.

CO-HEARING OFFICER DODUC: I'm sorry. So how should that sentence read?

WITNESS STRANGE: You can just strike out where it says "a dryer water year designation," those five words, yeah.

CO-HEARING OFFICER DODUC: So it should read --

WITNESS STRANGE: So it should read "and can result in reduced flows --

CO-HEARING OFFICER DODUC: Thank you.

WITNESS STRANGE: -- et cetera.

MR. VOLKER: And, finally, Mr. Michael Belchik. Your testimony has been marked as PCFFA-85.

Is that testimony your testimony?

WITNESS BELCHIK: Yes, sir.

MR. VOLKER: Is it accurate, complete and true?

WITNESS BELCHIK: Yes, with the following correction:

On Page 3, Line 9, and then it's mentioned several other times, the reference is Belchik, Hillemeir, Pierce 2004 instead of Belchik, Hillemeir and Ronnie. That was her first name. I think that's

spelled P-I-E-R-C-E.

Also . . . I'm trying to figure out where this is.

Okay. On Page 2, Lines 15, 16 and 17, it says (reading):

"I have published papers and peer-reviewed journals on these subjects."

I have published peer-reviewed papers and peer-reviewed journals on some of those subjects, not on each and every one of those.

MR. VOLKER: Anything else?

WITNESS BELCHIK: That's it.

MR. VOLKER: Okay. Thank you very much.

I'm now going to ask each of the panelists to summarize their testimony, starting with Mr. Stokely.

Mr. Stokely, could you summarize your testimony, please.

WITNESS STOKELY: Yes. Thank you.

Mr. Hunt, could you please bring up PCFFA-107, .pdf Page 61, please. It's a map of the State Water Project with an inset of the Trinity River.

(Exhibit displayed on screen.)

WITNESS STOKELY: I thought it would be good to have a map so people would know what we're talking

about.

The Trinity River fisheries already have a very high risk of running out of cold water, which will result in devastating consequences downstream in the Trinity River and the lower 44 miles of the Klamath River.

While we have been assured in the various environmental documents and testimonies that the WaterFix will not harm the Trinity River, we did find out during cross-examination of Mr. Reyes that the modeling shows there would be an incremental drawdown of Trinity storage during the driest of years under Alternative CWF H3+.

Therefore, mitigation is required to protect the Trinity River from both ongoing operations as well as the cumulative impact of CVP operations under the WaterFix in order to keep fish in good condition in the Trinity River downstream of Lewiston Dam.

For 28 years, the Trinity River has not had the same level of temperature protection in the Bureau of Reclamation's Water Permit terms and conditions that the Sacramento River has.

Water Right Order 90-5, which is State Water Board 24, is inadequate to protect the Trinity River from a temperature emergency and does not fully

implement all North Coast Basin Plan temperature objectives, which is PCFFA-102, for all beneficial uses in Reclamation's water rights.

The WaterFix is an opportunity for the State Board to provide the Trinity River with a level of protection consistent with its legal status to not be harmed, which is required by numerous State and Federal laws, administrative actions, legal opinions, regulations and court decisions.

My testimony identifies Mitigation Measures that the Board should incorporate into Reclamation's water Permits to protect Trinity River's fisheries and, in one aspect, also to protect the Sacramento River's fisheries from temperature problems.

Reclamation's existing State Water Permits for the Trinity River, which is State Board Exhibits 15 to 19, are woefully outdated with 1959 instream flow requirements of 170,500 acre-feet, being a fraction of existing instream flows under both the 2000 Trinity River Record of Decision, which is PCFFA-98, and the 2017 Lower Klamath River Record of Decision, which is PCFFA-106.

Despite some limited Trinity protections in Water Right Order 90-5, there are no limits on exports of cold Trinity Lake water to the Sacramento River and

the CVP. It is a recipe for disaster.

Ultimately, the Trinity Reservoir will run out of cold water during some future multiyear drought. North Coast Basin Plan temperature objectives will not be met. The Chinook, Coho, Steelhead, Sturgeon, Lamprey and other species in the Trinity River and Lower Klamath River will suffer increased mortality similar to impacts observed in 1997.

We have three exhibits in there, PCFFA-120 to 122, that talks about the severe impacts of running out of cold water during the 1977 drought at the Trinity River Hatchery, and also the impacts of the 2002 fish kill on the Lower Klamath River.

In recognition of the need for Trinity River temperature commitments -- or temperature protection, commitments were made by the State Board in 1989 in Water Quality Order 89-18, which is PCFFA-123, and again in Water Right Order 90-5 in 1990 to provide specific temperature protections for the Trinity River through amendment of Reclamation's water rights.

Showing my age, I attended those 1989 and 1990 hearings on behalf of Trinity County and yet, almost three decades later, there's been no action. We still have the same outdated water rights on the books for Reclamation's operation of the Trinity River Division

and the Trinity River's fisheries remain vulnerable.

It's time for the State Board to follow through on commitments made decades ago in order to protect the public trust and tribal trust resources of the Trinity River and the Lower Klamath River.

Catastrophes to the Trinity and Lower Klamath River fisheries, such as 1977 and 2002 events, are preventible and it is your responsibility to ensure that they do not occur again by adopting these recommended Mitigation Measures in the -- in my testimony that I'll go over later.

While we understand that there is modeling to comparatively assess the various alternatives for the WaterFix, actual operations are subject to change and the model runs are not necessarily how they will run the State Water Project or the CVP under CWF H3+.

We think that the operations need to be better defined than what is provided. Until operations are finally defined, we can't fully tell what the impacts will be and, therefore, the Board should operate on the side of caution to protect the Trinity River and other affected rivers.

Now I'm going to talk about why the Trinity River needs to be protected.

The 1955 Trinity River Act, which is PCFFA-89,

has a clause in there that was unique at the time, and it called for the Interior Secretary to preserve and propagate fish and wildlife in the Trinity River Basin. We see that as a do-no-harm clause.

However, it also included a clause that said that the Trinity River Division would be fully integrated into the Central Valley Project. And it also has a special reservation of a 50,000 acre-foot set aside for Humboldt County and other downstream users. Humboldt County Board of Supervisors signed a contract in 1959 with the Bureau of Reclamation, and that is Exhibit PCFFA-124.

There have been some disagreement over the years about whether the Humboldt County 50,000 acre-feet would be part of fishery flows or whether it's in addition to that.

The Ninth Circuit agreed that it was in addition to the fishery flows in a decision in 2017, which is PCFFA-91.

There were other legislative acts by Congress in 1984 and 1995. The '84 Act was the Trinity River Basin Fish and Wildlife Management Act, which is PCFFA-92. And then there was the Reauthorization Act in 1995.

And both of those Acts clarified that the

language in the 1955 Act that said the Interior Secretary is authorized and directed to preserve and propagate the fishery meant that the -- the Interior Department was required to restore the fishery levels to pre-CVP levels in the Trinity River with the hatchery to mitigate for lost habitat upstream of Lewiston Dam and natural production to make up the remainder of the restored fish runs downstream of Lewiston Dam. In 1992, the CVPIA was passed that had a section on the Trinity River, 3406(b)(23).

But one other thing that set the Trinity apart is, while we've all heard of the fish doubling goals in CVPIA, those do not apply to the Trinity River. The Trinity River has its own fishery restoration goal set in that Act -- that were referenced in that Act.

We also have Interior Department Solicitor opinions, 1979 Krulitz opinion by Leo Krulitz; Solicitor's opinion -- that's PCFFA-96 -- that talks about how the water exported out of the Trinity Basin is surplus to the needs of the Basin.

We also have the 1993 Interior Solicitor's opinion, which is PCFFA-94, that confirmed that there are federally reserved fishing rights for the Hoopa Valley Tribe and the Yurok Tribe, and that those rights date back 10,000 years, which predates any water rights

for the Trinity River.

In 1992 -- which was a big year for the Trinity -- we had approval of Trinity River North Coast Basin Plan temperature objectives. That was approved by the USEPA.

And Mr. Wise, who signed that letter, which is PCFFA-97, talked about how diversions to the CVP are a controllable factor in determining temperature compliance for the Trinity River.

So we can't just blame it on nature. It's a managed system.

Then in 2000, of course, we had the Trinity River Record of Decision, which is PCFFA-98, which significantly increased downstream flows on the Trinity River for the fisheries.

We also had a 2000 National Marine Fisheries Service Biological Opinion that established a perhaps squishy but 600,000 acre-foot minimum pool for Trinity Lake.

Of course, the Trinity River and its fisheries are also public trust assets. And the Mono Lake case is a classic example. That's PCFFA-99.

We also have the area-of-origin statutes under the California Water Code, PCFFA-100.

We also have Fish & Game Code 5937, which is

PCFFA-124, which calls for the owners of dams to keep fish in good condition below those dams.

Furthermore, we have Fish & Game Code 1505, which is PCFFA -- well, I have 124. I'm not sure that's correct because I listed it twice here, but it's -- it's in there. I apologize.

124 I have is 5937 and I have 1505 as 124. I'm not sure which one is which. Perhaps the attorneys can help me.

That's what I get for working late at night.

Well, I will go on.

So Fish & Game Code 1505 designates Lewiston Dam to the North Fork confluence as a prime Salmon and Steelhead spawning area, and that is also -- It was taken into consideration when the Northwest Regional Board designated temperature objectives for the Lewiston Dam to North Fork confluence.

Now I'm going to talk about some of the problems with the WaterFix analysis.

In 2015, the Board adopted a Temporary Urgency Change Petition, which was Water Right Order 2015-0043, which is PCFFA-103.

And I think it talked -- To me, it talks about the fallacy of saying there would be no impacts to the Trinity River, because it is fully integrated into the

CVP, and what happens at one reservoir in the system affects the others.

And the example is: In the TUCP, the Board established minimum pool -- cold water pool or this reservoir storage, targets for Folsom and Shasta but not for Trinity.

PCFFA-104 is an article from the Trinity Journal quoting Don Bader, the Northern California Area Manager for the Bureau of Reclamation saying that if the drought had continued -- he didn't know at that point when he was quoted -- but it could impact storage levels at Trinity. So they're obviously very linked.

Another flaw in the analysis for the WaterFix is that they did not include an analysis of the Lower Klamath Record of Decision, which is PCFFA-106, and even though the Hoopa Valley Tribe and perhaps others requested it.

And that analysis -- That calls for additional releases down the Trinity River, including Humboldt County's 50,000 acre-feet on top of the fishery flows, and, in some instances, it may be even more water than that.

And PCFFA-107 was the Draft EIS for that project, and it indicated that, with the Lower Klamath Record of Decision in some dryer years, CVP deliveries

would be 24,000 acre-feet less than they are now. That analysis was not included, so I would think that, in some dryer years, these estimates of CVP deliveries under the WaterFix would be less than what they are.

Now I wanted to talk about also why Water Right Order 90-5 does not protect the Trinity River.

Mr. Hunt, could you please put up State Water Board 24, Page 61.

(Exhibit displayed on screen.)

WITNESS STOKELY: Then .pdf Page 61.

(Exhibit displayed on screen.)

WITNESS STOKELY: Okay. I'm not going to read this whole thing, but it says at the bottom in the big letters (reading):

"It is further ordered that" -- all these Permits, which are the Trinity River Permits -- "be amended to add a condition . . .

"Permittee shall not operate its Trinity River Division for water temperature control on the Sacramento River in such a manner as to adversely affect Salmonid spawning . . . in the Trinity River."

The first thing to note is that it talks about

the Permittee being the Bureau of Reclamation, that it shall not operate the Trinity River Division for temperature control on the Sacramento River in a manner to adversely affect Trinity fish.

It does not talk about all of the other beneficial uses that the Bureau of Reclamation uses Trinity River water flow: Delta water quality, irrigation, power production.

So this particular condition, while it's intended to protect the Trinity River, it's only in relation to operations by the Bureau to control temperatures in the Sacramento River. It does not affect other -- other beneficial uses that the Bureau is complying with.

Let's go down a little bit further to the next page.

(Exhibit displayed on screen.)

WITNESS STOKELY: And what it has -- Actually, scroll up just is a little so we've got --

(Exhibit displayed on screen.)

WITNESS STOKELY: Okay.

(Reading):

"Adverse effects shall be . . . temperature that exceeds 56 degrees at the Douglas City Bridge between September

15 and October 1, or at the confluence of the North Fork . . . between October 1st and December 31st . . ."

CO-HEARING OFFICER DODUC: Hold on, please.

WITNESS STOKELY: Yes.

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: Yes.

I think I just found this in a footnote. But I think there's been a number readings from this Water Rights Order that are not directly in the testimony.

I am following his section on Water Right Order 90-5.

So I think that, above, he was quoting something that is not quoted in the testimony. I believe that he may be reading something that is written on Page -- Footnote 9 currently in his testimony.

But I would kind of prefer that he refers to his testimony. It makes it very difficult to follow along and not interrupt when he's straying from his direct testimony.

He certainly has a section on Water Rights Order 90-5 in his testimony, PCFFA-87.

CO-HEARING OFFICER DODUC: Mr. Stokely, is any of this outside the written testimony you provided?

WITNESS STOKELY: Not that I'm aware of. I believe I talked about how Water Right Order 90-5 was inadequate to protect the Trinity River in two areas.

One is that it does not -- which I'm about to get to it -- is that it does not include the summer temperature objective.

And I thought I included in here something about beneficial uses of water. I'm trying to find it right now.

CO-HEARING OFFICER DODUC: If you could and point that out, that would be helpful.

WITNESS STOKELY: Yes.

MS. ANSLEY: It would be helpful.

And then my objection would be bound by, if he does not block quote something in his testimony, I prefer not to have new evidence read into the record quoting from this -- the Water Rights Order.

Thank you.

WITNESS STOKELY: Okay. I've got on Page 11, Line 14, it says (reading):

"Additionally . . . Water Right Order 90-5 September through December 31 Trinity River temperature requirement only applies to transfers of Trinity water to the Sacramento River for

temperature control."

(Exhibit displayed on screen.)

WITNESS STOKELY: I was just illustrating it more with the Water Right Order but, you know, I don't think it's absolutely necessary.

May we please go to Exhibit PCFFA-102, please.

I just wanted to point out one other problem with the Water Order 90-5, and that is that it does not include the --

(Exhibit displayed on screen.)

WITNESS STOKELY: Oh, let's scroll down.

(Exhibit displayed on screen.)

WITNESS STOKELY: Next page.

(Exhibit displayed on screen.)

WITNESS STOKELY: Down at the bottom, there's a footnote.

Next page, I guess.

(Exhibit displayed on screen.)

WITNESS STOKELY: Okay. There it is.

Footnote Number 5, do you see it has a (reading):

"Daily Average Not to Exceed 60 degrees Fahrenheit July 1st to September 14th, Lewiston Dam to Douglas City Bridge."

That objective is not in Water Order 90-5. That's what I wanted to point out.

Thank you.

Okay. So Water Right Order 90-5 is only for purchases of diversions for temperature control in the Sacramento River. It does not include the summer temperature objective of 60 degrees.

I'm getting close here.

Also, I mentioned earlier PCFFA-109, the National Marine Fisheries Service Biological Opinion for the Trinity River.

And it is inadequate to protect the Trinity River from a temperature emergency. I'm not going to go into detail on that because Mr. Kamman's going to do that.

But -- Then I also wanted to bring up PCFFA-118. We have a --

And so if you could bring back up PCFFA-107, .pdf Page 61, Mr. Hunt.

(Exhibit displayed on screen.)

WITNESS STOKELY: For those of you who aren't familiar, you have Trinity Dam is the large dam.

Downstream of it is Lewiston Reservoir. It's 7 miles long and it's shallow.

And you basically have to run 900 to 1800

cubic feet per second through Lewiston Reservoir in the hottest times of the month in order to keep releases in the Trinity River at Lewiston Dam cold.

Since the base flow in the Trinity River's only 450 cubic feet per second, you have to run anywhere -- Well, the difference between 450 and 900 to 1800 cfs, you need to run over the hill to the Sacramento River to keep Lewiston Reservoir cool.

If you don't run that water through Lewiston Reservoir, the water heats up and you will not meet downstream Basin Plan temperature objectives.

And so there's kind of a balance here that, while I don't believe the Bureau operates this way, if you want to protect the Trinity River and you want to protect fish in the Sacramento River, you need to minimize it.

Let's show CSPA-358, please.

CSPA-358 is a download of CDEC.data for three different years that included the drought as well as 2015, 2016, 2017.

And when it gets up, you'll see it.

(Exhibit displayed on screen.)

WITNESS STOKELY: What these are is the differences in temperatures. This is the Spring Creek Powerhouse, so this is where the Trinity water enters

Keswick Reservoir.

You can see in the summer months --

CO-HEARING OFFICER DODUC: Hold on, Mr. Stokely.

I think Miss Ansley will want to ask where is this in your testimony? Does it reference PCF --

MS. ANSLEY: Or CalSPA-58 (sic).

I'm sorry. Was that --

WITNESS STOKELY: 358. Yeah. I had it -- I had it introduced -- Or I had it as evidence for PCFFA and CSPA. But when I was here a few weeks ago, I talked about this slide, so I wanted to keep --

CO-HEARING OFFICER DODUC: But --

WITNESS STOKELY: -- the same numbering.

It was originally PCFFA-119.

CO-HEARING OFFICER DODUC: 119. Okay.

MS. ANSLEY: Is that -- Okay. Hold on.

WITNESS STOKELY: They're the same thing.

MS. ANSLEY: And can you tell me what page that is on in your testimony? I don't remember seeing --

CO-HEARING OFFICER DODUC: 13.

MS. ANSLEY: Okay. Thank you.

WITNESS STOKELY: Thank you.

So this is -- This is 2017 -- No. Excuse me.

This is . . . Yeah, 2017.

You can see that the water going into the Sacramento River -- We'll just take a point in time there, August 28th. You can see that the water going into the Sacramento River from Trinity is about a range of 54 and a half degrees to about 55 and a half degrees.

Let's go to the next slide.

(Exhibit displayed on screen.)

WITNESS STOKELY: This is Shasta Dam during the same time period.

You can see on August 28th that the temperatures at Shasta Dam range from 47 and a half to about 52 degrees. So there's a very significant difference in temperatures, and I picked three different years.

Just scroll down one more page.

(Exhibit displayed on screen.)

WITNESS STOKELY: Okay. This is 2016. Again, you can see there's some pretty high temperatures for Spring Creek.

Let's scroll down one more page.

(Exhibit displayed on screen.)

WITNESS STOKELY: You can see that Shasta Dam is -- is still cooler.

And this is the case -- Let's go -- Scroll down one more.

(Exhibit displayed on screen.)

WITNESS STOKELY: This is, again, Spring Creek during the drought. You can see the temperatures were quite warm.

Let's go down one more.

(Exhibit displayed on screen.)

WITNESS STOKELY: And you can see Shasta was quite a bit lower.

So, by diverting Water Board from the Trinity River to the Sacramento River in the summertime, it's harming fish in the Sacramento River. It's harming the winter-run by warming it up.

And, so, in order to find a balance between Trinity -- keeping the Trinity cold and the Sacramento River cold, my recommendation is that the minimum amount -- If -- If the Trinity temperatures are more than 1 degrees warmer than Shasta Dam at Spring Creek, that the amount of water diverted from the Trinity River to the Sacramento River should be limited to the bare necessity that keeps Lewiston Reservoir flushed out, that 900 to 1800 cfs.

So, therefore, I am recommending that the State Board implement the following Mitigation Measures

through Water Permit terms and conditions on Reclamation's Trinity Water Permits to make sure that there's no harm to the Trinity from the WaterFix.

The first would be conformance with the instream fishery flows contained in the Trinity River Record of Decision as the minimum instream flows. The Trinity flows are about 594,500 acre-feet on average. The fishery flows in the 1959 Water Permits are 120,500 acre-feet. So there's -- there's one thing.

The other would be for provision for release of not less than Humboldt County's 50,000 acre-foot water contract in addition to fishery flows and tribal ceremonial flows, so there's no confusion that they are two separate blocks of water.

Another one would be inclusion of Permit terms and conditions to require Reclamation to comply with the Trinity River temperature objectives contained in the Water Quality Control Plan for the North Coast Region that I showed you earlier for all relevant time periods and for all uses of Trinity water diverted to the Sacramento River.

Fourth would be a requirement for a minimum coldwater storage in Trinity River adequate to preserve and propagate all runs of Salmon and Steelhead in the Trinity River below Lewiston Dam during multiyear

drought based on studies to date.

One and a quarter million to 1.75 million acre-feet is appropriate for starting storage before a drought, with storage levels not falling below 900,000 acre-feet in any year.

A fifth one would be to require Reclamation to address the temperature issue in Lewiston Reservoir through a feasibility study and NEPA document to follow up on the 2012 Lewiston Preliminary Technical Memorandum by Reclamation.

And then the last one would be: When releases from Spring Creek are more than one degree Fahrenheit warmer than releases from Shasta Dam, limit the export of Trinity water to the Sacramento River to the amount necessary to meet Trinity River Basin Plan temperature objectives. This protects both the Trinity River and Sacramento River Salmon from excessive heat.

Thank you. That concludes my summary.

MR. VOLKER: Thank you very much, Mr. Stokely.

Mr. Kamman, could you now summarize your testimony.

WITNESS KAMMAN: Yes. Yes.

My name is Greg Kamman, and I'm here speaking on behalf of PCFFA.

From 1997 to 2004, I was contracted by Trinity

County Planning Department to assist in evaluation of the proposed Trinity River Fish and Wildlife Restoration Flow Alternatives in support of the Trinity River Flow Evaluation Study.

During this time, I worked with a team of water temperature modelers to evaluate how flow alternatives performed at meeting the downstream temperature objectives on the Trinity River.

As Mr. Stokely showed you in one of his last slides, these temperature objectives are presented in the North Coast Basin Plan. I don't think we need to bring that up again. I think you saw that as Footnote 5 in that -- in that document.

I think the only thing I would add to what Tom had stated was that the Douglas City temperature compliance point is located 20 miles downstream of Lewiston Reservoir, whereas the North Fork Trinity River temperature compliance point is located twice that, down -- 40 miles downstream of Lewiston.

The modeling team I worked with used a series of models to simulate flow and water temperatures of the Upper Trinity River. The modeling team included the Bureau of Reclamation, who used a reservoir temperature model, which I'll refer to as the RTM, to simulate storage and temperatures in Trinity Lake.

Input in reservoir operations that were simulated using the RTM model were informed by the Bureau's PROSIM CVP operations model.

On behalf of Trinity County, I performed simulations of river flow and temperature in Lewiston Lake using a model that we refer to as the BETTER model, B-E-T-T-E-R.

Inflows to this model came from the outflows from the Bureau's upstream RTM model. Outflows from the BETTER model include releases due to the Trinity River and diversions to the Central Valley via the Clear Creek tunnel.

Finally, downstream of Lewiston, U.S. Fish and Wildlife Service simulated flow and temperatures along the main stem river, including those downstream temperature compliance locations, using their SNTEMP model.

In addition to evaluating how flow alternatives complied with downstream temperature objectives, the modeling team also identified revisions to flow schedules and reservoir operations to improve the flow schedule compliance with downstream temperature objectives.

The 2000 Trinity River Record of Decision presents the CVP operations and instream flow release

schedules to the Trinity River for the preferred alternative of the Flow Evaluation Study.

And I can provide -- If we could bring up slide -- Or, excuse me.

If we could bring up Exhibit PCFFA-98, Page 13 of that exhibit.

(Exhibit displayed on screen.)

WITNESS KAMMAN: This isn't a very clear, sharp graphic, but it's the best we have.

But what we've got plotted up there are flow hydrographs, the changes in flow release schedule over time for five different water year-types that are included in the ROD Flow Schedule from critically dry to extremely wet year-types.

As Mr. Stokely also stated, in addition to the ROD Flow Schedule, the 2000 NMFS BO stipulates a minimum carryover storage of 600,000 acre-feet be maintained as part of the ROD Flow Schedule.

Temperature modeling results from the work of the team resulted -- or indicated that the ROD Flow Schedule meets all downstream temperature objectives during wet and normal year-types for the ROD Flow Schedule.

However, the model team simulation results also indicate that, during dry year-types, compliance

with temperature objectives falls to 80 per 6 -- excuse me -- compliance with temperature objectives during the draw water year-type falls to 86 percent at the time. And during critically dry year-types, temperature objectives are met only 36 percent of the time.

The reason for these impacts are primarily due to the depletion of the cool water pool in the Trinity Reservoir during dry years.

During the summer, as you're probably well aware, the water temperatures in Trinity Lake are stratified; that is, there's a layer of warm water lying above a deeper pool of colder water.

As the lake level declines in response to releases from the reservoir, the upper warm water layer intersects the main outlet releasing warm water to Lewiston Reservoir and ultimately downstream to Trinity River.

Based on these findings, Trinity County contracted a number of investigations to identify the minimum carryover storage volume required in Trinity Lake to maintain the cool water pool through a single dry year-type, or -- and also during a multiyear dry or drought period.

The first study they contracted was completed in '92 by Finnerty and Hecht of Balanced Hydrologics.

And they analyzed the hydrology and reservoir operations for 1991, which was a dry year-type.

They concluded that reservoir storage or carryover storage of 900,000 acre-feet would have been needed to meet the downstream temperature objectives for that year.

In 1998, the Trinity also retained Mike Deas to model reservoir operations and temperatures for 1990, also a dry -- a single dry year-type.

He found temperature concerns with carryover storage volume when he started the simulations with a carryover storage of 750,000 acre-feet. However, he determined there were no temperature concerns if the carryover -- starting carryover storage volume of 1250 to 1500 thousand acre-feet were used.

In 2012, a study from the Bureau of Reclamation states that a September 30 carryover storage volume less than 750,000 acre-feet is problematic in meeting downstream temperature objectives.

In 1998, I completed a study to evaluate how multiple-year droughts would affect carryover storage in Trinity Lake. So far, the examples I just ran through are really dealing with what does it take to get you through a single dry year-type.

The approach I used was to account for the annual changes in Trinity Lake storage volumes that would have occurred during the 1928 to 1934 drought if the reservoirs were operated according to the ROD Flow Schedule.

This study determined that total storage in Trinity Lake decreased by 17.5 thousand acre-feet during dry year-types. And then, during a critically dry year-type, from start to end of that year, the reservoir volume would decrease by 341 thousand acre-feet.

This means that during these dry year-types, there's more outflow from the reservoir than inflow-to-recharge that leaves.

The December 30th carryover storage volume progressively decreases from year to year during drought periods.

This study concluded that a minimum carryover storage volume of 100 -- 1250 to 1500 thousand acre-feet is required to maintain a minimum carryover storage of 600 to 900,000 acre-feet during the drought period that we simulated.

In preparing for this hearing, I evaluated how implementation of the ROD flows and reservoir operations affected Trinity Lake carryover voltage

volumes, especially during drought periods.

Similar to the approach I used in the '98 study, this analysis was completed -- this analysis completed an annual accounting of lake storage and operational volumes for the period 2002 to 2016 when we actually had the ROD flows going down the river.

This period contains two three-year droughts. 2000 through 2009 -- excuse me -- 2007 through 2009 three-year drought consisted of all dry-year water types. From 2013 to 2015, that drought consisted of a critically dry year sandwiched between two dry years.

This accounting indicated that the annual decline in storage during the dry year-type was multiple times to an almost an order of magnitude higher than that determined from the '98 study.

Similarly, the annual decline during critically dry year-type was over two times what we found in the '98 study; that is, two times the 341 thousand acre-feet.

Similarly, the annual decline during the -- Excuse me.

Carryover storage at the beginning of each of these three-year drought periods over the simulation period started at approximately 1800 thousand acre-feet.

At the end of the 2000-2009 drought, minimum carryover storage drops to 919,000 acre-feet in the reservoir.

At the end of the 2013 to 2015 drought, the minimum carryover storage dropped to 546 thousand acre-feet. So you can imagine one more dry year with the starting carryover storage of 546 is -- is pretty dire.

It's also interesting to note that, during the two drought periods, the volume of water diverted to the Central Valley was greater than the amount of water released to the Trinity River.

Based on my studies and knowledge of the Trinity River Division operations, I conclude the following:

The minimum carryover storage in Trinity Lake necessary to satisfy downstream temperature objectives during one single dry year-type -- or, excuse me -- one single dry year is between 1250 and 1500 thousand acre-feet.

The storage volume provides sufficient coldwater pool to overcome the adverse effects of a single critically dry year in the event that that's the year type that occurs.

Dated studies indicate that a single carryover

storage volume that provides protection from multiple-year droughts under current CVP operations is elusive.

As seen in the recent three-year droughts, carryover storage volumes are at critical levels by the end of the drought, even when starting with 1800 thousand acre-feet of storage.

Setting a minimum carryover storage volume for Trinity Lake that supports compliance with downstream temperature objectives through multiyear droughts will require revision of CVP operations that reduce diversions to the Central Valley in some manner to order -- in order to maintain greater reservoir storage and cool water pool in Trinity Reservoir.

Thanks for the opportunity to provide this testimony.

MR. VOLKER: Thank you, Mr. Kamman.

Our next witness is Dr. Joshua Strange.

Mr. Strange -- Dr. Strange, would you please summarize testimony advertisement.

WITNESS STRANGE: Yeah, gladly.

So, I've worked pretty extensively in the Klamath-Trinity system. I worked on a wide variety of fisheries and river management issues from basic fish biology to fish migration to fish disease. And my

training is actually in ecology since it's kind of relevant here in the sense that there really isn't any topic that -- that isn't relevant to the study of ecology. So that would include things like geomorphology, hydrology, all those types of things.

Specifically, I was involved early on with the -- one of the fish diseases that impacts Salmonids in the Klamath-Trinity system, particularly the adults, and that's the Ich disease which resulted in the 2002 Klamath River fish kill.

So, I was part of a team that helped develop proactive flow recommendations, essentially pulse flows, both proactive and emergency, that could help with reducing the risk of that particular disease outbreak.

And it should just be noted that that particular fish disease-causing parasite has little ciliated hairs, so it can literally, like, be able to swim around from fish to fish. So, when you increase the flow, it disrupts their -- their ability to do that.

Also, water temperature's very important as well because that's going to control the metabolic rate of the parasites' life cycle and the mathematics of the disease outbreak.

So, the Trinity River flow releases, as developed as part of that criteria for protecting adult fish health, is -- it's very essential that -- that those flows are available.

And in the case of the Trinity River, that cold water from the Trinity -- from Trinity Dam is very helpful as well because that cold water, it actually is able to transmit all the way down the system to the Pacific Ocean to the target area, which in this case is primarily the Lower Klamath River from the confluence of the Trinity River downstream.

And, you know, it's -- As he was just alluding to with his testimony, the cold pool has definitely been impacted during these drought years in Trinity Reservoir, and it set up several problematic dynamics.

One is that, as part of the Management Team that was looking at these flow releases during the drought years, there was concern and pushback about releasing these flows because they could, in fact -- you know, that extra release could deplete that cold pool, so we could actually run out of cold water during this release which would impact the effectiveness of the release for the fish disease but also creates these other problems for juveniles throughout the Trinity and also for fish that are coming in to spawn in the fall.

That happened with Coho Salmon and also in terms of the hatchery itself.

So it's -- it's a big potential problem already under existing management that has already been evident, and so there's a lot of concern that he just spoke to about how you address that issue.

And so to the extent that the California WaterFix or any other proposals would -- would further impact that coldwater storage or that dynamic of the management of coldwater storage, would transmit those impacts to fish disease risk.

There's also a -- another problematic paracytic fish disease-causing pathogen in the Lower Klamath River that impacts more the juveniles. And I've been involved in research that with, like, field work, as well as developing management prescriptions.

And there is also protocols for releasing flows in order to reduce the risk of disease and mortality for the juveniles, which is a really serious problem. And it's impacting juvenile Salmon from both the Klamath and the Trinity systems.

And, so, with those -- That also includes both proactive flow releases as well as an emergency release when there's evidence of a severe outbreak occurring.

And one thing about this particular pathogen

of fish disease is that the sort of hyperinfectious zone has been shifting around over the years. I mean, you know, that's ecology for you. Things kind of get messy out there. But it's been shifting more towards the Lower Klamath.

So one of the things we've been discussing is that there's more and more of a potential need to use Trinity releases as part of that as well as from -- from the Klamath River system of dams.

So the same kind of issues crop up there in terms of the management of Trinity River Reservoir and making sure there's sufficient volumes of water and cold water available to do that release when needed, because it's very time-sensitive.

And that's just one final point that I want to bring your attention to in my testimony, is that with both of these fish diseases, and fish diseases in general, you really have a window of opportunity to act and to interrupt the fish disease life cycle before it explodes into a full-blown problem that's going to result in a high level of mortality, and so it's absolutely crucial to act within that timeframe.

And you're going to see a lot of benefits from having a well-timed appropriate response, both in terms of the benefits to the fish and the disease risk, but

also in terms of amount of water that you use.

If you have an effective proactive flow release, that's going to use considerably less water than having one that's ineffective and then triggering a larger emergency release.

And I guess my final comment that I do allude to in here, which is just that we've already seen the coldwater pool in Trinity Reservoir be impacted during the recent drought years under the current management paradigm.

And that has propagated, you know, some impacts throughout the fishery and including some potential constraints on releasing these flows.

So, just based on my own observation as part of this process, I'm definitely concerned that already the management footing is not particularly responsive to this issue.

And so, yes, I would definitely be concerned, as a Manager, for any additional pressure that would be brought to bear on the coldwater pool and the management footing that's used to manage.

Thank you.

MR. VOLKER: Thank you, Dr. Strange.

Our last witness in this panel is Michael Belchik, the Yurok Tribe's Senior Water Policy Analyst.

Mr. Belchik, would you please summarize your testimony.

WITNESS BELCHIK: Good afternoon.

My name's Michael Belchik. And I've been working on water issues on both the Klamath and Trinity Rivers for the Yurok Tribe since 1995, about 22 years now.

I want to talk about -- Well, in the course of my duties working for the Yurok Tribal Fisheries Department, I've acquired an intimate and detailed knowledge of the flow management.

I served as the Yurok Tribe's technical lead for the Trinity EIS and, more recently, have been very involved in monitoring the river for this Ich, managing -- or participating in conference calls regarding flow management to prevent the Ich, and also on the Klamath River in the management of the ceratomyxa shasta, which is the disease that Joshua was talking about that affects the juveniles.

I want to talk to you about the 2002 fish kill, the contributing causes, including low flow; the reoccurrence of this disease in 2014; the role of increased Trinity flows in reducing the risk for Ich outbreak; and also the role of Trinity River fall flow augmentation releases to prevent a repeat of this fish

kill.

So, in 2002, over 34,000 adult Salmon, as a conservative estimate, and up to 78,000 adult Salmon died in a catastrophic fish kill on the Klamath River.

The primary cause of this fish kill was ichthyo -- ichthyophthirius multifiliis, also known as Ich, with the secondary cause of columnaris, another bacterial disease.

I personally went to the river and looked at the devastation on there, and it was something that I hope I never have to witness again.

There was fish -- tens of thousands of fish lining in the shoreline four deep. We couldn't even operate a boat without sucking fish in the intake in the jet motor.

And it was clear right away that this was an environmental catastrophe and not a -- some sort of poisoning or something, because really only Adult Salmonids were the primary victims of this, and other -- and other biota appeared to be unaffected.

I -- Subsequent to that, I wrote a report outlining the causes of that. And there were also two other reports on that: One from Cal Fish and Wildlife; and another one from United States Fish and Wildlife.

All of these reports implicated the same

factors, which were marginal water quality conditions that were not unusual but marginal, larger than usual fish run, and low-flow conditions. And the low-flow conditions in particular were common to all three of those reports.

Subsequent to that, the Yurok Tribal Fisheries Department, under my direct supervision and with direct participation from myself personally, have monitored the Klamath River every year for the recurrence of Ich.

With the exception of the year after the fish kill, our monitoring showed that the Ich had not returned, and much to our relief.

But in 2014, our relief ended because the disease showed back up again.

In between that time, though, we had had preventive fall flow releases from the Trinity River when the conditions appeared to be a high-risk condition for the fish. And we had such releases in 2014, but nonetheless the disease returned.

In response to the disease, we asked for and received an emergency flow increase from Trinity, which -- So they increased the flows at Lewiston from 450 cubic feet per second to 5,000.

And if we could show . . . I'm getting a little lost here.

If we could show Figure 1 on Page 6 of my testimony, which is PCFFA-85.

(Exhibit displayed on screen.)

WITNESS BELCHIK: So, here you see three different flow -- flows, Trinity at Lewiston Dam, the Klamath River below Iron Gate Dam, which is about 190 miles from the ocean, and the Klamath near Klamath.

The very first spike in late August is for cultural flows for the -- for the Hoopa Valley Tribe Boat Dance. Those were unrelated to any biology, were not in response to any conditions or biology. They're cultural.

And then what -- There was increased flows starting in early September out of Lewiston Dam. The Ich was then detected.

And then you could see the very large flow spike, first in the large dashed lines of Lewiston Dam, then there's a travel lag time, and appearing down below at -- at the mouth of the Klamath.

We watched -- Can I see the figure on Page 8 of my testimony.

(Exhibit displayed on screen.)

WITNESS BELCHIK: This figure here shows the number of Ich organisms per gill as viewed by microscope and shows the increase as we ran through

from detecting several dozen per gill in early September all the way up until we had near 1,000 organisms per gill.

These -- These densities on the gill are some of the -- were -- are the highest recorded in literature. And I believe that, had we not had those flows, that we would have experienced another fish kill.

We had -- We had the Ich increase to beyond literature values, but other than some increased pre-spawn mortality for Coho Salmon on the Trinity River, we did not witness direct mortality on the Klamath River.

And I firmly believe, based on all my experience, that the flows from the Trinity River, the releases from Lewiston, prevented another catastrophe.

Beginning in the -- after the fish kill, the Yurok Tribe became very involved in requesting and managing and coming up with the criteria for increased fall flows in order to lower the risk of another catastrophic fish kill.

We had releases from the Trinity in 2003, 2004, 2012, 2013, and 2014 to -- in order to lower the risk of a fish kill. And also '15 and '16. I'm sorry.

In 2017, flow conditions were deemed high

enough to not make this flow necessary.

As a result for the need for these flows, the United States Bureau of Reclamation implemented long-term plan to protect adult Salmon in Lower Klamath River and drafted an EIS and associated Record of Decision that outlines risk factors and increased flow releases in order to protect the Salmon on the Lower Klamath River from another catastrophic fish kill.

We believe that this water is absolutely necessary in order to protect the Lower Klamath from another catastrophic fish kill as happened in 2002 and as nearly happened in 2014 and 2015.

The science has outlined in the EIS, in our reports, including the reports that I authored on the Ich outbreak of 2014, is very clear in how the mechanisms upon which this operated and has also withstood litigation from those who opposed the increased fall flow releases.

What we're incredibly worried about is, if we encounter high-risk conditions but the coldwater pool in the Trinity has been deleted -- or depleted and, thus, is unavailable in order to lower the risk in the Lower Klamath River, if this occurs, we face the very real possibility of a recurrence of the 2002 fish kill.

I have learned since I've written this

testimony that the WaterFix does have the potential to reduce this coldwater pool, as per the slide from Erik Reyes.

Can I not introduce that?

WITNESS STOKELY: It's already out there.

WITNESS BELCHIK: It's already out there.

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: Yes.

I would object this is beyond the scope of his direct testimony. I believe he's bringing in Part 2 -- Erik Reyes' Part 2 testimony. Certainly you can ask that on cross -- this is obviously direct -- but I object to that being on the record as part of his testimony.

CO-HEARING OFFICER DODUC: All right.

WITNESS BELCHIK: That concludes my testimony.

Thank you.

CO-HEARING OFFICER DODUC: Thank you.

MR. VOLKER: Thank you.

That concludes our panelists' direct testimony for this panel.

CO-HEARING OFFICER DODUC: All right. Let's get some estimates, please, in terms of cross.

MS. ANSLEY: I believe our estimate of cross is 30 to 40 minutes, probably closer to 30, and I

believe it will be conducted mostly by Mr. Mizell when he gets back.

MR. O'HANLON: Daniel O'Hanlon for Groups 4 and 5.

I estimate about an hour.

CO-HEARING OFFICER DODUC: Okay.

MR. HERRICK: John Herrick, South Delta parties.

15 to 20 minutes.

CO-HEARING OFFICER DODUC: All right. That's roughly two hours.

That will take us to about 4 o'clock if these estimates are correct.

MS. ANSLEY: And if it helps any, I don't know what the other cross estimates are, but we have very limited to no cross of Panel 3. So when Mr. Mizell gets back, I can confirm that with him, but if that helps plan the rest of the day.

CO-HEARING OFFICER DODUC: Is there any other cross for Panel 3?

Okay. Well, hopefully, we'll --

MS. ANSLEY: Let me -- Let me just confirm with him that we'll ask no questions, but it would be on the order of five to 10 minutes even, so . . .

CO-HEARING OFFICER DODUC: Let's try to do

that so that no one has to return on Thursday.

But we do have a hard stop at 5 o'clock today.

MR. O'ROURKE: It doesn't matter. I'm here for the duration. I can't go anywhere without my staff, who provide me with safe car rides, you know.

CO-HEARING OFFICER DODUC: All right. Let's go ahead and take our break and then -- before we start with the cross-examination.

A short break, if that's okay, Candace?

THE REPORTER: Um-hmm.

CO-HEARING OFFICER DODUC: All right. Let's return at 2:15.

(Recess taken at 2:06 p.m.)

(Proceedings resumed at 2:15 p.m.:)

MR. VOLKER: Madam Chair --

CO-HEARING OFFICER DODUC: Hold on. It is 2:15. We are back in session.

Let's do a little bit of housekeeping.

MR. VOLKER: Yes. Thank you.

CO-HEARING OFFICER DODUC: Mr. Volker, there are a couple ways we can proceed. Given that it'll take at least two hours for cross-examination of this panel, one proposal is to get your third panel up and have them present their direct. And given that there's very little cross involved, they could then be

dismissed.

MR. VOLKER: That is Option A. I have an Option B actually --

CO-HEARING OFFICER DODUC: Okay.

MR. VOLKER: -- which may even be simpler.

I've inquired of opposing counsel, those attorneys likely to cross-examine the tribal Chairman, and they've indicated they have no cross-examination questions --

CO-HEARING OFFICER DODUC: Okay.

MR. VOLKER: -- for Mr. O'Rourke.

In light of that, we're prepared to stipulate that his direct testimony be accepted as is and that he be permitted to leave today with the staff return -- and not -- not appear to summarize his testimony, which might lead to cross-examination conceivably.

CO-HEARING OFFICER DODUC: Is that acceptable?

MS. ANSLEY: Yes. Sorry. We were discussing.

But we are fine with not crossing Mr. O'Rourke, obviously, and if he wants to -- with the stipulation of submitting his direct testimony in writing, that would be fine.

We would like a confirmation that the testimony of Amy Cordalis is being withdrawn in the same manner that Mr. Cuchner (sic) -- And I apologize

if I said that wrong.

MS. KRIEG: It would be Dr. --

CO-HEARING OFFICER DODUC: Hold on.

Microphone, please.

MS. KRIEG: Oh.

CO-HEARING OFFICER MARCUS: Yeah. It's easier to pull it close to you than to lean forward.

MS. KRIEG: I believe the name you're looking for is Dr. Cutcha Risling Baldy.

MS. ANSLEY: Yes, that's what I'm referring to.

And I just would like confirmation that those two witnesses, their testimony is being withdrawn from the proceeding? I know that Miss Oroni (sic) has been scheduled for a later date.

MR. VOLKER: That's correct.

Ms. Brittani Orona will be appearing later in the week. She's available on Thursday and Friday if that pleases the Board.

The other two witnesses, unfortunately, due to scheduling changes, are unable to make it so their testimony will be withdrawn.

CO-HEARING OFFICER DODUC: And with respect to Miss Orona, if she is available on Thursday, we would welcome her appearance then.

MR. VOLKER: Yes. Good. That works best for us. Thank you.

CO-HEARING OFFICER DODUC: And we will get to her after we complete with Clifton Court, who will presenting first on Wednesday (sic).

MR. VOLKER: All right. Thank you very much.

CO-HEARING OFFICER DODUC: Okay. Chairman O'Rourke, thank you for making time to be with us today.

Would you like to perhaps make a policy statement for three minutes?

MR. O'ROURKE: You know, I would just like to say thank you, you know, for having this hearing, you know, to gather information to believe able to --

CO-HEARING OFFICER DODUC: Microphone, please, for the viewing audience.

MR. O'ROUKE: Can you hear okay?

CO-HEARING OFFICER DODUC: (Nodding head.)

MR. O'ROUKE: My name's Thomas O'Rourke. I'm the Chairman of the Yurok Tribe. The Yurok Tribe is in the northern portion of the State of California along the Klamath River.

I would just like to say thank you, you know, for having these hearings, you know, to gather the information that is necessary to be able to make a wise

decision in moving forward. So thank you.

CO-HEARING OFFICER DODUC: Thank you.

CO-HEARING OFFICER MARCUS: Thank you.

CO-HEARING OFFICER DODUC: Thank you for not only coming all this way but for investing so much time and resources into helping us understand the complexities involved and helping us to reach a good decision.

MR. O'ROUKE: And within my testimony, you know, it explains that, and that's what we do.

Thank you.

CO-HEARING OFFICER DODUC: Thank you. Safe travels.

All right. And with that, I actually will now turn to Mr. Mizell, I believe, for cross-examination of this panel.

And if you could begin by outlining the issues you'll be covering.

MR. MIZELL: Questions for each of the witnesses we'll be cross-examining relate basically to the conclusions about Trinity River impacts and how they relate to the California WaterFix.

CO-HEARING OFFICER DODUC: How they relate.

CROSS-EXAMINATION BY

MR. VOLKER: Good afternoon, Mr. Stokely.

WITNESS STOKELY: Good afternoon, Mr. Mizell. Always nice to see you.

MR. MIZELL: Likewise.

If we could bring up your testimony, PCFFA-87.

(Exhibit displayed on screen.)

MR. MIZELL: And go to Page 7.

(Exhibit displayed on screen.)

MR. MIZELL: Toward the bottom.

(Exhibit displayed on screen.)

MR. MIZELL: There we go.

So on Page 7, you cite to the Recirculated Draft EIR's conclusions regarding impacts to the Trinity River; is that correct?

WITNESS STOKELY: Could you refer -- Which -- We're on Page 7, which line?

MR. MIZELL: 19.

WITNESS STOKELY: 19.

MR. MIZELL: Lines 16 through 19 ending in Footnote 10.

WITNESS STOKELY: Yes. It said in the Recirculated Draft EIR/EIS that there would be no changes for the CVP operations in end of -- end-of-month storage.

MR. MIZELL: Okay. Is it your understanding that, following the issuance of the RDEIR, the Final EIR/EIS was issued and adopted?

WITNESS STOKELY: Yes.

MR. MIZELL: Is it also your understanding that, following the Final EIR/EIS, the NMFS Biological Opinion was adopted or was issued?

WITNESS STOKELY: Yes.

MR. MIZELL: Is it your understanding that the Proposed Project, as represented in the Biological Opinion, proposes no changes to the upstream Operational Criteria of the reservoirs?

WITNESS STOKELY: I didn't review the Biological Opinion, so I can't answer that question.

MR. MIZELL: But you did review the Recirculated Draft EIR?

WITNESS STOKELY: Yes.

MR. MIZELL: And did you review the Final EIR?

WITNESS STOKELY: No.

MR. MIZELL: So, just to be clear, you have not reviewed any of the analysis presented in the Final EIR with regard to Trinity Reservoir?

WITNESS STOKELY: That's correct. I just saw what was presented by your witnesses earlier in this hearing on Part 2.

MR. MIZELL: If we could bring up DWR-1028, please.

(Exhibit displayed on screen.)

MR. MIZELL: And turn to Slide 41.

(Exhibit displayed on screen.)

MR. MIZELL: So, you are familiar with the testimony of Mr. Erik Reyes; is that correct?

WITNESS STOKELY: Yes.

MR. MIZELL: And you've reviewed the slides of --

WITNESS STOKELY: Yes.

MR. MIZELL: -- his.

Is it your understanding that these slides that he presented show no change to Trinity River end-of-May storage?

WITNESS STOKELY: Yes.

MR. MIZELL: If we could go to the next slide, please.

(Exhibit displayed on screen.)

MR. MIZELL: And is it your understanding that this slide shows no change to the end-of-September Shasta storage?

WITNESS STOKELY: Generally speaking. There's some minor variations there, but it's approximately the same.

It is very difficult to determine details from these graphs.

MR. MIZELL: If we could go to Slide 45, please.

(Exhibit displayed on screen.)

MR. MIZELL: Is it your understanding that this graph also shows no change to the Trinity River end-of-September storage?

WITNESS STOKELY: No. It shows in the dryest of years, which would be the bottom left side of the graph, the magenta line which is CWF H3+ dips below the No-Action Alternative in the dryest of water years.

To me, that shows a change.

MR. MIZELL: So --

WITNESS STOKELY: He admitted to me when I cross-examined him. My -- My words to him was, does this figure show an incremental impact to Trinity storage in the dryest of years, and he said yes.

MR. MIZELL: I'll object to that as being hearsay, for the record.

So, in your estimation --

CO-HEARING OFFICER DODUC: So noted. It's in the transcript, I'm sure.

MR. MIZELL: In your estimation, what percentage of the time is the magenta line below the

black line?

WITNESS STOKELY: I can't tell you that because I did not do a statistical analysis of it.

MR. MIZELL: Are you unable to read the graph?

WITNESS STOKELY: I can read the graph. I see that it's below it in the dryest of years; in some years, it's a little bit higher; some years, it's the same; some years, it's slightly lower.

I think it's -- Again, it's difficult to get the data off of these figures without actually having a -- a chart or a spreadsheet that actually gives you the numbers, and I did not review that.

MR. MIZELL: If you'd just give me a few minutes. I'm trying to parse the questions that relate to the Final EIR versus questions related to the testimony of Erik Reyes on the RDEIR.

If we could go back to PCFFA-87, Mr. Stokely's testimony, please.

(Exhibit displayed on screen.)

MR. MIZELL: Looking at Page 8.

(Exhibit displayed on screen.)

MR. MIZELL: On Page 8, you discuss the 2015 TUCP; is that correct?

WITNESS STOKELY: Yes.

MR. MIZELL: And your concerns about Trinity

River are regarding the lack of carryover protections, and those are independent of the California WaterFix; is that correct?

WITNESS STOKELY: Yes.

But it also includes the WaterFix. Because anything that can increase the delivery of water south of the Delta can impact Trinity storage.

MR. MIZELL: If we could go to Page 11, please.

(Exhibit displayed on screen.)

MR. MIZELL: Here you discuss the Lower Klamath ROD.

WITNESS STOKELY: Could you repeat that? I can't hear very well.

MR. MIZELL: Here you discuss the Lower Klamath ROD, dated April 20, 2017; is that correct?

WITNESS STOKELY: I discuss the Lower Klamath ROD on which pages, which lines?

MR. MIZELL: Well, we can try Page 9 for starters.

WITNESS STOKELY: Page 9.

MR. MIZELL: Line 7.

(Exhibit displayed on screen.)

WITNESS STOKELY: Yes.

MR. MIZELL: Is it your understanding that

Reclamation is required to comply with this ROD?

WITNESS STOKELY: Yes, that's my understanding.

MR. MIZELL: And isn't it true that implementation of this ROD for the Lower Klamath will occur whether or not Cal WaterFix is implemented?

WITNESS STOKELY: Yes.

MR. MIZELL: If I can focus you on Page 9, Line 19.

WITNESS STOKELY: Line -- Which line?

MR. MIZELL: 19.

WITNESS STOKELY: Thank you.

(Exhibit displayed on screen.)

MR. MIZELL: You discuss (reading):

"Inadequate Water Right Protection for the Trinity River fisheries."

Correct?

WITNESS STOKELY: Yes.

MR. MIZELL: And you talk about obligations under the 2000 Trinity River ROD; correct?

WITNESS STOKELY: Yes.

MR. MIZELL: You also talk about Trinity River temperature objectives adopted by North Coast Regional Water Quality Control Board; is that correct?

WITNESS STOKELY: Yes. They've also been

adopted by the State Board and USEPA.

MR. MIZELL: And you discuss issues with carryover storage required by the NMFS 2000 BiOp.

WITNESS STOKELY: Yes.

MR. MIZELL: And all of these regulatory constraints are on the current operations; correct?

WITNESS STOKELY: Yes.

MR. MIZELL: So the concerns you raise regarding these regulatory requirements, they are independent of the California WaterFix; correct?

WITNESS STOKELY: I have concerns independent of the WaterFix and in conjunction with the WaterFix, that the WaterFix will put additional pressure on Trinity Reservoir. That's the concern.

And since we don't have a concrete Operations Plan, we don't really know what's going to happen. We just have model runs that are kind of your best guess about what's going to happen.

MR. MIZELL: And the concerns about California WaterFix are based upon a few percentage points in the lowest of water years of a few tens of thousands of acre-feet based on the graphic you reviewed in Erik Reyes' testimony; correct?

WITNESS STOKELY: Could you repeat that.

MR. MIZELL: Are your concerns about Trinity

Reservoir levels based upon the graphics presented by Erik Reyes?

WITNESS STOKELY: I am concerned about Slide 45 in that there will be less coldwater storage in Trinity in the very dryest of years when that water will be needed the most.

MR. MIZELL: So have you, or any witness by PCFFA that you rely upon, conducted any analysis indicating other impacts to Trinity River storage by the California WaterFix?

WITNESS STOKELY: No.

MR. MIZELL: Okay. I'm going to move on to Mr. Kommon (phonetic).

Am I saying that right, sir?

WITNESS KAMMAN: Kamman.

MR. MIZELL: Kamman.

WITNESS KAMMAN: Rhymes with Salmon.

MR. MIZELL: Ah. That's an easy way to remember it.

Have you or Kamman Hydrology & Engineering, Inc., performed any modeling of the impacts of the California WaterFix on the surface water hydrology or temperature?

WITNESS KAMMAN: No.

MR. MIZELL: If we could bring up Mr. Kamman's

testimony, PCFFA-126.

(Exhibit displayed on screen.)

MR. MIZELL: And turn to Page 2, please.

(Exhibit displayed on screen.)

MR. MIZELL: At the top of Page 2, you state that (reading):

"Under the California WaterFix . . . that (sic) Trinity River will be managed pursuant to the 2000 Trinity ROD."

Is that correct?

WITNESS KAMMAN: Top of Page 2.

MR. MIZELL: Yes, roughly in Lines 3 to 6.

CO-HEARING OFFICER DODUC: I'm not sure this is the right page.

WITNESS KAMMAN: Yeah. I -- I -- I don't see that on Page 2.

CO-HEARING OFFICER DODUC: It's on Page 3.

(Exhibit displayed on screen.)

MR. MIZELL: Thank you, yes. Page 3, Lines 3 through 6.

WITNESS KAMMAN: (Examining document.)

Could you repeat the question again, please.

MR. MIZELL: Is it your testimony that, under the California WaterFix, the Trinity River will be managed pursuant to the 2000 Trinity ROD?

WITNESS KAMMAN: Yes, that's what I state.
MR. MIZELL: And isn't that the case without the California WaterFix as well?
WITNESS KAMMAN: Yes.
MR. MIZELL: Can we turn to Page 5.
(Exhibit displayed on screen.)
MR. MIZELL: On Pages 5 and 6, you discuss the modeling you performed to determine how the 2000 ROD flows comply with the Trinity River objectives; correct?
WITNESS KAMMAN: Yes.
MR. MIZELL: And the results of this study are PCFFA-128; is that correct?
WITNESS KAMMAN: Yes.
MR. MIZELL: And you performed this analysis in 1999; correct?
WITNESS KAMMAN: Yes.
MR. MIZELL: And this analysis -- Just to confirm: This analysis does not look at the impacts of the California WaterFix Alternative 4A H3+; correct?
WITNESS KAMMAN: No, it doesn't.
MR. MIZELL: On Pages 6 and 7, you discuss additional analyses performed, one in 1998; is that correct?
WITNESS KAMMAN: Yes.

MR. MIZELL: And this is regarding carryover storage --

WITNESS KAMMAN: Yes.

MR. MIZELL: -- under the conditions of a multiyear drought?

WITNESS KAMMAN: Yes.

MR. MIZELL: And the study in 1998 also does not take into account the California WaterFix; is that correct?

WITNESS KAMMAN: No.

MR. MIZELL: Does it take into account the last 20 years of regulatory developments?

WITNESS KAMMAN: No. It can't.

MR. MIZELL: Starting on Page 7, you discuss two additional studies regarding carryover storage; is that correct?

(Exhibit displayed on screen.)

WITNESS KAMMAN: Yes.

MR. MIZELL: And their dates are 1992 and 1998; is that correct?

WITNESS KAMMAN: Yes.

MR. MIZELL: On Page 9, you conclude that initial October 1st carryover storage volumes of 600,000 and 750,000 acre-feet --

(Exhibit displayed on screen.)

MR. MIZELL: -- are not sufficient to satisfy Trinity River objectives; correct?

WITNESS KAMMAN: For a single dry or critically water year-type.

MR. MIZELL: Okay. Thank you.

And this conclusion is based upon your analysis under the 2000 ROD flows; is that correct?

WITNESS KAMMAN: Yes.

MR. MIZELL: Within your testimony, do you -- do you cite to any analysis of impacts of the California WaterFix on carryover storage for Trinity?

WITNESS KAMMAN: No.

MR. MIZELL: Thank you very much.

If I can move to Mr. Belchik now.

Good afternoon, sir.

WITNESS BELCHIK: Good afternoon.

MR. MIZELL: So you're listed as an expert witness, and you're the Senior Biologist for the Yurok Tribe; is that correct?

WITNESS BELCHIK: For the last year and a half, I've changed titles to Senior Water Policy Analyst. But before that, I was Senior Biologist for 21 years.

MR. MIZELL: Thank you.

So just to confirm: Your Statement of

Qualifications has not been submitted as a separate exhibit. It's incorporated within your testimony itself; is that correct?

WITNESS BELCHIK: Yes.

MR. MIZELL: And your expertise is based on the first two pages of your testimony?

WITNESS BELCHIK: Yes.

MR. MIZELL: Within your testimony, do you provide any evidence that California WaterFix will impact coldwater storage in Trinity Reservoir?

WITNESS BELCHIK: No.

MR. MIZELL: Thank you.

I'll move on to Dr. Strange.

If we could bring up Dr. Strange's testimony, please.

(Exhibit displayed on screen.)

MR. MIZELL: And could you turn to Page 4, please.

(Exhibit displayed on screen.)

MR. MIZELL: So, Dr. Strange, you state on Page 4, Lines 21 through 23, that your testimony centers on potential negative impacts of California WaterFix if it impacts water level management in Trinity River, including the volume of coldwater pool; is that correct?

WITNESS STRANGE: Yeah. That's what that sentence there reads.

MR. MIZELL: And is it true that nowhere in your testimony you point to evidence or analysis that the California WaterFix will have an impact on Trinity Reservoir; is that correct?

WITNESS STRANGE: I don't point to analysis, but I would like to point out that, on Page 6, I discuss the importance of a cautionary margin of error to ensure proactive, preventive approaches and that that's not compatible with aggressive management of Trinity River Reservoir.

And so what I personally witnessed is that the Operators of the CVP/SWP are under a lot of pressure to do irrigation deliveries, and it's been very concerning as far as the track record when it comes to that.

So, it is important that there is that context when then considering potential impacts of the California WaterFix, because it's one thing to look at specific quantitative analyses and it's another to look at the performance of the Managers. And, as they say, the best predicter of future behavior is past behavior.

And so, in that sense, yeah, I think there's some real concern. And that's specifically why I wrote that on there.

MR. MIZELL: Okay. So your margin of error concerns, though, are based on the existing practice of the CVP and are not specifically tied to California WaterFix?

WITNESS STRANGE: Well, they're tied because it would be the same agencies operating, so, yeah, there's that direct tie.

And I also have experience in the Bay-Delta and the management there, and I've seen the same pattern in terms of the pressures to deliver water.

And what -- what I've observed is that there's actions that do not -- management requirements that do not appear discretionary when you look at the law and the biological needs, and yet it ends up somehow being discretionary as far as how it's implemented.

And that's what I've observed in Management Training Project and in the Bay-Delta Project from both the Bureau and DWR.

Which I can gladly expand on that with more specific examples, if you want.

MR. MIZELL: No. Thank you.

If we could turn to Page 7, though.

(Exhibit displayed on screen.)

MR. MIZELL: Looking at Lines 21 to 26.

(Exhibit displayed on screen.)

MR. MIZELL: So your conclusions here, though, are based on a hypothetical -- is that true? -- to the extent the California WaterFix impacts Trinity River storage.

But you've -- You have no analysis that would actually indicate those impacts are likely to occur.

WITNESS STRANGE: Yeah. I mean, any -- any analysis of California WaterFix is going to be hypothetical because the final management operations aren't actually specified, so that's one thing to keep in mind.

There is -- I don't have any specific analysis that I conducted that I'm pointing to, but I would just refer again to Mr. Reyes' model, which I characterize as being extremely favorable to DWR's goals and even that showed that there's potential impact.

So I think that, if you looked at, you know, adjustments to the assumptions in some of the foundational inputs to that modeling, might get some different results.

And, then, yeah, it's kind of -- As a scientist, it's really challenging for me to understand how this whole process plays out when there's not an actual Operating Plan on the table.

MR. MIZELL: That concludes my cross.

CO-HEARING OFFICER DODUC: Thank you, Mr. Mizell.

Mr. O'Hanlon.

Mr. O'Hanlon requested or at least estimated 60 minutes.

If you could begin by listing the topics you'll be covering.

MR. O'HANLON: Yes. Thank you.

Daniel O'Hanlon on behalf of San Luis & Delta-Mendota Water Authority and Westlands Water District.

I plan to ask: Mr. Stokely questions about the proposed conditions;

Mr. Kamman about carryover storage and temperature;

And Mr. Belchik about the flow augmentation releases.

CROSS-EXAMINATION BY

MR. O'HANLON: Mr. Stokely, I'd like to start with you, please.

WITNESS STOKELY: Sure.

MR. O'HANLON: In your written testimony, you claim a unique protection applies to the Trinity River under existing Federal and State law; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. Now, I'm not going to debate you about the law in this proceeding. I think that can be more usefully be done in legal briefing.

But I do have a few questions about that.

WITNESS STOKELY: Sure.

MR. O'HANLON: The legal protections you claim do not change depending upon whether the Water Board issues a Permit to the California WaterFix; correct?

WITNESS STOKELY: The legal protections are the same, but the regulatory protections is what we're asking for change.

MR. O'HANLON: You're asking for regulatory changes; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. But if the Water Board were to grant a Permit, that wouldn't change the subject of Federal statute, for example.

WITNESS STOKELY: Correct.

MR. O'HANLON: If the California WaterFix were not approved, would you still be pursuing these conditions?

WITNESS STOKELY: Oh, yes. I've been asking for them for about 20 years. I've appeared before this Board many times asking these same -- same conditions

be imposed on the Bureau's -- imposed on the Bureau's Permits.

MR. O'HANLON: And I'll -- And I can confirm that that's correct.

(Laughter.)

MR. O'HANLON: All right. So, now, in your testimony, at Pages 13-14, you lay out six conditions you would like to have added to the Water Rights Permits for the Trinity River Division; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: Mr. Hunt, could we please have Mr. Stokely's testimony. It's PCFFA-87, and the conditions begin at Page 13.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. Let's start with Condition Number 1.

You want the Water Board to add a water rights condition requiring Reclamation to make the fishery releases set under the Trinity River Record of Decision issued in 2000; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And isn't Reclamation already under an obligation under Federal law to make those releases?

WITNESS STOKELY: No, not under Federal law.

They're under a Federal administrative decision, the 2000 Trinity River Record of Decision, but there's nothing in the Federal statute that says that those fishery flows must be released down the Trinity River. And they could be changed by another administrative act of the Interior Secretary.

So my intention was to backstop those Federal flows in State water permits.

MR. O'HANLON: So your understanding of the law is that they're not currently required, and that the Department of the Interior could change them?

WITNESS STOKELY: They could change them. They would probably have to go through an EIS and years of litigation with the tribes and others, but it could be changed.

MR. O'HANLON: Are you of any -- aware of any statements by Reclamation that it intends to make changes to the Trinity River ROD?

WITNESS STOKELY: There was the Notice of Intent for the Environmental Impact Statement to -- for reconsultation of the Central Valley Project. And it said in there that it may affect tribal trust resources in the Trinity River Basin.

So some of us, not knowing what's going on with that EIS process, are concerned that there could

be an effort to undermine the Trinity Record of Decision flows. I don't know that, but we do have that concern.

MR. O'HANLON: Do you have -- Have you seen any statements specific to the Trinity River Record of Decision that Reclamation was considering changing those flows?

WITNESS STOKELY: No.

MR. O'HANLON: Mr. Hunt, could I please have PCFFA-98 and .pdf Page 12.

And this is the Trinity River Record of Decision.

(Exhibit displayed on screen.)

MR. O'HANLON: Could you scroll up a little bit, please. I'd like to see the table that's towards the bottom of the page, on Page 12.

(Exhibit displayed on screen.)

MR. O'HANLON: Thank you.

All right. Mr. Stokely, have you seen this table before?

WITNESS STOKELY: Oh, yes, many times.

MR. O'HANLON: And this table shows the volume of instream releases under the Trinity River Record of Decision; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. And the volume of releases each year is determined by water year-type; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And the water year-type is based on projected inflow to the Trinity Reservoir; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. So the volume of Trinity River Record of Decision releases each year does not depend on carryover storage in Trinity Reservoir; correct?

WITNESS STOKELY: It doesn't as long as there's enough water in there to meet those flows.

It could be a situation where the carryover storage might be drawn down to the point where they might not be able to put 369,000 acre-feet down the river. We have not gotten to that point yet, but I -- I do believe it's a possibility.

MR. O'HANLON: But in -- But, under the ROD, in terms of the obligations that it polices, it's based on inflow; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: I'd like to switch for a moment to Mr. Belchik.

Mr. Belchik, you testified earlier that you're familiar with the releases from Trinity Reservoir that Reclamation made for the benefit of fish in the Lower Klamath River; correct?

WITNESS BELCHIK: That's correct. I don't think I have every year memorized but, in general, I'm familiar with it.

MR. O'HANLON: And those releases are commonly called flow augmentation releases; correct?

WITNESS BELCHIK: That's correct.

MR. O'HANLON: You mention that you're not sure of the years.

Do you recall that -- that releases were made in seven of the years since the fish die-off that occurred in 2002?

WITNESS BELCHIK: I'm looking for that just to verify, but I'll take your word for it --

MR. O'HANLON: All right.

WITNESS BELCHIK: -- since you asked me.

MR. O'HANLON: It's not critical. We'll be looking at an exhibit later to confirm that.

Now, the flow augmentation releases are in addition to the releases under the Trinity River Record of Decision; correct?

WITNESS BELCHIK: Yes.

MR. O'HANLON: And those releases -- The flow augmentation releases occur in August and September typically; correct?

WITNESS BELCHIK: Yes.

MR. O'HANLON: All right. And in those months of the year, typically those are low-flow periods for the Trinity River, natural flows?

WITNESS BELCHIK: Well, the flow out of Lewiston's governed by the Record of Decision and it would be 450 cubic feet per second throughout the summer months.

But, in general, yeah, the tributary contributions are well over, and it's a low-flow time of year.

MR. O'HANLON: The flow augmentation releases, they're the subject of a second Record of Decision that was entered in 2017; correct?

WITNESS BELCHIK: Yes.

MR. O'HANLON: All right. And -- And flow augmentation releases are made based on projected flows in the Lower Klamath River; correct?

WITNESS BELCHIK: Yes.

MR. O'HANLON: And under the 2017 Record of Decision, Reclamation will make flow augmentation releases whenever projected flows on the Lower Klamath

River in August and September are less than 2800 cfs; correct?

WITNESS BELCHIK: Yes.

MR. O'HANLON: Were there years prior to 2002 when the flows on the Lower Klamath River were less than 2800 cfs?

WITNESS BELCHIK: Yes.

MR. O'HANLON: Was there -- in recorded history, anyway -- a fish die-off in the Lower Klamath River prior to 2002?

WITNESS BELCHIK: When we asked the tribal elders, there had been no large-scale event of that magnitude prior to 2002.

MR. O'HANLON: And there has not been a repeat of the 2002 event since then; correct?

WITNESS BELCHIK: Well, in 2014 and again in 2015, we had a pretty significant outbreak of Ich and, like I said, in my professional opinion, we narrowly averted a disaster on that one if it were not for the flows.

MR. O'HANLON: Reclamation made flow augmentation releases in 2014 and 2015; correct?

WITNESS BELCHIK: Yes.

MR. O'HANLON: All right. Now, the 2017 Record of Decision for flow augmentation releases, that

does not include any exception to the effect that Reclamation won't make those if the California WaterFix is approved; correct?

WITNESS BELCHIK: To the best of my knowledge, that's correct.

But if I could clarify on that.

I don't think the issue that we're concerned with here is whether or not this would change the Record of Decision. We're worried about running out of cold water due to increased diversions to the Central Valley.

And, so, I don't think we ever challenged here in my testimony that there be changes in the Record of Decision, either one, the 2017 or 2000, but we're worried simply about running out of cold water right at the time we need it the most, to prevent catastrophe in the lower river, yeah.

MR. O'HANLON: And Reclamation, of course, is aware of its own obligations under both Records of Decisions; correct?

WITNESS BELCHIK: I presume so.

MR. O'HANLON: It's made --

WITNESS BELCHIK: If you want me to answer for the Bureau --

MR. O'HANLON: No.

WITNESS BELCHIK: -- I can assume.
MR. O'HANLON: No, I don't.
WITNESS BELCHIK: Okay.
MR. O'HANLON: I don't.
But you've already testified that they made those releases -- correct? -- and they're certainly aware of that obligation; correct?
WITNESS BELCHIK: Yes.
MR. O'HANLON: Okay. Can we have Mr. Kamman's testimony, which is PCFFA-126, Page 9.
And I'm not going to ask you questions yet, Mr. Kamman. This is still questions for Mr. Belchik.
But there's a table.
(Exhibit displayed on screen.)
MR. O'HANLON: There's a table there that I wanted to ask Mr. Belchik about.
And could you scroll up a little bit so we can see the bottom numbers?
(Exhibit displayed on screen.)
MR. O'HANLON: Thank you.
All right. What I'm going to ask you about is Water Year 2014.
You see that in the table in Mr. Kamman's testimony?
WITNESS BELCHIK: Yes.

MR. O'HANLON: And Water Year 2014, it shows end-of-September storage in Trinity Reservoir of 600,000 -- excuse me -- 605,600 acre-feet; correct?

WITNESS BELCHIK: So I'm looking at the third column down, third from the bottom, 2004 critically dry, 605,600. Yes, it's here.

MR. O'HANLON: Thank you.

And I'm going to ask you the same question but with respect to Water Year 2015.

It shows end-of-September storage in Trinity Reservoir in 2015 of 545,600 acre-feet; correct?

WITNESS BELCHIK: Yes.

MR. O'HANLON: And looking at all the years of carry -- end-of-September storage that are in this table, which goes from 2001 to 2016, those were the lowest two years of carryover storage; correct?

WITNESS BELCHIK: Yeah. Yes.

MR. O'HANLON: All right. Now I'm going to ask you to look at the -- talk about the volume of flow augmentation releases.

And for that, Mr. Hunt, could we please have PCFFA Exhibit 113.

(Exhibit displayed on screen.)

MR. O'HANLON: I'd like to see the table, so please scroll up.

(Exhibit displayed on screen.)
MR. O'HANLON: Thank you.
Mr. Belchik, do you recognize this table?
WITNESS BELCHIK: No. I've never seen this table before.
MR. O'HANLON: All right. Well, then I'll perhaps ask Mr. Stokely.
Have you seen this table before?
WITNESS STOKELY: I have. It came off of the Trinity River Restoration Program website.
MR. O'HANLON: Okay. And in this table, the water year's the far left column; correct?
WITNESS STOKELY: The water year is, yes.
MR. O'HANLON: And this table includes Water Years 2001 through 2017; correct?
WITNESS STOKELY: Yes.
MR. O'HANLON: All right. I'd like you to look at the information for Water Year 2014.
This table indicates that the forecasted inflow of the Trinity Reservoir in 2014 was 395,000 acre-feet; correct?
WITNESS STOKELY: Yes.
MR. O'HANLON: All right. And that was a critical year-type under the Trinity River Record of Decision?

WITNESS STOKELY: Yes.
MR. O'HANLON: All right. And then moving across, there's a number 370,500 acre-feet in a column headed Actual Restoration Releases.
So that would be the volume of water released pursuant to the Trinity River Record of Decision; correct?
WITNESS STOKELY: Yes.
MR. O'HANLON: All right. And if you keep moving to the right, there's another number, 64,800 acre-feet in the column headed Other Releases.
Do you see that?
WITNESS STOKELY: Yes.
MR. O'HANLON: Okay. And that is the volume of flow augmentation releases made in 2014; correct?
WITNESS STOKELY: Yes.
MR. O'HANLON: All right. Now I'd like you to go down to the year 2015, Water Year 2015, and look at the same numbers.
For 2015, the forecasted inflow to Trinity Reservoir was 934,000 acre-feet; correct?
WITNESS STOKELY: Yes.
MR. O'HANLON: And that is a dry year-type --
WITNESS STOKELY: Yes.
MR. O'HANLON: -- under the Trinity River

Record of Decision; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And moving across, there were 450,700 acre-feet of releases under the Trinity River Record of Decision; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And the other releases, the flow augmentation releases, for that year were 47,900 acre-feet; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. So, to summarize, those two consecutive years, 2014 and 2015, during a drought period, Reclamation made more than 100,000 acre-feet in flow augmentation releases despite relatively low storage in Trinity Reservoir; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. Mr. Stokely, I'd like to continue questions for you, but I'm going to change topics now.

WITNESS STOKELY: Okay.

MR. O'HANLON: I'd like to ask you about your Condition Number 2.

And could we go back to Mr. Stokely's testimony, which is PCFFA-87 at Page 13.

(Exhibit displayed on screen.)

MR. O'HANLON: Thank you, Mr. Hunt.

Okay. And Condition Number 2, you're asking the Water Board to add a permit term based on a contract between the United States and Humboldt County; correct?

WITNESS STOKELY: Yes. It's also in the 1955 Trinity River Act.

MR. O'HANLON: Okay. Here, you request "Provision for release" -- that's the quote -- quote-unquote -- of, quote-unquote, "not less than . . . 50,000 acre-feet"; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. And by "provision for," do you mean you want the Board to mandate release of this water?

WITNESS STOKELY: No. What I'd like -- I may not have worded it correctly. I'd like to just make sure that, if and when Humboldt County chooses to release its 50,000 acre-feet down the Trinity River, that it be in addition to the ROD flows, not as part of the ROD flows.

MR. O'HANLON: And are you asking that it would be in addition to the flow augmentation releases?

WITNESS STOKELY: No. It would be part of that.

MR. O'HANLON: All right. I'd like to look at the Humboldt contract.

Mr. Hunt, could you please pull up PCFFA-112.

(Exhibit displayed on screen.)

MR. O'HANLON: Mr. Stokely, is PCFFA-112 a copy of the Humboldt contract you were referring to in your proposed Condition Number 2?

WITNESS STOKELY: Yes.

MR. O'HANLON: And based on the first page, this is a contract between the United States and Humboldt County; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: Okay. Now, you're here on behalf of PCFFA and the Institute for Fisheries Resources, not Humboldt County; correct?

WITNESS STOKELY: Correct.

MR. O'HANLON: All right. This -- This contract says it was entered June 19th, 1959; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. I'd like to scroll up a bit to Recital Paragraph Number 3.

(Exhibit displayed on screen.)

MR. O'HANLON: Thank you.

All right. Here it recites that the Humboldt County appeared before the Water Board as an interested

party with regard to the United States Application for Permits to appropriate water from Trinity River; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: Mr. Hunt, could I see the next page, Recital Number 5.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. Recital 5 quotes a provision of the 1955 act -- I believe it's the one that you referred to a minute ago -- which says (reading):

". . . That not less than 50,000 acre-feet shall be" --

I should read it up there (reading):

". . . Shall be released annually from the Trinity Reservoir and made available to Humboldt County and downstream water users."

Correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And are you familiar with that provision of the 1955 Act?

WITNESS STOKELY: Yes.

MR. O'HANLON: And that's an accurate quote of the Act?

MR. O'HANLON: Further down the page, do you see -- Could we scroll up, please, Mr. Hunt -- thank you -- to Paragraph 8.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. In Paragraph 8 (reading):

"The United States agrees to release sufficient water" to make available "not less than 150,000 (sic) acre-feet . . . for the beneficial use of Humboldt County and other downstream water (sic) users."

Correct?

WITNESS STOKELY: Yes. That's 50,000. I thought I heard you say 150,000 but I don't hear very well. But it's 50,000.

MR. O'HANLON: 50,000, yes. Thank you.

If I did misstate it, thank you for correcting me.

Now, this essentially repeats Section 2 of the '55 Act; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And this is the paragraph of the contract that you're asking the Water Board to make the subject of a water rights condition?

WITNESS STOKELY: Yes. It's actually already

in the water rights.

MR. O'HANLON: You anticipated my next question.

Let's look at one of the permits for the Trinity River Division.

Mr. Hunt, could we have State Water Resources Control Board Exhibit 15.

(Exhibit displayed on screen.)

MR. O'HANLON: And could we please have .pdf Page 165.

(Exhibit displayed on screen.)

MR. O'HANLON: Okay. So this is the first page of Permit 11967; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. And, Mr. Hunt, could you please show us the very last page of the document, .pdf Page 167.

(Exhibit displayed on screen.)

MR. O'HANLON: I'm sorry. The very last page of the document.

(Exhibit displayed on screen.)

MR. O'HANLON: There we go. Sorry. At the bottom. What I'm looking for is the date at the bottom, the date of issuance of the Permit.

That shows it was issued September 16th, 1959;

correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: Okay. So that's about three months after the contract was entered; correct?

WITNESS STOKELY: Yeah. I don't remember the date on the contract but I will take your word for it.

MR. O'HANLON: Thank you.

It was June, June '59.

All right. Mr. Hunt, could we please have the previous page in this permit.

(Exhibit displayed on screen.)

MR. O'HANLON: And specifically Term Number 9.

Now, Permit Term 9 essentially repeats Paragraph 8 of the Humboldt contract; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: Okay. And this same Permit Term 9 is in all the Water Rights Permits for the Trinity River Division; correct?

WITNESS STOKELY: Correct.

MR. O'HANLON: So the Water Rights Permits for the Trinity River Division already say in Permit Term 9 what the Humboldt contract says regarding water for Humboldt County.

WITNESS STOKELY: That is correct.

MR. O'HANLON: Could you scroll down just a

little bit, Mr. Hunt. I'd like to see Permit Term 8.

(Exhibit displayed on screen.)

MR. O'HANLON: Is Permit Term 8 the permit term regarding fishery releases in the Water Rights Permits?

WITNESS STOKELY: Yes.

MR. O'HANLON: Okay. And the highest rated releases required here is 250,000 -- I'm sorry -- 250 cfs; correct?

WITNESS STOKELY: That is correct.

MR. O'HANLON: And, by contrast, the minimum rated releases required by the Trinity River Record of Decision is 300 cfs; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And Reclamation has been making fishery releases required by the Trinity River Record of Decision even though those releases are not required by this Term of Permit; correct?

WITNESS STOKELY: That is correct.

MR. O'HANLON: Likewise, Reclamation has been making the flow augmentation releases in August and September for the Lower Klamath River even though those are not required by Term 8 of this Water Rights Permit; right?

WITNESS STOKELY: Could you repeat that?

MR. O'HANLON: Yes.

And Reclamation has been making flow augmentation releases in August and September for the benefit of Lower Klamath River even though those are not required by Term 8 of this Water Rights Permit, is that correct?

WITNESS STOKELY: That is correct.

MR. O'HANLON: Are you aware that Humboldt County itself previously raised its contract and water rights terms with the Water Board?

WITNESS STOKELY: I am aware.

MR. O'HANLON: And do you recall that Humboldt County filed a water rights complaint in 2004 seeking to require releases for the benefit of Salmon on the Lower Klamath River?

WITNESS STOKELY: I do recall.

MR. O'HANLON: And you recall the outcome of that water rights complaint?

WITNESS STOKELY: I do.

MR. O'HANLON: What was the outcome?

WITNESS STOKELY: The outcome was that, since the Bureau of Reclamation is releasing more than the 120,500 acre-feet in Term 8 in there and Term 9 together, which would be 170,500 acre-feet, that the Bureau is not in violation of its Water Permits.

MR. O'HANLON: And Reclamation made flow augmentation releases in 2004 even though the Water Board did not act on Humboldt County's water rights complaint; is that correct?

WITNESS STOKELY: That's correct.

MR. O'HANLON: And, to your knowledge, since 2004, has Humboldt County filed suit against the United States claiming a breach of this contract?

WITNESS STOKELY: No. But they also got a Solicitor's Opinion in 2014 that reversed decades of Reclamation Solicitor's Opinions that, in fact, the 50,000 acre-feet is in addition to fishery flows.

Prior to that Solicitor's Opinion, all the legal opinions were that the 50,000 acre-feet was subsumed within fishery flows, whether it was Permit Condition 8 or the Trinity Record of Decision or any other flow regime for the Trinity.

So the 2014 Solicitor's Opinion was a huge shift in policy for the Bureau of Reclamation.

MR. O'HANLON: And I expect that will be the subject of further legal briefing in this proceeding.

I'd like to change topics now, Mr. Stokely, and ask you about Condition 3.

WITNESS STOKELY: Sure.

MR. O'HANLON: Mr. Hunt, again, could we go

back to Mr. Stokely's testimony, which is PCFFA-87, Page 13.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. Now, here, you're asking for a term -- water rights term requiring compliance with the Trinity River temperature objectives; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: Okay. And by the phrase "for all relevant time periods," do you mean that compliance would be required for 100 percent of the time that the objectives are in effect?

WITNESS STOKELY: What I meant was, is that the -- I'm asking the Board to put in Permit conditions that would require the Bureau of Reclamation to meet the Basin Plan temperature objectives for the time period that is in those objectives, which is July 1st to December 31st.

MR. O'HANLON: Okay. So you're not asking that it be -- that there be zero days of -- of -- of missing compliance because, for example, there's an temp -- air temperature spike or something like that.

WITNESS STOKELY: I'm not quite sure I understand your question.

MR. O'HANLON: Okay.

WITNESS STOKELY: Could you restate it.
MR. O'HANLON: Sure.
WITNESS STOKELY: I'm not that smart.
MR. O'HANLON: Well, I'll back up a second.
When you were in Trinity County, you proposed a measure that would require complying with temperature objectives 90 percent of the time.
Do you recall that?
WITNESS STOKELY: I don't recall that.
MR. O'HANLON: All right. Well, then, I'll move on.
Now, this may be getting to a legal issue, but . . .
You're asking that -- that these releases for temperature be given priority over all other uses of water from the Trinity River Division; is that correct? All other uses in the Central Valley.
WITNESS STOKELY: Yes.
It's my understanding that surplus water was to be exported out of the basin but, if it was needed within the basin, it would be used in the Trinity River Basin.
MR. O'HANLON: So you're asking that -- Are you asking that this Permit term would require use for meeting these temperature objectives even if, for

example, that water was needed from Trinity River Division to maintain temperatures for winter-run Salmon in the Sacramento River?

WITNESS STOKELY: That's correct.

And I will add that sending Trinity water to the Sacramento River during the winter-run period of spawning generally heats the Sacramento River rather than cooling it.

MR. O'HANLON: All right.

WITNESS STOKELY: So I think it's a misstatement that Trinity water cools the Sacramento River for winter-run in the summertime.

MR. O'HANLON: I think there will be further testimony about that.

WITNESS STOKELY: Oh, boy.

MR. O'HANLON: So, have you had anyone do an analysis of how your proposed condition would affect operations in the Central Valley Project?

WITNESS STOKELY: Well, not specifically. But in 2000, the Bureau of Reclamation did a Trinity River Technical Enhancement Appraisal study.

And when I was working for Trinity County, we asked them to analyze carryover storage in order to meet Basin Plan temperature objectives. And there was a table in there that came up with tunnel shortages

that would result from different levels of carryover storage.

It was actually not specifically to meet the temperature objectives but the carryover storage numbers were intended to help meet those downstream Basin Plan temperature objectives.

So there was an analysis of impacts.

MR. O'HANLON: And so that was done in 2000, you say?

WITNESS STOKELY: Yes.

MR. O'HANLON: Was that done using PROSIM?

WITNESS STOKELY: Yes.

Nancy Parker, who was one of the Federal witnesses on Panel 2, did the work. And I worked with her on that to give her some information on what the county would like to see in terms of carryover storage.

It was actually an analysis of raising Trinity Dam. And what they did -- What the Bureau did is, they looked at what -- whether or not it would be worth it to raise Trinity Dam if there were certain carryover storage requirements in there.

Basically, the determination was, any carryover storage below 600,000 acre-feet had no impact on CVP deliveries. 900,000 acre-foot carryover storage had some impacts, but it was not enough to justify

raising the reservoir. And then when you got into the 1.2 million acre-foot carryover storage, then it would allow -- it would justify raising Trinity Dam because there would be enough water saved during those wetter years when it might otherwise spill.

MR. O'HANLON: Are you aware of any similar analysis using CalSim II and current regulatory requirements?

WITNESS STOKELY: I'm not.

MR. O'HANLON: All right. I'll -- I have a few more questions about Condition 3 and Condition 4 but I'll save those for Mr. Kamman.

WITNESS STOKELY: Thank you.

MR. O'HANLON: Mr. Stokely, I do have some more questions for you.

WITNESS STOKELY: Okay.

MR. O'HANLON: I'd like you to -- Mr. Hunt, could we please have Page 14 and Condition Number 5 in Mr. Stokely's testimony.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. In Condition 5, you -- here, you propose that Reclamation be required to follow up on a Technical Memorandum that it released in 2012; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: And this Technical Memorandum, it does not address the California WaterFix; correct?

WITNESS STOKELY: Correct.

MR. O'HANLON: And the temperature management issue it describes for Lewiston Reservoir is based on existing facilities and conditions; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. Finally, I'd like to ask you a few questions about Condition 6. All right. Here, you're asking the Water Board to limit the export of water from the Trinity River when the temperature of water released to the Sacramento River from Spring Creek Powerhouse exceeds the temperature of water released from Shasta Dam by at least one degree Fahrenheit; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. And this request is based on your analysis of three years of temperature data that is shown in CSPA Exhibit 358?

WITNESS STOKELY: Well, actually it's based on about 28 years of experience during the drought of the late '80s and the early '90s.

The Bureau of Reclamation kept announcing that they needed to send lots of cold Trinity River water over to the Sacramento River.

And an employee with the California Department of Fish & Game, which is now California Department of Fish and Wildlife, sent me information that indicated that the Trinity River was significantly warming the Sacramento River during that time period and that, in fact, it was not true at all that the cold Trinity water was needed to help the winter-run.

What it appeared to me is, actually, the more Trinity River they sent over, the more bypass they had to do at Shasta Dam because they did not have the temperature curtain in it at that time.

There was -- There are now curtains in Whiskeytown Reservoir which reduce the temperature differential between Spring Creek releases and Shasta Dam releases. But, as you can see from those charts, it's still a problem.

MR. O'HANLON: Do you know whether, in any of the years for which you've given us temperature information, 2015, 2016 or 2017, releases from the Spring Creek Powerhouse caused an exceedance of the temperature objectives for protecting winter-run Salmon?

WITNESS STOKELY: I did not analyze that, but it's my understanding there must have been some kind of temperature exceedance because the vast majority of the

eggs and Juvenile Salmon perished, over 90 percent of spring-run, winter-run and fall-run. But I did not do an analysis.

MR. O'HANLON: You don't know whether the releases from Spring Creek Powerhouse to the Shasta -- to the Sacramento River contributed to any temperature exceedances in 2015; do you?

WITNESS STOKELY: I don't know that, but I suspect they were since the Trinity temperatures were so much warmer than the Shasta Dam releases, but I cannot tell you specifically that that led to temperature exceedances in the Sacramento River.

MR. O'HANLON: Do you know what volume of water was moved over from -- through the -- through the -- excuse me -- Spring Creek Powerhouse beginning in June through November in 2015?

WITNESS STOKELY: No, I do not.

MR. O'HANLON: How about in 2016?

WITNESS STOKELY: No. I didn't look at those numbers. I -- I generally look at annual volumes rather than monthly or seasonal volumes.

MR. O'HANLON: All right. Releases from the Spring Creek Powerhouse enter the Sacramento River upstream of the Keswick Dam; correct?

WITNESS STOKELY: Yes.

MR. O'HANLON: All right. And each year, Reclamation must meet it -- must meet water temperatures for winter-run at a compliance point that's downstream of Keswick Dam; correct?

WITNESS STOKELY: They're supposed to meet them.

MR. O'HANLON: So, under that requirement -- Excuse me.

So, under that existing requirement, Reclamation already has to account for the effect of any releases from Spring Creek Powerhouse on its ability to meet temperature objectives for the winter-run; correct?

WITNESS STOKELY: Well, again, they're supposed to. They appeared to very much miscalculate temperatures in 2014 and 2015 when so many Salmon died.

MR. O'HANLON: The subject here, of course, that I'm asking about is the proposed condition which you seek to add to the Water Rights Permit for the Trinity River Division and whether it would have any effect on the ability of Reclamation to comply with the temperature objective.

WITNESS STOKELY: Yes.

I think, for me, it's just a common-sense thing. If you're putting cold water in from Shasta and

the water's warmer from Trinity, that the downstream temperature's going to be warmer than if you didn't have the Trinity diversions to the -- to Keswick Reservoir.

MR. O'HANLON: Okay. But, again, you haven't had anyone model whether -- what difference your --

WITNESS STOKELY: No.

MR. O'HANLON: -- proposed condition would have made for temperature compliance in the Sacramento River in 2015, 2016, or 2017.

WITNESS STOKELY: That is correct.

MR. O'HANLON: Do you know whether adding Condition 6 to the Water Rights Permits for the Trinity River Division would result in a faster drawdown of storage in Shasta than occurs without the condition?

WITNESS STOKELY: It probably would.

MR. O'HANLON: Thank you, Mr. Stokely. I have no further questions for you.

WITNESS STOKELY: Thank you.

MR. O'HANLON: Mr. Kamman, I'd like to ask you a few questions.

Could I please have Mr. Kamman's testimony. It's PCFFA Exhibit 126, Mr. Hunt.

(Exhibit displayed on screen.)

MR. O'HANLON: I'd like to start at Page 5 of

the testimony.

(Exhibit displayed on screen.)

MR. O'HANLON: Mr. Kamman, at Pages 5 and 6 of your written testimony, you describe an analysis that you did of the ability of the Trinity River ROD flows to meet temperature objectives in the Trinity River; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: And you did that analysis in 1999?

WITNESS KAMMAN: If -- If not earlier, and later as well, but yeah.

MR. O'HANLON: But in terms of the report that we have, it's dated June 1999.

WITNESS KAMMAN: Yeah, the report was written in '99. We might have been doing analyses in '98, as well.

MR. O'HANLON: All right. Thank you.

And you -- There were a series of modeling used to do this analysis; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: All right. In Footnote 2 of your testimony, you say that input data for one of the models came from a model called PROSIM; correct?

WITNESS STOKELY: Correct.

MR. O'HANLON: And in 1999, PROSIM was used to model CVP and SWP operations; correct?

WITNESS KAMMAN: That's my understanding, yes.

MR. O'HANLON: And a lot has changed for CVP and SWP operations since 1999; correct?

WITNESS KAMMAN: To the best of my knowledge, yeah.

MR. O'HANLON: All right. Are you aware that, today, Reclamation uses a model called CalSim II --

WITNESS KAMMAN: Yes.

MR. O'HANLON: -- to model CVP and SWP operations?

WITNESS KAMMAN: Yes.

MR. O'HANLON: All right. Using CalSim II today would like result in input that is different from what PROSIM produced in 1999; correct?

WITNESS KAMMAN: I would assume so. I -- I -- I don't know. I'll take your word for it.

MR. O'HANLON: That's fine.

And did -- And for your testimony for this hearing, did you try to use or have someone else use CalSim II to update the modeling work on temperatures that you did back in 1999?

WITNESS KAMMAN: No.

MR. O'HANLON: All right. In the first full

paragraph of Page 6 of your testimony --

May I have Page 6, Mr. Hunt?

(Exhibit displayed on screen.)

MR. O'HANLON: Thank you.

All right. You referred here to some -- some tables, and these are tables, I believe, from your June 1999 report.

I was not able to find those tables.

WITNESS KAMMAN: I was not able to find them, either. The are not . . . They are not included in the exhibit on the WaterFix website.

The report text is there. I noticed the tables were missing.

MR. O'HANLON: Okay. All right. Your written testimony does not include any data on actual temperatures in Trinity River since the Trinity River Record of Decision was implemented; correct?

WITNESS KAMMAN: That's correct.

MR. O'HANLON: Okay. At Pages 6, Lines 10 to 11, you state, and I think you repeated this in your summary earlier today, that according to your modeling done in 1999, the ROD flows would achieve temperature objectives only 36 percent of the time in a critically dry year; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: And the year 2014 was a critically dry year in the Trinity River watershed; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: Do you know what percentage of the time the Trinity River temperature objectives were actually met in 2014?

WITNESS KAMMAN: I do not.

MR. O'HANLON: In preparation for your testimony today, did you compare your modeling projections made in 1999 with the actual temperatures in the Trinity River in any of the years since the Trinity River ROD was implemented?

WITNESS KAMMAN: No, I haven't. But I wouldn't -- I wouldn't know why I would want to do that. The modeling I did back in . . .

Well, I'll just leave it at that. No, I did not do that.

MR. O'HANLON: All right.

At Pages 6 and 7 of your testimony, you describe an analysis of carryover storage during drought that you completed in May 1988; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: And for that analysis, you used input from the PROSIM model; correct?

WITNESS KAMMAN: (Examining document.)

Let's see. Would have used the ROD flows . . .

Possibly. I'm not -- I'm not absolutely sure.

Let's see.

MR. O'HANLON: Would you like to look at the Exhibit PCFFA-117?

Mr. Hunt, could you please pull up PCFFA-117.

(Exhibit displayed on screen.)

WITNESS KAMMAN: Yeah. It's been a long time. I . . .

(Examining document.)

MR. O'HANLON: If you look in the second paragraph, fifth line down, there's a sentence that begins, "These values are based on PROSIM output."

WITNESS KAMMAN: Then -- Yes. Then they were.

MR. O'HANLON: So for this analysis again you used output from the PROSIM model?

WITNESS KAMMAN: Yes.

MR. O'HANLON: And I take it this analysis has not been updated using CalSim II?

WITNESS KAMMAN: No. No.

MR. O'HANLON: All right. In Footnote 1 of this memorandum --

Mr. Hunt, could you please scroll up so I can

see the footnote at the bottom of the page.

(Exhibit displayed on screen.)

MR. O'HANLON: Thank you.

And I think again in Footnote 4 of your testimony, actually, you acknowledge that operations during drought periods would likely differ from what the PROSIM model projected; correct?

WITNESS KAMMAN: That's correct.

MR. O'HANLON: All right. Now, at Page 7 of your testimony, you refer to other testimony from June 1992 by Hecht and Finnerty; correct?

(Exhibit displayed on screen.)

WITNESS KAMMAN: Correct.

MR. O'HANLON: And Mr. Hunt, can we please have PCFFA Exhibit 116.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. And for this analysis, Hecht and Finnerty looked at conditions in a single year in 1991; correct?

WITNESS KAMMAN: Yes, that's my understanding.

MR. O'HANLON: At the bottom of Page 2 --

(Exhibit displayed on screen.)

MR. O'HANLON: Thank you, Mr. Hunt.

I'll just read the sentence there, too. It says (reading):

"Comparison of reservoir temperature distributions, storage volumes, inflows and outflows for many other years will be required in order to estimate how Water Year 1991 compares statistically with other years and, in particular, with the 90 percent exceedance criterion."

Do you see that?

WITNESS KAMMAN: Yes.

MR. O'HANLON: Do you know whether that additional work was ever done?

WITNESS KAMMAN: I can't imagine it wasn't in some study to characterize what the water year-types were for 1991. It would be -- It might have happened sometime after this was published, but I'm trying to think.

I can't think of a specific report to cite to to back up that assumption.

MR. O'HANLON: Okay. All right. I'd like to move on and ask you about another report.

This one's referred to, on Page 7 of your testimony, an August 1998 reservoir carryover analysis by Deas.

WITNESS KAMMAN: Yes.

MR. O'HANLON: All right. Now, that study

looked at temperatures in Trinity Reservoir under what circumstances warm water would reach the intake of the power plant; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: And, again, the PROSIM model was used to project Project operations for this analysis; correct?

WITNESS KAMMAN: I am not sure, because Mike did not use the same Bureau RTM model. He used his own Trinity Reservoir temperature model.

And so I'm not quite sure where the input and operational assumptions for that model came from. I'd -- I'd have to review his report.

MR. O'HANLON: Okay. Mr. Hunt, could you please pull up PCFFA Exhibit 129.

(Exhibit displayed on screen.)

MR. O'HANLON: I'd like to have the second page, please.

(Exhibit displayed on screen.)

MR. O'HANLON: And I think the information we're looking for --

WITNESS KAMMAN: There it is (reading):

"Operations were derived from PROSIM temperature . . ."

MR. O'HANLON: Okay.

WITNESS KAMMAN: So that's where he got them.

MR. O'HANLON: That's interesting. My copy is highlighted but yours -- the one on the screen is not.

All right. But, yes, you have found and identified the correct sentence. It's in the second paragraph in the middle. It says (reading):

"Operations were derived from PROSIM temperature analyses of proposed flow alternatives for critically dry and dry year-types with carryover storage of 650,000 acre-feet."

Correct?

WITNESS KAMMAN: That's what it says, yes.

MR. O'HANLON: Okay. It also says in that paragraph, further in that same paragraph, that (reading):

". . . Care should be used when interpreting these results."

Correct?

WITNESS STOKELY: Yup.

MR. O'HANLON: All right. And this paragraph explains that the modeled Project -- modeled Project operations were based on carryover storage of 650,000 acre-feet, not the varying initial levels of carryover storage used for this analysis; correct?

WITNESS KAMMAN: Yes.

MR. O'HANLON: And that's significant because different levels of carryover storage would result in different Project operations; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: All right. I'd like to move on to one of the other reports, and I'm almost finished, Mr. Kamman.

WITNESS KAMMAN: (Nodding head.)

MR. O'HANLON: At the bottom of Page 7 of your testimony, at Line 26 --

(Exhibit displayed on screen.)

MR. O'HANLON: -- you state that a Reclamation report from 2012 found that (reading):

". . . Carryover storage . . . less than 750,000 acre-feet is 'problematic' in meeting . . . temperature requirements (sic) . . ."

Correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: Mr. Hunt, could we please have that memorandum. It's PCFFA Exhibit 115.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. Do you see in the first paragraph of that memorandum --

And, for the record, this is a memorandum dated August 20, 2012, on the letterhead of Bureau of Reclamation.

First paragraph it refers to, it says -- The second sentence in the first full paragraph says (reading):

"This Technical Memorandum is part of a reconnaissance-level sensitivity analysis."

Do you see that?

WITNESS KAMMAN: Yes.

MR. O'HANLON: And the -- The first sentence in the next paragraph says (reading):

"This cursory sensitivity analysis" --

And then it carries on; correct?

WITNESS KAMMAN: Yes.

MR. O'HANLON: Okay. And it uses -- This memo uses the word "problematic" in two places. The first is in -- in the highlighted portion, and it reads (reading):

"This cursory sensitivity analysis indicated that end-of-September Trinity River" -- excuse me -- "Trinity Reservoir carryover storage less than 750,000

acre-feet is potentially thermally problematic . . ."

Did I read that correctly?

WITNESS KAMMAN: Yes.

MR. O'HANLON: And "potentially problematic" is different than "is problematic"; correct?

WITNESS KAMMAN: Yes.

MR. O'HANLON: All right. "Problematic" also appears at Page 4, carrying on to the top of Page 5 of this memorandum.

Mr. Hunt, could you please --

(Exhibit displayed on screen.)

MR. O'HANLON: -- scroll to the bottom of Page 4, and then I'll ask you to move it onto Page 5.

(Exhibit displayed on screen.)

MR. O'HANLON: So the second sentence there in Conclusion Number 1 says (reading):

"End-of-September carryover storage (sic) of 750,000 acre-feet or less" --

WITNESS KAMMAN: So, I'm not with you. Sorry.

MR. O'HANLON: I'm sorry. That's my fault.

If you read the -- Do you see the conclusions sections, Paragraph Number 1 --

WITNESS KAMMAN: Um-hmm.

MR. O'HANLON: -- second answer. It says --

It begins (reading):

"End-of-September carryover of 750,000 acre-feet or less could be thermally problematic . . ."

Do you see that?

WITNESS KAMMAN: Yup.

MR. O'HANLON: And again "could be problematic" is different than "is problematic"; correct?

WITNESS KAMMAN: Yes.

WITNESS STOKELY: May I add something?

MR. O'HANLON: No. I have one more -- a couple more questions for Mr. Kamman. Thank you.

And this is on Page 9 of your testimony. This is PCFFA-126, Page 9, Table 1.

(Exhibit displayed on screen.)

MR. O'HANLON: All right. Do you have that table in front of you?

WITNESS KAMMAN: Yeah, I do.

MR. O'HANLON: Thank you.

Now, you had observed and describe using this table the operations of the Trinity River Division during two drought periods; correct? That's 2007-2009 period and 2013-2015 period.

WITNESS KAMMAN: Yes.

MR. O'HANLON: Okay. What I'd like to focus on is how Reclamation operated at the end of each drought.

And, so, for the first drought, let's look at the year 2010 and how the Reclamation operated Trinity Reservoir in 2010.

Looking at your numbers in your Table 1, it indicates that Reclamation replenished storage in the Trinity Reservoir by 639,000 acre-feet in 2010; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: And it did that in 2010 by limiting diversions to the Central Valley; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: And, in fact, releases to the Trinity River in 2010 were more than twice the level of diversions to the Central Valley; correct?

WITNESS KAMMAN: That's correct.

MR. O'HANLON: And in 2016, we see the same pattern. In 2016, Reclamation replenished storage in Trinity Reservoir by 423,000 acre-feet; correct?

WITNESS KAMMAN: Correct.

MR. O'HANLON: And it did that in 2016 by limiting diversions to the Central Valley; correct?

WITNESS KAMMAN: And -- Yes, and having a wet

year.

MR. O'HANLON: Thank you.

I have no further questions for this panel.

CO-HEARING OFFICER DODUC: Thank you, Mr. O'Hanlon.

Candace, how are you doing?

THE REPORTER: Fine.

CO-HEARING OFFICER DODUC: Should we take a short five-minute break?

THE REPORTER: (Shaking head.)

CO-HEARING OFFICER DODUC: You're good?

THE REPORTER: Um-hmm.

CO-HEARING OFFICER DODUC: All right. Mr. Herrick.

MR. HERRICK: (Examining name tag.)

I wanted to make sure it didn't say "Thomas Keeling."

Thank you.

John Herrick for the South Delta parties. I have a few questions. Most of my questions are Mr. Stokely. They deal with general overview of the Trinity system, some questions about storage carryover and required flows, and I also have some questions on adaptive management for him.

And . . . and I have a couple questions

perhaps for Mr. Kamman and for Dr. Strange but those will only deal with facts associated with the questions I'm asking Mr. Stokely.

So, with that . . .

CROSS-EXAMINATION BY

MR. HERRICK: Mr. Stokely, I think it would be important, without wasting too much time here, just to describe how the Trinity sys -- Trinity River system works. And if you'll just chime in here.

We have Trinity Reservoir -- Trinity Lake, excuse me, and it flows downstream into Lewiston Reservoir which is 7 miles long and shallow.

Then at Lewiston Reservoir, there is a glory hole submerged intake for the Clear Creek Tunnel that goes to Whiskeytown Reservoir, so that Lewiston water can either go over to the Central Valley or it can be released down the Trinity River. Lewiston Dam is the upstream point for anadromous fish in the Trinity River.

Once the water leaves the Clear Creek Tunnel, it goes into Whiskeytown Reservoir. And then, at the east end, there is another submerged glory hole intake for the Spring Creek tunnel, which then goes down to the Spring Creek Power Plant and discharges into Keswick Reservoir.

So the Trinity system is operated not just for the Trinity/Klamath system but also contributes water to the Sacramento system; correct?

WITNESS STOKELY: Yes. I refer to it as the Water District there at Clear Creek.

MR. HERRICK: That is true.

What are the current carryover requirements for Trinity Lake?

WITNESS STOKELY: The 2000 NMFS Biological Opinion has a 600,000 acre-foot minimum carryover storage on September 30th, but they can go down to 400,000 acre-feet if they reconsult with NMFS.

I will add that, in the WaterFix, the modeling there used a 750,000 acre-foot trigger, or benchmark, to determine that Trinity Lake was having potentially temperature problems.

MR. HERRICK: But with those numbers, say, 600,000 or 700,000 carryover, is it your understanding from Mr. Kamman's work that that's insufficient to provide for coldwater needs on the Trinity system in multiple dryer critical years?

WITNESS STOKELY: That's correct. And it may actually be insufficient even in a single year, according to the 1992 analysis by Hecht and Finnerty.

MR. HERRICK: And there aren't any later

analysis dealing with more current requirements that change that conclusion?

WITNESS STOKELY: No. The only one I'm aware of is the -- There is a Trinity carryover study that the Bureau did in 2012, and that's the one that we were just looking at that had the "750,000 may be problematic" language.

MR. HERRICK: Thank you.

It doesn't decrease the carryover for multiyears.

WITNESS STOKELY: No.

MR. HERRICK: Now, there was a couple of references by Mr. Kamman. I'll ask you.

I think you said 1200 or 1250 thousand acre-feet. You're referring to 1,250,000 acre-feet --

WITNESS KAMMAN: Yes.

MR. HERRICK: -- is that correct?

WITNESS KAMMAN: Yes.

MR. HERRICK: And in your analyses, that number is necessary to address a three-year dry period that included a dry year, a critical year and then a dry year; is that correct?

WITNESS KAMMAN: My analysis . . .

Yes. Yeah.

MR. HERRICK: So, anyway, for a three-year dry

period, it's your testimony that at least 1,250,000 acre-feet is necessary for September carryover storage in Trinity?

WITNESS KAMMAN: You know, if it were three truly dry water year-types, just dry, that might be sufficient.

You throw in a critically dry year, that's -- that's the killer. That -- I mean, a critically dry water year-type is -- is bad news.

And, so, you put two of those together, that might -- Well, in the example that I gave, the second -- the 2013-through-2015 period, we had dry, critically dry, dry.

By the end of that three-year drought -- We started with 1800 thousand, 1,800,000 acre-feet, and by the end of that time, we were under 600 over those three years, so . . .

And that's why I said, you know, a single carryover storage volume for a multiyear drought period is elusive. It really depends on having 20-20 foresight, whether you get that critically dry-year killer or not.

MR. HERRICK: And your testimony is based upon meeting -- or being able to meet Trinity River or Trinity River system coldwater needs, not Sacramento

system; correct?

WITNESS KAMMAN: Correct.

MR. HERRICK: And are you aware whether the coldwater -- Were any of the coldwater standards on the Trinity River violated during the drought you mentioned from 20 -- was it 14 through --

WITNESS KAMMAN: I do not know. I didn't -- I didn't look at that data.

And I think it's important to point out that these multiyear carryover storage analyses that I did didn't specifically address how temperature objectives were -- if they were satisfied or not.

It was really just looking at the storage volumes -- the carryover storage volumes beginning the season, end of season -- or I should say beginning-of-year, end-of-year storage volumes, and what that volume was.

And, so, at end-of-year storage volume, if that's dropping below 600,000 acre-feet, I'm assuming that's bad news, but I did not model what the temperature compliance was downstream.

MR. HERRICK: Mr. Stokely, do you know whether or not temperature -- I'll say requirements rather than standards -- on the Trinity system were violated during the last 20 years?

WITNESS STOKELY: Yes, they have been on several occasions, generally during critically dry years.

I don't have the exact numbers but it's my understanding that there were a few dozen violations in 2015.

MR. HERRICK: And you're familiar with the operations of the CVP with regard to the Trinity system and the Sacramento system?

WITNESS STOKELY: Yes.

MR. HERRICK: And are decisions by the Bureau of Reclamation in operating the Trinity system based upon multiyear needs in the Trinity system for coldwater pools?

WITNESS STOKELY: That's not my understanding. It's an annual basis, and they kind of pray for rain and snow the next year.

MR. HERRICK: And so their -- their operations, then, are based upon projected inflows to the reservoirs; is that correct?

WITNESS STOKELY: Yes.

MR. HERRICK: And, of course, if those projections are wrong, the amount of water they transferred over to the Sacramento system may have been needed in the Trinity system; is that correct?

WITNESS STOKELY: Correct.

MR. HERRICK: And is that one of the points of your testimony today, is that that concern is not addressed?

WITNESS STOKELY: Yes.

MR. HERRICK: You're familiar with -- Excuse me.

You were asked questions that dealt with the DWR witness Mr. Reyes' chart of carryover storage for the Trinity system end of September, I think.

WITNESS STOKELY: Yes. That was modeled.

MR. HERRICK: End of September.

And you testified that there -- it did appear to be impacts based upon the -- sorry -- impacts during those dryer times, although the exact numbers were hard to tell from the chart; correct?

WITNESS STOKELY: Yes.

MR. HERRICK: Now, if the -- For whatever the reason, if the California WaterFix scenario shows less carryover storage in the Trinity -- in Trinity Lake during the dryer years, does that have an adverse impact on meeting Trinity River coldwater requirements in the following years?

WITNESS STOKELY: Yes. It has an impact on coldwater requirements and meeting North Coast Basin

Plan temperature objectives for the Trinity River.

MR. HERRICK: And so any water that would have been transferred from the Trinity system to the Sacramento system in those types of years would put in jeopardy the following year's ability to meet the coldwater needs on the Trinity system.

WITNESS STOKELY: Yes.

MR. HERRICK: And, of course, in years when there isn't a coldwater requirement -- when coldwater requirements aren't controlling releases, the Bureau is transferring water from the Trinity system over into the Sacramento system also; correct?

WITNESS STOKELY: Yes.

MR. HERRICK: But in any year, any transfer that's made affects the following year's carryover; does it not?

WITNESS STOKELY: Yes.

MR. HERRICK: Of course, the caveat to that would be, in a high-flow year, if you're spilling water, it may not matter; correct?

WITNESS STOKELY: Correct.

MR. HERRICK: So you're looking for conditions to prevent transfers into the Sacramento system in order to maximize compliance with coldwater requirements on the Trinity system; correct?

WITNESS STOKELY: Yes, to comply with Basin Plan temperature objectives.

MR. HERRICK: Dr. Strange, you mentioned that you were aware of examples when the mandatory requirements placed on the Bureau sometimes became less than mandatory.

Do you recall that?

WITNESS STRANGE: Yes.

MR. HERRICK: Do you have examples of that that you'd like to relate?

WITNESS STRANGE: Yeah. Yeah, sure. There would be several.

I mean, mandatory -- Or, you know, non-discretionary perhaps would be a better word.

But, yeah, one example would be with the -- the -- the far releases, as far as there was protocols for releasing the water for adult fish health, and there's very clearly defined triggers and what not.

But the decision came with an asterisk, which was that it was also in how they saw fit. So there was an instance where the releases came a little too small, a little too late, and the outbreak progressed much more significantly and triggered an emergency release. So that would be one example.

You know, another example would be in terms of

the releases from Trinity Dam through Lewiston to keep Lewiston cold during the drought years, was in excess of what was required to keep Lewiston cold.

So that was the -- that was their reasoning for why they're sending so much water through Lewiston Reservoir and then over the hill is to keep Lewiston cold, but they were actually releasing far more than that. And what it was doing is, it was getting, you know, that cold pool closer and closer to completion.

And then the -- Then the reasoning became that they needed that cold water in Sacramento from the Trinity to benefit winter-run Chinook. But, you know, it was pointed out that real-time data was indicating that the temperature from the Trinity, Spring Creek, was -- was actually higher because it actually was a violation.

So that didn't dissuade them from continuing that and putting that in the press as far as their reasoning for doing that.

So, yeah, I can think of some others but . . .

MR. HERRICK: Is there any doubt in your mind that, during the timeframe you were just talking about, that the Trinity water wasn't warmer than Sacramento River?

WITNESS STRANGE: Based on the data that I was

looking at, which was, you know, provided in real-time -- If you showed an example, you can online many times a day. I was monitoring that and, you know, it was warmer, for sure, during that period.

MR. HERRICK: So, Dr. Strange, at any time when -- Excuse me. Let me back up.

At some times, your testimony indicates that additional flows might be needed if diseases such as Ich are determined to be present or getting out of control, or something, correct?

WITNESS STRANGE: Right.

MR. HERRICK: So at any time that those additional flows are needed, any water that has previously been transferred into the Sacramento system is now no longer available to do that; is it?

WITNESS STRANGE: Correct, yeah.

And we were, in particular, advising or warning the Bureau in 2013, 2014, 2015 about the risk of multiyear drought and the need to be more cautious in the end-of-the-year water volume in Trinity Reservoir for that exact reason. And those reasons got ignored.

And I should just add that the climatology behind what's driving the drought is something that has emerged more recently and has the potential to be

pretty persistent and to lock in for multiple years.

So just the latest, best-available science when it comes to the droughts we've been experiencing lately in California suggests that they're much more likely to be persistent over multiple years as opposed to, you know, past droughts that we experienced. It was different, dryer, in terms of the climatology behind that.

MR. HERRICK: Mr. Stokely, is the -- is the Salmon fishery on the Trinity at the 1959 levels which you believe the --

WITNESS STOKELY: No.

MR. HERRICK: -- Project is?

WITNESS STOKELY: No. I think there were many one or two years in the late '80s when there was some really good returns of hatchery runs where maybe the total numbers might have been met. But in terms of natural production in the Trinity River below Lewiston Dam, it was very far from meeting the target.

MR. HERRICK: So, in your opinion, is the Trinity River system being operated to protect the area-of-origin rights in the Trinity and Klamath River Basins?

WITNESS STOKELY: I think the Bureau tries but when it becomes inconvenient, they ignore it. They

ignore the protections for the Trinity River.

MR. HERRICK: Now, if the Bureau doesn't meet some Record of Decision, say, requirement, what happens?

WITNESS STOKELY: Nothing. There's no fishing. Or it would be significantly reduced.

MR. HERRICK: Is there any Federal agency that would take action against the Bureau to somehow correct that?

WITNESS STOKELY: No, not to my knowledge.

MR. HERRICK: And is that one of the reasons why you're looking for conditions through this process, if not a separate one --

WITNESS STOKELY: Yes.

MR. HERRICK: -- in order to provide protections?

WITNESS STOKELY: Yes.

MR. HERRICK: If I may change topics briefly. I'm almost done.

Mr. Stokely, are you fam -- Do you have any experience in Adaptive Management Programs?

WITNESS STOKELY: Yes. I've been involved with the old Trinity Restoration Program from 1988 until the Record of Decision in 2000.

I was on the Environmental Review Management

Team representing Trinity County as the CEQA lead agency for the EIS/EIR for the Trinity Record of Decision, and adaptive management was written extensively into the Trinity River Record of Decision.

Following my retirement from Trinity County in 2008, I tried to take a few years away from the Trinity River, but I got called back into duty because Byron Reidecker (phonetic) died and a couple other guys couldn't take it anymore.

So they called my back and I was appointed to the Trinity Adaptive Management Working Group in 2012 by the Interior Secretary and reappointed a -- I think a couple of times, at least once or twice.

Most recently, I served as Vice-Chairman and, then, in March of 2017, I took over as Chairmanship.

And, then, shortly thereafter, the new administration canceled all meetings of the Adaptive Management Working Group.

And then, in November, it was announced that the Adaptive Management Working Group was, quote, "administratively inactive." And they basically disbanded us and we were told through a newspaper article -- A reporter asked them, and the reporter told -- excuse me -- the Interior Department spokesperson Heather Swift told the reporter that the

TAMWG did not turn in the paperwork necessary to justify its existence.

Subsequently, a FOIA request was filed by the Eureka Times Standard, and it turns out all the paperwork was submitted in a timely manner.

And so, basically, we had a so-called Adaptive Management Working Group that was a Federal Advisory Committee. We were there to help implement adaptive management. We sent a very scathing letter last March, and after that, we never met again.

So my experience with adaptive management -- and this is just my own personal opinion -- is that it's a buzzword. It says, well, we'll -- we'll look and see if this works and, if it doesn't work, we'll try something else.

But -- And the Trinity program is trying to do a better job on adaptive management. But the Science Advisory Board for the program -- they have an independent Science Advisory Board -- they came out with a report, I don't know when it was, 2013 -- I don't remember exactly -- and they basically said the Trinity River Restoration Program was not properly implementing adaptive management.

I know there have been efforts to improve it, but my experience has not been positive. Let me say

that.

MR. HERRICK: When the -- When the Adaptive Management Program was ongoing, did it -- did it gather data, including real-time data, in an effort to adjust -- adjust operations to the benefit of the fisheries? Was that the purpose?

WITNESS STOKELY: Yeah, that was the purpose. If they tried something that was in the Record of Decision and it didn't necessarily work, then they would try something else.

But, normally, the adaptive management process would require a hypothesis. You test the hypothesis. If the hypothesis clearly doesn't work, then you develop another hypothesis and implement that.

And, in some cases, the program is -- just switched gears and tried something else without necessarily going through a formal process, at least according to the Science Advisory Board.

I will say that they have been trying harder in the last couple years, but it's difficult at best.

MR. HERRICK: Was the Bureau part of that process?

WITNESS STOKELY: Yes.

MR. HERRICK: And was there tension in the adaptive management process between what might be

recommended for fisheries and what the Operators of the Project were interested in doing?

WITNESS STOKELY: I would say, actually, there was more conflict between the Federal Advisory Committee Group, which was various stakeholders, and the Trinity Management Council, which is an eight-member Federal, State and Tribal body that is supposed to act like a Board of Directors.

So, in many cases, the Adaptive Management Working Group would make a recommendation, which would be rejected by the Management Council.

In some cases, they eventually came around. For many years, the working group who had a lot of fishing guides felt that the program was putting too much spawning gravel in the river. It was filling in pools and causing damage.

And we were told, no, no, no, no. We keep -- We have to keep adding all this gravel. Eventually, some of their scientists actually evaluated and then they determined that our group was actually right and probably an order of magnitude less of gravel needed be added to the river.

MR. HERRICK: So, based on your experience, would you -- would you caution this Board in approving any project that had a to-be-determined Adaptive

Management Program?

WITNESS STOKELY: Oh, yes. I would very much caution this Board about adaptive management.

Don't leave the details to the Bureau and DWR because you may not get the result you want.

MR. HERRICK: Mr. Stokely, is the Trinity River designated wild and scenic by State or Federal law?

WITNESS STOKELY: Yes, it is.

MR. HERRICK: By which or both?

WITNESS STOKELY: Both.

MR. HERRICK: And does that have any -- Does that designation have any effect on the operations of the Bureau?

WITNESS STOKELY: Not that I'm aware of.

MR. HERRICK: Is it supposed to have any effect on the operations of the Bureau?

WITNESS STOKELY: Well, I didn't adopt the Act so I'm not sure what the intention was exactly.

But it's my understanding that, generally, it prevents the construction of new reservoirs on wild and scenic rivers.

MR. HERRICK: I don't --

WITNESS STOKELY: I don't believe there's ever been a Management Plan prepared for the Trinity River

under the Wild and Scenic Rivers Act.

MR. HERRICK: Thank you.

Thank you all.

That's all I have.

CO-HEARING OFFICER DODUC: Thank you very much, Mr. Herrick.

Any redirect, Mr. Volker?

MR. VOLKER: Yes. Very briefly for Dr. Strange.

REDIRECT EXAMINATION BY

MR. VOLKER: Dr. Strange, you've indicated concerns with respect to fish disease in the Trinity River.

How does climate change affect the risk of fish disease?

WITNESS STRANGE: Yeah. That's just an important point to make is that sometimes there's a perception that the fish disease risks and the programs that we've implemented, like on the Trinity and Klamath, that it's a static situation.

But the reality is that, with climate change and global warming, is that it's not static. And part of that is directly through increased water temperatures as the -- as the climate warms. But there's multiple pathways, and so it becomes like an

additive or synergistic effect.

And so I think just the important take-home there from, like, a higher-level perspective is that the risk for a given pathogen causing a disease outbreak is likely going to increase over time, and, therefore, what we can do, what we have in our tool kit, then, is to increase our response.

And that includes the pathogens that we spoke to today, but it also could include pathogens that we are not anticipating right now.

For example, in 2002, you know, multiple parties warned the Bureau that the river was in really bad shape and they needed to increase the flows or something bad would happen. But no one actually anticipated Ich. Ich was not on anyone's radar on the Klamath until 2002.

So I just think it's really important for everyone to know that it's not a static situation. The risk is increasing so, when you're making your longer-term plans, you have to take that into account.

That's been made clear to the Bureau, but, you know, not with very much recognition, I don't think, at this point, so . . .

MR. VOLKER: Thank you.

Nothing further.

CO-HEARING OFFICER DODUC: Any recross based on that?

MR. MIZELL: (Shaking head.)

CO-HEARING OFFICER DODUC: All right. Not seeing any.

I had a question for Dr. Strange.

WITNESS STRANGE: Sure.

CO-HEARING OFFICER DODUC: Were you here when Mr. Oppenheim testified earlier today?

WITNESS STRANGE: Yeah. I was --

CO-HEARING OFFICER DODUC: He --

WITNESS STRANGE: -- trying to pay attention.

CO-HEARING OFFICER DODUC: He had some specific flow recommendations for the Lower Sacramento, for Freeport and I believe it was for Rio Vista.

WITNESS STRANGE: Yeah.

CO-HEARING OFFICER DODUC: As a fishery Biologist, do you concur or support those recommendations?

WITNESS STRANGE: I would have to, like -- like, read up on that more to give you an informed opinion.

But, you know, one of the things I find curious, if I may comment, is that the -- there are obviously salinity problems associated with the pumping

in the South Delta and that sort of concentrated in the South Delta.

And the California WaterFix and the tunnels, I think, is intended partly to fix that and yet it seems like it could, in fact, just create a new salinity problem in the North Delta.

So, to the extent that flows relating to salinity and needs for multiple fish species, I think it's important to kind of step back and review that.

CO-HEARING OFFICER DODUC: Thank you.

Thank you, Mr. Volker.

MR. VOLKER: Thank you.

And we'll introduce the testimony and exhibits at the end of all of the witnesses' testimony, then.

CO-HEARING OFFICER DODUC: And why don't we take a short break while you ask your third panel to come up.

Do you have a third panel?

MR. VOLKER: Our third panel will be appearing on Thursday. Ms. Brittani Orona.

CO-HEARING OFFICER DODUC: Ah, okay. My list is incorrect.

MR. VOLKER: Yes. Thank you.

CO-HEARING OFFICER DODUC: And, in that case, then, is there a -- Actually, I think I have a

housekeeping matter.

Hold on a second before we adjourn for the day.

All right. This is -- I have a ruling on -- based on -- The State Water Contractors moved to strike portions of Mr. Bratovich's oral testimony as falling outside the scope of his written testimony.

And, specifically, this was in reference to statements he made regarding different impacts occurring at different gradation of temperature and a statement about the lethality of temperatures in excess of 75 degrees.

We have reviewed the hearing transcript, Mr. Bratovich's written testimony, and the written response provided by the Water Forum and the ARWA parties.

We find that Mr. Bratovich's oral testimony was fairly within the scope of his written testimony, and inclusion of his statement regarding the lethality of temperature above 75 degrees would not result in any prejudice to the parties.

With that, the objection is overruled; the Motion to Strike is denied.

And that -- Unless there are any other housekeeping matter . . .

Where are we on Thursday?

We will be in the Coastal Hearing Room on Thursday.

We will start at 9:30 with case in chief by Clifton Court. Then we'll get to your remaining witness. Then North Delta C.A.R.E.S, Mr. Porgans, and Snug Harbor.

With that, thank you all, and we'll see you on Thursday.

WITNESS STRANGE: Thank you.

MR. VOLKER: Thank you.

(Proceedings adjourned at 4:01 p.m.)

State of California)
)
County of Sacramento)

I, Candace L. Yount, Certified Shorthand Reporter for the State of California, County of Sacramento, do hereby certify:

That I was present in the afternoon of the above proceedings;

That I took down in machine shorthand notes all afternoon proceedings had and testimony given;

That I thereafter transcribed said shorthand notes with the aid of a computer;

That the above and foregoing is a full, true, and correct transcription of the afternoon, and a full, true and correct transcript of all afternoon proceedings had and testimony taken;

That I am not a party to the action or related to a party or counsel;

That I have no financial or other interest in the outcome of the action.

Dated: April 21, 2018

_____
Candace L. Yount, CSR No. 2737

STATE OF CALIFORNIA)
) ss.
COUNTY OF MARIN)

I, DEBORAH FUQUA, a Certified Shorthand Reporter of the State of California, do hereby certify that the foregoing proceedings (Pages 1 through 99) were reported by me, a disinterested person, and thereafter transcribed under my direction into typewriting and which typewriting is a true and correct transcription of said proceedings.

I further certify that I am not of counsel or attorney for either or any of the parties in the foregoing proceeding and caption named, nor in any way interested in the outcome of the cause named in said caption.

Dated the 23rd day of April, 2018.

DEBORAH FUQUA

CSR NO. 12948