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01 PUBLIC HEARING  
02 STATE WATER RESOURCES CONTROL BOARD  
03 DIVISION OF WATER RIGHTS  
04 STATE OF CALIFORNIA

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08 SUBJECT: AMENDMENT OF CITY OF LOS ANGELES' WATER RIGHT  
09 LICENSES FOR DIVERSION OF WATER FROM STREAMS THAT ARE  
10 TRIBUTARY TO MONO LAKE

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14 Held in  
15 Sacramento, California  
16 Monday, Decmeber 13, 1993

17

18 VOLUME XXI

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24 Reported by: Kelsey Davenport Anglin, RPR,  
24 CM, CSR No. 8553

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01 BOARD MEMBERS

01

02 JAMES STUBCHAER, Hearing Officer

02 JOHN W. BROWN

03 MARY JANE FORSTER

03

04

04 STAFF MEMBERS

05

05 DAN FRINK, Counsel

06 JAMES CANADAY, Environmental Specialist

06 STEVE HERRERA, Environmental Specialist

07 RICHARD SATKOWSKI, Engineer

07 HUGH SMITH, Engineer

08

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23  
24  
24  
25  
25  
0003

COUNSEL AND OTHERS

01  
01  
02 For the U.S. Fish and Wildlife Service:  
02  
03 ERIKA NIEBAUER  
03 Assistant Regular Solicitor  
04 Office of Solicitor  
04 Pacific Southwest Region  
05 2800 Cottage Way  
05 Sacramento, California 95825  
06  
06 For the Sierra Club:  
07  
07 LARRY SILVER:  
08  
08 For California Department of Fish and Game:  
09  
09 HAL THOMAS  
10 VIRGINIA CAHILL  
10 McDonough, Holland & Allen  
11 555 Capitol Mall, Suite 950  
11 Sacramento, California 95814  
12  
12 For the U.S. Forest Service:  
13  
13 JACK GIPSMAN  
14 Office of General Counsel  
14 U.S. Department of Agriculture  
15  
15 For the National Audubon Society and Mono Lake  
16 Committee:  
16  
17 BRUCE DODGE  
17 PATRICK FLINN  
18 Attorneys at Law  
18 755 Page Mill Road  
19 Palo Alto, California 94304  
19  
20  
20 For California Trout:

21  
21 RICHARD ROOS-COLLINS  
22 CYNTHIA KOEHLER  
22 Attorneys at Law  
23 114 Sansome Street, Suite 1200  
23 San Francisco, California 94104  
24  
24  
25  
25  
0004  
01 COUNSEL AND OTHERS  
01  
02 For the City of LA and LA DWP:  
02  
03 THOMAS W. BIRMINGHAM  
03 JANET GOLDSMITH  
04 Attorneys at Law  
04 Kronick, Moskovitz, Tiedemann & Girard  
05 400 Capitol Mall, 27th Floor  
05 Sacramento, California 95814  
06  
06 For State Lands Commission, Department of Parks and  
07 Recreation:  
07  
08 MICHAEL VALENTINE  
08 Assistant Attorney General  
09 1515 K Street  
09 Sacramento, California 95814  
10  
10  
11 For Meter Water District of Southern California and  
11 LA MWD:  
12  
12 VICTOR GLEASON  
13 Attorney at Law  
13 1111 Sunset Boulevard  
14 Los Angeles, California 90050-0153  
14  
15 FRANK HASELTON  
15 Haselton Associates  
16  
16 JOHN ARCULARIUS  
17  
17  
18  
18  
19  
19  
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SACRAMENTO, CALIFORNIA  
MONDAY, DECEMBER 13, 1993, 8:30 A.M.  
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HEARING OFFICER STUBCHAER: Good morning.  
Mr. Del Piero is not here, so I'm going to act as  
Hearing Officer in his absence. We're going to have a  
broken schedule today because of a prior commitment.

08 We're going to recess at 10:15 this morning. Also,  
09 there's a brief hearing on the Big Bear Lake issue from  
10 one to three this afternoon, so we will not be in  
11 session on Mono from 10:15 until 3:00 p.m. I apologize  
12 for that, but that's the way it is. And we plan on  
13 terminating no later than five this afternoon.

14 Any questions on that?  
15 With that, Ms. Cahill, do you have your panel  
16 ready?  
17 MS. CAHILL: Mr. Thomas is preparing this panel.  
18 HEARING OFFICER STUBCHAER: Mr. Thomas. All  
19 right.  
20 Mr. Thomas, are you ready?  
21 MR. THOMAS: Just a second.  
22 HEARING OFFICER STUBCHAER: Before you begin, if  
23 we could have a little order in the audience, please?  
24 If you have discussions, please go out in the hallway.  
25 Before we begin, Mr. Thomas, if Mr. Del Piero does  
0007  
01 return from his other business, he may decide to go  
02 this evening. I don't know if that's the case,  
03 though. So when I said we're going to terminate at  
04 five, that's if I'm still the Hearing Officer.  
05 Now, Mr. Thomas, have your witnesses been sworn?  
06 MR. THOMAS: No, they haven't, Sir.  
07 HEARING OFFICER STUBCHAER: Would the panel please  
08 rise? Do you promise to tell the truth in these  
09 proceedings?  
10 (All say I do.)  
11 HEARING OFFICER STUBCHAER: All right. Be  
12 seated.  
13 MR. THOMAS: Good morning, Mr. Stubchaer. This  
14 morning we have three experts on our duck panel. We'll  
15 begin with Dr. Scott Stine followed by Ron Thomas,  
16 who's a biologist, a field biologist for the Department  
17 of Fish and Game, and ending with Dr. Frederic Reid  
18 with Ducks Unlimited.  
19 DIRECT EXAMINATION BY MR. THOMAS  
20 Q We'll start with Dr. Stine at this time.  
21 Dr. Stine, is MLC -- NAS/MLC 141 a true and  
22 correct copy of your qualifications?  
23 A DR. STINE: Yes, it is, and it was put in earlier and  
24 discussed.  
25 Q And is MLC/NAS Exhibit 1-U a true and correct copy  
0008  
01 of your direct testimony?  
02 A Yes, it is.  
03 Q Could you summarize your direct testimony, or  
04 would you like to start with your qualifications?  
05 A I would simply point out on the qualifications one  
06 thing beyond what I said last time and that is that  
07 there's one auxiliary report, one of the five that I  
08 wrote for the DEIR, that is particularly pertinent  
09 here, and it concerns historic and modern distribution  
10 of shore-fringing wetlands, Mono Lake, California.  
11 Other than that, I think the qualifications stand  
12 as I discussed them last time, and if you'd like me to  
13 summarize, then, my Exhibit 1-U, I'm in a position to  
14 do that now.  
15 Q Proceed. Thank you.

16 A This concerns ducks -- waterfowl, but ducks  
17 particularly on Mono Lake. The interest here has  
18 arisen because according to many historical witnesses  
19 who I consider to be reliable, Mono Lake and the  
20 surrounding areas were seasonally inhabited by large  
21 numbers of ducks during the period between the 1930s  
22 and the early to mid 1960s.

23 In the testimony that follows, I want to cover  
24 three elements of the duck environment there; first the  
25 environmental conditions that existed in these areas of  
0009

01 duck abundance between the 1930s and the early 1960s.

02 Secondly, the changes in the environments that  
03 occurred around the early to mid 1960s and, Thirdly,  
04 the measures that can be taken to reestablish the  
05 environmental conditions that prevailed during the  
06 period of duck abundance.

07 I have here an exhibit that we have numbered  
08 Exhibit 159, that is --

09 HEARING OFFICER STUBCHAER: Mr. Stine, would you  
10 please take the mike for the purpose of the tape  
11 recorder? We can certainly hear you, but --

12 DR. STINE: This has been marked as Exhibit  
13 NAS/MLC 159. It's a photo composite showing --

14 Q BY MR. THOMAS: Dr. Stine, that's NASMLC --

15 A BY DR. STINE: NAS/MLC 159. Yes, that's right.

16 -- showing Mono Lake as it existed in 1930, and  
17 what I've done here is simply to piece together the  
18 photographs, the aerial photographs, from 1930 to  
19 create this photo mosaic.

20 There were four general areas of duck abundance on  
21 and around Mono Lake. The first of the areas was on  
22 Mono Lake itself, on and immediately adjacent to Mono  
23 Lake in areas that I'll be pointing out here in a  
24 little while.

25 The second was the lagoons that occurred along the  
0010

01 north shore of Mono Lake, and you can see the large  
02 lagoons that existed right here along the northern  
03 shore. We call these the North Shore Lagoons and they,  
04 too, were an area of duck abundance.

05 The third area was the Rush Creek bottom lands, an  
06 area that I discussed last time, and you've seen  
07 photographs of that.

08 The fourth area is immediately above Grant Lake in  
09 an area that no one has discussed much yet. And this  
10 is exhibit -- unmarked, actually, so we'll need a  
11 number for this one.

12 Q Fish and Game 164.

13 A 164, did you say?

14 Q 164.

15 A What this photograph shows is, again, 1930. What  
16 the photophaph shows is --

17 MS. GOLDSMITH: Objection. I believe this goes  
18 beyond the scope of the direct examination.

19 MR. SMITH: I'd also like to make a point of order  
20 here, too. 164 is not -- is not this exhibit.

21 MR. THOMAS: Next in order Fish and Game 164.

22 HEARING OFFICER STUBCHAER: This is direct  
23 examination, I believe, it's not cross.

24 MS. GOLDSMITH: That's right, and I have an  
25 objection to this because I don't believe this was  
0011 included in the direct testimony that was submitted to  
01 the Board. Nothing concerning Grant Lake was  
02 submitted.  
03  
04 MR. THOMAS: We've heard an extensive amount of  
05 testimony in the direct of Los Angeles Water and Power  
06 regarding waterfowl in the Mono Basin and on the  
07 Crowley, Upper Owens, and Grant Lake as it relates to  
08 waterfowl populations, and we were merely examining  
09 that issue in some detail as the issue was brought up  
10 before.  
11 MS. GOLDSMITH: Mr. Chair.  
12 HEARING OFFICER STUBCHAER: Yes.  
13 MS. GOLDSMITH: Testimony concerning Crowley Lake  
14 waterfowl was submitted by L.A. DWP with its direct  
15 testimony.  
16 HEARING OFFICER STUBCHAER: It appears to me that  
17 to introduce new testimony now is kind of a surprise to  
18 the other parties. They don't have an opportunity to  
19 prepare for cross-examination. I'm going to consult  
20 with Mr. Frink a moment.  
21 MR. THOMAS: In addition, Fish and Game Exhibit,  
22 I think it's 195 was submitted showing 1940 duck kills.  
23 In our direct testimony, in those 1940 duck kills,  
24 there are ducks killed in this location, and I will  
25 show you --  
0012  
01 HEARING OFFICER STUBCHAER: That's all right.  
02 I'm going to rule. I'm going to sustain the objection,  
03 and you may introduce it during your rebuttal  
04 testimony.  
05 MR. THOMAS: Sir, I'm -- I beg the Chair's  
06 understanding. We have introduced in our direct  
07 testimony information as to ducks killed at this  
08 location. I can show you on --  
09 HEARING OFFICER STUBCHAER: Are you testifying?  
10 MR. THOMAS: My point, Sir, is that this does not  
11 go beyond our direct because, in fact, in our direct we  
12 talked about ducks killed at this location in 1940.  
13 This is very pertinent to the pre-diversion  
14 conditions. All we're doing is showing you a map of  
15 what we showed you on DFG --  
16 HEARING OFFICER STUBCHAER: I think you can  
17 introduce that map during rebuttal, but it's not  
18 appropriate to use it at this time.  
19 MR. THOMAS: Whatever your ruling, Sir.  
20 Proceed, Dr. Stine.  
21 DR. STINE: I'll restrict myself, then, to the  
22 three areas of duck abundance; the first being, as I  
23 said, the lake on and immediately adjacent to the lake.  
24 The second area being the lagoons on the north shore of  
25 the lake here and here, and the third being, then, the  
0013  
01 Rush Creek bottom lands.  
02 HEARING OFFICER STUBCHAER: Mr. Stine, would you  
03 please get the mike?  
04 DR. STINE: Yes.  
05 What I wanted to do here, then, is to discuss each

06 one of these in some amount of detail. The first,  
07 then, is the lake itself, the areas on and immediately  
08 adjacent to the lake. And I'll refer here to -- let's  
09 see, I think it is Fish and Game exhibit -- no, I  
10 believe it's the NAS/MLC Exhibit 176 which shows Mono  
11 Lake as drawn by Walter Dumbrowski in the mid 1940s,  
12 and what Mr. Dumbrowski, who was a Mono Basin resident,  
13 was doing here was showing the areas where -- excuse me  
14 a minute -- showing those areas where ducks were  
15 abundant on Mono Lake. Mr. Dumbrowski made duck counts  
16 on Mono Lake and then mapped as these arcs here the  
17 areas where the ducks were most abundant. The arcs are  
18 shown in the dashed lines, the arcs close on the shore  
19 of Mono Lake. He also then has a percentage of the  
20 total duck population that he was finding in these --  
21 in these various -- various areas here.

22 Now, what struck me about this map was that --  
23 what I found intriguing was that this was not only a  
24 map of duck abundance, but it was also a map of fresh  
25 water on Mono Lake. In all cases, the areas of duck

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01 abundance coincide with those very areas where fresh  
02 water enters Mono Lake. In a couple instances, this is  
03 obvious because we have Rush Creek flowing in here from  
04 the south, Lee Vining flowing in here from the south on  
05 the map and, in both cases, these terminate in a big  
06 arc that projects out into the water.

07 The other areas and their association with water  
08 are perhaps less obvious, but starting up here at the  
09 sort of eleven o'clock position, ten o'clock position  
10 on this map, we have the Monte Vista Springs area which  
11 is an area where Wilson Creek, Mill Creek, and the  
12 Monte Vista Springs put water into the lake.

13 Proceeding clockwise around the lake at about the  
14 eleven o'clock area, 15 percent of the ducks shown at  
15 the DeChambeau Ranch area, this is an area where an  
16 artificial branch of Wilson Creek together with some  
17 natural springs put water on to the lake.

18 The third area over here at approximately two  
19 o'clock proceeding around the lake is the Warm Spring  
20 area, Warm Springs area, it should be, that, too, is an  
21 area where water is coming in to Mono Lake. Likewise,  
22 down here at approximately four o'clock, it's called  
23 the Salmon Springs area, most people know that as the  
24 Simons Springs area, and then finally the Tufa area  
25 down here on the very south shore of the lake where

0015

01 South Tufa exists today, and that, too, was and, to a  
02 lesser extent, remains an area of spring activity on  
03 the lake.

04 Now, the remarkable thing about fresh water  
05 flowing into Mono Lake is that it doesn't flow into  
06 Mono Lake and immediately mix as, say, water in Lake  
07 Tahoe would flow into -- or streams would flow into  
08 Lake Tahoe and mix. Rather because Mono Lake is so  
09 very saline, the fresh water floats on the top of Mono  
10 Lake, a phenomenon that is referred to as hypopycnal  
11 flow, H-Y-P-O-P-Y-C-N-A-L, referring to the density  
12 difference between the upper fresh water layer, which  
13 tends to be light, and the lower salt water layer,



14 which tends to be very heavy.

15 Hypopycnal stratification is something that I've  
16 seen a number of times at Mono Lake. It occurs most  
17 abundantly, or most conspicuously at the mouths of the  
18 streams where large amounts of fresh water are going  
19 into the lake, but it occurs in other places as well  
20 under the proper conditions.

21 I'd like to go to slides, if I could, and show a  
22 couple of examples of hypopycnal stratification, if you  
23 can get those. This first slide --

24 HEARING OFFICER STUBCHAER: I hate to be sticky  
25 about this, but --

0016

01 DR. STINE: I'm sorry. This first slide is taken  
02 in 1986 at the mouth of Rush Creek, and what we're  
03 seeing here is a lens of fresh water moving out on to  
04 the lake at the stream mouth. One of the things that I  
05 like about this and that I think is particularly  
06 illustrative of the phenomenon is that you have a line  
07 of breakers, of white caps that are breaking, lake  
08 waves that are breaking on the lens of the fresh water  
09 illustrating the density difference there between the  
10 two waters.

11 Q BY MR. THOMAS: Dr. Stine, this is NAS 178?

12 A BY DR. STINE: This is NAS/MLC 178 and the subsequent  
13 slide here is NAS/MLC 177.

14 What I'm showing here is a rather unusual case of  
15 hypopycnal stratification at DeChambeau Creek. I point  
16 it out only as an example of how different the specific  
17 gravities, different the densities are of these two  
18 waters. What has happened here is that DeChambeau  
19 Creek has cut a trench because Mono Lake was low. Mono  
20 Lake then rose, and a tongue of the salt water made its  
21 way up into the ria, we call it, R-I-A, into the stream  
22 channel. This rather brownish-pinkish material right  
23 down through here in the lower and left portions of the  
24 slide are brine shrimp, and the brine shrimp are living  
25 in this layer of very salty water that is hugging the

0017

01 creek bottom.

02 Meanwhile, the fresh water is moving outward over  
03 and to the lakeward, but over the top of the salt  
04 water. It was a very interesting phenomenon to observe  
05 because the brine shrimp are going back and forth like  
06 this slowly driven by waves on the lake whereas the  
07 salt water is uni-directional. It's traveling at the  
08 same rate and in the same direction all the time. But  
09 again, just simply an example of the hypopycnal  
10 stratification. Thank you.

11 The -- I'll go to this one in a second. So just  
12 leave it on there, John, if you would. The ultimate  
13 fate of the fresh water that moves on to Mono Lake is  
14 to mix with the salt water. This mixing is achieved  
15 through the agency of wind-induced waves. The waves  
16 provide the energy that then mixes the fresh water with  
17 the salt water. The waves, of course, and therefore,  
18 the mixing is particularly pronounced in the open water  
19 of the lake particularly here off the Rush and the Lee  
20 Vining Creek deltas, and we would expect, then, this  
21 kind of mixing to go on more in the open water of the

22 lake. The reason that we could have these hypopycnal  
23 lenses persisting around the mouths of the streams is  
24 because we have a considerable amount of fresh water  
25 coming in at those places.

0018

01 Well, what about in these areas where we have less  
02 fresh water coming in? How is it that the fresh water  
03 was able to persist, then, on the lake surface as a  
04 hypopycnal stratum? The answer, I think, is that in  
05 all cases, with the exception of the stream mouths  
06 themselves, in all cases, the fresh water was coming  
07 into the lake at areas of still-water coves. And here  
08 is an example of one of those still-water coves right  
09 here. This is the DeChambeau Ranch area, DeChambeau  
10 Ranch area as shown here at about the ten o'clock,  
11 eleven o'clock position on --

12 MR. THOMAS: Dr. Stine --

13 HEARING OFFICER STUBCHAER: You have to identify  
14 the exhibits that you --

15 DR. STINE: I'm sorry. Of course, I do, and some  
16 day I'll be good at this, perhaps.

17 This is Exhibit NAS/MLC 179, okay? And on Exhibit  
18 179, as I say, we see a cove here that is protecting,  
19 in a sense, the water, the fresh water that enters Mono  
20 Lake by way of this diverted channel of Wilson Creek  
21 here, so that the water, the fresh water, can build up  
22 in the cove that sits immediately off shore, a cove  
23 that's been built by the erosion of -- easily erodible  
24 volcanic material from Black Point, the big blob shown  
25 just to the left of center in the photograph.

0019

01 The next slide is NAS/MLC Exhibit 182. This shows  
02 Warm Springs in about 1956. The lake level here is  
03 just about 6404, 6405 feet, and one can even get a  
04 sense of the currents that are moving from left to  
05 right on here carrying sand as they go. You can see  
06 the coves, the embayments here that are protecting  
07 fresh water that's making its way into the lake from  
08 these marshlands right here. These are the sources of  
09 the fresh water, the dark-banded areas that we see  
10 here. The fresh water can then build up on the lake  
11 surface and persist in these coves with less chance of  
12 mixing due to waves.

13 The, let's see, next slide is MLC -- pardon  
14 me, NAS/MLC Exhibit 180. This is Simons Springs.  
15 This, now, is down at the four o'clock or so position  
16 of Mono Lake as shown on NAS/MLC 176 and once again, I  
17 would use this simply to point out the bays, the  
18 embayments, the coves, that existed here at Simons  
19 Springs as well that were then able to trap the water,  
20 protect the relatively small amount of fresh water that  
21 was going into the lake, keep it still for enough time  
22 to provide a fresh water lens on the lake at these  
23 sites. The message here, I think, is that anything  
24 floating on this lake, be it a stick, or a duck, or  
25 anything else, a piece of pumpice, was essentially

0020

01 floating in fresh water at particular sites around the  
02 lake. We had a fresh water skim at numerous sites  
03 around the lake.

04 Now, another thing that characterized these  
05 various -- these various areas of duck abundance, in  
06 all cases -- we had hypopycnal stratification, but in  
07 all cases, it was adjacent to marshlands and that shows  
08 up well here on Exhibit 180, NAS/MLC 180. The dark  
09 band here at Simons Springs just to the right and to  
10 the left of the fault -- here's a fault, which is why  
11 that point is there. Faults are the reason why many of  
12 these coves exist. But the dark bands that exist to  
13 either side of the fault here are areas of marshland,  
14 and it seems to have been this combination of fresh  
15 water and -- floating on the lake surface and marshland  
16 that coincided with the duck abundance.

17 Can we go back one slide, please? We're going  
18 back now to Exhibit 182 where we were a moment ago, and  
19 I would simply, again, point out the marshlands that  
20 were adjacent to the coves here on this slide as well.

21 Okay. Now, let's see. If we can go forward two,  
22 John.

23 HEARING OFFICER STUBCHAER: Just pardon me a  
24 minute. When you say "point out marshlands here on  
25 this slide," in the written record, that doesn't read

0021

01 too well.

02 DR. STINE: If we can go back, John, here, then?  
03 One more? It is the dark areas here that lie  
04 immediately -- let's see. What are we looking at  
05 here? It would be immediately east of the fault that  
06 constitutes the reason for the embayment there. In  
07 other words, immediately down -- as we're viewing the  
08 slide here, immediately down from the coves  
09 themselves. This is the Warm Springs area -- excuse  
10 me. Yes. Okay. Let's then -- we'll hold it there for  
11 one moment, John.

12 Let's go to this concept of lagoons, and what I  
13 would like to do is discuss for a moment the lagoons  
14 that existed on the north shore of Mono Lake, the  
15 so-called North Shore Lagoons. I would point out  
16 several things. First of all, they were large --  
17 John. I need a -- something to draw on here. They  
18 were large, constituting approximately 216 acres. They  
19 were brackish water --

20 MS. SOMACH: Excuse me, Dr. Stine. You're failing  
21 to give us the exhibits. I apologize for  
22 interrupting. Is that NAS 159?

23 DR. STINE: This is NAS/MLC 159, yes. Let's put  
24 it up on this one, yeah.

25 Great. I need something to write with, though.

0022

01 These lagoons constituted approximately 216 acres.  
02 They were brackish water. That is to say, they were a  
03 combination of fresh water that was coming in from the  
04 landward and salt water that was coming in -- thanks --  
05 from the lake. They were also permanent features, and  
06 Dr. Jehl the other day correctly pointed out in the  
07 sense that the lagoons forming today at Mono Lake are  
08 temporary features. Indeed they are.

09 The lagoons that existed previously, though, the  
10 lagoons in the pre-DWP years, were permanent features.  
11 They were there week after week, month after month,

12 year after year. They're there on the 19 -- pardon me,  
13 the 18 -- the maps from the 1850s and sixties. They're  
14 there all the way up until Mono Lake drops below an  
15 elevation of about 6400 feet. That's when they --  
16 that's when they disappear. So these lagoons, in any  
17 case, were permanent features.

18 What I'd like to do here is draw a cross-section  
19 of these lagoons and make sure that people are aware of  
20 the composition of these features. They lie to the  
21 landward side of a large burm, and this burm is  
22 composed of material that has been eroded from here,  
23 from Black Point. The waves move along the shoreline  
24 in the clockwise direction in this portion of the lake  
25 eroding debris from Black Point, depositing it up here

0023  
01 in the north shore of the lake as a big burm like this.  
02 And so what we get is a lagoon sitting to the landward  
03 dammed, in a sense, from the rest of the lake by that  
04 big -- by that big burm.

05 Water comes in from the landward this way, it's  
06 coming in from bringing fresh water, and we have salt  
07 water, then, from the lake itself moving through the  
08 burm and getting into the lagoon. Now, we know that  
09 these were brackish water features because, first of  
10 all, we have accounts from L.A. DWP personnel, most  
11 notely, Charles Lee (phonetic) from the 1930s, saying  
12 they were brackish. He was out there on site.

13 Secondly, we have diatoms taken from these --  
14 taken from these areas. The diatoms indicate that this  
15 was indeed not a fresh-water species, not a salt-water  
16 species, but rather a brackish species, in other words,  
17 a brackish water environment there.

18 HEARING OFFICER STUBCHAER: Pardon me. Is this  
19 going to be an exhibit?

20 MR. THOMAS: Yes.

21 Dr. Stine, if you can mark that --

22 HEARING OFFICER STUBCHAER: And again, when you  
23 say "comes in here," it's not clear. It's not labeled.  
24 The water's coming in from the left, the fresh water's  
25 coming in from the left, the burm is in the middle.

0024  
01 So we need to get things in the written record that  
02 will identify the exhibit.

03 DR. STINE: I tried there to say the landward  
04 versus the lakeward --

05 MR. THOMAS: Dr. Stine, that would be DFG 165.

06 HEARING OFFICER STUBCHAER: Why don't you just  
07 write "fresh" by that arrow, fresh water, something  
08 like that. And then lake.

09 DR. STINE: Okay. The third environment, the  
10 third and, I guess, last environment that I'll talk  
11 about here is the Rush Creek bottom lands, and I think  
12 that the next slide there shows the Rush Creek bottom  
13 lands as NAS/MLC Exhibit 192. This is the -- NAS/MLC  
14 192. It's the Rush Creek bottom lands. I talked about  
15 it the other day. I won't say too much more except to  
16 point out that it is a rather unusual portion of Rush  
17 Creek in that where the stream doesn't occupy a  
18 V-shaped canyon bottom, it's a very wide canyon bottom,  
19 over a thousand feet wide. It's composed or

20 characterized by multiple channels. It's easily  
21 flooded so that we have marshlands standing around many  
22 areas of the Rush Creek bottom lands, and this was one  
23 of the areas reported to have been characterized by  
24 large numbers of ducks.

25 The springs -- that's off track. Excuse me. Note  
0025

01 here on the very northern edge of this exhibit that  
02 right at the stream mouth, we have a burm that has  
03 formed there. This is a rather temporary feature, but  
04 we had a lagoon behind that burm, too, on the Rush  
05 Creek delta. And these kinds of features, these  
06 lagoons here, were common around Mono Lake, so it  
07 wasn't just the large lagoons. It was other more  
08 ephemeral lagoons as well that provided some habitat,  
09 according to these early witnesses.

10 The next slide is --

11 MR. HERRERA: Excuse me, Mr. Thomas. Your time  
12 has elapsed.

13 MR. THOMAS: We would petition for an  
14 additional -- 15 minutes?

15 DR. STINE: 15 minutes.

16 MR. THOMAS: 15, in light of the public trust  
17 importance -- the importance of the subject matter to  
18 the public trust balancing that the Board is conducting  
19 and the technical detail that the Board needs to  
20 understand.

21 HEARING OFFICER STUBCHAER: The purpose of the  
22 direct testimony, as you know, is to summarize the  
23 written testimony, and so I think that a good case is  
24 going to be made for granting more time in the case of  
25 cross-examination, but on direct testimony, I'd like to

0026

01 see the summaries more concise. And I'll give you  
02 another ten minutes, but please try and keep the  
03 subsequent witnesses to the allotted time.

04 MR. THOMAS: Sir, I will certainly take your  
05 instructions to heart. I would encourage you to be  
06 equitable in your view of this matter because we have  
07 sat through many, many overruns of the 20-minute time  
08 with Los Angeles Department of Water and Power has been  
09 generous in their petitioning. We will do our best to  
10 be brief, but this is an important part of the case.  
11 And we do not want to cut off the evidence --

12 HEARING OFFICER STUBCHAER: Well, the evidence is  
13 already submitted, isn't it?

14 MR. THOMAS: The evidence is submitted but to have  
15 these visual exhibits explained to you is important  
16 because these are highly technical issues that perhaps  
17 would not show up in a slide that just sits in the  
18 record without explanation.

19 Thank you.

20 DR. STINE: Next slide, please, is NAS/MLC Exhibit  
21 205. It's been shown before. I put it in only to  
22 remind people of the amount of standing water, slowly  
23 moving and standing water that existed in the Rush  
24 Creek bottom lands.

25 The next slide is NAS/MLC Exhibit 207. Once  
0027

01 again, just to emphasize the amount of slowly moving,

02 spread-out water with the cress beds and what not that  
03 characterize the Rush Creek bottom lands.

04 Now, briefly, what happened to these -- these  
05 environments? First of all, the lagoons -- why don't  
06 we turn that off and maybe the lights on there. The  
07 lagoons desiccated simply because Mono Lake fell, and  
08 as Mono Lake dropped to lower and lower elevations and  
09 dropped indeed below the elevation of the burm shown on  
10 DFG 165, the lagoon simply drained, so that they  
11 haven't existed since approximately 1960 or so when the  
12 lake dropped down below or approached 64 -- 6400 feet  
13 in elevation.

14 A second element here is that the -- the water was  
15 cut off from the streams. DWP diverted the water on  
16 both Rush and Lee Vining Creeks effectively, at least  
17 temporarily, doing away with the hypopycnal lenses that  
18 existed at the mouths of these streams. Over time, the  
19 lake withdrew from the marshlands as well, from the  
20 marshlands and from the coves, and so today, as the  
21 lake exists today, we no longer have the coves that  
22 characterized the area previously.

23 Q BY MR. THOMAS: Dr. Stine, that's NAS 142?

24 A BY DR. STINE: This is NAS/MLC --

25 Q I think it's 142.

0028

01 A I believe it's 152. Actually -- no. You're  
02 right. 142, excuse me.

03 This is an aerial photo mosaic that was produced  
04 from photos that were taken in 1982, and I would point  
05 out here that an embayment no longer exists here at  
06 Warm Springs such as occurred previously. The  
07 embayment no longer exists here at Simons Springs such  
08 as existed previously. Likewise, the embayment that  
09 existed here at the DeChambeau Ranch area is not gone  
10 as well.

11 Furthermore, it's important the point out that the  
12 water sources that gave rise to the marshes, the water  
13 sources themselves, are now distant from shore and  
14 rather than the fresh water coming basically out of the  
15 ground flowing a very short distance and going into  
16 Mono Lake as a concentrated stream, the fresh water is  
17 now diffused over a large area of the shore lands and  
18 it goes into -- enters Mono Lake in a large number of  
19 areas. The ability for water to build up, then, as  
20 hypopycnal stratum at these various areas is diminished  
21 for two reasons, first of all, water being more diffuse  
22 here on the lands. And, Secondly, a lack of coves, a  
23 lack of embayments for the water to -- to build up.

24 We've also lost marshlands at the Rush and the Lee  
25 Vining Creek deltas, and that's been because of

0029

01 incision of the deltas by the streams. Mono Lake has  
02 dropped in ways that I discussed last time. Mono Lake  
03 has dropped as a result. Rush, Lee Vining, Mill Creeks  
04 have in sites, they've lowered the water table,  
05 therefore, on the delta surfaces so that while today,  
06 we have fresh water going back into the lake at these  
07 sites, we no longer have it -- have the fresh water  
08 adjacent to the -- adjacent to the fresh water marshes  
09 that used to exist.

10 I should point out that there has been an increase  
11 in marsh area; marshlands themselves are today somewhat  
12 larger than they used to be, but that they are  
13 different. Different in that they're not immediately  
14 adjacent to the lake, different in that they're not  
15 associated with hypopycnal natural waters off shore.  
16 All right.

17 What would be required to give these -- get these  
18 environments back, to restore these conditions? First  
19 of all, the Rush Creek bottom lands, we could get water  
20 back into the bottom lands of Rush Creek, get it to  
21 flood again, get water spread out, return the  
22 marshlands if we rewatered abandoned channels similar  
23 to what we talked about in relation to fish last week.

24 Secondly, the brackish water lagoons, the big  
25 lagoons that used to exist up here on the north shore  
0030 of Mono Lake and today are missing. As we can see here  
01 on NAS/MLC 142, the lagoons are gone. We would have to  
02 pull the lake back up to about 6405 feet to restore  
03 those environments.  
04

05 The -- there's a -- well, let's look at one more  
06 slide here if we can. Here, I'll do it, John. I have  
07 a couple other -- this is the mouth of Rush Creek in  
08 1985. Mono Lake has risen into the stream cut, itself,  
09 and --

10 Q Dr. Stine, NAS/MLC 184?

11 A Yes.

12 Mono Lake has risen into the stream cut there, and  
13 we've created a lagoon-like environment here. I point  
14 this out simply because the DEIR, Jones and Stokes,  
15 have referred to this as a lagoon. It isn't truly  
16 lagoonal, but this is what they have mind when they say  
17 that we would gain six acres of lagoon if Mono Lake  
18 rose to 6383.5 feet. 16 acres of this kind of habitat  
19 which they're calling lagoon would exist if the lake  
20 rose to 6390 feet. We're not talking about the  
21 hundreds of acres of lagoon that existed previously.

22 If you'll go back one slide, please?

23 Q Dr. Stine, I'm sorry. I may have misspoke. 185,  
24 is that your Exhibit 185?

25 A Fine, 185? What did you call that?

0031

01 Q I said 184.

02 A Okay. 184 is this slide here. This is a slide  
03 of -- that's NAS/MLC 184. This is a slide of the  
04 Simons Springs area. I would put it in to show how the  
05 embayments are gone, the lake used to be in these  
06 semicircles here. Also, the extent to which water is  
07 being now diffused over a large line of the shore and  
08 notice, if you would, please, this lagoon right here.  
09 This is the type of lagoon that Mr. Tillemans pointed  
10 out existing around the lake. This constitutes today  
11 approximately 12 to 16 acres. Once again, it's not the  
12 216 acre totals that we were talking about when Mono  
13 Lake was high. Most of that 12 to 16 acres, by the  
14 way, is salt-water lagoon. This one here happens to be  
15 fresh water, but most of the small amount of lagoon  
16 that exists today is salt water -- salt-water lagoon.

17 Finally, to get Mono Lake up again to where it

18 actually embays the coves, puts the marshland  
19 immediately adjacent to the lake, and allows hypopycnal  
20 waters to persist in the coves, we would there, too,  
21 have to get Mono Lake up to between 6400 and 6405 feet.  
22 And, finally, to get Mono Lake up to the point where we  
23 have marshes on the deltas and so hypopycnal water in  
24 contact with marshes at the deltas, Mono Lake would  
25 have to be up at about 6400 to 6405 feet. In other

0032

01 words, roughly halfway between Judge Finney's 6377  
02 order and where the lake would be today but for  
03 diversions.

04 Thank you.

05 Q Thank you very much, Dr. Stine.

06 Sir, have we made our ten minutes?

07 HEARING OFFICER STUBCHAER: I have to ask the  
08 timer.

09 MR. HERRERA: Yes, you did.

10 MR. THOMAS: Thank you.

11 Could we have a couple of minutes to rearrange  
12 slides so there's no confusion as to exhibits?

13 HEARING OFFICER STUBCHAER: Yes.

14 MR. THOMAS: Thank you.

15 MS. GOLDSMITH: While they are doing this, we  
16 would note that we don't have color copies of any of  
17 these slides, and we would ask that they be provided to  
18 us.

19 HEARING OFFICER STUBCHAER: Mr. Thomas?

20 MR. THOMAS: The NAS/MLC exhibits were not  
21 photocopies, so I don't have control of those.

22 HEARING OFFICER STUBCHAER: Most of the aerial  
23 photos were black and white.

24 MS. GOLDSMITH: But there were some color slides  
25 that were shown.

0033

01 HEARING OFFICER STUBCHAER: Could you provide  
02 copies of the color slides that were shown?

03 MR. THOMAS: Certainly. We'll make a note of  
04 that.

05 MR. BIRMINGHAM: May I confer with Mr. Thomas,  
06 Mr. Stubchaer?

07 HEARING OFFICER STUBCHAER: Yes.

08 MR. THOMAS: Mr. Birmingham's informed me that  
09 L.A. DWP does have color copies.

10 HEARING OFFICER STUBCHAER: Good.

11 MR. THOMAS: We have no additional slides.

12 MR. BIRMINGHAM: Would it help if you had a spare  
13 tray to arrange the slides in beforehand?

14 MR. THOMAS: I think he's almost done. We just  
15 had a few that we were sharing. Again, our  
16 reproduction ability is a little more limited than the  
17 other parties in this proceeding.

18 HEARING OFFICER STUBCHAER: Is there anything that  
19 could be done in the absence of the slides? You can go  
20 in the back room and sort them, if you like.

21 MR. THOMAS: That's a good suggestion, Sir.

22 Thank you for your patience, Mr. Stubchaer. Our  
23 next witness is Ron Thomas who's a field biologist for  
24 the Department of Fish and Game.

25 Q BY MR. THOMAS: Mr. Thomas, is DFG Exhibit 21 the



0034

01 true copy of your written testimony?  
02 A BY MR. RONALD THOMAS: Yes, it is.  
03 Q And is DFG Exhibit 2 a true copy of your  
04 qualifications?  
05 A Yes, it is.  
06 Q Do you have any corrections to your written  
07 testimony?  
08 A Yes, I have.  
09 HEARING OFFICER STUBCHAER: Pardon me, could you  
10 get the black mike and pull it close to you, please?  
11 MR. RONALD THOMAS: Yes, I have several  
12 corrections to my written testimony.  
13 Q BY MR. THOMAS: If you could read those corrections  
14 slowly into the record with the mike as close as  
15 possible so that the record accurately reflects your  
16 concerns.  
17 A BY MR. RONALD THOMAS: The first correction I would  
18 like to make is on Page 2 in Paragraph 5 of my written  
19 testimony which now reads, quote, RD basis --  
20 MS. GOLDSMITH: Excuse me. The paragraphs are not  
21 numbered, and if he could refer to it by full  
22 paragraphs and line, I can correct my copy as well.  
23 HEARING OFFICER STUBCHAER: Do you have a written  
24 copy of your corrections or extra written copies of  
25 your corrections?

0035

01 MR. RONALD THOMAS: I believe I do.  
02 MR. THOMAS: I can state that corrections A  
03 through -- the first four corrections are typographical  
04 in nature and shouldn't bother Counsel --  
05 HEARING OFFICER STUBCHAER: If she could just  
06 refer to it, if there's a copy of it, just for ease of  
07 reference, not for content.  
08 MR. THOMAS: I'll see if we've got an extra copy  
09 of the corrections.  
10 HEARING OFFICER STUBCHAER: And Staff, do you have  
11 copies, or will we get it later?  
12 MR. FRINK: We could get it later. If they're not  
13 too extensive, we can get them as you read them into  
14 the record.  
15 MR. RONALD THOMAS: They're brief.  
16 MR. THOMAS: Proceed, Mr. Thomas.  
17 MR. RONALD THOMAS: Again, on Page 2, Paragraph 5,  
18 where it reads, "RD Bases," I would change that to a  
19 singular "a basis".  
20 Q BY MR. THOMAS: Next?  
21 A BY MR. RONALD THOMAS: On Page 3, Paragraph 1, I  
22 would delete the words "an open," which is hyphenated  
23 to read, quote, "nearby fresh water broading areas".  
24 Q Okay.  
25 A And on Page 4, Paragraph 5, I would delete the  
0036  
01 word "diversity" in the fourth line of that paragraph.  
02 Q Next.  
03 A On Page 9, Paragraph 7, change the word "ecology"  
04 to "ecosystem".  
05 MR. CANADAY: Where is that?  
06 MR. THOMAS: Page 9, Paragraph 7.  
07 MR. RONALD THOMAS: And also on Page 9, Paragraph

08 7, I would correct the next to the last sentence to  
09 read, quote, it is my opinion that habitat capability  
10 can be restored to support 280 ducks per acre of fresh  
11 water habitat based on my analysis of the 1948 Pacific  
12 flyway surveys at Mono Lake."

13 Q BY MR. THOMAS: Does that conclude your corrections?

14 A BY MR. RONALD THOMAS: Yes, it does.

15 Q Could you summarize, now, your written testimony  
16 for us and in light of the time constraints, I would  
17 urge brevity when possible. I'm sorry. Please give us  
18 your qualifications. Same admonishment about brevity.

19 A I hold a Bachelor of Science degree in biological  
20 conservation. I've worked for the Department of Fish  
21 and Game since 1969. For the past 23 years of that  
22 period, I've been a field biologist in various areas of  
23 Central and Southern California.

24 In the years 1972 to 1979, I worked in the  
25 central -- southern part of the Central Valley, San  
0037

01 Joaquin Valley, where my major responsibility was lead  
02 biologist in charge of the work we did on waterfowl and  
03 shore birds including leading the department's efforts  
04 in control of waterfowl botulism during those years.  
05 That work included a lot of aerial survey work, reading  
06 of aerial maps, directing the control efforts, as well  
07 as population and distribution surveys of waterfowl and  
08 shore birds.

09 During that same period, another major duty that I  
10 was involved with was the control and eradication of  
11 oil sumps in the San Joaquin oil fields that were  
12 killing thousands of water birds per year. That work  
13 also required extensive aerial surveys, use of aerial  
14 photos to determine waterfowl habitat areas as well as  
15 problem areas that were causing the loss of these large  
16 numbers of water birds.

17 Other work I performed over the years have been  
18 live captures and field research on big game species  
19 such as elk, deer, bear, antelope, mountain lion,  
20 bear. Much of that work also involved aerial work,  
21 using photos, helicopters, taking photos, as well as  
22 examining aerial photos.

23 I produced a number of technical reports including  
24 management plans for various wildlife species, and I  
25 published scientific papers on the status of the  
0038

01 California elk population and on the techniques of  
02 helicopter capture of Great Basin mule deer.

03 In addition, I worked in Mono County since 1981.  
04 My work there has included a number of different areas  
05 but is concentrated to some extent on various land  
06 development proposals such as wetlands alterations,  
07 water rights, energy projects, recreation and housing,  
08 and a number of other environmental review projects.  
09 My routine duties in that area also include population  
10 surveys of deer and waterfowl, upland game, and other  
11 species.

12 In addition, I have hunted ducks for over 35 years  
13 now and have hunted ducks numerous times on Mono Lake  
14 over the past eight years.

15 Q Thank you. Could you now summarize your written

16 testimony?

17 A I'm before the Board today to bridge the  
18 information provided by Dr. Stine, which is physical in  
19 nature, and provide the Board with information on how  
20 that -- how those physical features of the lake benefit  
21 ducks, how ducks use those various habitats as  
22 described by Dr. Stine. I think I can be brief. I'll  
23 run briefly through our several points -- major points  
24 of our evidence.

25 First, I'll describe for you the qualities of  
0039

01 these habitat providing for the pre-diversion high  
02 quality habitats that supported large numbers of  
03 ducks.

04 Dr. Stine has shown you the map by Walter  
05 Dumbrowski which was part of the waterfowl surveys he  
06 did in 1948 --

07 MR. THOMAS: Just a second, Mr. Thomas.

08 Mr. Stubchaer, should I move that around so you  
09 can see?

10 HEARING OFFICER STUBCHAER: Even standing, I can't  
11 see it, so --

12 MR. THOMAS: Let's put you right out front here so  
13 there's no question what it contains. I know those  
14 lines are hard to see.

15 MR. FRINK: Please identify the exhibit numbers as  
16 you can, too, Mr. Thomas.

17 MR. RONALD THOMAS: I'm sorry. This is DFG No.  
18 96.

19 MR. THOMAS: And it's at the bottom right of the  
20 exhibit.

21 MR. RONALD THOMAS: As Dr. Stine has pointed out,  
22 there's dotted areas shown on the map are not only  
23 areas of duck concentration, but also areas of fresh  
24 water layers. I've flown the lake many times, hunted  
25 the lake a number of times and speak with particular

0040  
01 knowledge on a couple of areas that I've hunted any  
02 number of times. The associations that exist even  
03 today at these areas, particularly Warm Springs in this  
04 area on the -- it would be kind of the northeast side  
05 and what we now call Simons Springs on the south side,  
06 are probably the major waterfowl concentration areas  
07 existing on the lake today. That's where the hunting  
08 occurs. The reason for this is that there's still  
09 remnants of the historic habitats that existed in the  
10 pre-diversion times. The areas -- although the fresh  
11 water area on the surface of the lake is lacking, we  
12 still have marsh features which are located near to, if  
13 not adjacent to, as they did, near to the lake shore.  
14 This provides a habitat association beneficial to ducks  
15 in that they can feed up in the marshes near the shore  
16 and yet without making long distance flights, they can  
17 go to the safety and security of the open water to rest  
18 and be safe from predators.

19 HEARING OFFICER STUBCHAER: Mr. Thomas, perhaps  
20 you could rotate that a little bit counter clockwise,  
21 clockwise, I guess it is, so the audience can see it.  
22 That's fine.

23 MR. RONALD THOMAS: I think I'll move on to our

24 next exhibit which is DFG No. 95. We may come back to  
25 this one after a bit. But DFG 95 is a blowup of the

0041

01 map of the 1940 duck kill. This was -- this map was  
02 produced as part of the statewide game take survey  
03 produced in 1942. It was, at that time, called the  
04 Division of Fish and Game and, at this time, they were  
05 producing bi-annual reports of wildlife conditions  
06 throughout the state.

07 This map depicts --

08 Q BY MR. THOMAS: Mr. Thomas, those dots are very hard  
09 to see, in fact, that blowup is not as accurate as I  
10 would have liked it, but we were reproducing it from an  
11 old document. Could you be very specific in pointing  
12 out the features that are there on the original?

13 A BY MR. RONALD THOMAS: Even our Xerox copies look  
14 better than this blowup.

15 I can bring this closer if need be.

16 HEARING OFFICER STUBCHAER: I can read it. It  
17 says, "One dot per thousand ducks."

18 MR. RONALD THOMAS: Each dot represents a thousand  
19 ducks, as you said. In the area of our concern in Mono  
20 County, I'll draw your attention to the north shore of  
21 Mono Lake which is somewhat distorted on this blowup,  
22 but there are three dots noting 3,000 ducks taken along  
23 the north and west shore of Mono Lake. The map shows  
24 two dots and only 2,000 ducks in the vicinity of Grant  
25 Lake and Upper Rush Creek. Other dots in the county

0042

01 are two at Bridgeport Reservoir up on the East Walker  
02 River, and we show two dots noting 2,000 ducks taken  
03 down at Crowley.

04 I think the importance of this map primarily is to  
05 depict the relative importance of the historic habitats  
06 at Mono Lake and the Mono Basin. Here's 5,000 ducks  
07 reportedly taken in the basin and compared to a total  
08 of 2,000 down at Crowley and 2,000 up at Bridgeport.

09 Okay. I'll move on to our third exhibit, which is  
10 DFG 97. Fritz, would you hand me that -- in fact, I  
11 think I can sit back down now.

12 DFG 97 is a copy of the Pacific flyway report of  
13 1949. This -- I draw the Board's attention to this  
14 document merely to denote the importance of the lake at  
15 that time to wintering Canada geese. This document  
16 shows the return of banded Canada geese taken on the  
17 lake which were banded in Alberta, Alaska, again just  
18 to demonstrate the importance of the lake at that time  
19 for migratory waterfowl from the northern part of  
20 flyway into the prairie provinces of Canada.

21 We can also infer the importance in the  
22 high-quality habitats and large numbers of ducks on the  
23 lake in the early years from some of the testimony the  
24 Board and Staff heard at Lee Vining. If you recall,  
25 there was testimony there at that time regarding the

0043

01 use of the Rush Creek marshes for hunting clubs.  
02 Apparently, there was testimony relative to the high  
03 success that those hunters experienced.

04 And I would like to emphasize, being familiar with  
05 duck hunters and hunting in general, that it's apparent

06 to me that those hunters in those days, especially in  
07 those days, were not going to travel the long difficult  
08 distances from the L.A. Basin to go to Mono Lake to  
09 hunt ducks and the costs involved if there wasn't some  
10 pretty good duck hunting there. So the numbers of  
11 ducks had to be there to support that kind of an  
12 effort. A commercial operation in those days would  
13 demand that there be large numbers of ducks in good  
14 habitats.

15 A little further discussion on the habitat  
16 elements that contributed to the high quality of duck  
17 habitats in the past. I'm convinced that the main  
18 factor that contributed to the high quality of the  
19 habitats on the lake were the higher lake levels.  
20 Those higher lake levels were highly beneficial in a  
21 number of ways. One of the major -- one of the major  
22 factors was, as Dr. Stine has talked about, was the  
23 close association of the marshes and the lake surface.  
24 As I pointed out on the Dumbrowski map, it's critical  
25 that the -- that the shore-land marshes be adjacent to

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01 or at least very close to those fresh water, open water  
02 resting and security areas.

03 I would like to show a slide now, John -- this is  
04 178? I wanted to show this slide because I've seen  
05 this phenomenon myself many times on Mono Lake. There  
06 are two factors of importance here; the fresh water  
07 layer, which is graphically displayed with the line of  
08 waves, as Dr. Stine as pointed out. The fact -- the  
09 critical fact of this is that when this fresh water  
10 layer was close to the shore and when the pristine  
11 marshes existed up the stream nearby, these ducks had  
12 that association they needed. They could sit in fresh  
13 water, which ducks are tied to, which ducks require,  
14 sit in fresh water, rinse any salts from their  
15 feathers, drink, and be safe from predators, and have  
16 to only make very short, daily feeding flights up to  
17 the marshes where they were to forage and where they  
18 were also hunted during the early days.

19 Next slide, John? As you can see in the last  
20 slide, in this slide, and as I have seen many times  
21 over the years --

22 Q BY MR. THOMAS: This is NAS/MLC 185?

23 A BY MR. RONALD THOMAS: This is 185, right.

24 Many times I've seen this phenomenon where numbers  
25 of birds -- now, what we're seeing here --

0045

01 Q Mr. Thomas, could you describe the particular area  
02 which you're referring to?

03 A At the mouth of Rush Creek where the fresh water  
04 is concentrated, what we see here is a concentration of  
05 water birds. What are showing up at this distance are  
06 mostly gulls, but in my experience, there would be  
07 grebes, ducks, many other species of birds mixed in  
08 with the gulls as they concentrate on these fresh  
09 waters. These birds are tied to these fresh water  
10 areas on the lake, and I just used this slide to  
11 illustrate the importance. The previous slide also  
12 showed the same concentration.

13 I think we can have the lights back now for a

14 moment.

15 Q For the sake of time, let's skip 179, 180, and  
16 181, and just refer --

17 A Okay. I'm going to want to show 184 in a minute,  
18 though.

19 Dr. Stine talked about the importance of the coves  
20 and bays. Well, for the sake of time, we'll skim over  
21 that. I just want to emphasize for the Board that the  
22 coves and bays were highly critical features for ducks  
23 for a very important biological reason. Ducks always  
24 tend to seek sheltered areas on large bodies of water.  
25 Some of us were over at the field trip a few days back

0046

01 and you know how the wind can blow in the Mono Basin.  
02 Ducks are always going to avoid getting out on that  
03 open water where there are coves for protection. Wind  
04 and waves are a terrible energy drain, so they're going  
05 to be seeking out those sheltered spots.

06 In addition, the coves and bays where there was  
07 fresh water inflow, as Dr. Stine pointed out, would  
08 tend to create a persistent area of that fresh water  
09 layer, so those coves and bays were very important and  
10 much more numerous at higher lake levels.

11 The lagoons at higher lake levels -- maybe we  
12 better --

13 Again, the pre-diversion lagoons that were -- that  
14 were available for waterfowl habitat at higher lake  
15 levels --

16 Q And you're pointing to --

17 A 159 on the north shore, the extensive lagoons. I  
18 would draw your attention to the close proximity of  
19 these brackish water lagoons to the lake shore. Again,  
20 the lagoons were very important because they provided  
21 shelter from wind and waves in an environment with  
22 lower salinity. These features now largely absent,  
23 very extensive, and in close proximity again to the  
24 open water.

25 Could we -- I keep jumping back and forth, but I'd  
0047

01 like to show a slide which is NAS/MLC 184. It's upside  
02 down. If we could flip ourselves over, we can -- this  
03 is Simons Springs, a recent photo, although not current  
04 photo, it portrays a very similar lagoon situation to  
05 that existing today. I'm familiar with this area.  
06 I've hunted it. I've flown it. In fact, in September  
07 of this year, we flew a comprehensive survey, aerial  
08 survey of the lake to count ducks on the lake to see  
09 what was there at this time as compared the past  
10 years. It was interesting that over 50 percent of the  
11 ducks -- and we'll talk about numbers later, but over  
12 50 percent of the ducks that were on the lake were in a  
13 position about right in here.

14 Dr. Stine, I believe, talked about fresh water.  
15 My guess would be that this is probably brackish and  
16 somewhat saline rather than fresh, but the point I want  
17 to make is --

18 HEARING OFFICER STUBCHAER: When you describe  
19 "right in here," you need to give a little better  
20 definition.

21 MR. RONALD THOMAS: This narrow and long lagoon

22 near the mouth of these diffuse inflows at Simons  
23 Springs.

24 What I want to emphasize that even though these  
25 lagoons are very much diminished, actually tiny  
0048

01 remnants of what once was, the importance of this  
02 habitat feature to me is clearly demonstrated by the  
03 fact that over half the ducks on the lake were sitting  
04 in this area right here on September 14th of this  
05 year.

06 Yeah. Let's have the lights back. One last point  
07 I'd like to make on the higher numbers of ducks on the  
08 higher quality habitat that existed in pre-diversion  
09 times. I'd like the Board and the Staff to keep in  
10 mind that with the greater productivity of the lake  
11 with these better habitats, these duck numbers would  
12 have provided prey for a number of other wildlife  
13 species, too. I'm especially thinking now of predators  
14 of all kinds, but particularly bald eagles and  
15 Perigrine falcon. These are two listed species that  
16 evidence indicates were abundant or at least common on  
17 the lake during pre-diversion times when duck numbers  
18 were much greater. Those two species, by the way, are  
19 specialists when it comes to preying on ducks and shore  
20 birds.

21 Okay. The next point I'd like to discuss is the  
22 pre-diversion habitats on the tributaries. I -- in the  
23 interest of time, I'll move quickly through this one  
24 because the Board has already seen and is familiar with  
25 the testimony of Vestal. His photo, which is our DFG  
0049

01 98, we won't bother to bring it up, showed the grassy  
02 marsh, the extensive marshlands and channels. His  
03 deposition talked about the bottom land morass  
04 describing extensive areas of marshy habitat and again  
05 graded channels with extensive -- extensive marshland  
06 qualities.

07 Q Mr. Thomas, you want to put that slide 205 up?

08 A We should show 205 and 207. Do you have those  
09 ready, John?

10 Q I understand this takes some time. Is it NAS 205  
11 and 207?

12 A 205 and 207.

13 Q The historic conditions?

14 A Yeah. I would like just to draw the Board's  
15 attention -- I know you've seen these several times,  
16 but from a wildlife habitat, especially from a  
17 waterfowl habitat point of view, it just doesn't get  
18 any better than this. We've got the cress beds, fresh  
19 water inflow, there'd be scuds, fresh water shrimp and  
20 all kinds of other invertebrates in these beds. This  
21 would provide some nesting habitat but certainly in the  
22 fall and winter migratory period, we're looking at a  
23 piece of waterfowl habitat there that would provide  
24 food and shelter and cover for many, many ducks.

25 It would also be -- it would also be an excellent  
0050  
01 hunting area because there would be places for hunters  
02 to hide on these edges. As testified by Mr. Hess in  
03 Lee Vining, the old timers walked these creek bottoms

04 and all these graded channels and jumped ducks and shot  
05 mallards, and that's excellent duck habitat.

06 207, NAS/MLC 207. Same thing. A little higher  
07 view, but of the same type of situation, just a variety  
08 of habitats, dense area. When I look at this, I think  
09 mallards, teal, and wood ducks and although wood ducks  
10 haven't been mentioned in the past in the Mono Basin,  
11 my guess is that there were probably wood ducks in  
12 addition to those other species. So these are the kind  
13 of habitats that used to exist and provided -- and tell  
14 me, as a water person experienced in waterfowl, that  
15 certainly that habitat existed to support thousands and  
16 tens of thousands and hundreds of thousands of  
17 waterfowl.

18 Q Let's move along, if we can.

19 A Okay. Let's talk for a minute about the impacts  
20 of the diversion, the diversion and export of water  
21 from the Mono Basin. I think we can -- I think that's  
22 the last of the slides now, so we can put that up for  
23 the last time.

24 We can look at the -- look at the composites. The  
25 draft document mentions -- mentions the impacts of --

0051

01 several impacts of diversion, physical impacts of  
02 diversion. I'd like to try to relate those to the  
03 Board and how they relate to waterfowl populations and  
04 habitats.

05 One of the first mentioned is that the lake  
06 level's fallen nearly 45 feet. We've discussed that  
07 and how that's affected these lagoons. The surface  
08 area -- this is something that hasn't been talked about  
09 much, but the surface area of the lake and the food  
10 that could have been produced in the lake has been  
11 reduced by almost one-third. These -- the draining of  
12 the marshes that Dr. Stine has talked about in the Rush  
13 Creek bottom lands, Lee Vining Creek, the loss of the  
14 lagoons, I believe that in about 1960, when the lake  
15 fell below about the 6400 foot level, this incision  
16 occurred that you heard discussed about the same time  
17 at the 6400 foot elevation these lagoons were drained.  
18 It's coincidental that --

19 Q Again, Mr. Thomas, when you say "these lagoons,"  
20 identify --

21 A The north shore lagoons on exhibit number --

22 Q 142? No, I'm sorry, 159?

23 A Right. It's coincidental that these effects on  
24 the key habitats occurred very near the same time in  
25 all areas. It's also coincidental that their reports,

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01 the accounts of the long-time residents as documented  
02 in the DEIR as well as the reports of hunters that I  
03 have contacted during my surveys of the lake, the  
04 coincidental disappearance of the habitat features  
05 occurred at the same time that the ducks began to  
06 decline sharply in about the early sixties. Hunting  
07 held up, according to most -- the best reports, hunting  
08 held up pretty well through the fifties and began to  
09 taper off sharply in the early sixties, fell  
10 dramatically by the end of that decade.

11 Another aspect discussed in the draft document is



12 the decline in habitat quality at the -- at the  
13 remaining wetlands -- what we see is that -- in the  
14 document, and I concur, that the total acreage of  
15 wetlands around the lake shore have increased. As the  
16 lake level has fallen, under any classification we  
17 would call wetlands, all of this stuff around here  
18 which is, in fact, a lot of alkali flat --

19 HEARING OFFICER STUBCHAER: When you say "all that  
20 stuff around here -- "

21 MR. RONALD THOMAS: Again, now, this is exhibit --

22 Q BY MR. THOMAS: 142.

23 A BY MR. RONALD THOMAS: 142, NAS 142.

24 And this is a composite of the lake shore, the  
25 date of this exhibit was --

0053

01 Q 1983 -- '2. Sorry.

02 A The broad band between the historic lake shore  
03 here, which still contains the remnant fresh water  
04 marshes at the existing springs, that band between that  
05 higher lake level and the lake shore constitutes the  
06 vast acreages of areas now called the new wetlands on  
07 the lake, what I would call the new wetlands on the  
08 lake. Unfortunately, the habitat quality for wildlife  
09 of these new wetlands is very much diminished from what  
10 used to exist at these habitats that we've previously  
11 discussed.

12 The Auxiliary Report Number Three to the draft  
13 document talks about this -- the wildlife surveys on  
14 various habitats in the basin. What that report  
15 concludes is that these habitats on the lake shore, and  
16 I believe they were called lake shore willow and lake  
17 shore salt -- alkali meadow, I believe, these habitats  
18 had very much fewer numbers and species than other  
19 habitats in the basin. My experience and -- with --  
20 during helicopter surveys of the lake shore, airplane  
21 surveys, hunts, and other visits to the lake, is that  
22 you see very few numbers, very low numbers of critters  
23 in this -- in these new wetlands, and very few  
24 species. So I believe that what the -- what the  
25 document says about the low quality of the habitat in

0054

01 those lake shores, I concur with that.

02 MR. HERRERA: Mr. Thomas, your 20 minutes are up.

03 MR. THOMAS: Could we --

04 HEARING OFFICER STUBCHAER: I think it's been  
05 actually more than 20 minutes, I think the time  
06 keeper's been generous.

07 MR. THOMAS: Could we petition for an additional  
08 ten minutes? Ten would do it. Again, we have a field  
09 biologist.

10 MR. RONALD THOMAS: I'm going to skip a couple of  
11 sections and talk about just a couple of thoughts on  
12 restoration of the pre-diversion habitats.

13 To my mind, with my experience of the lake, the  
14 bottom line really is that higher lake levels are  
15 what's needed to reestablish the waterfowl habitat.  
16 Dr. Stine has shown us the physical features. I'm  
17 convinced that the evidence is compelling that there  
18 were large numbers of ducks there under these  
19 pre-diversion conditions. I believe that due to the

20 levels needed, as described by Dr. Stine, for example,  
21 the rewatering of the north shore lagoons would require  
22 6405 feet. I believe that naturally fluctuating lake  
23 levels at that level at 6405 and higher would restore  
24 the waterfowl populations that we've seen in the past.  
25 Just one last thought. I'm convinced from my

0055

01 experience in other areas of the Central Valley, the  
02 marshes in Mexico that I've visited, I've seen newly  
03 flooded waterfowl habitats in those areas. When newly  
04 created waterfowl habitat exists, the ducks find it.  
05 They come there. If we recreate these habitats as the  
06 they used to exist on the lake, the ducks will be  
07 there.

08 MR. THOMAS: Thank you very much. That concludes  
09 your testimony, Mr. Thomas?

10 MR. RONALD THOMAS: That concludes my testimony.

11 MR. THOMAS: Next we have -- if you want us to  
12 proceed.

13 HEARING OFFICER STUBCHAER: Yes, Mr. Thomas, I  
14 have to state, though, that we're going adjourn  
15 promptly -- recess promptly at 10:15 whether we're in  
16 the middle of testimony or not.

17 MR. THOMAS: I understand. That's why I'm  
18 hurrying.

19 Dr. Reid is next.

20 Q BY MR. THOMAS: And Dr. Reid, is your testimony -- is  
21 your qualifications statement, which is DFG Exhibit 24,  
22 a true and correct copy?

23 A BY DR. REID: I believe it's DFG 23.

24 Q Is your qualifications statement? DFG 24 would be  
25 your qualifications and DFG --

0056

01 A Yes.

02 Q Is DFG 24 a true and correct copy of your  
03 qualifications?

04 A Yes.

05 Q And is DFG 23 a true and correct copy of your  
06 testimony?

07 A Yes. Except that my name is spelled wrong on the  
08 front page. It's spelled in the German style with the  
09 K. It's Frederic with a C.

10 Q My apologies for our clerical staff.

11 A That's quite allright.

12 Q Could you summarize your written testimony and  
13 qualifications for us starting with your  
14 qualifications?

15 A Um-hum. My name is Frederic Reed. I am the  
16 biological supervisor of the Pacific flyway for Ducks  
17 Unlimited. Ducks Unlimited, as many of you may know,  
18 is the largest wetland conservation organization in the  
19 world. Currently, we have restored, enhanced, or  
20 protected over six million acres of wetlands in North  
21 America.

22 In my capacity as a biological supervisor for  
23 Ducks Unlimited in the Pacific flyway --

24 HEARING OFFICER STUBCHAER: Would you get that  
25 mike just a little closer, please, or in front of you?

0057

01 DR. REID: How's that? In my capacity as a

02 biological supervisor of Pacific flyway, we are  
03 responsible for the ten western states including  
04 California, Alaska, Hawaii, including basically  
05 everything west of the Rockies. We've worked closely  
06 with our sister organizations in Canada and Mexico, and  
07 I have worked quite often in those locations as well.

08 My graduate degrees include a masters and Ph.D. in  
09 fisheries and wildlife from the University of Missouri.  
10 I also have a post-doc from the University of Missouri.  
11 These degrees were earned with a specialty in wetland  
12 ecology based on my work with water bird habitat  
13 management.

14 I have over 15 years experience with wetland and  
15 water bird management especially on migration and  
16 wintering areas of water birds, and my major research  
17 and extension efforts are in moist soil management and  
18 marsh management. I have extensive training and  
19 extensive experience throughout the west and Alaska  
20 down through the Sinaloa (phonetic) marshes of Mexico.  
21 I have international experience in several places, and  
22 I'll just avoid that and mention here it's in my  
23 vitae.

24 The results of my research have been published in  
25 over 40 papers presented at over 30 scientific

0058 meetings, over 60 wetland management workshops. I'm  
01 regularly asked to give a number of university  
02 lectures, I present somewhere between five and eight a  
03 year. I've spoken at about 20 universities in the  
04 United States.

05 Over the last 15 years, I've had the opportunity  
06 to visit the vast majority of this continent's wetlands  
07 and waterfowl habitats. I have directly consulted on  
08 over 80 national wildlife refuges, over 100 state  
09 wildlife areas in 38 states. I've worked on  
10 approximately 30 national forests, 36 other federal  
11 areas, and I've also advised approximately 75 private  
12 wetland areas on water wetland and invertebrate  
13 management techniques and restoration.

14 I'm formally a visiting assistant professor  
15 biology department of Southeast Missouri State and a  
16 post-doctoral fellow and lecture in wetland ecology at  
17 the University of Missouri, and as I said, I'm  
18 currently -- in my capacity as the biological  
19 supervisor for Ducks Unlimited. In that capacity,  
20 again, I oversee restoration projects. I help train  
21 wetland managers through on-site workshops, and I  
22 coordinate all our research efforts with western  
23 universities through our institute for wetland and  
24 waterfowl research.

0059 01 As I mentioned before, Ducks Unlimited is the  
02 largest wetland conservation organization in the  
03 world. We currently have approximately 500,000 members  
04 in the United States. Ducks Unlimited, since its  
05 founding, has invested more than \$750 million towards  
06 waterfowl conservation in this continent.

07 I have read the Draft EIR for the Mono Basin,  
08 many of the relevant primary papers referenced in that  
09 document. I've investigated potential wetland

10 restoration projects in the basin, and we are currently  
11 undertaking a wetland project, which I'll talk about in  
12 a few minutes. I've walked the majority of the former  
13 deltas, much of the current and historic lake shores  
14 with Dr. Stine and Mr. Thomas here, and I've talked to  
15 several long-term residents of the basin.

16 What I'd like to do briefly is just frame where  
17 the Mono Basin fits in terms of continental U.S. for  
18 waterfowl. I'd like to talk about the specific  
19 habitats, why they're important for water fowl, and  
20 then frame it as related to Dr. Stine's information on  
21 the geomorphology, why specifically these areas are  
22 important for waterfowl.

23 Historically, the intermountain region of the  
24 United States is composed of about 33 parks or wetland  
25 areas, and these have provided historically about 1.2

0060

01 to 1.6 million hectares of waterfowl habitat. And while  
02 much of the published waterfowl literature for this  
03 region concentrates on production, some of the best  
04 marshes and concentration areas in this region host  
05 millions of waterfowl in migration. And I think, as  
06 you'll see, the Mono Basin, like most of the wetlands  
07 in the Great Basin, is most important as a migrational  
08 habitat.

09 As an example, National Wildlife Refuge complex up  
10 at Klamath may attract greater than five million  
11 waterfowl during migration. It's often considered the  
12 single most important waterfowl refuge in the United  
13 States. The complex of marshes on the east side and  
14 north side of the Great Salt Lake in Utah also hold  
15 between one to two million waterfowl in migration, and  
16 I think the importance of these types of habitat in the  
17 Great Basin are best described in a paper that I cite  
18 by Cadillac (phonetic) and Smith who say that in  
19 contrast to the perception that the Great Basin is a  
20 desert of little value to waterfowl, the reality is  
21 that the marshes of these wetlands are of higher value  
22 to waterfowl than are many areas in wetter regions. In  
23 fact, the very rarity of marshes in a dry region adds  
24 to their value, and this as we look at migrational  
25 strategies of waterfowl who are concentrating their

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01 breeding activities in the prairie pothole regions of  
02 Canada where approximately 60 to 70 percent of  
03 waterfowl production in Northern California occurs. In  
04 Alaska where somewhere between 15 and 20 of waterfowl  
05 production occurs, as they are moving south, then, into  
06 the very important wintering regions, the wintering  
07 regions that we have here in the Central Valley, in the  
08 western coast of Mexico, in the delta, the Rio Hardy  
09 (phonetic), Rio Colorado, these are extremely important  
10 areas, and so the Great Basin wetlands are a major  
11 component of the migration habitat that these waterfowl  
12 use.

13 Now, you've talked about -- you've had other  
14 people talk about other birds and how they've used Mono  
15 Lake. I think it's important when we talk about  
16 waterfowl as a group, we recognize that this is the  
17 most diverse family of water birds that exist. There's

18 somewhere upwards of 62 species of waterfowl that use  
19 North America. Now, what we have in the Great Basin is  
20 we have one species of swan, four species of geese, and  
21 approximately 23, 24 species of ducks. So when we talk  
22 about waterfowl use of these habitats, you need to  
23 recognize that it's not a single species using these  
24 habitats, but it's variety of species, and they use  
25 them somewhat differently.

0062

01 In addition to some of the marshes I talked about,  
02 I think, as we look at the Great Salt Lake, the marshes  
03 that are most important along the Great Salt Lake are  
04 those that we see in the deltas of the Bear and the  
05 Jordan Rivers, the Ruby Lake marshes, which are spring  
06 fed in Nevada, Carson Sink, which is a closed basin  
07 that includes Still Water National Wildlife  
08 refuge, Humboldt Wildlife Area, the Montier (phonetic)  
09 Basin, which is a stream-fed, closed basin, the Warner  
10 Basin in eastern Oregon, the Klamath Basin, which I  
11 mentioned before, and Mono Lake in the Owens Valley and  
12 eastern California.

13 Now, Klamath, Mono, and Owens Valley have been  
14 especially impacted by man's activities including  
15 drains for agriculture, diversion of water, and water  
16 quality degradation. Within the Mono Basin, some  
17 waterfowl were present during breeding season. I think  
18 you've had some testimony to that. Mallards,  
19 green-winged teal gadwall, and northern chubblor  
20 (phonetic) were the species that were probably the  
21 most common breeders. However, the evidence suggests  
22 that these breeding numbers were tiny as compared to  
23 the vast concentrations of waterfowl in migrations, and  
24 this is representative of all the marshes we see in the  
25 Great Basin, that their importance is really in

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01 migration rather than in breeding.

02 And in general, we see three major flight  
03 corridors from the breeding grounds to the wintering  
04 grounds in the Pacific flyway. We see a coastal route.  
05 We see an interior coastal route that includes the  
06 Willamette Valley of Oregon, the Central Valley of  
07 California, and we see an interior route which includes  
08 the Great Basin wetlands. It's this interior route  
09 which is so important, I believe, to what historically  
10 existed in the Mono Basin.

11 To complicate the fall migration patterns over the  
12 Great Basin, we know that many prairie nesting species  
13 migrate southwest across this intermountain region on  
14 route to California wintering areas. As an example, we  
15 know, for example, that the San Joaquin Valley  
16 historically has played an extremely important region  
17 for wintering habitat. As an example, in recent times  
18 43 percent of the northern shovelers in the Pacific  
19 flyway, 53 percent of all the gadwall, and 68 percent  
20 of all our green-winged teal in the Pacific flyway use  
21 the San Joaquin Valley as a wintering ground.

22 Other birds tend to concentrate at the Great Salt  
23 Lake and funnel through Ruby Lake, Carson Sink, and  
24 Mono Basin before wintering in either California, Rio  
25 Colorado, the Hardy Delta, or to the Sinaloa (phonetic)

0064

01 marshes of western Mexico. A much smaller fraction of  
02 birds tends to shift to the east and winters in the  
03 middle Rio Grande or even to the Texas Gulf coast, and  
04 with huge concentrations of migrant birds in the Great  
05 Basin in few stopover spots, the spectacular  
06 concentrations often are found on suitable areas.

07 I believe -- excuse me, I'd also, at that time  
08 time, like to thank the Board for allowing me to speak  
09 and say that I think as you look at the Draft EIR, it  
10 is very well prepared, and I think your Staff and Jones  
11 and Stokes deserves a good salutation over the amount  
12 of effort that they've had. I'd especially commend  
13 Mr. Canaday, Mr. Herrera, and Dr. Ted Beatty (phonetic)  
14 who worked on the Draft EIR because overall, this is  
15 an excellent document.

16 There are, however, I believe, some other  
17 informations related to how important the Great Basin  
18 is in a broader sense that I'm trying to provide here,  
19 and that's what my testimony is about.

20 The Draft EIR and other evidence suggests that the  
21 Mono Basin had such suitable migrational habitat prior  
22 to stream diversion from the early 1940s. I think the  
23 Draft EIR provides countless pieces of evidence to  
24 pre-1940 conditions or those even in the early years of  
25 diversion, were conducive to the kinds of Great Basin

0065

01 habitats that support substantially more waterfowl than  
02 exist in the Mono Basin today. The Draft EIR states  
03 that prior to DWP diversions, the Mono Basin, quote,  
04 supported a diversity of ponds, lagoons, and other  
05 fresh water and brackish water habitats that were fed  
06 by creeks and springs, unquote. And that, quote,  
07 dense, continuous stands of riparian forest dominated  
08 by cottonwoods and willows grew along the major  
09 tributary streams to the lake store, unquote.

10 These descriptions, along with references from  
11 early naturalists, quantify counts by waterfowl  
12 biologists and descriptions from long-term basin  
13 residents and waterfowl hunters, support the evidence  
14 that the Mono Basin was an important migrational  
15 habitat for waterfowl.

16 We need to understand that as we look at pre-1955  
17 data for waterfowl in any place of North America,  
18 there's not a lot of quantifiable data. We see a lot  
19 of information that says the sky's turned black, et  
20 cetera. In this particular case, we are actually  
21 blessed with couple of pieces of evidence which do  
22 suggest that we had substantial populations. For  
23 instance, I believe -- while I'm over here -- I  
24 believe -- and Ron Thomas talked about this particular  
25 item which is entitled -- which is number --

0066

01 Q That's DFG 95.

02 A -- DFG 95, which shows, as Ron had talked about  
03 earlier, that duck kills in 1940, each dot representing  
04 a thousand birds, there are five in Mono Basin. And  
05 what's interesting about this particular information is  
06 that we know that much of the actual kill was by people  
07 that lived in the L.A. area, and many of these people

08 may have reported their ducks in the L.A. area. So it  
09 may actually be a low count, but even if we use 5,000  
10 ducks killed, killed in 1940, and you consider the  
11 current harvest rates at a particular area, which are  
12 about 5 percent, that puts the population in 1940 at  
13 about 100,000 or over of birds that were in that  
14 particular area.

15 Statements by long-term residents of the Mono  
16 Basin which are in the Draft EIR including Banta  
17 (phonetic), Vestal, McPherson (phonetic), DeChambeau,  
18 describe populations that numbered in the hundreds of  
19 thousands to million of waterfowl. Accounts of  
20 waterfowl in the Owens River Valley pre-diversion also  
21 describe over a million ducks during fall migration.  
22 As we look at the strategies that birds are using here,  
23 we need to recognize that the Mono Basin is important  
24 in migration, and it's most important in wintering. It  
25 probably is not going to be a real critical spring

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01 migrational habitat because of where it sits at its  
02 high altitude. Most of the waterfowl are going to move  
03 through the Central Valley, through the coastal routes  
04 as they move north because they're trying to get to the  
05 prairies of Canada, to the flood plain basins in  
06 Alaska, just as those areas are iced out or snowed out.  
07 And so what we find is that the areas around the deltas  
08 of the streams, which are probably the most important  
09 habitats for waterfowl in the Mono Basin, are not  
10 readily available in the spring for spring usage. So  
11 when I talk about migrational use, I'm really going to  
12 emphasize fall migration.

13 The statements that these people made in the DEIR  
14 are from waterfowl hunters who spent many days, many  
15 weeks, many years observing ducks and geese that they  
16 hunted. The statements indicate that population levels  
17 stayed high until early 1960s when populations crashed.  
18 A recent fall 1993 California Fish and Game aerial  
19 survey, which was conducted by Dan Paragar (phonetic)  
20 and Ron Thomas, counted less than 900 total ducks on  
21 Mono Lake or related tributaries. And this contrasts  
22 greatly with the kinds of populations that were  
23 documented in the forties and even into -- even into  
24 the late forties. Two California Fish and Game  
25 employees, Vestal and Dumbrowski, are in agreement with

0068

01 local hunters over Mono Lake waterfowl population  
02 levels prior to water diversions and during the early  
03 periods of stream diversions.

04 Dumbrowski's waterfowl population estimates in  
05 fall 1948, and we have a map --  
06 Q It's DFG 96, and then the blowup from that  
07 exhibit.

08 MR. HERRERA: Just to note, Mr. Thomas, there's  
09 five minutes remaining.

10 HEARING OFFICER STUBCHAER: I'll give you until  
11 10:15.

12 MR. THOMAS: Thank you, Sir.

13 DR. REID: In his estimates in fall 1948, they  
14 indicate substantial waterfowl numbers in the hundreds  
15 of thousands to a million waterfowl, the peak count

16 that he had at an instantaneous time was approximately  
17 a million birds. By far, the dominant species in these  
18 counts were northern shoveler, and this is very  
19 interesting because northern shoveler is mainly a  
20 carnivore, it's a spatulate feeder. It has a very  
21 spatulate bill, and it feeds almost exclusively on  
22 invertebrates. Based on current waterfowl corridors,  
23 population levels of migrating waterfowl in the Great  
24 Basin Pacific flyway, and the aerial photos depicting  
25 the former lagoon and marsh habitats along the Mono

0069

01 Lake shores and deltas, I believe that pre-diversion  
02 lake conditions supported orders of magnitude of more  
03 waterfowl than exist today.

04 References in the Draft EIR cite visits with these  
05 two gentlemen here, Stine and Thomas, and descriptions  
06 of physical conditions from Stine that he has presented  
07 here this morning in his written testimony, indicate  
08 that prior to 1941, the most important waterfowl  
09 habitat consisted of the near shore localities  
10 including the lagoons of the north shore, deltas of the  
11 mouths of Rush Creek, Lee Vining Creek, Wilson Creek,  
12 Mill Creek, DeChambeau Creek, and the springs entering  
13 the lake, Monte Vista Springs, South Tufa, Warm  
14 Springs, and Simons Springs. According to the Draft  
15 EIR, in 1940, the Mono Lake water elevation level stood  
16 at 6417 feet. The lagoons shown in pre-diversion  
17 aerial photos -- and this -- this evidence is number --  
18 Q BY MR. THOMAS: 142?

19 A BY DR. REID: 142, you see these lagoons located in  
20 the northern areas. And I would point out that if you  
21 look at satellite information --

22 Q I'm sorry. I keep inverting that. I'm sorry,  
23 that's NAS 159.

24 A This is NAS 159. Okay. But if you look at these  
25 lagoons located at this time frame, these are very

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01 similar to the kinds of habitat that you see today in  
02 the Sinaloa Marshes of western Mexico where about 1.5  
03 million pentells tend to winter. It's very similar to  
04 habitats we see along the lake shores in the Great Salt  
05 Lake, and these kinds of habitats, from an aerial point  
06 of view, tend to look like those that are readily used  
07 today.

08 These lagoons covered, as Dr. Stine mentioned,  
09 over 200 acres in size. These lagoons are formed by  
10 spring water inputs blocked by beach burms, of which  
11 you had a wonderful drawing made for you. According to  
12 Dr. Stine, when the Mono Lake elevation falls below  
13 6400 to 6405 feet, the lagoons vanish to desiccation.

14 Now, the hypopycnal stratification --

15 Q Dr. Reid, that wonderful drawing was DFG 165?

16 A The wonderful drawing was DFG 165. Yes.

17 The hypopycnal stratification which just has  
18 recently been described by Stine and Thomas for you  
19 here this morning, is characteristics of zones most  
20 important to waterfowl depicted in Dumbrowski's 1948  
21 map which again was --

22 Q DFG 96?

23 A -- DFG 96. Okay. So those areas here as Simons



24 Springs, Rush Creek, Lee Vining Creek, DeChambeau area,  
25 Warm Springs area. This stratification would greatly  
0071  
01 increase the zone of important waterfowl habitats at  
02 the mouths of the creek.

03 Where Mono Lake -- where Mono Lake levels dropped  
04 below 6400 feet, the streams incised to historic deltas  
05 and the quality waterfowl habitats were greatly  
06 degraded. While Stine and Thomas conclude that  
07 hypopycnal stratification still occurs in the mouth of  
08 Rush and Lee Vining Creeks, the fresh water lenses are  
09 substantially reduced and not occurring with  
10 marshlands.

11 Now, if we look at other areas in North America  
12 that have this kind of interaction with fresh water and  
13 salt water, we can, of course, turn to tidal actions.  
14 And a classic example is at Chesapeake Bay where --  
15 when you look at the tidal actions and the fresh water  
16 running across the denser salt water, for a long time,  
17 we thought that waterfowl were actually concentrating  
18 in saline conditions and, in fact, they were following  
19 this line of the movements of the tidal action of the  
20 fresh water. And, in fact, for many years we tried to  
21 reintroduce saline plants in these areas and were  
22 unsuccessful. Only in the last ten years where they  
23 looked at this stratification in Chesapeake Bay had  
24 they realized that they had to re-introduce brackish  
25 rather than saline vegetation in order to be

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01 successful.

02 I mentioned before that Ducks Unlimited is  
03 involved in the Mono Basin. We are currently working  
04 to restore some 30 acres of waterfowl habitat at the  
05 DeChambeau Ponds, and this is at a cost of more than  
06 \$400,000. This price is substantially greater than the  
07 normal restoration projects with which we've become  
08 involved, but reflects the expensive nature of  
09 groundwater pumped restoration projects which would be  
10 necessary in this basin.

11 At the current lake level or below, realistic  
12 waterfowl habitat restoration will be both expensive  
13 and marginal in impact. Any current waterfowl  
14 restoration projects will be mere postage stamp-size  
15 wetlands in a huge alkaline sink. Most of the existing  
16 wetlands today are alkaline meadow or dry emergent  
17 flats which provide little or no waterfowl habitat.  
18 While individual restoration projects could have  
19 waterfowl respond with the micro-habitat conditions  
20 provided, substantial improvements in migrating  
21 waterfowl populations can only be achieved by  
22 increasing water levels.

23 Reduction of stream diversions which will allow  
24 lake levels to rise to 6390 feet or above should  
25 improve the hypopycnal wetland association of both Warm  
0073

01 and Simons Springs. According to -- allowing the lake  
02 levels to rise to 6400 feet or above would restore  
03 marsh conditions in the Rush, Lee Vining, and Mill  
04 Creek deltas, and lagoon complex at the DeChambeau  
05 embayment. Allowing the lake to rise to 6405 or above

06 would restore the north shore lagoons. Allowing the  
07 lake levels to reach 6405 feet and then fluctuate  
08 between that level and 6400 feet, will result in  
09 habitat that can provide substantially greater  
10 populations of waterfowl than exist today. And  
11 certainly, we know that there were substantial  
12 populations of waterfowl that did use that habitat when  
13 the lake levels were at that level.

14 In addition to lake level changes, specific  
15 riparian restorations of Rush Creek and Lee Vining  
16 Creek, Wilson Creek, and Mill Creek will benefit  
17 species such as mallard, green teal, and gadwall, which  
18 are basically riparian species in nature. Emergent  
19 vegetation restoration of the lake shore associated  
20 with tributary deltas and springs would improve  
21 waterfowl habitats at the higher lake levels. During  
22 the period when lake levels should rise from 6377 to  
23 6405, interim restoration projects may include small  
24 strait modifications at the north shore or groundwater  
25 pump restoration sites of the north and west shores.

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01 And I can go into that a little later perhaps.

02 Currently, there's a continental effort called the  
03 North American Waterfowl Plan which is attempting to  
04 partner state, federal, and provincial governmental  
05 agencies with private conservation organizations to  
06 restore North American wetland habitats such that  
07 continental waterfowl population levels will be  
08 restored to the levels of the 1970s, which included 62  
09 million breeding population and 100 million birds full  
10 flight. Currently, we have about 49 million in the  
11 breeding population.

12 There are substantial efforts to improve waterfowl  
13 habitats in the Sacramento Delta, San Joaquin Valleys  
14 of California. Ducks Unlimited has recently announced  
15 that we are going invest \$16 million in the Central  
16 Valley of California over the next five years. The Rio  
17 Colorado and Rio Hardy Deltas are in need of  
18 restoration activities. Ducks Unlimited Mexico is  
19 currently embarking on a project there, and the  
20 wetlands of the Great Basin where we have a number of  
21 projects there with our partners. Efforts to restore  
22 Pacific flyway populations can be reached only if  
23 quality habitats are restored in critical breeding, in  
24 critical migration, and critical wintering habitats.  
25 These are species which have adapted to a migrational

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01 life cycle. You can't pull out one of these major  
02 areas and expect these species to exist. It's not  
03 going to happen. You're going to have a great decline  
04 in populations. Only as we bring back these real  
05 critical staging areas along their flight lines, are we  
06 going to be able to have substantial population. We  
07 can't simply invest dollars on the wintering grounds in  
08 the Central Valley and invest dollars in the breeding  
09 grounds in Canada and expect these birds to come back.

10 I think there's some strong evidence to suggest on  
11 the Rio Grand Valley where they have put a number of  
12 different restoration projects at the historic areas,  
13 such as the Basci-Dela Patchi (phonetic) National

14 Wildlife Refuge, that they have, in fact, brought back  
15 a number of birds such as pintail, such as snow geese,  
16 such as Ross' geese, and other species including sand  
17 hill cranes, to numbers that are actually increasing.  
18 Thank you very much.

19 MR. THOMAS: Thank you very much and particularly  
20 for your effort to reach the magic appointed hour.

21 We have no further questions on --

22 HEARING OFFICER STUBCHAER: We'll offer the  
23 exhibits at the conclusion of cross-examination for  
24 acceptance?

25 MR. THOMAS: Yes. Well, perhaps, I think Fish and  
0076

01 Game's offering all of its exhibits at the end of its  
02 case.

03 HEARING OFFICER STUBCHAER: Thank you. And this  
04 hearing will recess until 3:00 p.m.

05 (Whereupon a recess was taken.)

06 HEARING OFFICER STUBCHAER: Good afternoon. We're  
07 going to reconvene the Mono Lake water rights hearing.  
08 We're going to proceed with the cross-examination of  
09 the panel which testified this morning and ordinarily,  
10 cross-examination would start with Los Angeles  
11 Department of Water and Power. In this case, however,  
12 two of the witnesses presented by the Department of  
13 Fish and Game are appearing jointly on behalf of Fish  
14 and Game and the National Audubon Society and the Mono  
15 Lake Committee. Therefore, in accordance with  
16 Mr. Del Piero's previous rulings, the order of  
17 cross-examination will start with the National Audubon  
18 Society and the Mono Lake Committee and then Los  
19 Angeles Department of Water and Power and down the  
20 list.

21 But before we get into that, I want to announce  
22 that Mr. Del Piero's plane was delayed, and this is bad  
23 news for all of you. There will be no night session  
24 tonight.

25 (Whereupon a cry of anguish arose in unison from  
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01 all participants.)

02 HEARING OFFICER STUBCHAER: So we will conclude no  
03 later than 5:00 p.m.

04 MR. CANADAY: Mr. Stubchaer, we might advise the  
05 parties that I'm willing to bet Steve's pay -- month's  
06 pay -- that tomorrow night we will be going late. So I  
07 would prepare in that event for tomorrow.

08 HEARING OFFICER STUBCHAER: I wouldn't bet against  
09 that.

10 Is the panel ready? All right. Mr. Dodge?

11 MR. DODGE: I have a preliminary matter.

12 Mr. Birmingham reminded me that last Friday we decided  
13 to add Dr. Herbst (phonetic) to Wednesday's panel,  
14 which consists of Dr. Winkler (phonetic) and  
15 Mr. Shuford (phonetic). So I wanted to advise everyone  
16 else of that fact, also. I previously advised  
17 Mr. Birmingham of that or someone in my office had.

18 MR. BIRMINGHAM: Actually, we received a letter by  
19 facsimile today from Morrison and Forester advising us  
20 that Mr. Herbst was going to be added to a panel with  
21 Dr. Winkler (phonetic) and Mr. Shuford (phonetic) for

22 Wednesday. I have expressed some concern to Mr. Dodge  
23 that Mr. Herbst's testimony is really unrelated to that  
24 of Dr. Winkler (phonetic) and Mr. Shuford (phonetic),  
25 but Mr. Dodge and I have briefly discussed the way in  
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01 which that panel would be cross-examined, and I think  
02 we'll be able to reach some kind of an agreement so  
03 that there will not be a need to object to Mr. Herbst  
04 appearing with that.

05 HEARING OFFICER STUBCHAER: Thank you.

06 MR. DODGE: I would also add that Dr. Stine's  
07 written testimony that we've been here discussing this  
08 morning, National Audubon Society Exhibit 1-U, has, at  
09 the end of it, some analysis relating to habitat for  
10 nesting gulls starting on Page 7. It's entitled  
11 "Peninsularization and Near Peninsularization of  
12 Neggit, Twain, and Java," and Dr. Stine will be giving  
13 very brief -- a matter of a couple or five minutes,  
14 very brief direct testimony summarizing that on  
15 Wednesday with the gull panel.

16 HEARING OFFICER STUBCHAER: Does a couple of five  
17 minutes mean ten minutes?

18 MR. DODGE: No. It means two to five. He's  
19 promised to take a low profile on this.

20 DR. STINE: Mr. Dodge?

21 MR. DODGE: I just have a few questions of this  
22 panel.

23 CROSS-EXAMINATION BY MR. DODGE

24 Q Dr. Reid, there was testimony about historically  
25 there being some 216 acres of brackish lagoons, and  
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01 there currently being some 12 to 16 acres of mostly  
02 saline lagoons. Do you recall that testimony?

03 A BY DR. REID: I do.

04 Q Now, let me ask you to assume that the saline  
05 lagoons that exist today are -- the salinity is  
06 approximately 100 grams per liter and that the salinity  
07 of the historical lagoons was between 50 -- excuse me,  
08 15 and 50 grams per liter. Do you have that assumption  
09 in mind?

10 A Okay.

11 Q My question to you is on a per-acre basis, can you  
12 compare the historical habitat for ducks as compared to  
13 the present habitat for ducks?

14 A Based on habitat for both breeding and migration,  
15 when you get salinities of, say, 15 to 50 grams per  
16 liter, brackish waters, you have the highest diversity  
17 of waterfowl species using these kinds of habitats. As  
18 an example, the prairie potholes of Canada, much of  
19 that is somewhat brackish in nature in the boundaries  
20 of that salinity. Yukon Flats in Alaska, one of the  
21 most important migration breeding grounds in Alaska,  
22 over a million birds annually, that has similar  
23 salinities to the fresh brackish that you've described  
24 as being historic.

25 So with that in mind, and knowing -- well, there  
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01 are certain species of waterfowl that readily use, say,  
02 saline waters, marine environments in the winter for  
03 migration and for breeding, if it's not -- the saline

04 lagoons that you described would not be used to the  
05 degree that the fresh water or brackish lagoons would  
06 be.

07 Q You say the highest diversity was at what  
08 salinity, Sir?

09 A I would say that you'd find between 15 to 50 grams  
10 per liter.

11 Q And implicit in your answer is that there would be  
12 a falloff at 100 grams per liter; is that right?

13 A I'm not saying that there is a definitive  
14 threshold between there, but certainly, if you were to  
15 estimate both the diversity and number, it would be  
16 greater in the fresh water to brackish.

17 Q And again, diversity and numbers of what?

18 A Of waterfowl, of ducks, specifically.

19 Q I just have one question for you, Dr. Stine, and  
20 that is your testimony this morning related to a  
21 variety of physical changes, and I'm not sure I listed  
22 them all, but one was coves and bays. Another was  
23 lagoons on the north shore. A third was the -- help me  
24 with that term where the fresh water comes out over the  
25 salt water, hypopycnal layer, correct?

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01 A BY DR. STINE: Hypopycnal stratification, yes.

02 Q And you also talked about wetlands at the deltas  
03 of various creeks, correct?

04 A That is correct. And I would add that I also  
05 talked about the bottom lands environment of Rush  
06 Creek.

07 Q Okay. Now, I want to exclude, for purposes of  
08 this question, the bottom lands environment of Rush  
09 Creek, and let me ask you for each of the other matters  
10 that you discussed that existed historically, if  
11 Mono -- and you were talking about elevations between  
12 6400 and 6405, correct?

13 A That's correct.

14 Q Now, my question is a simple one. If Mono Lake  
15 were today ordered back by this Board to 6400 to 6405,  
16 that range, would all of those conditions that you  
17 described historically, would they naturally recreate  
18 themselves?

19 A They would, and they would approximate in most  
20 cases their former aerial distribution. They would  
21 occur in the same places, and they would be  
22 approximately the same size with one exception; that  
23 is, I think that we could -- because the deltas are now  
24 incised, we could probably expect the fresh water  
25 marshlands on the deltas to be smaller than they

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01 formerly were by maybe a factor of two, something like  
02 that.

03 Q So the fresh water deltas on the marshland upon  
04 return to 6400 or 6405 feet would be smaller?

05 A The fresh water marshes on the deltas would be  
06 somewhat smaller than they were before. That's right.  
07 I think everything -- there's no reason to think that  
08 everything else wouldn't be as it was.

09 Q Would that be a temporary situation or a permanent  
10 situation?

11 A Temporary, though long -- in the long-term sense.

12 I think it would take awhile, probably centuries scale,  
13 to fill those delta trenches to the point where the --  
14 where the delta plains would once again have -- be  
15 characterized by marshes the size that those existed.

16 Q Now, Dr. Reid, back to you. You mentioned three  
17 routes. The one I understood related to Mono Lake was  
18 the, quote, interior route, end quote. Is that  
19 correct?

20 A BY DR. REID: The interior Pacific flyway route, yes.

21 Q The interior Pacific flyway route. Okay. Can you  
22 elaborate on that and explain how Mono Lake fits into  
23 the interior Pacific flyway route?

24 A As I mentioned before, with a majority of the duck  
25 species, breeding, and prairie pothole in Canada and  
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01 the Boreal (phonetic) forest zones of Alaska and  
02 Canada, one would see a funneling of birds out of these  
03 northern regions and concentrating in areas around the  
04 Great Salt Lake. The Great Salt Lake is a real pivotal  
05 complex of wetlands for migration of this route, and  
06 where we find the most important wetlands for waterfowl  
07 in the Great Salt Lake are along the deltas of the Bear  
08 River, the Jordon River, the Weber River, not  
09 necessarily asimilar from what we might see at Mono.

10 As you look at the Great Salt Lake overall, it's  
11 fairly a desert in terms of waterfowl use. Annual  
12 volume, for instance, gets about five inches of  
13 rainfall, But overall, waterfowl are concentrating in  
14 the deltas. From the area of the Great Salt Lake,  
15 there'll be funneling, then, either to the east over to  
16 the Texas coast, some even to the Louisiana coast.  
17 Others will funnel down through Rio Grand Valley, the  
18 main wetlands there, Basci-Dela Patchi, Bernardo, et  
19 cetera, along the middle Rio Grande. Some of these  
20 birds, especially pin tail and white fronted geese will  
21 funnel down to the highlands or the Chihuahua Basin,  
22 and then birds that are making their way to the west  
23 from the Great Salt Lake can either funnel through the  
24 Ruby Marshes down into the Mono Basin. Most likely  
25 historically they use the Owens River Valley. They

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01 could have funnelled either from Mono directly across  
02 to the Central Valley, the grasslands area, which still  
03 holds large numbers of waterfowl.

04 They also could funnel down the Owens Valley into  
05 the Colorado River delta, and some birds most likely  
06 funnel down to western Mexico into the marshes of  
07 Sonora and Sinaloa. Sinaloa, today the marshes there,  
08 which are basically pristine, still can hold vast  
09 numbers of waterfowl.

10 Q Do you have an opinion as to whether the loss of  
11 Mono Lake in the past few years as a part of the  
12 interior Pacific flyway has affected the rest of the  
13 flyway?

14 A Well, as I think Dr. Scott -- Dr. Stine described,  
15 most likely, when diversions began on the lake at the  
16 lake, the response by ducks was not immediate because  
17 you did not see immediate decline in those lagoons. It  
18 was probably into the sixties that you saw a response  
19 by waterfowl, a decline by waterfowl --

20 Q I'm asking you to assume for purposes of my  
21 question that the decline in waterfowl at Mono Lake  
22 took place in the early sixties.

23 A Right.

24 Q My question is simply did that decline likely have  
25 an effect on the rest of the interior Pacific flyway?

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01 A There is, as I mentioned earlier this morning,  
02 very strong evidence which suggests that the quality of  
03 the breeding habitat, quality of the migration habitat,  
04 quality of the wintering habitat, all directly impact  
05 the survival and the population status of waterfowl,  
06 therefore, when you take out and measure migrational  
07 habitat, you break a link in a chain, so to speak, and  
08 you can have a collapse of the population.  
09 Remembering, too, that we've got many species that are  
10 present dominated by northern shoveler, but there would  
11 be a collapse of the population.

12 MR. BIRMINGHAM: Can the Reporter mark that,  
13 please?

14 THE REPORTER: Sure.

15 Q BY MR. DODGE: Let me move to your work on the  
16 DeChambeau Ponds, and I think you skipped over it pretty  
17 quickly this morning. I have a couple of questions on  
18 that.

19 You mentioned that that involved 30 acres at a  
20 cost of \$400,000, correct?

21 A That's correct.

22 Q Now, the DeChambeau Ponds are well above any lake  
23 level that we're talking about in this proceeding,  
24 aren't they?

25 A About 6435.

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01 Q And so your work on DeChambeau was unrelated to  
02 this particular fight over lake levels, correct?

03 A It was.

04 Q And, in fact, your work on the DeChambeau Ponds  
05 allowed us to find you for this lake level hearing;  
06 isn't that correct?

07 A That's true as well, yes.

08 Q Did -- your work on DeChambeau preceded any  
09 interest you had in the level of Mono Lake; is that  
10 correct?

11 A Absolutely. We were very interested in restoring  
12 wetlands in the Mono Basin as indication of how  
13 possible it was, the fact that restoration of quality  
14 waterfowl habitat was feasible. We recognized that it  
15 was going to be an expensive proposition, that we were  
16 probably going to run into a pretty small project. We  
17 traditionally don't do projects under 100, even under  
18 500 acres in the west. Most of our projects are  
19 several thousand acres. 4,000 acres in one project.  
20 We work on big projects because that's how we can  
21 economically put back major habitats in the west.

22 In this particular case, we wanted to demonstrate  
23 that it was feasible to do this. I don't think any of  
24 us in the office recognized just how expensive it  
25 probably was going to be.

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01 Q Let me just ask you one final question, and that

02 is, hypothetically, if this Board were to restore Mono  
03 Lake to 6405 feet, do you have -- and you talked about  
04 Mono Lake being a -- historically being primarily for  
05 migratory ducks as opposed to breeding ducks, correct?

06 A Correct.

07 Q Hypothetically, if Mono Lake were restored to 6405  
08 feet, do you have an opinion as to whether the  
09 migratory duck populations would return?

10 A Yes. Our projects that we've conducted in the  
11 west, even over the last five years, have shown some  
12 substantial returns of birds in very short order. For  
13 instance, we completed a project at Yano Seco Rancho  
14 (phonetic) in the Sacramento Valley this last year in  
15 the summer. By fall -- this is a 270 acre seasonally  
16 flooded wetland. By fall when it was flooded up, we  
17 had over 300,000 ducks utilizing this habitat on the  
18 one 270-acre plot. So we had over a thousand ducks per  
19 acre using the habitat which was graded farmland up  
20 until was it was recreated into historic wetlands.

21 We can see the same thing happening in the Great  
22 Basin. We can see at Basci-Dela Patchi down in New  
23 Mexico. This is an area that was degraded, the water  
24 had been channeled. The water had been kept strictly  
25 to the channel and was not allowed to flow into the

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01 flood plain. What we did was we recreated the natural  
02 flooding and, in fact, then had germination of seed and  
03 bud roots that existed in the former flood plain, and  
04 now we're getting a whole series of returning water  
05 birds in Basci-Dela Patchi. That's an area which had  
06 lost a lot of birds, now we see increasing numbers  
07 of a number of waterfowl species including northern pin  
08 tail, including shovelers, including gadwall, et  
09 cetera.

10 At Deleva (phonetic) National Wildlife Refuge in  
11 Sac Valley, we have seven new projects in the  
12 Sacramento complex, Deleva is one of them. In the last  
13 three years, we've seen not only large numbers of birds  
14 returning to these sites which, again, with degraded  
15 farmlands, they were historic wetlands. We put them  
16 back. We recreated the hydrology, and the birds  
17 responded. What's interesting about the Deleva case is  
18 we are now seeing family groups of swans returning to  
19 the same marsh. So  
20 there -- you know, the site fidelity seems to have  
21 recreated some of those same senses.

22 So my feeling is that again, this is a chain, and  
23 we can't simply hope to put back an individual wetland  
24 and the birds will return. There has to be a corridor,  
25 but we are doing work in the Rio Grande delta. We are

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01 doing work and hope to do more work along the Colorado  
02 River. We've done a lot of work -- we can hope to  
03 expand our efforts in the Great Salt Lake. We have a  
04 major effort going on in Elverta. \$4.0 million this  
05 last year to restore wetlands in the upland habitats  
06 there. Clearly one of the breaks in the chain in this  
07 corridor down through here is the Mono Basin and Owens  
08 Valley.

09 MR. DODGE: I have no further questions. Thank



10 you. All of you.

11 HEARING OFFICER STUBCHAER: All right.

12 Department of Water and Power. Pardon me. Mr. Dodge,  
13 were you speaking for both the Audubon Society and the  
14 Mono Lake Committee?

15 MR. DODGE: Yes.

16 HEARING OFFICER STUBCHAER: All right. Water and  
17 power? Ms. Goldsmith?

18 CROSS-EXAMINATION BY MS. GOLDSMITH

19 Q Just a very few questions for you, Dr. Stine.

20 You've testified that a hypopycnal layer is present at  
21 the current time, and you've shown us some photographs  
22 dating throughout the past decade which you've  
23 characterized as providing demonstrative evidence that  
24 such a layer exists. Is that right?

25 A Yes.

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01 Q And that hypopycnal layer of stratification has  
02 caused -- hypopycnal?

03 A Yes.

04 Q -- stratification is caused by the difference in  
05 salinity between the inflowing fresh water from  
06 whatever source, springs or streams, and the salinity  
07 of the lake's water; is that right?

08 A That's correct.

09 Q Did you take measurements documenting the depth  
10 and extent of the stratification at the historic sites  
11 around the lake?

12 A Not at all the sites around the lake, but I was  
13 able to do that at both the DeChambeau Creek site that  
14 I showed as well as at the mouth of Rush Creek.

15 Q What was the aerial extent of the layer at  
16 DeChambeau Creek?

17 A The aerial extent meaning depth, again? Or --

18 Q Can you describe the physical size of what you  
19 characterize as the hypopycnal layer?

20 A Well, it was confined, as I showed in the slide,  
21 to a stream channel where the water column in the  
22 stream channel was in its lower half, approximately,  
23 depending upon where you were, how far upstream you  
24 were in the channel, the lower half roughly was saline  
25 water and the upper half was fresh water.

0091

01 Q What was the difference in salinities?

02 A Salinity or the -- salinity would have been very  
03 close to zero in the fresh water. It would have been  
04 approximately, at that time, 90 grams per liter in  
05 the -- in the salt water. I think a more instructive  
06 way of looking at this would be in terms of specific  
07 gravity or specific gravity of the salt water or the  
08 difference in specific gravity between salt water and  
09 the fresh water would have been approximately .05, .04  
10 to .05.

11 To put this in perspective, the difference in the  
12 specific gravity of the top water and the bottom water  
13 that characterized the monomixtic condition --  
14 meromixic condition at Mono Lake during the 1980s and  
15 which caused things to not overturn was approximately  
16 .01. So at the present day salinities of Mono Lake,  
17 the difference between the fresh water and the salt

18 water is approximately five times what existed during  
19 the period of meromixis during the 1980s. It's a very,  
20 very large density difference that's hard to break  
21 down.

22 Q What date was it when you took these measurements  
23 at DeChambeau Creek?

24 A This would have been in 19 -- 1983 and '84.

25 Q What was the other site that you mentioned you had  
0092 taken measurements?

01 A That was again the site that I showed in the  
02 slide, and that was -- and these are not measurements  
03 now on salinity. These are measurements on the  
04 thickness of the water, which I believe was your first  
05 question.

06 Q That's right.

07 A This was in -- I believe it was June of 1986.

08 Q June of 1986. And that was at the mouth of Rush  
09 Creek?

10 A Mouth of Rush Creek, yes.

11 Q And what was the aerial extent at that time?

12 A Aerial extent meaning depth or aerial extent in  
13 terms of acreages?

14 Q Aerial extent in terms of feet, radius?

15 A Aerial extent of the --

16 Q Horizontally.

17 A Okay. I would estimate it to be approximately 200  
18 to 300 acres, something like that.

19 Q And what was the depth?

20 A Well, it varied. The depth of this thing, I  
21 haven't looked at it in its middle, but typically, it  
22 feathers out to a more or less feather edge, so it's  
23 probably -- my guess is that it may be as much as six  
24 inches or so deep at the center of the pile of water  
0093

01 and then moving out to more or less a feather edge on  
02 the edges of the pile. And that could be affected by  
03 current, it could be affected by the amount of waves,  
04 or the wind, et cetera.

05 Q Now, I'd prefer it if you could express it in  
06 differences in salinity because differences in specific  
07 gravity mean very little to me, and I'm used to  
08 thinking of the lake in terms of salinities. What was  
09 the salinity of Mono Lake -- what was the difference in  
10 salinity at the mouth of Rush Creek in 1986?

11 MR. DODGE: Objection. Vague and ambiguous.

12 HEARING OFFICER STUBCHAER: She said what was the  
13 salinity at the mouth of the creek in 1986? Are you  
14 talking about the lake salinity or the stream -- or the  
15 mixing zone salinity?

16 MS. GOLDSMITH: What was the salinity of the  
17 lake --

18 HEARING OFFICER STUBCHAER: Unmodified by the --

19 MS. GOLDSMITH: In June of 1986.

20 MR. DODGE: That's a new question. I have no  
21 objection to that question. The first question asked  
22 for a difference and --

23 HEARING OFFICER STUBCHAER: I'm just trying to  
24 clarify the question.

25 MR. BIRMINGHAM: He's sustaining your objection,

0094

01 Mr. Dodge.

02 DR. STINE: I'm confused as to exactly what the  
03 question is. Shall I ignore the first question and go  
04 to some second question?

05 Q BY MS. GOLDSMITH: Yes. The second question is what  
06 was the salinity of the lake in June of 1986.

07 A 1986, the level of the lake was approximately  
08 6380.9 feet, and the salinity would have been  
09 approximately, give or take a little bit, right around  
10 85 grams per liter.

11 Q Now, isn't it true that the persistence of a  
12 hypopycnal layer will increase as the difference in  
13 specific gravity, if that's the term, between the  
14 lake's water and the inflow increases?

15 A It will, yes.

16 Q And isn't it true that under all currently  
17 proposed lake levels and areas even including the one  
18 that's proposed by Los Angeles Department of Water and  
19 Power, that there will continue to be inflows at Rush  
20 and Lee Vining Creeks into the lake?

21 A That is correct, yes. I would simply clarify that  
22 that would not be the case under the no-change  
23 alternative for the -- what did we call that? The  
24 all-diversion alternative, or whatever we called it.

25 Q And nobody is proposing that as an alternative

0095

01 adopted by this Board; isn't that right?

02 A It was one entertained in the DEIR.

03 Q And isn't it true that that's not an alternative  
04 that is legally available to this Board?

05 A I'm sorry.

06 MR. THOMAS: Objection. The witness isn't  
07 qualified to make a legal conclusion.

08 HEARING OFFICER STUBCHAER: Sustained.

09 MR. BIRMINGHAM: Could the Reporter mark that,  
10 please, because I'm going to quote that later?

11 (Laughter.)

12 MR. THOMAS: Out of context, I'm sure.

13 MR. BIRMINGHAM: No.

14 Q BY MS. GOLDSMITH: I want to ask you about your  
15 testimony in -- your written testimony which you didn't  
16 mention this morning concerning the loss of wetlands in  
17 Long Valley as the result of the construction of  
18 Crowley Reservoir.

19 A Yes.

20 Q Your testimony states that you estimate 2400 acres  
21 of wetlands were lost as a result of the construction  
22 of Crowley; is that right?

23 A That's correct.

24 Q Do you continue to hold that opinion?

25 A Yes. I think that there was a lot of wetlands --

0096

01 in fact, I think there was probably more than 2400  
02 acres of wetlands lost by the construction of Crowley  
03 Lake, and I would take it one step farther and say that  
04 DWP is incorrect in contending that their creation of  
05 Crowley Lake created wetlands. The wetlands that are  
06 there today and that apparently do provide very good  
07 bird habitat were wetlands that were there prior to

08 Crowley.

09 Q On what do you base your estimate that 2400 acres  
10 of wetlands were lost?

11 A There was a -- I base it on examination of a  
12 number of different maps and descriptions of the basin,  
13 of the Crowley Lake Basin. And the -- the number would  
14 include a large amount of marshland which is marked on  
15 the lands to which Mr. -- marked on the maps that  
16 Mr. Tillemans testified to. Then in addition to that  
17 marshland, which is actually standing water with  
18 emergent vegetation, as U.S.G.S. uses the symbol, in  
19 addition to that there would have been wetlands  
20 extending for some unknown distance beyond the edge of  
21 the actual marsh.

22 Q Is that shown on any maps that you have?

23 A Is which, now?

24 Q The extension of wetlands beyond those delineation  
25 on the U.S.G.S. maps?

0097

01 A No. U.S.G.S. simply shows marshland. They don't  
02 show other types of wetland.

03 Q My question, however, was do you have other maps  
04 that illustrate further extent of wetlands beyond those  
05 shown on the U.S.G.S. map which, for clarification, is  
06 L.A. DWP Exhibit 79?

07 A Can I see that map? I believe I did answer your  
08 question. I do not have other maps that show it.  
09 U.S.G.S. simply shows marshland. They do not show  
10 wetlands extending beyond actual standing water.

11 Q So your testimony is that you do not have any maps  
12 or area photographs that allow you to extend the  
13 existence of marshlands beyond those depicted in L.A.  
14 DWP 79 except by inference; is that correct?

15 A That is correct, yes. I would, however, point out  
16 that there is, even on L.A. DWP Exhibit 79, a fair  
17 amount of marshland that has been lost -- roughly what,  
18 a thousand acres, something like that, that was lost to  
19 DWP. This is just marshland that was lost to DWP's  
20 creation of Crowley Lake.

21 In addition, the marshlands that are shown on L.A.  
22 DWP Exhibit 79 that were there prior to Crowley Lake  
23 are the very marshlands that Mr. Tillemans is  
24 attributing to the creation of -- to the production of  
25 or creation of Crowley Lake. Those marshlands were

0098

01 there prior to Crowley Lake being created.

02 MR. THOMAS: Could we look at that? We don't have  
03 a copy to use. Do you have an extra copy?

04 MS. GOLDSMITH: We have a set of copies which I  
05 believe were brought over this morning.

06 I'd like to turn now to --

07 MR. THOMAS: If you could, just a second -- a  
08 question for a matter of foundation. Is this the  
09 exhibit that was introduced --

10 HEARING OFFICER STUBCHAER: We can't hear you.

11 MR. THOMAS: I'm sorry. I was asking if this was  
12 the exhibit introduced for Mr. Tillemans.

13 MR. SMITH: Yes. It was during Brian Tillemans'  
14 testimony. It is No. 79, and we do not have copies of  
15 it yet.

16 MS. GOLDSMITH: If we have a break, I will  
17 telephone my paralegal and have her get them over  
18 here. I had thought she had brought them over this  
19 morning.

20 HEARING OFFICER STUBCHAER: We're not having a  
21 break this afternoon until we break.

22 MS. GOLDSMITH: Then they'll be here tomorrow. I  
23 promise.

24 MR. THOMAS: I might add also that I thought what  
25 we saw with Mr. Tillemans was an original and not a  
0099

01 reprint, so we would want to make sure that we're  
02 dealing with apples and apples here. I don't know --  
03 I'm not going to introduce a foundational objection,  
04 but we will want to see the original.

05 MS. GOLDSMITH: Well, this is a reproduction of  
06 the exhibit that Mr. Tillemans testified about. And I  
07 can bring the original copy for you to verify, if you  
08 like. I will note that the note at the bottom says  
09 that was surveyed in 1911 to 1912.

10 MR. THOMAS: In order to expedite things, go  
11 ahead. I just -- there may be some foundation --

12 Q BY MS. GOLDSMITH: Turning to Department of Fish and  
13 Game Exhibit -- 96? Is that right?

14 A BY DR. STINE: 96 which is also MLC/NAS 176.

15 Q And comparing it with NAS/MLC 159, which is the --  
16 the pre-diversion mosaic of Mono Lake. I notice that  
17 Mr. Dumrowski's map, which is DFG 96, does not show any  
18 north shore lagoons nor does it report any waterfowl  
19 for those lagoons.

20 A Yes. I think Mr. Dumbrowski was interested in the  
21 lake itself. He did not show lagoons.

22 HEARING OFFICER STUBCHAER: Microphone, please?  
23 You have to a good loud voice --

24 Q BY MS. GOLDSMITH: That is speculation on your part;  
25 is it not?

0100  
01 HEARING OFFICER STUBCHAER: Excuse me. I  
02 interrupted his answer.

03 Q BY MS. GOLDSMITH: It does not show any waterfowl  
04 concentrations in the north shore lagoons; is that  
05 right?

06 A It does not show north shore lagoons.

07 Q Thank you.

08 A I would like to point out, however, that I was  
09 quoting a number of people. I never interviewed  
10 Mr. Dumbrowski, but I did interview Mr. Vestal,  
11 Mr. Banta (phonetic), both Messrs. Banta (phonetic), as  
12 a matter of fact, one of whom is pushing 100 years old,  
13 as well as a number of other people who did say there  
14 were large numbers of ducks at the lagoon. My  
15 point that there were ducks there was not simply based  
16 on the Dumbrowski map and, indeed, you're right. If  
17 you were to just simply go on the Dumbrowski map, one  
18 would infer no lagoons nor any ducks there.

19 Q At the risk of violating a rule of  
20 cross-examination, I'm going to ask you a question that  
21 I don't know the answer to. You testified on your  
22 direct examination -- Mr. Birmingham is having a fit --  
23 that many of these coves are adjacent to faults that

24 extend out and presumably have some -- have some role  
25 in forming the lagoons.

0101

01 MR. BIRMINGHAM: We don't joke about  
02 Mr. Birmingham having fits.

03 (Laughter.)

04 MS. GOLDSMITH: Well --

05 MR. THOMAS: Weighted usable area make way.

06 Q BY MS. GOLDSMITH: Are those faults still there at  
07 the lower lake level?

08 A BY DR. STINE: I'd just like to correct you. I did  
09 not say that the faults created lagoons. I said that  
10 the faults created the coves.

11 Q The coves, right.

12 A And there is a difference there. And your  
13 question, then, was what, excuse me?

14 Q Do those faults continue out into the lake at the  
15 current lake levels?

16 A Yes, they do. And we can see actually these --  
17 the fault displacement on the bathymetry, so we can  
18 trace them out into the lake.

19 Q Is it likely that those faults would have some  
20 future role in creating coves given a stable lake level  
21 for some period of time?

22 A I would say no, that they would not. That for the  
23 same reason that those same faults are not making coves  
24 at the present day lake level, they will not make coves  
25 if the lake goes -- either goes lower or stays

0102

01 stationary. The coves do occur along faults but only  
02 at the higher lake levels. I explained why in this  
03 Historic and Modern Distribution of Shore Fringing  
04 Wetlands, Mono Lake, California, which is one of the  
05 auxiliary reports.

06 Q Now, turning to you, Dr. Reid. The Draft EIR  
07 cites you as one of the authorities in support of its  
08 statement, and I quote, its possible that duck  
09 populations that formerly stopped at Mono Lake no  
10 longer exist or have shifted their fall migrations to  
11 other Great Basin lakes or the Central Valley." Do you  
12 agree with that statement?

13 A Yes, I do. I believe that you will eliminate  
14 certain stock of birds and other birds can shift over  
15 to some degree. However, if we are to regain  
16 population levels of 100 million waterfowl in fall  
17 migration, we will need to restore some wetlands along  
18 these corridors.

19 Q I don't mean to cut you off, but my time is  
20 limited and perhaps you could expand on those answers,  
21 unless it's really necessary, on questions by other  
22 parties. I'm sure you'll be given the opportunity.

23 MR. HERRERA: Regarding your time, Ms. Goldsmith,  
24 you have four minutes.

0103

25 Q BY MS. GOLDSMITH: Now, isn't it true that many of

01 the species that are reported to have migrated through  
02 the Mono Basin breed in the northern prairies of the  
03 United States and Canada?

04 A BY DR. REID: That's absolutely true.

05 Q That's an area known as the prairie pothole

06 region?

07 A That's true. They also breed in what's called the  
08 boreal forest zone which is north of the prairie  
09 pothole region in Canada and Alaska.

10 Q And there have been enormous changes in the  
11 breeding habitat in the prairie pothole region since  
12 the 1960s; isn't that true?

13 A Absolutely. That's why Ducks Unlimited has spent  
14 millions of dollars in that region.

15 Q In fact, a Ducks Unlimited publication on pin tail  
16 recovery recently characterized it as, quote, extensive  
17 loss and degradation of wetland and upland habitats on  
18 the prairie breeding grounds resulting from  
19 agricultural intense if I occasion over the past 20  
20 years." Are you familiar with that publication?

21 A Yes.

22 Q And the expansion of agriculture in that area has  
23 replaced natural vegetation with wheat fields,  
24 largely?

25 A They're a variety of crops that are grown there.

0104

01 Wheat is predominant in Alberta and Saskatchewan.

02 Q And has resulted in filling of potholes and  
03 leveling of land?

04 A Well, one of the real problems is that for a  
05 species like pin tail, it tends to breed in the  
06 uplands, and it tends to breed a fairly long distance  
07 from any pothole. So it's not necessarily that the  
08 potholes have been lost, but what's happened is that  
09 the upland habitat has been so degraded that there's  
10 virtually no place for a duck to put a nest that won't  
11 be easily predated by a mammalian predator. It's not  
12 so much the potholes themselves as the upland  
13 constituents with it, so the whole landscape has been  
14 modified, absolutely.

15 Q And have these changes had the effect of  
16 concentrating the waterfowl population into smaller  
17 breeding habitats than they had historically?

18 A Certainly. If you eliminate certain areas for  
19 them to breed, it's going to be smaller.

20 Q Now, I recently viewed a video that was produced  
21 which featured the chief biologist for Ducks Unlimited  
22 in Canada. Are you familiar with that video that was  
23 produced by Turner Broadcasting?

24 A We've got a lot of them. I don't know. Terry  
25 Neuranson (phonetic) is our chief biologist up there.

0105

01 Go ahead.

02 Q And if I were to tell you that I heard him say on  
03 that broadcast that 90 percent of the waterfowl nests  
04 in the prairie pothole region are impacted by  
05 predation, would that surprise you?

06 A They are impacted by predation from one degree or  
07 another. They may -- some of them may be predated.  
08 Some of them may have nests predated. Some of them may  
09 merely shift their foraging strategies to feed at a  
10 time when they don't expose their nests to a great  
11 degree. So the impacts for the 90 percent really  
12 varied. Some of them are severe. Some of them are not  
13 as severe.

14 Q Now, in addition to the impacts due to land use  
15 changes in the prairie pothole region, it's true, isn't  
16 it, that the region has experienced an extended severe  
17 drought during most of the last decade in the 1980s?

18 A That is very true.

19 Q And that --

20 MR. HERRERA: Excuse me. Your 20 minutes is up.

21 MS. GOLDSMITH: I would apply for additional time  
22 in light of the length of some answers that we've  
23 gotten.

24 HEARING OFFICER STUBCHAER: How much more time?

25 MS. GOLDSMITH: I'd say another 20 minutes.

0106

01 HEARING OFFICER STUBCHAER: All right. I'll grant  
02 it.

03 MS. GOLDSMITH: And I will -- with the cooperation  
04 of the witnesses, I will try to whiz on through.

05 Q BY MS. GOLDSMITH: In fact, the waterfowl populations  
06 breeding in the prairie pothole region have declined  
07 dramatically over those that were there historically;  
08 isn't that right?

09 A BY DR. REID: It's shown much greater importance for  
10 the boreal forest and for Alaska, and we are very  
11 fortunate in the Pacific flyway that we have areas that  
12 have not been so modified. Those areas in the central  
13 flyway and Mississippi flyway have been greatly  
14 impacted and it's really impacted the continental  
15 population.

16 Q Now, you testified that when you're looking at  
17 waterfowl populations, you can't look just at one  
18 segment of their -- basically, their annual cycle, you  
19 have to look at the breeding habitat and the migration  
20 habitat and the wintering habitat. Is that right?

21 A That's right. And that's, as I said, that's why  
22 we are investing time and dollars in the Central Valley  
23 of California, in the Sinaloa Marshes in Mexico, in the  
24 delta of the Colorado River, in the breeding grounds of  
25 Alberta, Saskatchewan, et cetera.

0107

01 Q And if there were a drastic reduction in the  
02 breeding areas, that would affect the numbers you would  
03 see both in the wintering areas and the migration;  
04 isn't that right?

05 A Absolutely.

06 Q And one of the -- now, you mentioned that in the  
07 Pacific flyway there are three routes.

08 A Um-hum.

09 Q And the central -- three corridors. One was the  
10 Great Basin corridor or the interior corridor. One was  
11 the coastal corridor, and the other one -- I forget the  
12 name --

13 A Interior coastal

14 Q -- interior coastal corridor. Where did the birds  
15 from the interior coastal corridor come from?

16 A Interior coastal? It's a variety. They'll be  
17 birds from the YK Delta in Alaska. There'll be birds  
18 from the north slope. They'll be birds from interior  
19 Alaska. There'll be birds from the Yukon, MacKenzie  
20 Delta. There'll be birds from northwest territories.  
21 There'll be birds from Alberta, from Saskatchewan as



22 far away as Manitoba, British Columbia. There'll be  
23 birds from the Great Basin funneling down through -- in  
24 these particular cases, those wetlands that are so  
25 important for the interior coastal area, Willamette

0108

01 Valley, Klamath Basin, Malheur, et cetera.

02 Q So the birds that nest further north, say, in  
03 Alaska or the Yukon territories or in the far northwest  
04 are more likely use the interior coastal corridor  
05 rather than this Great Basin interior route; is that  
06 right?

07 A As a real gross generalization, yes.

08 Q Thank you. I realize it's a gross generalization.

09 And those areas have been less affected than the  
10 prairie pothole region by an intensification of  
11 agriculture and by the drought in Canada; is that  
12 right?

13 A Not the Klamath Basin nor the Malacure Basin nor  
14 the Willamette Valley, but areas in Alaska, areas in  
15 British Columbia, yes.

16 Q And if one were to compare the numbers of  
17 waterfowl seen in the Central Valley, for example, with  
18 the numbers of waterfowl seen at Mono Lake, for  
19 example, the numbers in the Central Valley could show a  
20 little bit more stability because of this additional  
21 more stable component of that migration. Isn't that  
22 right?

23 A Not necessarily because you've lost 93 percent of  
24 the wetlands in the Central Valley or more. The  
25 estimates now actually put it at 96 percent, and that  
0109

01 kind of devastation like we just talked about, you're  
02 impacting on the wintering grounds and on the migration  
03 grounds, and it's not necessarily that you could have  
04 the same type of -- a more stable system.

05 Q And the degradation in the Central Valley on the  
06 wintering grounds would also show up in the migration  
07 route along Mono Lake; isn't that right?

08 A The degradation? Yeah. One would assume that the  
09 San Joaquin Valley would have an impact, yes.

10 Q Now, turning to the maximum counts during the  
11 pre-diversion period that have been talked about. In  
12 your testimony, you estimate that the pre-diversion  
13 waterfowl populations numbered in the hundreds of  
14 thousands to million waterfowl and you cite statements  
15 of long-time residents Banta, Vestal, McPherson,  
16 DeChambeau.

17 Isn't it true that the only systematic attempts to  
18 count migrating waterfowl during the 19forties was done  
19 by Mr. Dumbrowski?

20 A That's true.

21 Q And this was during the 19forties, isn't that  
22 right? A That's right.

23 Q And during the 1940's, there was a dramatic  
24 increase in the waterfowl population in the Canadian  
25 prairies, isn't that true, due to wetlands?

0110

01 A We're really not sure about that. There was a  
02 dramatic decline in the late thirties. We're  
03 absolutely convinced of that, and that's one of reasons

04 why Ducks Unlimited was started. There was an increase  
05 in the population in the fifties when we began sampling  
06 that. I'm not aware of data from the forties. Um-hum.  
07 Q Well, you rely on a paper called "The Great Basin  
08 Marshes" by Cadillac (phonetic) and Smith (phonetic);  
09 isn't that right?  
10 A Right. I have that here. Um-hum.  
11 Q Let's go Heightmire (phonetic) because I have  
12 the page reference on that one. That's another one  
13 that's DFG 122 that you rely on and at --  
14 MR. BIRMINGHAM: Excuse me. Can the witness be  
15 instructed to answer the questions affirmatively as  
16 opposed to saying "um-hum"?  
17 HEARING OFFICER STUBCHAER: Yes. It's hard for  
18 the Court Reporter to get uh-huh.  
19 MR. BIRMINGHAM: Could the record reflect that the  
20 last two answers were yes positive answers?  
21 HEARING OFFICER STUBCHAER: The record can reflect  
22 that if that's what he said.  
23 Q BY MS. GOLDSMITH: Is that correct, your last two  
24 responses were affirmative, Sir?  
25 A BY DR. REID: Right, yes.

0111

01 Q Now, at Page 487, doesn't Heightmire (phonetic)  
02 say in the late 1930s and early 19forties Canadian  
03 prairies became wet again and waterfowl populations  
04 increased dramatically?  
05 A Yes, it does.  
06 Q And didn't crop degradation become a problem with  
07 an increase in waterfowl populations?  
08 A In the fifties, yes, it became a problem.  
09 Q And so is it possible that the populations that  
10 Mr. Dumbrowski was reporting reflected that upsurge in  
11 continental, if you will, waterfowl populations?  
12 MR. DODGE: Can I have that question back,  
13 please?  
14 (Whereupon the record was read as requested.)  
15 MR. DODGE: I'm going to object to it. It's  
16 ambiguous. Upsurge as compared to what prior time  
17 period?  
18 HEARING OFFICER STUBCHAER: You want to clarify  
19 the question?  
20 MS. GOLDSMITH: In the context of the previous  
21 question in which we cited Mr. Heightmire (phonetic) in  
22 DFG 122, Mr. Heightmire (phonetic) said in the late  
23 1930s and early 19forties Canadian prairies became wet  
24 again and waterfowl populations increased dramatically.  
25 The question to Dr. Reid is might not

0112

01 Mr. Dumbrowski's counts in the 19forties reflect an  
02 unnaturally high population count due to that upsurge?  
03 MR. DODGE: Excuse me. I have the same objection.  
04 With all due respect to the author of that article,  
05 whose name I've forgotten already, he or she doesn't  
06 tell us compared to what either. If the question is as  
07 compared to the early 1930s, then that's fine. If the  
08 question is as compared to some natural level that was  
09 not measured, I think we're entitled to know that.  
10 HEARING OFFICER STUBCHAER: Ms. Goldsmith?  
11 MS. GOLDSMITH: This article discusses the

12 history, basically from the beginning of the century,  
13 of waterfowl populations. The discussion immediately  
14 proceeding the question discussed drought in the  
15 Canadian prairies during the 1920s and early 1930s.

16 HEARING OFFICER STUBCHAER: And so the upsurge was  
17 -- well, you can't answer the question. Would you read  
18 the pertinent portion again so I can make a ruling?

19 MS. GOLDSMITH: In the late 1930s and early  
20 19forties, Canadian prairies became wet again and  
21 waterfowl populations increased dramatically.

22 HEARING OFFICER STUBCHAER: All right. I'll  
23 overrule the objection.

24 DR. REID: Can I have the Court Reporter read back  
25 exactly what the -- could you read --

0113

01 Q BY MS. GOLDSMITH: The question is can  
02 Mr. Dumbrowski's counts have reflected this dramatic  
03 increase and be unrepresentative of the level of  
04 waterfowl production or migration numbers generally  
05 during the period -- pre-diversion times?

06 A BY DR. REID: No. Because what -- as I understand,  
07 you're asking me is this an unnatural event which  
08 causes, and it's no. That we know that there are  
09 cyclical aspects of both the wintering grounds, the  
10 breeding grounds, the migration grounds in relation to  
11 the natural hydrology and that -- the -- any  
12 fluctuations we could see would be natural in nature.  
13 I don't see that they're unnatural or un -- or, you  
14 know, one would suspect that there would be some  
15 changes among years based on wet and dry years in the  
16 prairies.

17 Q Let me rephrase it. Is it likely that  
18 Mr. Dumbrowski's count would be at the high range of  
19 the natural fluctuations?

20 A If there were wet conditions in Canadian prairies  
21 during those time periods, we would expect to see  
22 higher numbers of birds during those migrations.

23 Q Are you familiar with Mr. Dumbrowski's duck  
24 census?

25 A Yes, I've read them.

0114

01 Q I believe they are NAS/MLC Exhibit 103. Isn't it  
02 true this million dollar -- million dollar -- million  
03 duck count is referred to in his population data dated  
04 November 1st, 1948, where he says, "The ducks at  
05 present are rafted up near the center of the lake where  
06 it is difficult to make an estimate of the numbers,  
07 however, including ruddies, there are now well over a  
08 million ducks on the lake, 80 percent of which are  
09 ruddies and shovelers." And that's the only place  
10 where he mentions a million ducks; isn't that right?

11 A Yes, that's true.

12 Q Now, you'd agree, wouldn't you, that it's  
13 difficult to count very large numbers of birds  
14 accurately?

15 A When you get into larger numbers of ducks, you run  
16 into a greater variances. That's absolutely true.

17 Q And would you agree that identifying species at a  
18 distance of about a mile and a half is pretty  
19 difficult?

20 A It's difficult, but it can be done.  
21 Q Identifying species can be done?  
22 A Identifying waterfowl, whether they're waterfowl  
23 or non-waterfowl. Like flight patterns, et cetera. It  
24 can be done.  
25 HEARING OFFICER STUBCHAER: Will you get the mike  
0115  
01 a little closer to you? Your voice is trailing off.  
02 Q BY MS. GOLDSMITH: Now, if ducks are rafted up, that  
03 means they're sitting there and not flying; isn't that  
04 right?  
05 A They've got to move in and out of a raft, and if  
06 one observed them for a time --  
07 Q Assuming one could see them fly, one might know  
08 what they are.  
09 A That's true.  
10 Q If one did not see them moving, they would be dots  
11 on the lake. Isn't that right?  
12 A If you've observed waterfowl for any number of  
13 times, you can perceive them as waterfowl. I think  
14 you're correct in saying that it is difficult in  
15 determining differences among duck species. It would  
16 be very difficult to say that that is a widgeon at that  
17 distance versus that is a shoveler or that is an pin  
18 tail.  
19 Q So your testimony is that at a distance of about a  
20 mile and a half, you could tell numbers and species of  
21 birds on a lake?  
22 A You could estimate numbers of birds on a lake.  
23 You could not estimate a species breakdown at that  
24 distance, and I don't believe if you look at his data  
25 that that's what he did. When he estimated as species,  
0116  
01 he took subcounts of species at closer levels, and I  
02 think those are his estimates, which is very similar to  
03 how we count ducks today.  
04 Q At that distance, would it be relatively easy or  
05 relatively difficult to distinguish grebes from ducks?  
06 A Grebes would be fairly easy to distinguish over  
07 ducks.  
08 Q Would you be surprised at the testimony of  
09 experienced ornithologists that it is difficult, even  
10 impossible to make such distinctions at that distance?  
11 A There are some ornithologists that would make that  
12 statement. I believe that.  
13 Q And in 1940 when the lake was higher -- in 1948  
14 when the lake was higher, the diameter would have been  
15 larger than it is today. Isn't that right?  
16 A That's correct.  
17 Q Are you aware that Mr. Dumbrowski ran a hunting  
18 club?  
19 A I am.  
20 Q And have you seen Cal-Trout Exhibit 5-C, which is  
21 a local chamber of commerce map?  
22 A I'm not sure. No. I have not seen this map.  
23 MR. THOMAS: Is this exhibit --  
24 Q BY MS. GOLDSMITH: This is Cal-Trout Exhibit 5-C.  
25 And drawing your attention to -- I believe it's labeled  
0117  
01 Mono Creek Ranch; is that right?

02 A Um-hum.  
03 Q Walter Dumbrowski, proprietor?  
04 A Um-hum. Yes.  
05 Q He's advertised his duck hunting is unsurpassed  
06 anywhere; isn't that right?  
07 A That's correct. It says, "Our duck shooting is  
08 unsurpassed anywhere."  
09 Q Do you have an opinion as to whether or not it  
10 would have been in Mr. Dumbrowski's financial interests  
11 to maximize the number of ducks he counted?  
12 Particularly near his land?  
13 A It would be conjecture on my part, but -- if you  
14 see more ducks, it might interest more people in coming  
15 there. That's conjecture.  
16 MS. GOLDSMITH: I hear a beep. I have about four  
17 more minutes of questions.  
18 MR. HERRERA: You have seven minutes remaining.  
19 HEARING OFFICER STUBCHAER: I couldn't hear you.  
20 MR. HERRERA: Seven minutes remaining.  
21 Q BY MS. GOLDSMITH: Now, in your testimony, you talk  
22 about the importance of marshland associated with fresh  
23 water habitats.  
24 A Um-hum. Yes, I do.  
25 Q For duck migration. And your opinion is that the  
0118  
01 proximity of wetlands to open water is important to  
02 migrating waterfowl; is that right?  
03 A Yes.  
04 Q How close, in your opinion, must that association  
05 be?  
06 A Well, there are different distances which would be  
07 important. Most ducks on a foraging flight will fly --  
08 for dabbling ducks will fly up to ten miles in a radius  
09 for a foraging flight. Most ducks, if they are going  
10 to maximize their energetic requirements, which is  
11 really essential during migration, will move much  
12 closer between loafing areas and migrational areas and  
13 foraging areas. So --  
14 Q Would an area of a mile and a half to two miles be  
15 unduly burdensome to migrating waterfowl?  
16 A No, it would not. It causes greater energetic  
17 demands on the birds. Flight is the most energetically  
18 expensive activity that birds have. For waterfowl,  
19 flight is 15 times the basal metabolic rate for  
20 energetics.  
21 Q Now, you saw the pictures, the slides that  
22 Dr. Stine showed of wetlands in the Rush Creek bottom  
23 lands; is that right?  
24 A Yes, I did.  
25 Q And if I were to tell you that those wetlands were  
0119  
01 approximately one and three-quarters mile from the lake  
02 shore, would that strike you as suitable migrating duck  
03 habitat?  
04 A It strikes me as suitable migrating duck habitat  
05 especially if the birds could use a flight corridor of  
06 a stream, of a riparian zone, to get to those sites.  
07 That -- photographs that he showed were classic  
08 examples of really important habitat for mallards, for  
09 green-winged teal, for widgeon, and some for shoveler.

10 Q Now, Dr. Stine, I do have another question for  
11 you. Those -- the location of those photographs that  
12 you showed, and I believe you know which ones I'm  
13 talking about, the ones -- I don't have the numbers.  
14 The ones that were of the Rush Creek bottom lands that  
15 showed wet land habitats. How far are those from the  
16 mouth of Rush Creek?

17 A BY DR. STINE: Today or in 1930 and '40?

18 Q Today.

19 A Probably a mile and a half or so today, much less  
20 in 1940.

21 Q And those locations are above the area that you  
22 identified in your testimony the other day as being --  
23 they're within the area that you testified the other  
24 day as being capable of regeneration; is that right?

25 A I'm sorry. They are --

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01 Q Within the area that you testified the other day  
02 would be capable of regeneration. That is, not subject  
03 to incision?

04 A I think maybe we're confusing a couple of concepts  
05 here. I'm -- I'm not sure exactly what you're trying  
06 to get at. Are you asking whether or not these can be  
07 rewatered?

08 Q Yes.

09 A Yes. They can be rewatered, yes.

10 Q Thank you.

11 Mr. Thomas -- one more question and this is to  
12 either Mr. Thomas or to Dr. Reid. Have you visited  
13 Lake Crowley?

14 A BY MR. RONALD THOMAS: Oh, yes.

15 Q And does Lake Crowley have lake fringing  
16 wetlands?

17 A Yes, it does. It has lake -- the lake fringing  
18 wetlands that exist at Crowley are extensive but, in my  
19 opinion, they are certainly much less extensive and of  
20 lower quality than those that existed there prior to  
21 the filling of Crowley.

22 Q Do you know whether or not there was open water  
23 prior to the filling of Crowley?

24 A I -- my impression of the -- from the historic  
25 reports is that the extent of open water was much less

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01 at certain periods of the -- during the annual cycles.  
02 However, the open water that would have existed at the  
03 edge of the perennial marsh would be open water and  
04 intermittently flooded marshlands, wetlands, which are  
05 very, very high quality waterfowl habitats.

06 In fact, if I could expand just for a second on  
07 that. On our waterfowl areas throughout the State of  
08 California, our emphasis these days is on the creation  
09 and management of ephemeral wetlands rather than the  
10 permanent and stagnant wetlands as exist at Crowley  
11 today.

12 Q Did you read the report of sanitary investigation  
13 that is DFG Exhibit either 137 or 142, I'm not sure  
14 which, it may be both?

15 A I saw that report. I haven't reviewed it in  
16 detail.

17 Q And are you familiar with its account of dead

18 cattle in the marshland areas?

19 A I don't think I saw that part of the report.

20 Q And are you familiar with the fact that the  
21 investigating group as report -- I'll read you a  
22 portion. "Near the stopping place of the automobile,  
23 we found the carcass of a beef which had recently died,  
24 and we were able to secure dried hairs and a bits of  
25 soil below the surface with which a guinea pig was

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01 inoculated subcutaneously. This animal died 34 hours  
02 later about midnight on our return trip to Little  
03 Lake."

04 The report -- assume that I'm correct in telling  
05 you that the report is replete with very disgusting  
06 details about animals dying and unsuitability of water  
07 for drinking. Would that make good waterfowl habitat?

08 A Those descriptions don't sound very appetizing,  
09 but I don't think they would markedly affect the  
10 quality of the marshland as waterfowl habitat. I would  
11 like to emphasize that the long-term and standing water  
12 in the wetlands, itself, in the marshlands and those  
13 bogs would be good waterfowl habitat as are some of the  
14 areas around Crowley today.

15 However, the primary value of those marshlands  
16 would have been based on the annual fluctuation in  
17 water level which would seasonally flood new areas  
18 which provide greater nutrients and nesting and feed  
19 for migrating waterfowl.

20 Q Dr. Reid, have you been down to the delta of Lee  
21 Vining Creek?

22 A BY DR. REID: Yes, I have.

23 Q And have you seen the ponds that are flowing  
24 there?

25 A Yes.

0123

01 Q In your opinion, will that provide suitable  
02 waterfowl habitat once it is completely developed?

03 A Yes, that will. It's very small in size, but  
04 there is -- there will be waterfowl use in that area.

05 Q Is it your opinion, Dr. Reid, that if Mono Lake is  
06 raised to elevation 6405, the duck population which  
07 feed and rest in the wetland areas will, in fact,  
08 approximate the historic pre-diversion levels given the  
09 changes in population that have occurred since 1960?

10 A I believe that we will see an increase in usage  
11 along the lake, and that depending on what else happens  
12 in relation to restoration along the corridors, we will  
13 potentially see increased populations potentially to  
14 those levels that were recorded in '48.

15 Q I can't resist Mr. Taylor -- Mr. Thomas, in -- you  
16 cite historic accounts by Fisher (phonetic), probably  
17 the condor article, quoting the fact that there is a  
18 belt of flies 100 miles long around the lake. Now,  
19 that's a quotation within that article, isn't it?

20 A BY MR. RONALD THOMAS: Yes. That's where that  
21 quotation comes from.

22 Q And it's attributed to a different writer, isn't  
23 it?

24 A I believe it is.

25 Q Do you know who that writer was?

0124

01 A I think I recall.  
02 Q Can you tell us?  
03 A I think Mark Twain said that.  
04 Q He was never known to exaggerate, was he?  
05 A No. But I would like to point out the picture  
06 that accompanied that photograph, and I think this is  
07 one of our exhibits. It shows a band of flies. Of  
08 course, you can't see 100 miles long in this picture,  
09 but you can certainly see a dark, very dense band of  
10 flies on the shore of the lake.  
11 MR. HERRERA: Ms. Goldsmith, your time has  
12 elapsed.  
13 MS. GOLDSMITH: I have three more questions.  
14 HEARING OFFICER STUBCHAER: Are they compound?  
15 MS. GOLDSMITH: They are not.  
16 HEARING OFFICER STUBCHAER: Okay.  
17 Q BY MS. GOLDSMITH: In your testimony you talk about  
18 Mr. Dumbrowski as -- you identify him as a DFG seasonal  
19 aide. Mr. Dumbrowski was hired to do creel checks for  
20 the Rush Creek test stream, wasn't he?  
21 A BY MR. RONALD THOMAS: I'm not clear on that. I  
22 never was sure the history of his employment status. I  
23 really can't answer that.  
24 Q To your knowledge, was he ever employed to do any  
25 duck censuses or waterfowl censuses?

0125

01 A I'm not sure.  
02 MS. GOLDSMITH: Thank you.  
03 HEARING OFFICER STUBCHAER: Okay. Thank you.  
04 Cal-Trout?  
05 MR. ROOS-COLLINS: No questions for this panel.  
06 HEARING OFFICER STUBCHAER: State lands?  
07 MR. VALENTINE: I have just a very few questions.  
08 MR. SMITH: Mr. Stubchaer, could we have a point  
09 of order here? Mr. Thomas said this was a DFG numbered  
10 exhibit. We haven't got a number on it yet.  
11 MR. THOMAS: It comes in from DFG 99. It's an  
12 excerpt from DFG 99.  
13 HEARING OFFICER STUBCHAER: I'm sorry. I don't  
14 have your name?  
15 MR. VALENTINE: I'm Michael Valentine, Staff  
16 Counsel from the State Lands Commission.  
17 CROSS-EXAMINATION BY MR. VALENTINE  
18 Q I have just a question or two for you, Dr. Stine.  
19 Ms. Goldsmith asked you that -- wasn't it true  
20 that under all the alternatives under active  
21 consideration by the Board, that they all include some  
22 fresh water flow which will result in hypopycnal  
23 stratification to some degree. Do you recall that?  
24 A BY DR. STINE: I do.  
25 Q And you said basically, yes, as I recall.

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01 A Yes, I did.  
02 Q Do you have an opinion as to whether or not the  
03 wetland association with that hypopycnal layer which we  
04 have talked about will be recreated under some of the  
05 plans but not under some of the others?  
06 A Yes. We will only be seeing fresh water  
07 marshlands such as existed in the pre-1940 times when



08 Mono Lake gets up onto the delta plain, gets up on to  
09 its delta plain. In other words, above 6400 to 6405  
10 feet.

11 Q Thank you. And in your opinion, Dr. Reid, would  
12 hypopycnal stratification by itself be extremely  
13 beneficial to waterfowl or would the associated  
14 wetlands be necessary?

15 A BY DR. REID: I believe --

16 MS. GOLDSMITH: Objection. Compound.

17 MR. VALENTINE: She's probably right about that.

18 HEARING OFFICER STUBCHAER: All right.

19 DR. REID: Thank you.

20 Q BY MR. VALENTINE: Dr. Reid, to what extent do you  
21 believe that waterfowl numbers will respond to their  
22 historic levels by hypopycnal stratification of Mono?

23 A BY DR. REID: I believe the hypopycnal stratification  
24 is extremely important in creating a feather edge of  
25 foraging habitat that is very typical of what you see

0127  
01 dabbling ducks feed in. However, I also believe that  
02 the lagoons and some of the marsh habitats, especially  
03 along the deltas up the corridors of the stream are  
04 really going to be critical in bringing back any viable  
05 population.

06 Q Thank you. I'm referring now to Dumbrowski's  
07 numbers in the forties, and I'll -- Mr. Thomas, either  
08 you or Dr. Reid, feel free to answer this. The numbers  
09 were characterized as substantially higher than some  
10 other numbers that had been made there. Isn't it fair  
11 to say that the Dumbrowski numbers were probably  
12 substantially higher than the severely depressed  
13 numbers of the 1930s?

14 A Yes. I think that would be safe to say. At the  
15 same time, I think it's important to remember that  
16 while the quantitative data for Dumbrowski is quite  
17 unique for that time period, across the nation there  
18 were very few quantified waterfowl censuses done prior  
19 to 1955. However, the historical information from a  
20 lot of duck hunters who were there indicate numbers up  
21 to a million birds.

22 A BY MR. RONALD THOMAS: If I could add to that just a  
23 bit. Not only does the DEIR state, but in my personal  
24 interviews with some of the old-time residents,  
25 observers in the area, these accounts very strongly

0128  
01 substantiate Dumbrowski's counts, not only in the one  
02 year of his counts, but, as I believe they have said,  
03 in the -- throughout the period of the late forties.  
04 So I think there's other evidence supporting those  
05 numbers in addition to just Dumbrowski's counts.

06 Q Would it be fair to conclude, Dr. Reid, that the  
07 numbers that Dumbrowski counted in the forties would be  
08 representative of the numbers that would have been at  
09 the lake prior to the dust bowl? In other words, that  
10 this represented a rebound of the population from the  
11 dust bowl drought?

12 A BY DR. REID: That's really conjecture because we  
13 have no idea what previously existed prior to the dust  
14 bowl. We know that there was a decline in population  
15 during the thirties on a continental basis because of

16 the devastation throughout the continent, the western  
17 U.S. If we have returning quality wetlands on the  
18 breeding grounds, on migration grounds, on the  
19 wintering grounds, one would suspect then that you  
20 would have higher populations.

21 Q Do you have any information on the techniques that  
22 Dumbrowski used to view and identify the birds on the  
23 lake or around the lake?

24 A It's my understanding that he had binoculars. He  
25 used fixed locations to observe the birds from the lake

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01 shore, and what he did in terms of his species accounts  
02 was he sub-sampled a small group of birds in a location  
03 near the deltas to give him an estimate of what the  
04 specific species of the ducks were and that -- the  
05 sub-sampling to then give you an indication of what the  
06 species occurrence is is a very common technique that  
07 is still employed today.

08 Q And even at a mile or so with the aid of powerful  
09 binoculars, identification of individual species is not  
10 impossible, is it?

11 A It may not be impossible. Again, I would say that  
12 when you are able to also use the way birds fly, you  
13 can identify individual species of ducks by flight  
14 patterns. And if he's standing at a set location for a  
15 while and looks out at a raft and sees birds moving  
16 around, moving in and out of the raft, he certainly  
17 could identify some species.

18 MR. VALENTINE: Thank you. I have no further  
19 questions.

20 HEARING OFFICER STUBCHAER: Does anyone else other  
21 than Staff wish to ask -- wish to cross-examine? I see  
22 none.

23 Mr. Thomas, are you going raise a point of order?

24 MR. THOMAS: No. I'm waiting for redirect.

25 HEARING OFFICER STUBCHAER: Staff have questions?

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01 Who's first? Mr. Herrera.

02 MR. HERRERA: Thank you, Mr. Stubchaer.

03 CROSS-EXAMINATION BY THE STAFF

04 Q BY MR. HERRERA: Mr. Thomas, how familiar are you  
05 with the Dumbrowski hunting operations?

06 A BY MR. RONALD THOMAS: I've only heard -- in addition  
07 to the information in the DEIR, I've only heard some  
08 accounts from local, long-time residents. I'm really  
09 not very familiar with the operation.

10 Q Would you know if they hunted the north shore at  
11 all? If his operations hunted the north shore?

12 A My impression is that some of the people that --  
13 I'll back up a second. I don't think they were in a  
14 position to actually have fee hunting on the north  
15 shore. Some of the people that hunted with Dumbrowski,  
16 especially some of the locals that were his friends  
17 that hunted there without paying, certainly went to the  
18 north shore and hunted frequently and very  
19 successfully.

20 Q What I'm getting at a little bit here is the map  
21 depicts areas for hunting. I'm assuming those are  
22 areas in which he would take clients or his people to  
23 hunt in those areas as is it a possibility to explain

24 why the north shore not depicted there?  
25 MS. GOLDSMITH: Objection. Calls for  
0131  
01 speculation.  
02 MR. DODGE: Also assumes that he took the clients  
03 to other areas for a fee, and I think there's no  
04 evidence of that.  
05 MR. HERRERA: I'll withdraw the question.  
06 HEARING OFFICER STUBCHAER: Sustained.  
07 Q BY MR. HERRERA: Either of you, Dr. Reid or  
08 Mr. Thomas, are irrigated pastures important for  
09 migrating waterfowl?  
10 A BY DR. REID: Irrigated pastures could be very  
11 important for migrating geese. It's not so important  
12 as we look at ducks. Some for widgeon, but certainly  
13 not as important unless we start to get so much  
14 irrigation that we're actually filling up pools within  
15 the irrigated pasture and then we have more mosaic of  
16 fresh water areas.  
17 Q Again, you would say then geese would primarily be  
18 using these pastures?  
19 A Yes, I would.  
20 Q Now, regarding Simons Springs, Dr. Reid, or  
21 possibly Dr. Stine, you indicated that at lake levels,  
22 pre-diversion lake levels, that these provided  
23 waterfowl habitat in the form of lagoons and fresh  
24 water interfaces with Mono Lake; is that correct?  
25 A BY DR. STINE: Actually, I wasn't talking so much  
0132  
01 about lagoons at -- Simons Springs, did you mention?  
02 Q Yes.  
03 A Not so much lagoons but these embayments. The  
04 coves, the still-water coves, rather than lagoons.  
05 Though there were minor ephemeral lagoons associated  
06 with that as well.  
07 Q On the exhibit, the aerial photograph --  
08 A I'm sorry. Can I make one other minor  
09 correction? You said that this was going to be in  
10 pre-DWP times and, indeed, it persisted for some time  
11 post-DWP times as well until the lake got down below  
12 about 6400 feet or so.  
13 Q Okay. And you had an aerial photo that depicted  
14 1982 conditions. What was the lake level at that time?  
15 A 1982 -- the lake got as low as 6372.0 feet in  
16 December of '81, January of '82. At the time these  
17 photographs here are taken, I'm pointing now at the  
18 photo mosaic of October 1982, the lake level was  
19 6372.67.  
20 Q Earlier in your testimony previously you indicated  
21 that you could construct burms to aid in the  
22 development of deltas primarily on Rush Creek. Is that  
23 true?  
24 A Yes. Although, if indeed the word "burm" was  
25 used, it was not in the littoral since,  
0133  
01 L-I-T-T-O-R-A-L. It was more in the artificial dike  
02 sense rather than long-shore burms.  
03 Q Could that same kind of concept be used in the aid  
04 or development of waterfowl -- or wetlands below Simons  
05 Springs between the '72 lake level or various lake

06 levels in between the historic 6400 scenario? Could  
07 that -- could you do the same thing with those type of  
08 dams?  
09 A It wouldn't be the same thing. Obviously -- or I  
10 shouldn't say obviously, maybe it isn't quite so  
11 obvious -- one can manipulate water flow at these  
12 areas, either digging trenches to move water from point  
13 A to point B or building dikes or some kind of  
14 embankments to hold back water and create ponds. But  
15 that would not -- I'm not sure how that could be used  
16 to create this sort of triumvirate of coves and marshes  
17 and hypopycnal water there. Maybe it could be  
18 engineered. You asked if it could be done. Perhaps it  
19 can be engineered. Whether it can be done politically  
20 with the Forest Service and the state holding sway over  
21 land development is another question that I'm not  
22 capable of answering.  
23 Perhaps Dr. Reid can talk about whether or not  
24 this would then improve duck habitat. I'm not capable  
25 of making that jump.

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01 Q Let me pursue that a little bit with Dr. Reid. If  
02 this Board was to select a lake level of somewhat below  
03 the recommended -- that you're recommending of 6405,  
04 are there various levels of restoration activities that  
05 may compensate for some of that alleged loss of  
06 wetlands that you have depicted below 6405?

07 A BY DR. REID: I believe that you could look at some  
08 potential interim restoration activities like that,  
09 either if you selected a lake level, say, at 6405 as an  
10 interim basis, or if you selected a lower level site,  
11 but if you selected a lower alternate lake level site,  
12 would it -- would those kinds of created wetlands  
13 provide the kinds of water fowl resources that you  
14 would get at 6405? I do not think so. I think you  
15 would get some waterfowl habitat. I believe you would  
16 back up some fresh water small lagoons in those areas,  
17 but I do not believe it would be to the same quality  
18 habitat.

19 What we have not investigated and what I cannot  
20 tell you is if you start moving that alkali material  
21 around in that basin, if you are going to be able to  
22 substantially hold a burn with water in those  
23 locations, I have not had a soil scientist down there  
24 looking at that yet.

25 Q If you were to look at the areas of interface

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01 between fresh water and salt water and the shoreline  
02 that's been depicted by Dr. Stine and yourself a little  
03 bit in here, is that habitat more important for  
04 waterfowl than the areas in the springs above the lake  
05 level? Simons Springs particularly? Which one of the  
06 two would you consider a better waterfowl habitat?

07 A Okay. I understand the first one. Can you  
08 describe the second one a little bit more?

09 Q The spring areas, let's say if we did create fresh  
10 water wetlands above the lake level itself.

11 A Um-hum.

12 Q At whatever lake level was selected.

13 A Um-hum.

14 Q Would that be of higher quality than those  
15 shoreline areas, or would it be more desirable for  
16 water quality?

17 A I think the shoreline areas probably would be more  
18 desirable as you got that fresh water input, but  
19 equally as important are those deltas, and the  
20 corridors of the tributaries that are coming into the  
21 lake. And I think what's important here is it's not  
22 that you're simply providing one type of habitat, but  
23 now you provided the mosaic of habitats which was  
24 present when we had the large duck populations, and  
25 those are the kinds of resources in group that are

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01 necessary to fulfill the various needs of that part of  
02 the annual cycle.

03 Q Okay. Thank you. One other question. We heard  
04 that in the Dumbrowski reports you were talking about a  
05 large number of ducks rafted up in the middle of the  
06 lake. Is there a particular species of ducks that you  
07 would think would be more susceptible of rafting in the  
08 middle of a large saline lake like this than other  
09 types?

10 A Absolutely. One would think that you would have  
11 large groups, say, of gadwall or diving ducks that  
12 would raft up. It also is most likely a situation with  
13 wind. And where you have large winds on the lake,  
14 there can be great thermal loss by the birds, which is  
15 very energetically expensive. And so where you get  
16 major wind action, the birds may, in fact, raft up away  
17 from some of the -- some of the delta areas and may be  
18 getting beat up on the shoreline or they may move to  
19 the lagoons, like you don't see there.

20 And what I would say is going on on that  
21 Dumbrowski map right there, is that's a clear day.  
22 That's a clear day. There's no wind. The birds are  
23 out in the deltas. There's no reason for them to go  
24 back to that lagoon. That lagoon habitat's going to be  
25 extremely important on a windy day. They're going to

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01 move into that and get protection behind the burms.

02 A BY MR. RONALD THOMAS: Before we leave that, if I  
03 could add just a bit. I've flown the lake a number of  
04 times over the year and including this September to do  
05 a comprehensive duck count. I've never seen grebe raft  
06 up. Ducks certainly do for the reasons Dr. Reid has  
07 mentioned, but in my experience on the lake over the  
08 years, I've never known the grebes to raft up in the  
09 tight bunches that the ducks commonly do. So I think  
10 with that in mind, it would be very easy to tell the  
11 rafts of ducks from grebes out on the lake at great  
12 distances.

13 Q Thank you. One last question for either of you  
14 again, Dr. Reid or Mr. Thomas. What effect do you  
15 believe that waterfowl hunting had on the use of  
16 migrating waterfowl in Mono Lake? Either pre-1940 or  
17 post-1940?

18 A BY DR. REID: If we have -- if we have substantial  
19 hunting around the entire ring of the lake, if we have  
20 continual human disturbance at the deltas of the  
21 streams, it's going to tend the push the birds either

22 interior into the middle part of the lake to get away  
23 from the hunters, or they'll push out. If we have some  
24 areas which are not hunted or are hunted only in the  
25 early morning and then are let go, then the birds will

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01 use those habitats. But if they're continually  
02 harassed and shot at, they'll move away from those  
03 areas like the delta if that's where they're being  
04 hunted.

05 Q And do you think that occurred in pre-diversion  
06 times, the hunting that heavy, to your knowledge?

07 A I don't know.

08 Q Mr. Thomas?

09 A BY MR. RONALD THOMAS: I can't answer that question  
10 either. I wasn't there in those years. I would say  
11 over the years, my experience as a duck hunter is that  
12 when there's a large body of water like Mono Lake  
13 nearby where the birds can raft safely up in the middle  
14 and be protected. I've seen many times over the years  
15 ducks seem to know when shooting time is over and as  
16 soon as that magic moment comes, they'll lift up off of  
17 the middle of that lake, fly to the marsh where they  
18 can't be hunted any longer, and they'll settle around  
19 in an area the size of this room and duck season might  
20 as well be closed, as far as they're concerned.

21 A BY DR. REID: And in that vein, Gray Lodge Wildlife  
22 Area, which is a state-owned area, is one of the best  
23 hunting areas we can find in the state and yet they  
24 hold upwards of a million birds this time of year. So  
25 depending on individual inviolate sanctuaries within

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01 the larger complex, you can have birds using the area.

02 MR. HERRERA: Thank you very much. That concludes  
03 my questions, Gentlemen.

04 Mr. Canaday?

05 MR. CANADAY: Mr. Smith had a question he wanted  
06 to ask.

07 HEARING OFFICER STUBCHAER: Mr. Smith?

08 MR. SMITH: Thank you.

09 Q BY MR. SMITH: Mr. Thomas, your former testimony was  
10 that eagles and Peregrine falcons were known to hunt  
11 ducks in the pre-40 time period.

12 A BY MR. RONALD THOMAS: I hope I wasn't misunderstood.  
13 I meant to say and I think I said that it was my  
14 opinion that large waterfowl and shore bird populations  
15 that existed pre-diversion, that those populations  
16 certainly would have supported -- as prey would have  
17 supported populations of bald eagles, golden eagles, as  
18 well, and Peregrine falcons. In fact, there are a  
19 couple of references in some of our exhibits that refer  
20 to the presence of duck hocks which are Peregrine  
21 falcons.

22 It's my opinion that there certainly would have  
23 been those two species as well as other species of  
24 predators in those days.

25 Q But do you mean to testify that the golden eagles

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01 or the bald eagles would be hunting the ducks?

02 A Certainly. In fact, I just picked up a road kill  
03 golden eagle last week and found duck parts in its

04 crop. They certainly do eat ducks.

05 Q Thank you.

06 For Dr. Reid, my question was we had some  
07 testimony that there was large rafts composed of -- of  
08 your -- what are those, the northern shovelers. I was  
09 trying to remember their other colloquial name. It  
10 would be gadwall and northern shovelers?

11 A BY DR. REID: It could be a mix. It could be a  
12 single species, a flock as well.

13 Q Just a question about your membership in Ducks  
14 Unlimited. Did you ever have a hunter by the name of  
15 Jack? If so, would you please give us his last name?

16 A BY MR. RONALD THOMAS: That was Hungry Jack.

17 HEARING OFFICER STUBCHAER: Mr. Canaday.

18 Q BY MR. CANADAY: Dr. Stine, we've talked about  
19 various different sites along the lake, but you haven't  
20 been -- no one's inquired too much about the Mill Creek  
21 wetlands area. Briefly describe the kinds of changes  
22 that have taken place at Mill Creek since the  
23 19forties.

24 A BY DR. STINE: Mill Creek has an interesting history  
25 and it's actually, if that's possible, somewhat more

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01 complex than the other streams. Without going into the  
02 morbid details, pre-1940 water had been taken out of  
03 Mill Creek by Southern California Edison to generate  
04 power, and that water was then put -- returned from the  
05 tail race of the Southern California Edison power  
06 plant, or its predecessor power plant, into Wilson  
07 Creek. So Mill Creek early on was deprived of some of  
08 its water.

09 But throughout the 1930s, apparently, the -- with  
10 the exception of some logging operations, the  
11 vegetation actually stayed pretty much intact on Mill  
12 Creek. By 1940, of course, DWP was taking Mono Basin  
13 water south to Los Angeles. They didn't take Mill  
14 Creek water but, of course, they forced a drop in lake  
15 level, and so Mill Creek incised roughly the same  
16 amount as Lee Vining Creek has incised, about 12 to 14  
17 feet maximum, something like that. And as a result,  
18 the wetlands adjacent to Mill Creek disappeared, and  
19 they drained and, therefore, disappeared.

20 The riparian vegetation along Mill Creek, likewise  
21 desiccated. Again, this isn't in direct response to  
22 Mill Creek use by Los Angeles, it's in response to Los  
23 Angeles drawing down the lake causing the incision of  
24 the stream.

25 Q If the lake were to rise to 6390 or higher, what

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01 do you believe would occur in that Mill Creek bottom  
02 lands as far as the -- any wetlands restoration that  
03 could occur there?

04 A There is some seepage that continues to go on  
05 along Mill Creek, at several sites along Mill Creek.  
06 So I think if one was to bring the lake up to 6390, one  
07 would find shoreline seeps in the vicinity of Mill  
08 Creek. However, the wetland distribution there would  
09 not approximate what it did in -- in the pre-DWP time  
10 unless one put pre-DWP amounts of water back into Mill  
11 Creek. So to get a substantial amount of wetlands back

12 on Mill Creek would involve not only bringing the lake  
13 up, but also putting water back in the stream, and it  
14 would create a lot of shore fringing wetlands at the  
15 mouth of Mill Creek and presumably a lot of the  
16 riparian vegetation that used to be there on Mill Creek  
17 would come back as well.

18 It would be -- you know, it's the one area in the  
19 Mono Basin that hasn't been discussed all that much.  
20 It's the one area where probably dollar for dollar you  
21 could do the most amount of restoration work for the  
22 least cost. No one is taking that water out of the  
23 basin, so its value is not nearly as great as if it's  
24 being used domestically. And so the restoration  
25 potential per dollar is, I think, huge on Mill Creek.

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01 Q The hypopycnal stratification is based on the  
02 differential density of the fresh water versus the salt  
03 water?

04 A Correct.

05 Q As -- let's assume a hypothetical. As the lake  
06 would rise at some level, 6390 or higher, that  
07 differential gets smaller and smaller, correct?

08 A Yes. It's not a threshold phenomenon. It gets  
09 smaller and smaller whether the rise is ten feet or ten  
10 centimeters.

11 Q But does the -- do you believe that the aerial  
12 extent of that will decrease?

13 A The aerial extent of the hypopycnal stratum?

14 Q Yes.

15 A No, I don't at all. I think it will actually  
16 increase once the lake gets up above about 6400 feet  
17 because all of a sudden, there are these coves for the  
18 fresh water to build up in and persist as a stratum for  
19 some period of time. I should point out that even if  
20 the lake was at 6417 feet, which is 12 vertical feet  
21 above what we're suggesting here would be required to  
22 restore the duck habitat out there or the environmental  
23 conditions that accompanied the ducks, even at 6417  
24 feet, the specific gravity differential between bottom  
25 water and top water would be approximately three to

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01 four times the density difference that caused miramixis  
02 to set up during the 1980s. So it's -- the water is  
03 going to stay stratified. Light stuff floats on heavy  
04 stuff, and that's going to remain to be the case even  
05 at 6417 or for that matter, even at 6430 feet, there's  
06 going to be light water floating on heavy water at Mono  
07 Lake.

08 Q You mentioned earlier about near shore seeps. Do  
09 you believe as the lake rises we'll see an increase in  
10 this near shore seepage that was there historically?

11 A Well, I think it would -- yeah. It will perhaps  
12 increase. I think what's happening now is that the  
13 lake, for some reasons that I've discussed in what I've  
14 written, the lake is now -- the lake margin is now  
15 abutting very, very gently sloping lands, and so the  
16 seeps that we're seeing around the lake today are  
17 actually coming out at a considerable -- in other  
18 words, they're emerging at a considerable distance from  
19 the shoreline. If Mono Lake rises, it rises up against



20 first very generally sloping shore lands, and then at  
21 higher and higher elevations, more steeply inclined  
22 shore lands. And as the lake gets up on to those more  
23 steeply inclined shore lands, the tendency is for the  
24 springs to emerge much, much closer to the shoreline  
25 itself rather than a considerable distance from the

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01 shoreline.

02 Q I'm trying to get a clarification in my notes on  
03 something you said about the Rush Creek bottom lands  
04 with the wide canyon bottom near the delta. Was it  
05 your testimony that there isn't going to be much  
06 emergent marsh or marsh developed in the Rush Creek  
07 delta unless the lake is at 6405 or higher?

08 A I think that's -- that will be the case. At least  
09 up on the delta plain. The delta plain is this big  
10 broad area that lies to both the north and -- pardon  
11 me, the east and the west of the incised Rush Creek  
12 Channel, and that used to be marshland. It is today  
13 upland scrub, chrysothamnus nauseosus and artemesia  
14 tridentata, primarily. In other words, the more --

15 HEARING OFFICER STUBCHAER: Could you spell that?

16 DR. STINE: Should I just give it to you later?

17 THE REPORTER: That's fine.

18 DR. STINE: In other words, it's desert scrub  
19 vegetation whereas it used to be marshland. If the  
20 lake were to rise to, say, 6383.5 or even 6390, those  
21 lands would still remain dry; that is to say, the water  
22 table would still be low, well below the surface of the  
23 delta plain. So it won't be until the lake gets up to  
24 6400, 6405 feet that you can actually raise the water  
25 table on those approximately 180 acres of land up there

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01 on the Rush Creek delta.

02 Q BY MR. CANADAY: But there will be additional lands  
03 below that that are exposed now that as the lake comes  
04 up that there will be opportunities for wetlands and  
05 marsh creation. Is that true?

06 A I'm not sure exactly where your -- what you're  
07 talking about. There are -- exactly the locale you're  
08 talking about. As Mono Lake rises up to 6400 feet at  
09 the deltas, it's rising against a very, very steep  
10 delta front, and you don't typically find marshland on  
11 steeply inclined lands. The steeply inclined lands  
12 just drain too rapidly. They don't hold the water.

13 You would get some wetland vegetation to be sure  
14 down in the trench where -- close to where Mono -- Rush  
15 Creek meets Mono Lake in the trench, but not along the  
16 front of the delta and not up on that gently sloping  
17 delta plain.

18 Q How wide is that trench?

19 A It's -- it's triangular. Width at the mouth would  
20 be approximately -- the present day mouth would be  
21 approximately a thousand feet. Let's say 800 feet plus  
22 or minus 100 feet, something like that. By the time we  
23 get upstream to about 6400 feet, the trench is  
24 considerably narrower, probably 200 feet, something  
25 like that, as a top width. There's a terrace in there,

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01 so that as a bottom width, it's probably less than 100

02 feet.

03 Q Mr. Thomas, you testified that you conducted an  
04 aerial survey this September for waterfowl in the Mono  
05 Basin?

06 A BY MR. RONALD THOMAS: That's correct.

07 Q Did you also survey either on the ground or in the  
08 air at Grant Lake?

09 A Not at that time, although I've been to Grant Lake  
10 a number of times this fall.

11 Q Do you have any population estimates that are  
12 using Grant Lake currently?

13 A I don't have numbers, but I can give you an  
14 impression or an opinion. The numbers are very low.  
15 They're usually a small number of mallards at the  
16 mouth. Sometimes a few Canadian geese scattered around  
17 the lake. Do you want a number estimate?

18 Q What I'm getting at is that -- I'm kind of curious  
19 of what the numbers were for Crowley, Bridgeport  
20 Reservoir, and Topaz, so I'll get an idea of the kinds  
21 of bird use we're getting there, at least this present  
22 year, as it compares to Mono Lake.

23 Q I live very close to Topaz. I haven't been to  
24 Crowley this fall, but there have been hundreds of  
25 Canadian geese on Topaz this fall, and that's a common  
0148 occurrence.

02 The other areas, Bridgeport -- I wasn't able to be  
03 there on the hunting opener. Just prior to the opener  
04 in early October, there were a few thousand ducks and  
05 probably some hundreds of Canadian geese on  
06 Bridgeport. So at about that same time, then, when I  
07 flew to Mono Lake when we had less than a thousand  
08 birds, there were -- there were greater numbers than at  
09 each of those other two habitats. And by the way,  
10 which are much smaller areas, water areas, also. This  
11 suggests to me the relative value of the quality of  
12 habitat on those different areas. Even though  
13 Bridgeport and Topaz are much smaller, the quality of  
14 the habitat must be much greater because there's a much  
15 greater number of birds that are using those areas.

16 Q Those reservoirs are both linked -- or have  
17 linkages to wetlands near open water, don't they?

18 A That's true. At the upper end of both of those  
19 reservoirs are extensive areas of -- again, this  
20 seasonally flooded ground that's of such value because  
21 you get the emergent vegetation that's highly  
22 nutritious. You get the increased nutrient cycling, so  
23 that forage there is much more nutritious. And then  
24 the open water, fresh water, resting area which is not  
25 only nearby, but actually adjacent.

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01 Q Dr. Reid, we heard last week some testimony --  
02 recently heard testimony over in the Mono Basin from  
03 some long-time residents, and I asked them some  
04 questions about waterfowl. And their recollections  
05 were that they call them spoonies or shovelers, so  
06 we'll assume it's the northern shoveler, but their  
07 recollection of the use of where the birds were, that  
08 the shovelers were typically found in large numbers on  
09 the lake and that the mallards were typically found

10 along the -- in the deltas or in the stream corridors  
11 of particularly Rush Creek. And --  
12 A BY DR. REID: That would certainly make sense. As I  
13 mentioned earlier and in my testimony that mallards and  
14 green-winged teal are really riparian species and just  
15 as we see in the Central Valley, the real movement of  
16 mallards in the Butte Sink area where you have the  
17 highest riparian corridors in the Central Valley,  
18 mallard is really a species that is oriented to that  
19 kind of habitat versus spoonies or northern shovelers  
20 which are zooplankton feeders. They're sweepers, and  
21 they're foraging in the open water.

22 Q We also heard testimony that -- by one of the  
23 gentlemen that if you wanted to hunt geese, you went to  
24 the Warm Springs area where the geese were feeding out  
25 in the grass and that would be consistent, too, with

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01 the biology of that bird as well?

02 A Absolutely.

03 Q So based on, however, this is anecdotal by  
04 long-term residents, you would -- if I said -- if I  
05 asked you -- I'm going to ask you the question this  
06 anecdotal testimony is fairly consistent with what you  
07 would believe to be use by waterfowl in the basin?

08 A Absolutely.

09 Q The Dumbrowski report discusses some of the  
10 rafting numbers on the lake, and they talk about  
11 ruddies and shovelers being roughly about 80 percent.  
12 Now, the ruddy duck suffered a significant population  
13 decline in what time period in the west, do you recall?

14 A I can't tell you for ruddies specifically. Ruddy  
15 ducks are unique in that they have a breeding strategy  
16 much more like a goose. They tend to lay very few  
17 eggs. Whereas a mallard or a shoveler or a gadwall  
18 will lay somewhere about eight to nine eggs, ruddy  
19 ducks lay about five, and they're huge. You can't  
20 believe that a female ruddy duck's going to lay that  
21 egg, and their strategy is to have fewer eggs but more  
22 reserves put into each individual egg. And so what we  
23 tend to see is we see that the survival of ruddy ducks  
24 on the breeding areas per broad, they have four to five  
25 young always survive in any kind of successful nest

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01 whatsoever. Whereas in dabbling ducks, we can  
02 oftentimes lose very large numbers.

03 A BY MR. RONALD THOMAS: If I could add something there  
04 just very briefly on ruddy ducks. I think it's  
05 pertinent that we see a very high percentage of ruddy  
06 ducks on the lake even today and probably more so  
07 today. It should be noted that the ruddy duck is --  
08 probably the duck that is most adapted to highly saline  
09 conditions. And this would help to explain the  
10 preponderance of ruddy ducks on the lake as salinity  
11 has increased over the years.

12 Q Mr. Thomas, are you aware of much nesting by  
13 either ducks or geese in the Mono Basin? And if they  
14 do nest, where?

15 A No. I expect there's some Canadian geese nesting  
16 here and there. I've seen Canadian geese nesting in  
17 places such as the rock piles on the way to Bodie up in

18 the Bodie Hills, so they're very adaptable. Today, I  
19 expect that there are very few, almost no ducks nesting  
20 in the basin, and I want to be clear that even in  
21 historic times, the importance of the Mono Basin was  
22 not as a nesting habitat but as a migratory habitat.

23 Q It was your testimony, Mr. Thomas, that while  
24 there are more lake shore associated wetlands, that  
25 these wetlands as they occur today are of less value  
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01 per acre than the kinds of historical wetlands that  
02 were there?

03 A That was my impression from being on the lake many  
04 times and flying low-level helicopter surveys of the  
05 lake shore. We were trying to look at the  
06 micro-habitats in detail from the helicopter a number  
07 of times over the years, and you find -- you flush with  
08 a helicopter almost no critters in those -- those  
09 alkali meadows, as you call them.

10 I was just recently -- just within the last few  
11 days, looked at the auxiliary report Number Three, I  
12 believe it was, that described the wildlife surveys  
13 conducted as part of the document. And the same  
14 information came out of that report, that the lake  
15 shore habitats had very low species. I believe two of  
16 the -- there was a lake shore willow habitat that had  
17 three species, as I recall. There was the -- the  
18 alkali meadow and alkali wetland, I believe were two  
19 categories that had only one species each, as I  
20 recall. At any rate, the other habitats in the basin  
21 had as many as 12 to 14 species, and those newly  
22 created alkali wetlands around the lake had very low  
23 numbers and species.

24 A BY DR. REID: One of the things related to that  
25 question is -- one of the things related to that  
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01 question was again the importance of this habitat is  
02 for fall waterfowl migration, and many of these  
03 habitats are flushed with water on a vernal basis but  
04 then are dry as you go out there in the fall, and so  
05 are virtually unavailable for waterfowl and so don't  
06 serve any waterfowl basis in fall migration.

07 Q Dr. Reid, your -- reading your resume, your vitae,  
08 you have tremendous experience in the marsh and wetland  
09 restoration or creation. You realize that there's  
10 going to be -- whatever lake level -- at many lake  
11 levels the Board could choose, there's going to be a  
12 transition period of a decade or longer?

13 A Yes. I recognize that.

14 Q What kinds of interim, if one of the goals was to  
15 acknowledge that in some future date there was going to  
16 be naturally occurring or naturally self-restoring  
17 wetlands, but in the interim, what kinds of things  
18 would you suggest that the Board should consider?

19 A Well -- and certainly as we looked at the basin,  
20 one of the reasons we selected the DeChambeau site was  
21 because of that elevation, it would be a viable habitat  
22 no matter how small it was, irregardless of the  
23 elevational changes. So one can look at some of these  
24 higher areas and look at the potential creation or  
25 restoration of some of these sites.

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01           Where I think the greatest potential for some of  
02 the interim measures will be is looking at the Warm  
03 Springs area, looking at the Simons Springs area, and  
04 looking at the potential for very low-level,  
05 earth-moving activities, rather than like putting up  
06 large burms, et cetera, rather putting in very, very  
07 small scrapes that will fill in with spring waters, et  
08 cetera, hold water through the summer periods and into  
09 fall. These have some -- I think some potential both  
10 for providing habitat -- it's not cheap, but it will be  
11 relatively inexpensive as compared with a lot of what  
12 can be done out in the basin.

13           There certainly is a potential, like we see at  
14 DeChambeau, to do some restoration with regard to  
15 groundwater. That's very expensive. As we get into  
16 groundwater work, that's a major investiture of  
17 dollars. Certainly one of the greatest areas, if there  
18 is some increase in the water levels and during that  
19 interim period, would be the areas in the stream  
20 corridors, most especially Rush Creek delta area, the  
21 Lee Vining Creek area, and in flood plains along those  
22 areas. As the lake levels rise, as water backs up in  
23 some of those tributaries, there will be a number of  
24 small back water sloughs created, and these will be  
25 very exciting habitats.

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01           I think the fact that you're bringing this up, I  
02 think this could be a very exciting venture and  
03 exciting time for all the parties involved, and I would  
04 hope that regardless of what happens in this situation  
05 here, that all the parties might come together at some  
06 time and look at those investitures.

07 Q        Would DU be willing to participate as a technical  
08 adviser in that propers?

09 A        Absolutely.

10           MR. CANADAY: Thank you. That's all I have.

11           HEARING OFFICER STUBCHAER: Any other questions of  
12 Staff?

13                           CROSS-EXAMINATION BY THE BOARD

14 Q BY HEARING OFFICER STUBCHAER: I just have one  
15 question regarding the slide that was shown to us  
16 where -- the fresh water fan out in the lake, the  
17 breaking waves around it in a semicircular fashion. It  
18 seemed to me that the color of that fresh water  
19 indicated the presence of silt. Was that an optical  
20 illusion or was that the case?

21 A BY DR. STINE: That is indeed the case. That silt is  
22 particularly evident on Rush Creek because the lower  
23 approximately one mile of Rush Creek cuts through very  
24 easily erodible, pumiceous, volcanic sediments, and so  
25 this stuff -- in fact, some of it floats. And so it's

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01 very, very easily erodible, and there's quite a load of  
02 silt by the time we get down to the Rush Creek marsh.

03           On Lee Vining Creek, we don't cut through that  
04 very easily erodible material, and I have observed this  
05 same phenomenon, white caps -- or actually not white  
06 caps, but breakers around the edge of the hypopycnal  
07 lens at the mouth of Rush Creek and there, it's really

08 only the area of breakers that lets you know that this  
09 lens is even there because there the color is not  
10 different enough to actually be able to distinguish the  
11 two waters that way.

12 Q Doesn't the silt affect the density as well as the  
13 salinity?

14 A Certainly. The silt, though, would tend to make  
15 the fresh water denser than would otherwise be the  
16 case, so it's actually working against hypopycnal  
17 stratification. Nevertheless, hypopycnal  
18 stratification persists despite the difference.

19 Q I may have said this before but how deep is the  
20 water in the middle of that area in that slide?

21 A I didn't go out into the middle of the area. I  
22 could see that -- I waded out a little ways into it,  
23 and it's actually fascinating to play around with this  
24 thing because where I was standing, the water was  
25 approximately, I would say, three to four inches thick,  
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01 the layer of fresh water. The way you could tell this  
02 is to put your hand very slowly down through fresh  
03 water, and when your hand all of a sudden encounters  
04 the salt water at depth, you get this schlieren  
05 phenomenon where it starts to look right around the  
06 edges of your fingers as though oil and water are  
07 mixing. And you get this beautiful sort of rainbow,  
08 three-in-one-oil-in-a-can-of-water-as-a-kid kind of  
09 effect where you can actually see the two waters  
10 mixing. So you can, in this rather crude way, check  
11 the depth of the water.

12 How deep that water was out in the middle or  
13 immediately off the stream mouth but close to the  
14 stream, I don't know. I wasn't able to get there. I  
15 suspect it was six inches, something like that perhaps.

16 Q All right. I've observed sediment plumes in the  
17 ocean going -- after major floods, going out 30 miles,  
18 and you can see them from space. And those sediment  
19 plumes are dense enough to not be on the surface until  
20 they get mixed. And so it seems to me that some of  
21 these sediment plumes would be between Mono Lake  
22 density and ocean density. I don't know if that  
23 applies. The sediment, as you said, might be lighter,  
24 but isn't that how the deltas are formed is by the  
25 settling out of that sediment?

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01 A It's how the bottom set beds of the deltas are  
02 formed. That's right.

03 Q Is that bed load movement or is it settling  
04 sediment that forms the deltas?

05 A The deltas are formed at top set beds, forward set  
06 beds, and bottom set beds, and it's really a  
07 combination of the three. The top set beds are the  
08 coarse material, pebble. The forward set beds would be  
09 the combination of the two. The bottom set beds, the  
10 material that's getting out into the lake which the  
11 delta is then building out over would be the very fine  
12 material. And I've always wanted to do a study on how  
13 far out into the lake you could get these -- get the  
14 suspended sediment, how far --

15 Q And how does the suspended sediment settle through

16 the saline layer underneath it?  
17 A The differential between the settling rate in the  
18 fresh water versus the settling -- you're an engineer,  
19 Sir? Maybe we could talk about this another time  
20 because I have some questions for you.  
21 HEARING OFFICER STUBCHAER: All right. We have to  
22 stop now. It's five o'clock. Interesting. We're not  
23 going to get the redirect today, so that will be in the  
24 morning. I understand that -- 8:30, Mr. Canaday?  
25 MR. CANADAY: Yes, 8:30. Sharp.

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01 HEARING OFFICER STUBCHAER: And regarding tomorrow  
02 night.  
03 MR. CANADAY: Sharp 8:30.  
04 HEARING OFFICER STUBCHAER: I wouldn't take  
05 Mr. Canaday's bet on tomorrow night because there may  
06 be another function going that would stop it. It's  
07 uncertain. You'll have to find out tomorrow.  
08 MR. CANADAY: It's his money. I never worry about  
09 his money.  
10 HEARING OFFICER STUBCHAER: And with that --  
11 Okay. After you make another announcement, we'll  
12 recess.  
13 MR. CANADAY: The particular function that you're  
14 talking about is only a two-hour function. If it  
15 starts at 5:30 and ends at 7:30, we still could be in  
16 evening session.  
17 HEARING OFFICER STUBCHAER: We'll recess until  
18 8:30 tomorrow morning.  
19 (Whereupon the hearing was adjourned  
20 at 5:02 p.m.)

21 ---o0o---

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01 REPORTER'S CERTIFICATE

02 ---o0o---

03 STATE OF CALIFORNIA )  
03 ) ss.  
04 COUNTY OF SACRAMENTO )  
04

05 I, KELSEY DAVENPORT ANGLIN, certify that I was the  
06 official court reporter for the proceedings named  
07 herein; and that as such reporter, I reported, in  
08 verbatim shorthand writing, those proceedings, that I  
09 thereafter caused my shorthand writing to be reduced to  
10 typewriting, and the pages numbered 1 through 160  
11 herein constitute a complete, true and correct record  
12 of the proceedings:

13  
14 PRESIDING OFFICER: James Stubchaer  
15 JURISDICTION: State Water Resources Control Board  
16 CAUSE: Mono Lake Diversion  
17 DATE OF PROCEEDINGS: December 13, 1993  
18  
19 IN WITNESS WHEREOF, I have subscribed this

20 certificate at Sacramento, California, on this 22nd day  
21 of December 1993.

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Kelsey Davenport Anglin, RPR,  
CM, CSR No. 8553