UNITED STATES OF AMERICA
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION

IN RE:	:	
Proposed Waiver and Regulations Governing the Taking of Eastern North Pacific Gray Whales by the Makah Tribe	:	**Docket No. 19-NMFS-0001** **RIN: 0648-BI58 and** **RIN: 0648-XG584**

REPORTER'S OFFICIAL TRANSCRIPT OF PROCEEDINGS
NOAA ADMINISTRATIVE PROCEEDING
HEARING ON PROPOSED WAIVER and RULEMAKING
DAY 5 of 6

Jackson Federal Building
915 Second Avenue
Seattle, Washington
Wednesday November 20, 2019

BEFORE:

THE HONORABLE GEORGE J. JORDAN
ADMINISTRATIVE LAW JUDGE

Also Present:
Heather L. MacClintock, Esquire, Attorney Advisor
Chang Zhou, Esquire Attorney Advisor

Timekeeper:
Joseph Heckwolf, Esquire, Attorney Advisor NOAA

Sally Gessner, Court Reporter

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I N D E X

P R O C E E D I N G S

(Time noted: 9:02 a.m.)

THE COURT: Good morning. Okay. I guess we're back on the record. Again, I just wanted to make sure all parties are here. NMFS?

MS. BEALE: Present.

THE COURT: Makah?

MR. GRUBER: Present.

THE COURT: MMC?

MR. GOSLINER: Present.

THE COURT: AWI?

MR. EUBANKS: Present.

THE COURT: Sea Shepherd?

MR. SOMMERMEYER: Present.

THE COURT: And Peninsula?

MS. OWENS: Present.

THE COURT: Very good. All right. I guess we're -- is our witness here? Oh, okay. You may take the stand. And, ma'am, you've been previously sworn.

Please proceed.

(Whereupon,

CARRIE NEWELL

was recalled as a witness, and having been previously duly sworn, was examined and testified as follows:)

CROSS-EXAMINATION

BY MS. IMAKI:

Q. Good morning, Ms. Newell.

A. Good morning. How you doing?

Q. Good. How are you?

A. Good. Thank you.

Q. Good. For the record, again, Caitlin Imaki on behalf of NOAA Fisheries. So I'd like to pick up where we left off yesterday. We were discussing the Calambokidis 2019 paper. And we did review this yesterday, but I'd like to look at it one more time just to orientate everyone where we're at.

So this is Table 3 on page 19 of the paper. And, again, this is displaying acronyms for different survey areas. So for Oregon, the area that I believe Ms. Newell is most familiar with, that would be Oregon coast, which is primarily Depoe Bay. Is that correct, Ms. Newell?

A. Yes.

Q. Okay. Great. So with these acronyms in mind, I'd like to move on to Figure 7, which is at page 41, and review this figure.

MS. IMAKI: If you could make it a little bit smaller, Rachel, so we could see the bottom?

BY MS. IMAKI:

Q. So this table, if you would take a look,

Ms. Newell, are you familiar with this particular data?

A. Yes.

Q. Okay. So, as I understand it, this is the proportion of whales that have been seen at least 2 years in the subregions of the PCFG range, so they're defined as PCFG whales. And they have also been seen in the Makah U&A; is that correct?

A. Yes.

Q. And this is '96 through 2017. And so is it correct to say, then, that whales from Oregon, which would be the Depoe Bay area, approximately 65% of those whales that have been seen in your region have also been seen -- and the thing that's being depicted here is also in the Makah U&A; is that correct?

A. Yes.

Q. Okay. And it looks like a number of the other subregions, most of them exhibit -- that are seen in those other subregions, most times approximately half or more are also seen in the Makah U&A; is that correct?

A. Yes. But there's more to that graph.

Q. Okay. Sure. We'll look at some other data as well.

A. Okay. Because that's an overly simplistic view of it, and if you -- to really understand more of what's going on with that graph, which I do, I'd like to explain

that.

Q. Okay. Would you like to look at the graph that we looked at yesterday with the red lines on it? Would that help?

A. No. I can first talk to this one.

Q. Okay. Well, first, I would just like to -- I just have some questions about this particular graph or -- excuse me -- figure. Do you have any reason to doubt the findings that are in this particular figure?

A. No. No, Mr. Calambokidis does a great job.

Q. Okay.

A. But I do have to tell you that the graph, what the graph does show, it shows that, yes, those whales have been sighted in that area, but it doesn't show the magnitude. I mean, if the whale was even sighted only one time briefly, you know, the whale just decides, oh, I'm going to check this out here, the MU&A, went up, looked at it 1 day and came back to the same area. So it doesn't necessarily not show site fidelity, what it does is that, yes, those whales did in fact go to that area, but it does not by any means show the magnitude of sightings that actually occurred in those various areas.

Q. Okay. But it does show that they at least visited that area once?

A. Visited at least once. That is correct.

Q. All right. So I'd like to ask you a few more questions about some of the whales that we reviewed yesterday. And these are the ones that you had identified in your original declaration. And we had a chance to look at those compared with the guidebook that you had provided yesterday specifically as it relates to their Cascadia Research Collective number.

A. Okay.

Q. And one of those we looked at yesterday, and that was number 204, Scarback, and we reviewed Table 1 in Appendix 1 at page 55. I'd like to look at that one more time. And we already looked at number 204, so we'll skip past that.

So I had a chance to look at the book, and as far as I could tell, Ginger was not listed in the book with a CRC number. I didn't find her in the book.

A. Right. She's a new whale.

Q. A relatively new whale?

A. Yes, yes.

Q. And Yogi was also not in the book.

A. Yes.

Q. I did not find that one.

A. That is correct.

Q. Okay. And Comet I did find, and the number for Comet was 565. And so as we scroll down and look at where

Comet was sighted, is it correct this would be -- I have to look closely at this, but by my reading -- if I can find it. It's very difficult to read on the screen. I hope that folks can look at it on their own screens.

So 565 was Comet. So it looks like that particular whale, by our calculations, was sighted in 12 different years and, if you scroll over to the right-hand side, in four different survey areas, from Northern California to Grace Harbor. Does that sound right?

A. Yes.

Q. Okay. So that whale was in Depoe Bay but also sighted in these other locations, correct?

A. Correct.

Q. And then the last whale that you mentioned in your original declaration was Morisa, and I believe her number is 196. So --

MS. IMAKI: Sorry, Rachel, for going out of order.

BY MS. IMAKI:

Q. If we go back up to that particular whale, 196 -- so by calculation, and we confirm this on the data, she was sighted 17 years and, over on the right-hand side, in eight different survey areas, from Northern California all the way up to the west coast of Vancouver Island. And in fact, she was sighted 11 years in Southern Vancouver

Island. That would be correct?

A. That is correct.

Q. So would you agree that even these whales that you've talked about as having extreme site fidelity to Depoe Bay, have also been found in other areas, then, of the PCFG range?

A. Yes. Like I mentioned yesterday, they do have regional preferences. Some of them -- when you talk about site fidelity, you have to be able to -- like John Calambokidis talked about numerous times in various papers, so they have certain areas that they specifically like to go to, but that doesn't mean that they don't go to other areas. So they do have specific areas they prefer, but they also have what we would call regional preferences, that they check out different areas for, you know, is there more food in --

Q. Right.

A. -- in a different area?

Q. So they go exploring.

A. Exactly.

Q. Yeah. So I'd like to sort of finish this conversation by reviewing, once again, Figure 8, which is on page 42. And this is a figure that we looked at together yesterday.

So do you recall when you were -- this is the

figure with the red bars on it that you pointed out in your testimony yesterday.

A. Right.

Q. Do you recall that portion?

A. Yes.

Q. And I believe you referred to some of the whales that had very large ranges on that chart as transient.

A. I was -- I wasn't correct when I spoke that.

Q. Okay. What did you mean to say?

A. Those are just -- because after I had said that, I reread the report last night, and from my recollection, he doesn't include transients in this graph.

Q. Okay.

A. And so, that was my fault. I misspoke. So, but those -- that is a whale that is not a transient but did have a broad dispersal.

Q. Okay. So, and a transient, just for the record, is a whale that is only sighted once within the PCFG --

A. Yes.

Q. -- range; is that correct?

A. Yes. And they have more sightings. This graph is six or more sightings. And so, after I had said it yesterday, I was like, oh, I didn't -- like I didn't mean to say that. And then, but I thought if you brought it up today, I would make the record straight that I misspoke.

Q. All right. So, and then just to clarify. You mentioned it, but this figure displays whales that have been sighted at least six or more times, correct?

A. Correct. It's pooled data. It's pooled data from the 22 years of six or more sightings, and those sightings --

Q. And the red line represents -- I believe it's stated there in the description of the figure -- the 75th inner quartile of the number of sightings, correct?

A. And what that actually means is that 75% of the time that whale was found in that locality over a span of 22 years.

Q. Okay. And what about the light gray lines? Did you explain those yesterday?

A. Those are ones that are -- the tiny ones, the dashed ones, is that the --

Q. Right. The light dashed lines, what do those represent on this figure?

A. That's actually the full range. That's the full range.

Q. So it shows all the locations, the latitude that those whales have been sighted over the entire time span?

A. Yes.

Q. Is that correct?

A. That is correct.

Q. Okay.
A. Yep. You got it.
Q. All right. It sounds like we're in agreement.
A. Yup.
Q. And just one more point on this matter. You mentioned in your declaration that the whale that was killed in 2007 in the Makah U&A was a whale that you had just photographed 2 weeks earlier in Depoe Bay. Do you recall that part of your testimony?
A. Yes, I do.
Q. And so does that serve as another example of whales being throughout the PCFG range?
A. Yes.
Q. And I believe you confirmed yesterday with Ms. Pruett that you have not published any peer-reviewed articles on site fidelity as it relates to PCFG whales; is that correct?
A. The paper that we had seen does get into site fidelity. We talked about that yesterday.
Q. Are you speaking about the paper that you published based on your master's work?
A. Yes.
Q. But the subject matter of that was the feeding behavior of the whales and the usage of mysid shrimp; is that correct?

A. Well, it talked about how these whales were in residence for a certain amount of time, some of them up to 85%, and that in fact is site fidelity.

Q. Okay. So besides the paper we reviewed yesterday, have you published anything -- I believe you confirmed that you had not published any other --

A. That is correct.

Q. And I think we should try to be careful for the court reporter so we're not speaking over each other. So I'll try to go slowly. She just has a hard time if we speak at the same time. So I'll try to be careful, too.

And I'd like to move on to something you testified about yesterday, that you referred to as cryptic mortality. And you were making some assumptions based off of a couple of whales that have stranded in the PCFG area. Do you recall testifying about this yesterday?

A. Yes.

Q. And were you able to hear Dr. Moore's testimony earlier in the proceeding about why applying that particular percentage to PCFG strandings is inaccurate?

A. No. I was not here. I was working.

Q. Okay. So is it safe to say that you're not familiar with how that 4 to 13% number was developed in terms of estimating cryptic mortality?

A. Yes.

Q. And, Ms. Newell, are you familiar with the fact that the PCFG is surveyed annually?

A. Yes.

Q. Okay. And so it sounds like then you're aware that we will have survey numbers each year that will help us understand the actual population abundance of the PCFG; is that correct?

A. Yes.

Q. And yesterday you talked about internal versus external recruitment and said that it was your true belief that internal recruitment was higher than external recruitment. Do you recall that testimony yesterday?

A. Yes. And I have seen that with my own eyes with the whales off Depoe Bay. I am by no means an expert, you know, in the rest of the range, but I have been in contact with John Calambokidis, and we have had discussions about this. And he's going to look at my data more and we're going to -- I'm going to look at other data. But I said it's my feeling --

Q. Okay.

A. -- that's my feeling, we don't -- I mean, in UME years, I think we definitely have an influx of those whales. If you -- like I said yesterday, if you don't have food, you're going to go to an area to find food. I mean, I've seen that all the time. But as far as what the

internal recruitment is, I really think from John Calambokidis' paper we talked about yesterday, I think a lot of the -- I mean, the females are teaching the calves where to go. And a lot of times, just like most animals, they are creatures of habit and if they learn that area from their mother, then they will continue to go to those areas. I would be very, very, very surprised if a large number of those calves, they went up to Alaska to feed. But that's my gut feeling --

Q. Okay.

A. -- just from what I've already seen with my data.

Q. And I'm sorry to keep asking this. But you didn't cite any peer-reviewed literature in support of that gut feeling; is that correct?

A. Not in my declaration, no.

Q. Okay. Thank you.

MS. IMAKI: That's all the questions I have at this moment, Your Honor. I would request, though -- we did do our best to review the exhibits we received yesterday around 6 p.m. via email. But given our workload for other matters for this hearing, we were not able to fully review everything. So at this point we would just like to reserve our right to recall Ms. Newell to ask any further questions related to her book during the course of

this proceeding, if needed.

THE COURT: All right. Very good. Thank you.

MS. IMAKI: Thank you.

CROSS-EXAMINATION

BY MR. SLONIM:

Q. Good morning, Ms. Newell. My name is Marc Slonim. I'm one of the attorneys for the Makah tribe.

A. Good morning.

Q. Good morning.

A. Nice to meet you.

Q. Nice to meet you. I wanted to try to clarify a couple points just quickly up front.

A. Okay.

Q. First of all, you mentioned you're a professor?

A. I am.

Q. And then you listed a number of places where you've taught in your testimony. And I think you mentioned Oregon State University?

A. Yes.

Q. So were you employed as a professor by Oregon State University?

A. I was an adjunct professor there.

Q. And when was that?

A. Oh. I don't have my resume in front of me. It was probably -- I taught in the summer. I taught marine

biology. Mid-2000s. Well, I had a -- let me think. I had a grandson that died, and so it was --

Q. I'm sorry.

A. -- that -- I was teaching there when that happened. So let me -- I think it was 2007; 2006, 2007. I'd have to go back.

Q. One or --

A. I mean, you can --

Q. One or two summers?

A. I taught at least -- it was at least two summers.

Q. Two summers. Okay.

A. Or it was -- yeah, I can't remember.

Q. And then your other teaching has been at community colleges; is that correct?

A. Yes.

Q. Okay. You've been aware of the Makah interest in hunting gray whales at least since 1999; is that --

A. That is correct. Uh-huh.

Q. And were you aware that NMFS issued a draft environmental impact statement in 2015 regarding the Makah whale hunt?

A. You know, I never really looked at that, to tell you the truth. I mean, I've been so busy. I've been out of the loop a little bit with that. So no, I did not look

at that.

Q. Okay. And so you didn't submit any comments on that?

A. I did not.

Q. So the written testimony that you submitted in this proceeding is the first time you provided information to NMFS relative to the Makah whale hunt?

A. Yes.

Q. And that was done after you were contacted by Sea Shepherd?

A. I'm sorry. I didn't hear the question.

Q. What was -- your submission of written testimony, that was done after you were contacted by Sea Shepherd; is that correct?

A. Yes.

Q. And you understand that Sea Shepherd is offering your testimony in opposition to any hunting by the Makah tribe; is that correct?

A. Yes.

Q. I'd like to ask you a few questions just to get a little more background on your research activities, what you've been doing.

A. Okay.

Q. So what I've heard and saw in your written testimony is that you've been involved in extensive

observations of gray whales of Central Oregon; is that correct?

A. Yes.

Q. And you've taken a lot of photographs of gray whales off Central Oregon?

A. Yes.

Q. You've collected fecal samples?

A. Yes.

Q. And you did that as part of your research for your 2006 article and master's thesis?

A. Yes. And I continue to do that.

Q. That's an ongoing activity?

A. Yes.

Q. Do you have a permit for that activity?

A. I don't encroach the whales more than 100 yards. But what I do, and fecal material a lot of times dissipates rapidly, and so I don't get nearly as many samples as like researchers that do have a permit. But we do at times -- if the whale excretes, I give it time, the whale leaves, and then I go out. And I always have -- I either have a plankton net or someone's baseball cap on board to collect it.

Q. Okay.

A. And so I'm -- so the times that I collect, that has been as the whales -- the whales are at least 100

yards away.

Q. Okay. So you wait for the whales to leave?

A. I do.

Q. And the researchers, like you mentioned Dr. Torres, they'll try to get to the fecal material as quickly as possible to avoid it dissipating?

A. Yeah, yeah. She does lot of good stuff. She does great work.

Q. Okay. And then, at least on one occasion, you were involved in taking biopsy samples with Mr. Scordino; is that correct?

A. I was.

Q. Have you done that on any other occasions?

A. I was not involved -- I was on boats that did it, but I wasn't directly involved in that. But I was on boats that actually were doing it.

Q. When was that?

A. Oh, there was a study on humpbacks in California, and I -- I'm sorry, I --

Q. Not gray whales?

A. No.

Q. Okay. And you haven't been involved in any satellite tagging?

A. No.

Q. And then you've also done research on gray whale

prey, both scuba diving and collecting and studying gray whale prey; is that correct?

A. Intensely, yes.

Q. Okay. Has all of your gray whale research been concentrated off of Central Oregon?

A. Yes. Well, I do go down to Baja and I do a little bit -- I do some photo ID stuff down there, and share some of those photographs, too. So I guess technically you could say there's a little bit off Baja, too.

Q. How about elsewhere within the PCFG range?

A. I'm sorry? I didn't hear you.

Q. How about elsewhere within the PCFG range besides Central Oregon?

A. No.

Q. Okay. And have you analyzed and published the results of your analysis of data you've collected since you completed your master's thesis?

A. I did not. And as I mentioned yesterday, I plan on starting to do that this year now that I've retired from teaching. And that's -- high on my list is to start getting a lot more peer-reviewed papers out there.

Q. Okay. But so far that hasn't happened?

A. That is correct.

Q. And do you attend scientific committee meetings

of the International Whaling Commission?

A. I did one. And I can't remember when.

Q. 2007 is in your --

A. No.

Q. -- CV; does that sound right?

A. No. Well -- well, yeah, if it -- I can't remember the exact date. So whatever I have written -- I can't remember the exact date, so whatever was written in there, that's the one I attended.

Q. And so none since that, whatever date is that --

A. None since then, no.

Q. Okay. How about meetings of the Scientific Review Group that is convened by NMFS to review stock assessment reports; have you ever been to those meetings?

A. No.

Q. Any other meetings of whale biologists that you attend?

A. I go to the American Cetacean Society meeting as much as I can.

Q. Have you ever presented papers at those meetings?

A. I have.

Q. When was the last time you did that?

A. It was -- I did a -- I actually won a poster award for my research. It must have been about 2005 or

so. And I'm guessing.

Q. And that's the research that's reflected in your 2006 article and your master's thesis?

A. Yes.

Q. Let me -- I want to ask a little more detailed questions about the photographs you take.

A. Okay.

Q. In your written testimony at a couple places you refer to research tours. Do you recall that?

A. The name of my business is Whale Research EcoExcursion. Like I probably should have put Whale Research EcoExcursion tours. So that's the -- my actual name of my business. So --

Q. Okay. So is there a distinction -- do you distinguish between taking photographs when you're out with clients on a whale watching trip as opposed to a more dedicated research trip?

A. I do -- so I do a combination. So when I want to do transects, those are just usually myself and my dog. And I would go out either early in the morning or in the afternoon after I'm done whale watching, and I just -- you know, I want to go from Point A to Point B and see the total number of whales and who they are. And so I do that usually by myself. And a lot of times I'll take my plankton net and get samples of the mysids.

And then when I'm doing my actual whale watching tours, again, as I said yesterday, we stop at a certain area, we find a whale, stop within, you know, so it's 100 yards away, and then we sit there. A lot of times we sit there for -- I don't like to stay on a whale more than 30 minutes. Not that I've ever seen anything that -- any behaviors that have scared the whale, but, you know, they're feeding, you know.

Q. If the whale is moving, will you move with the whale?

A. I typically will stay in one spot. If the whale starts moving, I'll let it move and just let it stay in that locality till it gets settled, you know, and then go on from there. I mean, my tours are not only whales, but I'm teaching them about birds, seals, sea lions. So in the time that the whales are moving, a lot of times I'll say, well, let's go see the Steller sea lions now, or let's go see the marbled murrelets or, you know, some of the other species that are there.

And then when the whales stop again, I guesstimate 100 yards, and then, you know, sit up on that whale or sit up another whale. I mean, it's not like we only have one whale in the area. I mean, if that one moves, you know, a lot of times there's numerous other whales. I mean, we can have up to 30 whales at one time

in that small area.

Q. And so those trips aren't designed to survey all the whales in the area. Your goal is to show whales to your clients, and if you find a whale, you can sit and watch that one whale?

A. Yeah. So I'm underestimating -- when I'm doing the tours, I underestimate, you know, the whales that are in the area. That's why a lot of times I like to do the transects because I know I'm underestimating them.

Q. And can you give me some sense of the relative number of transect trips versus whale watching trips?

A. I probably do -- I try to do maybe one or two a week, if I can. And then depending, again, on how tired I am and ocean conditions and stuff like that.

Q. And then I believe when Ms. Imaki was asking you questions, you were going through some numbers about whale watching trips, and those were four a day, 7 days a week in the summertime, and two a day, 7 days a week in at least some of the winter months.

A. Yeah. Although, I have done up to 10 trips a day sometimes when I'm -- I mean, we get lots of business. And sometimes I stack the trips and just go nonstop back to back to back. So I have done more than that. And she asked me and I just threw out some numbers, some general numbers.

Q. And were those numbers -- were those just for you or is that for your -- you have four boats, right?

A. That is correct.

Q. So are those numbers just for trips that you go out on or were those for all four of the boats?

A. Just myself.

Q. Okay. So in terms of your business, it may not be -- are the other boats going out as often as you are going out on your boat?

A. Not as often. I mean, depending like if we have trips -- like midday is when people mostly like to go out. And so last summer and the summer before, when I did have four captains total, including myself, we did go out, all four boats, all those times. But I'm the one that goes out earlier, I'm the one that stays out later, because it's my passion. I mean, I love doing it, and I love teaching and I love the people, love the whales.

Q. So if we just wanted a sense of the number of trips for the business as a whole, it would be maybe two or three times what you're doing, that four times?

A. For me?

Q. I'm just comparing -- you know, you've given us some numbers for how often you go out taking whale watching customers. And if I wanted to extrapolate that to your entire business, all four boats, would I take your

numbers and double them or --

A. So is your question, are you asking with all my other boats?

Q. Yes.

A. So, yeah, they're probably going out -- they're probably going out maybe three times a day, and I'm going out --

Q. And also 7 days a week?

A. Seven days a week.

Q. Okay. I want to ask you a few questions about your collaboration with Mr. Calambokidis.

A. Okay.

MR. SLONIM: And Cara, if you could pull up page 35 of Mr. Scordino's direct testimony.

BY MR. SLONIM:

Q. So I want to read from the first full paragraph.

MR. SLONIM: Can we make it a little bit larger? It might be a little easier. Okay.

BY MR. SLONIM:

Q. And just the beginning of that paragraph, Mr. Scordino in his testimony said that study collaborators provide all photographs to the staff at CRC after internal review and quality control at the end of their research season, usually sometime in winter. CRC

staff review the photographs for quality and then if they are of suitable quality, compare the best photographs of each side of each whale to a photo catalog maintained by CRC of whales previously identified.

Do you see that?

A. Yes.

Q. And does that accurately describe the way in which you collaborate with Mr. Calambokidis in terms of providing photographs?

A. He has not gotten all my photographs yet, but I do give him photographs.

Q. And do you -- you do kind of an internal review for quality before providing them to him?

A. When I have time, I have done that. When I don't have time -- like the last time I gave him a lot of my pictures, I did not have time to go through all of them, and I had a couple of external hard drives. And so, so previous to that -- and there's been some years that I've -- I mean, I still have photographs to give him.

Q. Okay. When was the last time you gave him photographs?

A. It was probably -- I didn't give them to him last year. I had told him -- I've been in contact with him, and I said that I'd get last year's photographs to him this year. I'm trying to remember. It was -- it's

been a few years. I'd have to actually -- it might have been 3 or 4. I really have to go back to see, because --

Q. Okay. Let me show you the table that he has of photographs from different researchers.

MR. SLONIM: So, Cara, can you pull up the new Calambokidis document, NMFS Exhibit 301.

UNIDENTIFIED SPEAKER: 101.

MR. SLONIM: 101.

UNIDENTIFIED SPEAKER: 3-101.

MR. SLONIM: 3-101. Thank you. This is Calambokidis et al. (2019). And if we can go to PDF page 17, Table 1. And then let's rotate that. Let's make sure that's Table 1. Nope. Go up a few pages.

One more. Okay. And now let's see if we can make this a little bit larger. One more. If we can -- okay. Good.

BY MR. SLONIM:

Q. All right. So you're -- this is a table showing the number of sightings contributed by different research groups from 1996 to 2017; is that correct?

A. Yes.

Q. Okay. And you're the third -- you're listed third on the table; is that correct?

A. Yep.

Q. Okay. So let me just ask you about a couple

time periods. So from 1996 to 2005, Mr. Calambokidis doesn't have any sightings from you. So can you -- were you submitting photographs in those years?

A. To tell you -- if John doesn't have on there, maybe not. I can't remember when I started submitting them to him. I know it was right around my thesis time, which was -- so according to the table, it says no, so -- and I was, I'm --

Q. You were taking photographs in those years; is that correct?

A. Yes.

Q. But you either didn't submit them or he didn't use them for some reason?

A. Yes. And I'd have to talk to John about that, because to tell you the truth, I can't remember back then.

Q. Do you recall any conversations with him where he had concerns about your photographs?

A. No.

Q. Okay. So then 2006 and 2007, he has 12 and 72 sightings from you. And then the next 4 years, it's 0, 18, 2 and 0. Do you recall what was going on in those 4 years, 2008 to 2011, that would explain the limited number of sightings?

A. I think I only had given him a small percentage of the actual photographs that I had taken. Again, I told

him I thought that -- I was inundated with working two full-time jobs, and to get -- to really do the pictures how John would like them to be done, he has a specific way he likes to have his photographs labeled, and it's very time intensive. And I like to do it as accurate as I can. And I started doing a few but I ran out of time. I do have that data and I've been in contact with him, and I said, you know, I have all this back data. I said now that I'm retired, you know, I will fill in those gaps.

Q. Okay. And then he has sightings from you from 2012 to 2014, and then nothing since 2014.

A. Right.

Q. And I think, as you've said, that's a time issue for you, you haven't had time.

A. That is correct.

Q. Okay. Do you know whether -- or do you have an opinion as to whether once you supply your photographs to Mr. Calambokidis, that will affect his abundance estimate for the PCFG whales?

A. I'll have to wait to see if -- once I submit them. I can't surmise one way or the other at this point.

Q. You think you have photographs of whales that haven't been seen by other researchers?

A. Until I look at my data, I can't say.

Q. Okay. So it may be that all the whales you

photographed have been seen by other researchers somewhere else and so they're already in the database?

A. Once I look at my data, I'll be able to say yay or nay.

Q. Okay. Right now you don't know?

A. I don't know.

Q. Okay. I'd like to ask you some questions about resident whales.

A. Okay.

Q. And for purposes of this discussion, I'd like to use the definition you have in your master's thesis.

A. Okay.

Q. So, just so we don't switch back and forth between different discussions.

A. Right, right.

Q. Or different definitions.

MR. SLONIM: And so, Cara, maybe you could bring that up. That's Exhibit CN-4. And I think it is on -- it's page 19, PDF page 31. Okay. And then under the heading "Resident Whales," we'll need to scroll down just a little bit.

BY MR. SLONIM:

Q. You say we identify gray whales as residents if they (1) return to one of the prey habitats around Depoe Bay or Newport in succeeding years; (2) spend a

minimum of 2 days in a feeding locality; and (3) exhibit feeding behavior. Is that correct?

A. That is correct.

Q. Okay. And are you comfortable using that definition for this discussion?

A. Yes.

Q. Okay. Good. In your written testimony, did you identify the total number of resident whales you've observed each year?

A. I'm sorry. Say it again.

Q. In your written testimony, did you identify the total number of resident whales you have observed each year?

A. You know, I can't remember. I have my declaration right here. I assume you have that?

Q. I do.

A. Okay. What page is that?

Q. I couldn't find it.

A. Well, I do talk about my book on number 4, and -- I do have that information in my book, but I don't know if I explicitly stated it. I can't remember if I explicitly state it in my declaration.

Q. And by your book, so if we look at -- the 2013 edition that you provided yesterday, that's the most recent edition?

A. Yes. I'm working on a new one right now.

Q. And if we look at the 2013 edition, it will provide for each year the total number of resident whales you observed?

A. If you go -- you will have to tease that data out. But on -- not all whales, but on many whales, what I've done is I stated, you know, I saw this whale in this year, this year, this year, this year, and this whale was here for 4 months, this whale was here for other amounts of time. Now I have written this book primarily for the layperson, just to give them an overview of a number of scientific concepts, although many scientists have also utilized the book. So again, the data is in there, but again you would have to tease it out.

Q. So --

A. And not complete data.

Q. Okay. And so when I was looking at it last night, and I'll admit I didn't have time to read every line of every page --

A. Right.

Q. -- but I -- there's a section of the book where you have gray whale discoveries in 2007, gray whale discoveries in 2008.

A. That's right.

Q. And in those, there's like a page or two on each

year, I frequently saw phrases like some of the whales we saw were or some of the new whales we saw were.

A. Right.

Q. But I didn't see anything that said the total number of whales we saw this year. Is that in there someplace and did I just miss it?

A. Like I said, not explicit totals, but I have -- when you get descriptions of each individual whale, you know, I think we -- I don't have my book up here right now, but -- thank you.

UNIDENTIFIED SPEAKER: Oh, you're welcome.

THE WITNESS: So let me just -- so on some whales -- let's take, for example, Ice Cap, page -- he's on 108, 109. Now I haven't seen Ice Cap for a few years now, but I'll say -- for example, Ice Cap, first saw him in July of 2008, and then I talk about he came here for 2 months in 2009, over 4 months in 2010, also showed up in 2011 and 2012. So that gives an overview of, you know, when some of these whales are in the area.

My Excel spreadsheets, which I have more of the scientific data on, will address that in much more detail. But this is, again, for the layperson.

BY MR. SLONIM:

Q. So that information doesn't tell us how many resident whales you observed in 2008 or 2009?

A. No.

Q. Okay. And we don't have the Excel spreadsheets?

A. No.

Q. Okay. How would you characterize the trend in the annual number of resident whales you've observed? Has it been stable, increasing, decreasing, fluctuating with no trend? How would you characterize it?

A. Well, again, without totally looking at my data -- I'm just going to go off the cuff on this -- I would say -- well, 2005, I documented that that was a very poor year because it was an El Niño year, and numbers seem to have -- and, again, I'm going to have to analyze my data to be a hundred percent on this answer, but data seemed to say they're about the same.

Sometimes, like this year, numbers in June were a lot lower than many of the other years. I mean, we were kind of afraid because the whales -- we weren't even starting to get numbers of whales until mid-July. And, I mean, we were hunting, you know, searching large areas in June to even find a whale. And that was atypical, because normally we have a few whales in June. I mean, more than a few, like, you know, maybe 6, 8, 10. And I remember this year it was lower because it was hard to find a whale in June.

Q. And then how many did you see later in the

summer?

A. Numbers were not as high as they have been. Say, for example, 2004 was an excellent year. 2005 was a terrible year. 2006, '7 and '8 were good years, and then it kind of flattened out to some extent. And then the last couple of years, I mean, was -- numbers were lower this year than they were the last 2 years. And again, I haven't been able to actually --

Q. Can you just tell me what the numbers were this year?

A. Okay. Off the top of my head, I would say in June this year we had maybe half a dozen different whales. July of this year we probably had probably 20 different whales. August, a little better -- and again, these are rough numbers -- maybe 25. And then normally, normally the beginning of September is our absolute best time. I mean, we have numbers ranging from 25 to 30 whales per trip. We did not approach those numbers this year. We were only in -- 22 is the highest number that I recollect, and that was only 1 day. We just didn't have the numbers this year that we've had in other years.

Q. Are those numbers similar to 2010?

A. 2010, can I remember 2010? You know, I do not remember 2010. I remember the last 3 years.

Q. Do you remember in your guidebook talking about

only two whales being around in June and July and then more showing up September, October?

A. Right.

Q. Does that sound familiar?

A. Yeah, yeah. If I wrote it down -- that's why I have to write things down.

Q. And that's similar to what you've seen this year?

A. Yeah, just not the numbers this year, not the numbers.

Q. Other than calves, do you ever observe new resident whales in the Depoe Bay or Newport areas that you haven't previously observed?

A. Yes.

Q. And does that happen fairly often?

A. It happens later in the season. I had mentioned yesterday what I feel is happening, and I've asked Mr. Calambokidis about this, I said, you know, John, I said, what I tend to see is we're getting these whales that I don't recognize in September. I said, you know, some of our regulars are still around, but, you know, then we're getting -- I'm getting these new ones I just don't recognize. I said, my guess, and I haven't compared your data, but my guess is that there are a number of whales that have left, say, Vancouver Island, you know, northern

whales that are progressively moving down ultimately to the breeding lagoon. I said, do you think that's feasible? He said, oh, I think you're absolutely correct with that, Carrie. So these are whales that --

Q. Do you ever -- I'm sorry. Do you ever see new whales earlier in the season?

A. Not very often. Once in a while.

MR. SLONIM: Can we look at Ms. Newell's guidebook? Do you have that? The one we received yesterday.

BY MR. SLONIM:

Q. And then can you go to PDF page 42. There's a reference to a new whale, and you may find it before I do.

A. Arrow?

Q. Yes. And when did Arrow arrive?

A. Arrow, let me -- okay. Arrow was first identified off Depoe Bay in July of 2006, and was seen again in 2007.

Q. Okay. So before that southern migration that you were talking about?

A. I'm sorry. What?

Q. July would have been before the southern migration phenomena that you were talking about?

A. Yes. I said I saw some. I mean --

Q. Let's go PDF page 43. There's also references

to new whales from 2007, and again, you might find them -- oh, if we look on the left-hand column just below the picture, it refers to some of the new residents including Raptor and Wishbone. Do you see that?

A. Yep.

Q. And do you know when they were first seen?

A. Let me look in my book. Raptor was later in the summer of 2007.

Q. And did he return, he or she return in a later year?

A. Yes.

Q. Let's go to PDF 45. And again, there's references to some new whales. Left-hand column below the picture, one of the new whales named in 2009 was Wilson. Do you see that?

A. Yes.

Q. And when did he arrive, or she?

A. Okay. Let me look that up. Wilson I named because of Tom Hanks; he has a big white spot. And so, Wilson was identified in 2009.

Q. Do you have a month?

A. July. July of 2009. And that's a whale that I had only seen a couple of times. That was one that doesn't consistently come back.

Q. But met your definition of a resident whale?

A. Pardon?

Q. Met your definition of a resident whale?

A. Met my definition of a resident whale but is not -- came back another year, so a couple of years. But I haven't -- I mean, this is an easy whale to identify; a huge white spot -- but have not -- this is not, I'm going to call, a regular whale.

Q. Let's look at PDF 46. These are new whales seen in 2010. Let's see if we can find them. On the right-hand column towards the top, the end of the paragraph, new whales were Angel Wings, Jersey, Schooler, and Buckshot. So you have four new whales in 2010. And I'm assuming they came late in the season --

A. Yeah, they came --

Q. -- since that's when most of the whales came that year?

A. Yeah. Those were late whales.

Q. And did they come back in later years?

A. Jersey, as I recollect, Jersey did not. I can look them all up, but -- let me see. Where are you seeing that? Oh, right there.

So Jersey was a whale that I did not see again. So that may be -- now that we're learning more, that may be one that, you know -- I don't think -- maybe I saw him one other year. I can't remember.

Q. Have you done an analysis to go back and try to identify the number of new whales you saw each year and look at when they arrived and whether you saw them in later years?

A. Not for all the whales. I've done them for some, but I have thousands and thousands and thousands of pictures. So, once again, that is something that I will be doing because that's part of the data I'm going to include in this paper I'm going to be writing.

Q. We don't have that available to us at this point?

A. No. I am so sorry.

Q. Okay. And then just one more. If we could go to PDF 49? This is 2012, and was Blanco a new whale that year or he or she present previously?

A. Let me look Blanco up. That whale liked teasing my dog all the time, if you look at the pictures. That was -- he's such an awesome whale. And I'd see him many, many, many times. He's a regular. So I first identified him in 2012.

Q. As a calf?

A. No, no. He was -- he came in that year in -- our summer on the -- I call them summer residents. It's the same thing as PCFGs. So he came in, and a lot of mating behavior takes place, a lot of courtship. You

know, I've seen -- every month in the summer, I've seen a lot of courtship and the Pink Floyds and other stuff going on. And he would come and he would go after the females. I mean, he would go after a female that was feeding, and I know --

Q. You described all this in the guidebook, don't you?

A. Yeah, yeah.

Q. Okay.

A. And he -- and they would ditch him. And so, so I remember that year, because he was being ditched by many, many whales, female whales.

Q. Okay. It's PDF 49, for anybody who's interested, all the details.

A. Sorry. I just get excited about --

Q. No problem.

A. -- some of these whales, so --

Q. Now you also saw a new female and a calf that year; is that correct? It's right at the beginning of that description.

A. Oh --

Q. Right where the cursor is. Top left.

A. Okay. Yes. And I don't think -- that was just one in passing, and as I recollect from that, saw a female and a calf, but just went through the area. So I have no

data on that, but just went through the area.

Q. And then you have a calf that showed up without a mother that came to the area on its own; is that correct?

A. Yeah. I think that Ying Yang, is that -- let's see. Where are we at?

Q. It's right below the discussion of the female and calf.

A. Yeah, yeah, that was Lucky. We talked about -- yeah, Lucky, a very young whale, very young. That's the one I had shown -- I think I showed you that one with the killer whale tooth -- with rakes on it.

Q. Okay. And you've seen that whale in subsequent years?

A. Many times. Many times.

Q. And it arrived without being led to the area by its mother; is that correct?

A. It came to this area as a young whale. It could have been a 2-year-old. It was a young whale. It was --

Q. Oh, okay. So when you refer to it as a young, friendly calf, that's not necessarily meaning it was a calf?

A. Well, it appeared young. I would guess that it was a 1- or 2-year old whale. I mean, it's -- you know, I've been out with these whales many times, and I'm fairly

good at guessing male/female, juveniles, but, you know, if I take one that is 2, maybe it could be 3, you know, possibly even 4, if it doesn't grow as fast.

This little whale appeared small, but sometimes, you know, sometimes a 2-year-old whale can be the size of a calf and it just doesn't grow as fast. I mean, I called it a calf because it was -- it appeared to be small, but again, unless we actually measured it, I mean, it could have been a 2-year-old. I mean, and it could have -- I don't know when the mother left. I mean, the mother could have got killed with -- in an attack. You know, it could have gotten killed just shortly before I saw the whale. I don't -- I haven't seen what led up to the attack with this younger whale.

Q. Now, in your written testimony you don't identify the number of resident whales that you observe each year that were observed for the first time and how many were returning whales, do you?

A. No.

Q. And you don't identify how many years you've observed each resident whale since it was first sighted, do you?

A. I do not -- I did not do that in my declaration, no.

Q. Do you observe some resident whales in some

years but not other years?

A. Yes.

Q. And in your testimony you didn't identify how often that occurs or how many years elapse between observations?

A. No.

Q. Have you previously observed resident whales that have not returned to Depoe Bay or Newport in the last 3 or more years?

A. There are a few, yes.

Q. And did you identify the number of whales that you previously observed but haven't seen in the last 3 or more years?

A. Have I -- please, say again?

Q. Sure. In your written testimony, did you identify the number of resident whales you have observed that have not returned to the Depoe Bay or Newport area in the last 3 or more years?

A. I don't believe I talked about that.

Q. Now in your written testimony you did mention how long certain specific whales were present in the Depoe Bay or Newport area in certain years; is that correct?

A. Since I -- I literally wrote this up late one night and finished it the next day, because it's right in the middle of my busiest part of the season. I just -- I

didn't have time to gather any data, didn't have time to attach any articles, and as I mentioned yesterday, I mean, I just -- I was scrambling. And, I mean, I wasn't even sure I could even do any of this. So I went -- when I talked about those whales, that was knowledge that I had from right there from that summer, because those are whales that were there right then.

Q. Now you know that other whales are present in Depoe Bay for much shorter periods of time; is that correct?

A. So I'm going to call the residency period of the whales as variable depending on the specific individual. Some of them tend to stay at certain sites for months at a time. Other whales will only stay, say, a couple of weeks and then move on. So it actually depends on the individual. It depends on the amount of food that's available that year. There's a number of factors that come into play when you think about, you know, how many whales do you have, where are they at, how long do they stay? There are, luckily, certain areas in Depoe Bay that are quite consistent with the mysid shrimp prey, and so they are repeatedly used by a lot of times the same whales.

Do these whales move off at times and then come back? Yes. Do some of them stay at the same areas pretty

much nonstop? Yes. So there is a lot of variability, and that's -- and I am so glad you asked me a lot of these questions, because in the paper that I'm going to be writing up this winter, you're giving me great ideas what to address. So thank you.

Q. Great. So with respect to the whales that are present for shorter periods of time, are there some that are only present for 5 or 10 days?

A. Yes.

Q. And you didn't mention that in your written testimony, did you?

A. No.

Q. In your master's thesis you have a figure that shows the duration of residency for whales for a number of years. Do you recall that?

A. Yes.

Q. And the largest cohort each year are the number -- are the whales that only stayed 5 to 10 days; is that correct?

A. I'd have to go back and --

Q. Okay. Let's take a look at it.

A. Yeah.

Q. The master's thesis is Exhibit CN-4. And I'm looking for page 65. I'm not sure it's going to correspond with the PDF page, but let's try that.

One more. Good.

So this is has residency of whales for 2003 to 2008, and shows days of residency?

A. Right.

Q. And so the first column in each of those tables is whales that were present for 5 to 10 days; is that correct?

A. Yes.

Q. And that appears to be the largest cohort each year?

A. That is correct.

Q. Okay. But that -- you didn't mention that in your testimony?

A. I did not.

Q. Does your testimony present any information on where the resident whales that you have observed go when they're not in the Depoe Bay or Newport area?

A. I don't have that data. Like we talked about, my area of expertise is Newport and Depoe Bay, primarily Depoe Bay now. So once they leave the area, I am not sure where they go.

Q. There is information about that in the Calambokidis reports; is that correct?

A. Yes.

MR. SLONIM: Can we go back to Calambokidis

2019? And that's Exhibit 3-101. And can we look at Table 8 on PDF page 24.

That's 21. There we go.

BY MR. SLONIM:

Q. Are you familiar with this table?

A. I am.

Q. And so this shows interchange of whales across regions for the entire study period; is that correct?

A. Yes.

Q. Okay. So on the left-hand column we have different regions, and also on the top row we have different regions; is that correct?

A. Yes.

Q. So whales -- is this -- if I'm reading this correctly, whales that have been sighted in Oregon, which is the Depoe Bay area, Central Oregon, have been seen from California to Kodiak Island; is that correct?

A. So if you look -- so go down to the very bottom where it says 153. So if you -- that number, 153, now if you go to the left, and see where it says 6?

Q. Yeah.

A. And -- thank you. So here -- okay, so 153 total sightings. I mean, just -- like 6 is just they saw them one time. It doesn't, again, get into abundance or anything. It's like we saw them, we saw them in that

locality. They may only have stayed 1 day. They may have stayed 5 months. We don't know. This table doesn't say that.

What this table does say is that of 153 whales that were seen in Kodiak, if you look here, you see the 6 and you go straight up here, you will see that 6 of those whales went all the way up to Kodiak Island.

Q. Those are six whales that were seen off Depoe Bay that went as far as Kodiak Island?

A. Yeah. And that could have been just up/down, you know, one quick sighting of them.

Q. And 100 of the whales seen off Depoe Bay were seen off of West Vancouver Island, 103?

A. So yeah, if you go West Vancouver Island, yes.

Q. And then 121 were seen off South Vancouver Island?

A. South Vancouver Island, yep.

Q. Okay. And going the other way, northern California, 124 of the whales seen in Oregon were also seen in northern California? So if you go, on the Oregon row -- yeah, and then go left. There.

A. Yes.

Q. Okay.

A. Yep.

Q. Okay. Let's --

A. And those, again -- again, you have to think -- when whales are moving south, again, your data's going to be a little bit biased. I mean, I think it's, you know, they go north, but then you have to keep in mind that, you know, most of these whales are heading down to Mexico. I'm not going to say all, but most of them are heading to Mexico.

So you would think that the numbers south, you would get higher numbers because as they're going down -- and they're still hungry. I mean, because, you know, they eat for approximately 4 to 6 months, and then they're going to fast. So that would make sense, as they're going down south you would, you know, get a sighting of more whales because they're already heading south. I mean, this is just --

Q. We have about the same number off of Vancouver Island; is that correct, going north?

A. Yes.

Q. Okay. Let's look at the famous Figure 8, PDF 42, maybe one last time. I can't promise you. Somebody else may want to know about it.

Is this -- that's what I want.

Okay, this -- we've looked at this before, and I just wanted to add one more point about this. What is the approximate latitude of Depoe Bay?

A. Depoe Bay is 44.
Q. Okay. Can you show me where that is on the map?
A. So we're looking, we're looking about right here.
Q. Okay. And do you see any whales at that latitude that have a 75% inner quartile of less than 1 degree of latitude?
A. This would be -- doesn't look like it.
Q. Okay. And 1 degree of latitude is 60 nautical miles; is that correct?
A. That is correct.
Q. So, at least according to this figure, all whale sightings off Depoe Bay are for whales that have a 75% kind of home range of at least 60 nautical miles?
A. Yes.
Q. And some quite a bit more than that?
A. Yes.
Q. Okay.
A. But this is again sightings, not numbers. This is sightings. So just to clarify that, it doesn't get into the magnitude. It's just a sighting.
Q. But it concentrates 75% of the sightings into the red bars.
A. And I -- and when John and I have talked about this, he said it doesn't exclude that there isn't site

preferences because it's just about the --

Q. Absolutely.

A. It's just about sightings, not the magnitude.

Q. Absolutely. In your -- I don't think anybody's asked you about this, but the video that you're in with the Cousteau crew?

A. Right.

Q. They did kind of a documentary on gray whales and the migration and you're featured in one segment of that video; is that correct?

A. Yes.

Q. And you talked about Scarback in that video, right? And you also talked about Scarback in your testimony yesterday, I believe.

A. Yes.

Q. And you indicated that whale was wounded sometime between 1985 and 1987, correct?

A. According to Dr. Bruce Mate, that's what he has said to me.

Q. And what is his theory about the cause of the wound?

A. What he said to me is that he thinks it was an exploding harpoon. That's --

Q. And where would that have taken place?

A. People have asked me that. We're not sure.

There's guesses, but we don't know for sure. I'm asked that question all the time. I said we really don't know.

Q. Was there any hunting of gray whales going on in the mid-'80s?

A. Up in -- up north there was.

Q. The Russian hunt?

A. Yes.

Q. That's the only one we know about it?

A. So, yeah, I don't know for sure. I cannot say. I tell people I don't know. That's -- and I don't. We just know she has that huge wound.

Q. Your guidebook has pictures of whales with a variety of wounds. Scarback may be the most extreme --

A. Yes.

Q. -- but you have pictures of whales with wounds from killer whale attacks, boat propellers, satellite tag wounds, and other injuries; is that correct?

A. Yes.

Q. Would you -- do you think those injuries are more serious than the injuries that would result from the nonlethal aspects of the Makah hunt?

A. It depends. If -- it depends upon where the whale was hit and the amount of trauma that was done upon the whales. I mean, Scarback, again -- it's not going to be as extensive as Scarback. But we don't know for sure,

I mean, until that happens.

So something -- something that I was thinking about, Dr. Leigh Torres is doing a lot of great fecal sample studies, and one of hers is looking at the stress hormone cortisol. So, I mean, that would be something that, you know, is like if it was hit -- I mean, we're learning more every year, as you well know. I mean, we -- we're learning things by leaps and bounds. But, you know, if a whale did get hit now, and you could collect an opportunistic fecal sample and, you know, say, you've had a fecal sample before that whale was hit and after, right after it was hit, and you could see the rise in stress hormones. Now would that cause issues, say, if it was a pregnant female? Maybe, maybe not. Do we really know at this point? We do not. I mean, we can surmise --

Q. So you don't know or you don't have an opinion as to whether a strike that didn't penetrate the whale's skin would have a greater or lesser impact than a killer whale attack or a boat propeller that penetrated the skin and created a scar? You just don't know?

A. I do not.

Q. Okay. In your guidebook you mention a whale that was cut by a propeller from a boat and you were able to watch the wound heal over the next several weeks.

A. Yes.

Q. So that whale, after being struck by the boat propeller stayed in the area and continued to feed?

A. Yeah. It was not -- it was just a very superficial cut, but at least I could watch as it healed over time.

Q. It was approached by -- must have been approached by a boat to be cut by the boat.

A. Yeah, I was quite upset. The boat actually went right over the whale. And, I mean, the boat saw the whale and -- I was not happy.

Q. In your written testimony when you were talking about if that's a disturbance on whales, you didn't mention that example, did you?

A. I don't think I had -- I talked about it, but I don't think I talked about it in my declaration.

Q. And then with respect to Dr. Torres' research, she is concerned with potential stress from whale watching; is that correct?

A. She did publish something about that, yes.

Q. And that's part of what she's looking for in her fecal sample collections now?

A. Not as far as I know, because she is -- that work was done maybe 3, 4 years ago. And I questioned her about that because we had some discrepancies about that, and I said -- because she mentioned in a report, she said,

oh, 11% of the time, you know, the whale is stressed. And I called her out on that, and I said, you know, I said, you can't say that. As a matter of fact, one of her grad students had said to me, and said, you know, we had to put some figure down, some percentage, and that's what her grad student told me. And then when I questioned Leigh more about that, then she says, well, yeah, I know when they're just sitting and not moving and they're actively feeding that's -- there's no disturbance, but she said that number really was when they're traveling. You know, if they're traveling and then there is -- you know, she thinks there's disturbance then.

And I said, well, Leigh, you know, the way you wrote it up, you know, it's kind of biased how you wrote that. And so we've gone back and forth on that. Because it's --

Q. Okay.

A. The passive whale watching is one thing, but if you're actively approaching a whale, and I've seen this, I mean, I've seen this more like -- like we have rules that we can't -- we got to follow and we can't do. You know, researchers get permits, and of course they can do take, they can harass the whales more because they are allowed to do that with a permit. And so, so when I see an article saying if you're passively whale watching versus,

you know -- like scientists get great data, but at the same time that is a form of harassment, that is a form of take. And so you have to really view it on two different points there.

Q. So Dr. Torres has been collecting fecal samples off of Depoe Bay recently; is that correct?

A. I believe she was. I know there was another guy that was doing some this summer, too. So she -- the only time -- I haven't seen her much this summer, because where I'm at -- she's I think more south. And so very seldom -- I think I only saw her maybe twice this year.

Q. And have you talked to her about whether her work is disturbing the whales?

A. I really, I haven't really seen that, so I haven't --

Q. You haven't -- what haven't you seen?

A. Like I said, I only saw her twice this summer and she was off Cape Foulweather. And so I haven't actually gone up to her. We talked in passing. I said, how's it going, you know, just some chit-chat. But I haven't had a talk with her as far as that specific statement. Because as I mentioned the other day that the person I did see, that was just a random guy who was doing some research with a school and I was like, ew. So --

Q. So in what you have seen of Dr. Torres, have you

ever observed whales being disturbed by her work?

A. I'll put it this way. I got phone calls from -- she has RIBs, Zodiac, and I have RIBs, and one other company has RIBs. And when she was actively getting photographs of the whales, she wanted to get a good photograph and so she would approach them quite close. So we got a lot of calls from people in Depoe Bay saying why are we chasing the whales. You know, that whale is -- you could tell it's scared, it's moving away.

And she was -- like, when she was in Depoe Bay and off Cape Foulweather, again, she -- you know, she has the permit to do it. But she would come quite close, and I remember one specific day we got so many phone calls, you know, like you can't be chasing the whales, you know, you're scaring the whales. Because in Depoe Bay they're like 30 feet off the shore. And she's like following them like super close, like right on them. And so then we had to call back with like, that's not us, you know, we don't have that orangish-red boat. That's not us. And then we got -- then we'd get more phone calls. It's like, that's not us; we have different colored boats. They're doing research. That is not us.

So I actually had the NMFS guy down there, and, you know -- because he got calls. And then I talked to him. It's like -- he says, yeah, he says, I watch you

guys like a hawk. And he said, you're doing fine, but he says, I do realize it was not you guys that were harassing the whales, you know, it was, you know, when they're trying to get the good photo ID shots.

So that was some of the -- I mean, when you have a whale watching business, and then someone's trying to do research at the same time, it can cause conflict. Just like I mentioned when the whales are trying to be satellite tagged right in front of Depoe Bay. I mean, you know, how the public is. I mean, you know, if they don't understand totally what's going on, you know, blah, blah, blah, blah. So --

Q. So did you have a discussion with Dr. Torres about that?

A. I mentioned it to her, yeah. And that's why --

Q. What did she say?

A. Well, I think that's why now she's doing most of her -- more of her research down south so she's not right in front of Depoe Bay where thousands of people can see.

Q. And did the whales that were involved in that incident leave the area?

A. They left the area for a while.

Q. How long is a while?

A. I know it was about -- I remember the one specific time probably 3 days, and the whale did come

back.

Q. You're talking about one whale?

A. Well, the whale in particular from the encounter I remembered where we got --

Q. Okay. I thought there were 30 whales in the area?

A. Well, that's the most whales. I mean, I wish there'd be 30 whales all the time. But as I mentioned earlier, it varies from 1 to 30.

Q. So when she was doing this there was only whale there?

A. Well, the one whale she was chasing. I mean, if you're not -- as Jonathan mentioned, if a whale -- if the whale is not targeted -- I don't know if the disturbance would be as great on that whale like if you're -- if you go and do something to one whale, you know, the whale might not say, oh, yeah, you know, I've been hit; you guys better leave. So that one whale that has been harassed or disturbed or, you know, had a strike or whatever, that whale probably will be leaving the area.

Q. And do you know where Dr. Torres' whale went for those 3 days?

A. It headed south. And I left it -- after one of the other trips that I came back --

Q. I'm just asking about that one whale.

A. I'm just talking about the one whale.
Q. Okay.
A. Yeah. So it headed south after she had gotten pictures, was heading south. And then we did go out on the next trip and I had seen that whale and it was still in traveling mode. So it disrupted the feeding. It was leaving the area. I don't know how far south it went. I just know it was heading south.
Q. And then returned.
A. Three days later it returned.
Q. Okay. I want to ask some questions about the portion of your testimony about --
THE COURT: Okay. Counsel, we're reaching the point where we take a -- normally we take a break at this time since -- we'll take about a 10-minute recess and then we'll resume --
MR. SLONIM: Okay.
THE COURT: -- so everybody a chance to take a break.
MR. SLONIM: Perfect. Thank you.
THE COURT: All right. Thank you.
(Off the record from 10:36 a.m. to 10:47 a.m.)
THE COURT: I guess we're ready to go back on the record.
MR. SLONIM: Thank you, Your Honor.

BY MR. SLONIM:

Q. Ms. Newell, I want to ask a few questions about the removal of a PCFG whale from the population as a result of the hunt. Is it your testimony that if a PCFG whale was removed as a result of the hunt that the remaining whales would be unable to locate the food sources that had been previously utilized by that whale?

A. Whales, the mothers teach the calves where the best localities are. So, and whales -- we don't know for sure how whales find the swarms of mysid shrimp. That's, I mean, that -- whoever finds that out is going to get huge amounts of grant money because we don't know how they find it. I mean, it could be that cultural history.

So, I mean, whether or not will that area still be utilized by another whale, if there's enough food, we would assume so.

Q. Are you aware of any large, dense mysid populations in Depoe Bay that are not exploited by gray whales?

A. I have not dove every single locality. The localities that I have seen, there are areas where I know there are mysids and sometimes I wonder why there aren't whales there. But I've not dove those areas, but I have at times put, you know, a lot of cameras down. Then again, as I mentioned yesterday, there is a lot of

dynamics that go into where a whale wants to feed and density, species of mysids. We have to know are the mysids juveniles, adults and are the mysids pregnant. So there's so much that goes into that. So it's sort of a loaded question because there -- I could go on for 3 hours and --

MR. SLONIM: Can we look at Ms. Newell's master's thesis.

I want to ask you about a statement on page 2 of your master's thesis.

Okay. Can you scroll down a little bit?

BY MR. SLONIM:

Q. Okay. So in the section on ecological interactions in the California Current System, you wrote -- and this -- I'm starting on the third line of that section, the system, "the California Current System is characterized by seasonal wind-driven upwelling that fuels a productive planktonic assemblage of phytoplankton and zooplankton. Baleen whales in these upwelling systems actively seek areas with high concentrations of prey." And you had a couple sources for that.

Do you still agree with that?

A. Yeah.

Q. And that would be true of gray whales as well, correct?

A. Yeah. But again, I -- that is true, but again that's an overly simplistic statement. I mean, they will seek out high concentrations of prey, but what I have found out through my research is that they have to have -- the prey base has to be of a certain type. And that's all I was getting at.

Q. And if it is, they'll be looking for it?

A. Absolutely.

Q. Okay. Now with respect to the -- we talked about the issues about disturbance. Are you aware of any instances in which researchers have gathered fecal samples without disturbing the whales?

A. Like I said, I haven't seen Dr. Torres actively collecting fecal samples because she's been doing it far south. But I did see, and I'm not even sure who the person was, but I could tell the whale pooed and this guy on the boat, he zipped up -- it was Ginger actually. And --

Q. Yeah, my question was are you aware of any circumstances where a researcher was collecting fecal samples without disturbing the whales?

A. I have not observed that, so I cannot answer the question.

Q. And the only observation you have is the one example in your written testimony?

A. Yes.

Q. And in your collections of fecal samples, did that disturb the whales?

A. When I -- like I said, I waited till the whale was far away. And so in that instance, no. I --

Q. No disturbance. Okay. Are you aware of any circumstances in which a researcher has approached within 100 yards of a whale for purposes of taking photographs without disturbing the whale?

A. Sometimes a whale is disturbed, sometimes it is not.

Q. Okay. And did you mention any of the -- did you mention that in your written testimony, that sometimes the whales are not disturbed in that situation?

A. I don't believe so.

Q. Do you know which four whales were biopsied when you were out with Mr. Scordino in 2010?

A. I do not. Actually, I gave Jonathan my pictures and I forgot to get a copy of them. So I -- and I meant to ask him, and I -- so I don't have that data.

Q. So were you able -- did you have any way to determine whether those whales were present after that day, either the same season or later seasons?

A. Again, I lost that data, so I cannot say. I'm sorry.

Q. And so do you have any reason to disagree with Mr. Scordino's testimony that he saw two of those whales the next day?

A. I believe there was a little more with his statement. And correct me if I'm wrong, I believe he said that the weather was not -- the ocean was not real good that day and I think that a couple of the whales came back. I'd have to go back to my notes, because I wrote copious amounts of notes. I believe that's what the testimony was.

Q. One of the whales he identified as being CRC No. 94, which I think you've named Dede; is that correct?

A. Yep.

Q. And she's been seen in years since 2010; is that --

A. She has. Yes, she has.

Q. And with respect to the other whales that were biopsied and the whales that were satellite tagged that you mentioned in your testimony, you didn't present any information about how frequently they had been seen in previous years or whether they were seen in subsequent years, did you?

A. No.

Q. The satellite tagging, that was part of the work that led to the Lagerquist article; is that correct?

A. As I recall, when this was happening it was -- I don't think she was involved in that study. I mean, she's been involved in the recent studies. I know Dr. Bruce Mate, he was -- I'm not sure if she was on the boat doing those studies. I'm sorry. I don't know for sure.

Q. Was that some of the data she used in her article?

A. I believe she had, if I remember correctly from the paper, 2009, I believe she --

Q. Correct.

A. -- had some satellite tag data. And I know that, if I remember correctly, I think there were two whales off Seal Rock, four whales off Cape Foulweather; there were 23 off Cape St. George, 35 whales total -- 23, 24, 25 --

Q. Let me just -- I'm sorry. Let me just ask you. Was that the satellite tagging that you were talking about in your written testimony?

A. No.

Q. Okay. You were talking about something else?

A. Yes.

Q. Okay. In your written testimony you indicate that you've seen more skinny whales this year than any other year; is that correct?

A. Yes.

Q. What proportion of skinny whales are you seeing this year?

A. Late in the season, like -- the beginning of the season all the whales are a little bit on the lean side. You know, they just came off a long fast. But typically by the end of the season, usually by August, September, especially October, you should see a nice robust whale because it's getting ready to go on that 6-month fast.

So the data I was seeing, from what I consider a poor body condition from how I defined it in my paper that was published, is you have a depression behind the blowhole and the --

Q. I'm just asking you what proportion you saw this year.

A. I'm going to guesstimate. I haven't analyzed my data -- well, you know, I haven't analyzed my data, so I would just be totally off the cuff.

Q. So you don't know? Do you think it's more than 80%?

A. I'd say less than 80.

Q. And 80% is what you observed in terms of whales in poor body condition in 2005; is that correct?

A. Yes.

Q. And are any of the whales that you've observed this year in a condition that you think indicates they

won't survive?

A. There's a few. There's a few that I'm extremely worried about. Matter of fact, the one that died, and I'm not -- I'm curious to see -- I don't know the number offhand. I know it was a PCFG whale that they found south. And I didn't get the number yet of the whale, so I'm --

Q. Do you know anything about the condition of that whale?

A. All I know -- all I heard about that whale is that it's a PCFG whale. That's all I know at this point.

Q. Also that it had a satellite tag wound?

A. It did.

Q. It did mention that.

A. I did know that. Yeah, I did know that.

Q. In your guidebook on page 85 you refer to a whale named Jenny Lace that was extremely thin in 2009 and 2010; is that correct?

A. Yes.

Q. And that whale has been seen every year since then; is that correct, somewhere in the PCFG?

A. You know, I have not seen that whale recently, so -- I'm trying to see --

Q. Have you checked the Calambokidis appendix to see if that whale was identified?

A. All -- a lot of this that you're asking, like I'm going to be going through this winter with John Calambokidis, I'm going to go through my whole guidebook, and any whales that are no longer in the area, I'm going to be taking those out, and I'm going to be adding new ones. And so, so I have not gotten that far yet with my data since I got off the ocean 3 to 4 days ago. But let me finish finding Jenny Lace here, see what I wrote about her.

So that whale, the last time I saw that whale was 2012. I have not seen that whale since then.

Q. Do you have a CRC catalog number for her?

A. That whale is 786.

Q. We could look her up in the Calambokidis paper --

A. Yes, we could.

Q. -- and see if she's been sighted.

A. Yep. Yeah, I just haven't seen her on --

Q. And you described her as extremely thin in 2009 and 2010.

A. Yes. Yeah, she was quite skinny. And she got attacked by orcas. She got -- the beginning of the season she had no tooth rakes, at the end of the season she did, and that was in 2010. So again, people say that -- scientists say that, you know, a lot of adult gray whales

are not attacked, but I do have evidence that that is not the case.

Q. On page 15 of your written testimony you wrote that "The Makah tribe and NMFS further expressed the opinion that PCFG gray whales are driven primarily by prey availability in selecting feeding areas. While this statement is true, I believe that they take the proposition too far by further claiming that PCFG distribution is highly variable, with the apparent goal of proving that PCFG gray whales will not necessarily be found in large numbers in the proposed Makah near-shore hunt area." Do you recall that?

A. Yes. I'm looking at it. Yeah.

Q. I want to ask you a few questions about that. First, just to be clear, you agree that PCFG gray whales are driven primarily by prey availability in selecting feeding areas?

A. Yes. If the prey is of the right concentrations and feeding type, yes.

Q. And then with respect to what you described as the Tribe's and NMFS's apparent goal, did you find that goal articulated in a testimony or how did you deduce that that was the goal?

A. Well, I had just heard through the grapevine. I have a large number of people that -- friends and some

employees, and after they found out that they're doing that, they'll say -- you know, I think it came from -- and I don't know who it was, one of my employees, she said, you know -- she's really up on everything and she -- I mean, she's a lot more up on everything than I am. Because when I'm actively doing the whale watching, I don't have time to even watch the news or anything.

Q. So it's not something you read in a NMFS declaration or a Tribal declaration?

A. No. No.

Q. And if the point that NMFS and the Tribe were making was simply that gray whales select feeding areas based on prey availability, you would agree with that?

A. Yes.

Q. Okay. Do you have any personal knowledge of PCFG use of the area of the Makah hunt?

A. The only knowledge I have is, the 4½ years that I had family living on the reservation, when I'd come to visit them, we would go out to Cape Flattery and hike, and I would observe gray whales near shore feeding. And, I mean, that's just from shore. I didn't get any good ID shots. I mean --

Q. So have you personally observed whales traveling to the same locality to feed on the same prey in the area of the Makah hunt each year?

A. Have I observed it?
Q. Yeah.
A. No.
Q. Have you studied prey resources in the area of the Makah hunt, and specifically whether they are consistently present in the same locations, same quality, each year?
A. No.
Q. Have you studied whether prey resources in the area of the Makah hunt are consistently present throughout the summer?
A. No.
Q. If the prey you've observed near Depoe Bay were not consistently present throughout the summer, would expect the whales to be consistently present?
A. I've already documented that they leave. I have my paper that shows that.
Q. And I think you testified here, both yesterday and today, that the Depoe Bay area is unique in terms of its consistent high quality prey base?
A. Depoe Bay always has consistent food. I can't say for sure -- I haven't -- I know Depoe Bay is consistent, but I can't say all these areas along the coast because I have not -- I've sampled -- you saw where I sample from: Seal Rock to Lincoln City.

Q. Maybe I misheard you. I thought you used the term unique to describe Depoe Bay, at least once or twice.

A. There is uniqueness with Depoe Bay where there's always food, but I -- it's not -- I can't say that it's unique from all other areas because if I --

Q. You just don't know?

A. I don't know.

Q. Okay.

A. I don't know. Thank you.

Q. And then, as you said, where prey -- where the quality or density of the prey was reduced, such as in 2005 or the beginning of 2010, you saw fewer whales in Depoe Bay; is that correct?

A. Yes.

Q. Okay. I want to turn to page 17 of your testimony, and these are quotes from Mr. Scordino's testimony; is that correct?

A. Yes.

Q. Okay. And so the one near the top of the page, that first bullet: "Some gray whales are consistently observed in the Makah U&A from year to year, but most show little to no fidelity to the area within and between feeding seasons." Is that correct? Did I read that correctly?

A. You read it correctly, yes.

Q. I know Ms. Imaki asked you a couple questions about this and I believe you said that you thought that was -- the language was somewhat vague. Was that -- or something to that effect?

A. I can't recall exactly what I said.

Q. Okay.

A. But, so my --

Q. Well, let me ask you a question then.

A. Okay. I'm sorry.

Q. Do you see the citation at the end of that sentence?

A. Yes.

Q. Do you know what that's referring to, what article that's referring to?

A. The Scordino et al. 2017b?

Q. Yeah.

A. I have not been able to pull that one up.

Q. Okay. It was attached to Mr. Scordino's testimony. Are you aware of that?

A. Yeah. I didn't get a chance to read all the -- everything.

Q. Okay. So you don't know whether that article supports the statement or doesn't support the statement?

A. I do not.

Q. And you didn't discuss that article in your

testimony?

A. I did not.

Q. Okay. Then Mr. Scordino says: "These findings are consistent with the PCFG range-wide photo-identification results (Calambokidis et al. 2017) and the satellite telemetry results (Lagerquist et al. 2019) showing that PCFG whales are commonly observed using a range of size that exceeds 60 nautical miles."

Is that a correct statement with respect to the Calambokidis study?

A. Yes. We looked at that.

Q. Okay. And then is it -- it's a correct statement with respect to the Lagerquist study, that you have qualms about the Lagerquist study; is that correct?

A. Yes.

Q. So he's correctly described what Lagerquist found, you just disagree with Lagerquist?

A. I disagree with some of the sampling methodology.

Q. And if I understood what you said yesterday, one of your concerns was that Lagerquist may have been capturing southbound migration movements; is that correct?

A. Yes.

Q. Did Lagerquist make an attempt to exclude southbound migration movements from their analysis?

A. She tried to make an attempt to do so, yes.
Q. And did you look at how she did that?
A. I did.
Q. And you didn't think she did it correctly?
A. I had questions about that.
Q. And then she also had some samples of whales that returned to the PCFG area the following year, following the northbound migration?
A. Yes.
Q. Did you have any concerns about her use of those data points?
A. No.
Q. Apart from your critique of the Lagerquist paper, did you provide any evidence that PCFG whales show greater fidelity to the Makah area than described by Mr. Scordino?
A. Please say that again.
Q. Apart from your critique of the Lagerquist paper, did you provide any evidence that PCFG whales show greater fidelity to the Makah area than described by Mr. Scordino?
A. No.
Q. You've testified that in your opinion you at least feel that within the PCFG internal recruitment may be more significant than external recruitment; is that

correct?

A. Yes.

Q. Have you studied external recruitment into the PCFG?

A. No.

Q. Have you reviewed any studies of external recruitment into the PCFG?

A. I've read a number of John Calambokidis' papers, and what he feels, and I would agree with that, is that the times of recruitment into the PCFGs are times when we have UMEs and -- him and I had this discussion not too long ago, that probably we will see some recruitment this year because if you -- again, gray whales are driven by food. So if you don't have the food, I feel and he feels that -- well, I shouldn't speak for him, but we had this discussion that there is going to be some external recruitment, but I do not feel that these whales will stay as PCFGs. I think they will come down, eat, get as happy -- fat and happy as they can, and then when food supplies get better up north, they will again go up north. That is my feeling.

Q. And do you have any scientific papers that make that contention and evaluate it?

A. Ask me in 2 years. Not yet.

Q. Okay. Thank you for your patience. I

appreciate it.

A. Thank you.

MR. SLONIM: No more questions.

THE WITNESS: Thank you.

THE COURT: Are you through? Do you have some questions, sir? Yes? Okay.

CROSS-EXAMINATION

BY MR. GOSLINER:

Q. Good morning.

A. Good morning.

Q. A lot of questions have been asked of you, but one area I don't think has been mined yet, and that's the question I'm going to ask you, or several questions, which is: It was clear from your testimony yesterday that you have a special interest and connection with the PCFG whales; is that --

A. I do.

Q. Yes. And as a result of that, you kind of suggested a compromise whereby the Makah could do something else in the summer and limit their hunting to the winter?

A. Yes.

Q. So there's a -- and I'm going to ask you this question not on your emotional side but on your -- wearing your hat as a biologist, which is: Do you have a similar

concern for the Western North Pacific gray whales and the conservation of that stock as well?

A. Absolutely.

Q. And do you realize that shifting hunting to the winter might pose more risks to the Western North Pacific stock?

A. Yes.

Q. And would you like to reassess your compromise solution in considering impacts to both PCFG and Western North Pacific, as a biologist?

A. I personally, as I said yesterday, I personally don't want to see any whales killed. That's bottom line. I mean, I don't like killing things period. And so, you know, but I also understand cultural things, not to the extent that other people do. I'm not trying to say I'm expert in that whatsoever.

But when we're -- my concern is also the Western Pacific whales, and also I've seen some of the PCFGs in March and April -- you know, that says, you know, typically May through November, but I have seen PCFGs in March and April. I have never to my knowledge seen WNPs, which would be extremely difficult if you're not familiar with them. So as a biologist, when we have two populations that are on the brink, especially the WNPs, and I don't think we have a large enough population with

the PCFGs to do anything to them, I mean, we're asking for trouble, as a biologist with a wildlife and fisheries management degree. If you look at the numbers, and there's even a slight chance that you could be killing either one of those and taking out of those two populations a whale that's already -- has a very small population, from a population dynamics point of view it's not good management.

MR. GOSLINER: No further questions.

REDIRECT EXAMINATION

BY MS. PRUETT:

Q. Good morning, Carrie.

A. Good morning.

Q. That wasn't so bad, was it?

A. Not too bad.

Q. You were a little concerned. Okay. So my questions are going to cover a little bit of things you've talked about before, yesterday as well as this morning in the ongoing cross-examination.

So yesterday I asked whether you were familiar with the time and location of the proposed hunts, and that is -- and you said yes. You were then asked by the representative from NMFS whether you had read the federal regs on this or any other sort of rulemaking and you said no. Does that mean you are not familiar with the timing

or the scope?

A. I have -- I didn't know the name of that document, and what I thought I read was not the document we were addressing, and when you showed that to me this morning, it's like, no, I have not read this one. So it was just -- I thought it was a different document when you had shown that to me and it was -- the one you showed me this morning, no, I had not read that.

Q. Okay. The one I showed you this morning was the official -- is the official register notice, but you were still familiar with the timing and the scope of the hunt, even though --

A. I've listened. I've taken lots of notes. So, yeah, from -- I learned all that. I unfortunately didn't have time to prepare like I would've like, had I not been working as much as I've been working.

Q. Okay. Great. Thank you. And so if you had had more time, you would have submitted more testimony, cited more papers, included more of your data?

A. (No audible response.)

Q. We appreciate what you've done already to date. So -- hang on a second. Okay. So as far as your -- the compromise that you stated yesterday out of concern for the needs of the -- purported needs of the Makah Tribe, that's a statement that you came up with on your own; is

that correct?

A. Yes.

Q. Okay. That doesn't represent Sea Shepherd's position?

A. It absolutely, positively does not represent Sea Shepherd's position. That was totally my own opinion. As I mentioned just a couple minutes ago, I personally don't want to see any whales killed, but again, I have a soft spot for the Makah. And so, so I always -- also being a teacher and managing numerous people in my business, I always try to look at both sides and I always try to figure out compromises so neither side's going to be like (makes noise). And so, so yeah, that was definitely not Sea Shepherd's point of view. It came totally from me.

Q. Okay. Because you understand that Sea Shepherd of course doesn't condone the killing of whales --

A. Yes.

Q. -- by anyone, anywhere, anytime?

A. Yes.

Q. Okay.

A. And -- yes.

Q. Regardless of the population of whales, yeah.

A. Right.

Q. Okay. Thank you. I mean, I'm sure you understood that, but I just wanted to make sure everyone

else understands that wasn't Sea Shepherd's position.

So just a quick question on PCFGs. So they're a little more accustomed to being around whale watching, right?

A. Right.

Q. So would that -- and in your testimony, your direct, your written testimony, you also said they might be considered sitting ducks --

A. Yes.

Q. -- because of that?

A. Yes.

Q. So they are potentially at higher risk than other whales that might not be as accustomed?

A. Yes.

Q. Thank you. And you also referred to -- so the research vessels that have interacted with whales, that the whales then are skittish as a result. Is that normal behavior, being skittish?

A. Not with the PCFGs that I have worked with directly off Depoe Bay.

Q. Okay. So is skittishness, in your opinion, stress?

A. Yes.

Q. You did say that some whales have come back after tagging studies, you believe?

A. Yes.

Q. But are tagging studies nearly as disturbing or stressful to whales as when they're pursued, shot, harassed -- or otherwise harassed, chased during hunts or training hunts, potentially?

A. I haven't directly seen that, but what I've seen -- I'm going to talk from what I have personally seen. Whales that I have seen being pursued, and over the years I have seen them be pursued, I feel that they have totally been stressed out. They stay under longer. They have more of an erratic swim pattern. I'm sure if we would collect fecal samples, you would see the cortisol levels dramatically increased.

You are taking them away from a feeding area. Like, for example, if you -- if there would be -- if you're going after a whale that's feeding in the summer and it has to feed 24/7, they don't take breaks. You know, they're feeding nonstop because they have to get their full food supply in 4 to 6 months of feeding and then they're fasting for up to 6 months. So if you disturb a whale when it is actively feeding, not only is it going to cause a disruption to its try and get enough energy reserves, but also it's going to increase the stress hormones and other things, and then cause potentially other medical issues to the whale. That is

hard to document, but there is that potential.

Q. Great. Thank you. So that's really good information. So, but do you think that, beyond that, if you're doing something more, if you're chasing them in a practice hunt, if you're chasing them because you're actually hunting them, or you're striking them or you're attempting to strike them, are those things going to be even more stressful and even a higher level of harassment than what you're already seeing with these tagging studies that can already produce significant stress and take them away from their food source?

A. Again, I'm guessing. Guessing, I would say there is -- yes, there is that potential.

Q. Thank you. Okay. So you mentioned a bit that -- you talked a little bit about the Crescent City whale, or I believe that's the same one that NMFS brought up earlier, that's the Humboldt's whale. So you mentioned it's entirely possible because you've seen a satellite tag cause an infection, which could have led to the death of a particular other whale?

A. Yes.

Q. And you said it's entirely possible that that whale in Crescent City had also died from this. But isn't also --

A. I don't know.

Q. Right, you don't know. But isn't also possible that it could have been part of the ongoing UME, a loss as a result of the ongoing UME?

A. Yeah. As far as I know, the satellite tag wound was a more -- it was further away. And so, I don't believe that wound caused the death of that whale. I haven't had enough time to really look at that. I just know a few tidbits. But my guess would probably -- my guess would be it's probably a UME whale, would be my guess.

Q. Great. Okay. Thank you.

So these are notes from 2 days' worth of cross here, so -- okay. So the issue of cryptic mortality in that 10% figure, approximately, that you used yesterday, that is something that Dr. Calambokidis or -- I'm sorry -- Mr. Calambokidis has confirmed is a conservative estimate; is that correct?

A. Yes.

Q. And he is an expert on PCFGs and gray whales in general?

A. Yes.

Q. Okay. And is it also your testimony that based on your conversations with Calambokidis and also your personal and consistent long-terms studies of PCFG gray whales, that internal recruitment is in fact the most

likely way that new whales are -- that the population is stabilized?

A. I believe that is -- we're going to find in the next 5 years, as we do more data and we write more papers, that it will be primarily internal recruitment with lots of calves and stuff, with the exception, as I mentioned, of UME years when I feel that there's going to be a larger influx of whales if they don't have enough food in Alaska. So I truly believe that it's primarily internal recruitment.

Q. And regardless of the fact that there may be some whales going to distant places, you firmly believe that PCFGs often exhibit high site fidelity?

A. They do. I mean, the data -- I mean, there's -- we've seen the data. The data doesn't lie. But the thing is, is how people interpret data. I mean, and that's one of my big things that I've always told my students. It's like, you know, people can interpret data however they want to interpret it. Like, wow, you see that it's this long range; it's like, but if you actually know more about what went into that graph, it may be overly generalized, and once you really dive into what's truly happening, I think -- people, I mean, people can develop biases. I mean, that's just -- I mean, everyone does. I do, everyone does. That's just human nature. And I have told

my students repeatedly that what you can only believe is what your eyes tell you and what your common sense says is right or wrong.

My advisor said that I have the best observational skills of any of his students that he's ever had, and he says you make sense because you don't read; you know, you are out in the field looking and making those conclusions from what you physically see, not what you, you know, are just surmising from reading papers or whatever. So when you are looking for a certain point in a paper, for example, even a paper that's directed one way, I could tweak that or someone else could tweak it to make it appear how you want it to appear.

Q. And isn't that one of your concerns with the paper we've been talking about, the Lagerquist study, that there are concerns about the scope of what they're really looking at and crunching the data in a manner that is either biased or skewed in a certain way to represent one thing? I mean, I believe your testimony is you were concerned about the geographic scope of it, the time of sampling, the sampling size; isn't that correct?

A. Yeah, yeah. I mean, and she does great work. Please, I don't want anyone to think I don't think she does great work; she does.

Q. Right.

A. But again, you have to really understand like, okay, you have a small sample size. Almost all the whales were tagged in one locality in a short period of time, so you're already biasing your sample how you did it. And it's already late in the season, so, yeah, the whales are already moving south. And I know she tried to take that out of her paper, but I still have problems with that.

Q. And do you need to attend scientific meetings to be able to formulate an expert opinion that PCFGs have high site fidelity and exhibit internal recruitment?

A. No.

Q. Regardless of whether you procured photos during transect trips, right -- so we -- there was a discussion today with did you get most of these photos during transect trips or some other, you know, a focus study or were they mostly -- and we're talking about the photos that you send to Calambokidis -- or during whale watching trips, you still record scientific data every single time, right?

A. Yes. And John, I mean, John gets tons and tons and tons of his -- John Calambokidis -- of his data from Brian Gisborne, and he runs a water taxi. And so most of John Calambokidis's photographs from around Southern Vancouver Island, are from Brian. So, I mean, an awesome guy, but he does -- I mean, he does great photographic

work, but again, you know, he runs a water taxi. And so, again data is data. I mean, you know, right now we're trying to set up places along the Oregon coast where we can have people, whale watching people, people from shore, whatever, submit their photographs to a common place, and then we can start looking at that distribution. What's so exciting about this is that -- I mean, I've learned tons over the years. I mean, stuff that I did before, I would have changed because I'm learning. I learn all the time. Every trip that I go out, I'm learning something new. And now, you know, with all this great technology we can accumulate these pictures from the common citizen. And it's so exciting for those people that they're involved as citizen scientists. I mean, that is a huge thing.

Birds -- I'm a big birder, so there's a huge thing with citizen scientists as a birder. Like, I saw this bird. And we're tying to set that up with whales. So now -- you know, I only have this limited area around Depoe Bay, but, you know, if I have people up and down the California, Oregon, and Washington coasts, which I connect with all those people. I have hundreds of thousands of people on Facebook and I am connecting with them. It's like, oh, yeah, I need pictures, please submit these. And then we can look at that distribution and where I'm not getting data because I wasn't there; I can't be in 20

places at once, but these other people are. And it's giving us so much happiness. Now I'm a scientist, I'm a citizen scientist. And that's where John's gotten, you know, a chunk of his data from, awesome data.

Q. Excellent. And so in that same vein, when you're talking about these people, all these people, hundreds of thousands of people potentially, they're all appreciating these whales because they're alive; is that correct?

A. Oh, yeah. I mean, when -- like I said, I'll post on Facebook, you know, like if we get something really cool happening. Like we had a Cuvier's beaked whale this summer in 23 feet of water, and I had never seen the whale. And so, I'm like, well, it's not this, not this, not this. I taught seabirds and marine mammals for so many years. And I seen this whale, I'm like, I can't figure it out. So I got a lot of good pictures, and it literally came -- my dog was barking and it came right up to the boat. And so, we got good pictures, but it's 23 feet from shore, and it's like, oh, my goodness.

And so I immediately called John -- John Calambokidis, he's my mentor. And I sent my pictures to him, and it's like, oh, God, I'm not 100% sure, I got to send it on. And so the people involved in that trip, I mean, I said this is so incredibly rare. I can't tell you

how rare this is. And we posted that on Facebook, and Facebook blew up; it blew up. I mean, people from all over the world are like, you know, giving you their two cents of, you know, oh, I think it's this, I think it's that, or whatever.

And so, but, you know, when people all around the world feel they're involved in something like that, and they're seeing these whales and, like I said, it's changed their lives. I mean, when whales, especially, you know, if they decide to come up to the boat and give us a good close encounter, and when I take these people to Baja and they can pet the whales, and -- I mean, you know, I can't tell you how that changes a person. I mean, it's something from the inside out. I mean, they cry; they laugh. There's so many emotions that come out when they see these whales that -- you know, living, breathing, you know, interacting.

And they look at them. I mean, they take their eye -- you saw my picture yesterday. They're self-aware, and there's very few animals in this world that are self-aware. Self-aware, like if you hold a mirror up, they look in the mirror and they know it's themselves. Cetaceans do that, chimps do that, elephants do that. That's it. So there's very few animals in this world that are self-aware, and cetaceans are self-aware.

Q. Thank you. So I'd love to continue talking about that because it's so the incredible, you know, how moving it is for people to have close encounters with live whales, but I'm going to get into some more technical stuff or a little less exciting.

So the fact that some new whales arrive, on occasion you've seen some new whales arriving early on, so like July. Is that even considered early? You were talking about --

A. Typically, like I said, the earliest I've ever seen a PCFG was Ginger, last year, and that was in March. It was spring break actually. And then Comet in April. A lot of our whales -- we start getting whales the end of May. And June, like I said we had a bad June this year. June is variable. July, you know, we're getting some more whales. August more whales come in the area. September the most whales. October they're starting to wean away. November we're lucky to have whales.

Q. Okay. So the fact that some come earlier than others and some stay longer does not change, and some stay very consistently, come back again --

A. Right, right.

Q. -- and again over even 27 years or something, whatever --

A. Right.

Q. -- you had -- some 18 to 20 years. But they're coming back over and over and over again.

A. Yes.

Q. But then you have some that just go to other places and don't stay as long. Does that change your opinion that there's high fidelity for even internal recruitment --

A. No, no, no.

Q. -- with PCFGs?

A. I mean, it's just some have larger regional preferences and some specific sites that they like to come back to.

Q. And given what you know and the concern you expressed, and you were afraid actually, you said, earlier this year that -- the numbers have been low this year for whales?

A. Yes.

Q. Does that give you any heightened concern about the potential for a hunt?

A. It does, because -- I mean, with the numbers that -- and again, I have to make a totally informed decision once I go through all my data. And once I do that, I can make more of an informed statement. But from what I've seen is -- first of all, I know there were less whales this year than other years. And I do know that

late in the season we had more skinny whales. Now I can't give you a percentage -- I mean, until I actually crank through the data, I really can't give you percentages of any of this. And so that's something that -- you know, I'll just say I have seen less whales and more skinny whales, and I'm going to leave it at that until I crank through the data.

Q. Okay. And the fact that -- okay, so in that figure -- the Figure 8, we're not going to bring it up again, but the Figure 8 in John Calambokidis's most recent paper, the one with the red bars --

A. Right.

Q. -- representing latitude and so forth. So one of the reasons that you're saying that even though that's supergood information it's not complete, is it because you haven't had an opportunity to review data? Part -- one of the reasons you said, right?

A. Yeah. Yeah, one of the reasons -- I mean, Dr. Leigh Torres, the last few years, she's been able to take some pictures also off Depoe Bay, but previous to that, John said I was the only person who had any photographs. And so I am very, very anxious to share those photographs with him that I have not yet shared with him. And that could change that. I don't know how much. You know, we'll have to wait and see, but it could. So

I'll be curious to see.

Q. But in any event, you believe that PCFG whales do exhibit higher site fidelity than Mr. Scordino has described?

A. What I've observed off Depoe Bay, the whales I've seen off Depoe Bay, yes. I cannot address that for other localities. But what I have seen off Depoe Bay, yes, that is true.

Q. Okay. And, you know, you talked a lot about Scarback over the past day and a half, and one of the things in particular that you mentioned is that Dr. Bruce Mate, who is also a foremost cetacean scientist; is that correct?

A. Absolutely.

Q. That he guessed that it was sometimes in the '80s, potentially, that Scarback had been hit by a harpoon.

A. Right.

Q. Are you familiar with Dr. Tillman's testimony on behalf of the Marine Mammal Commission, that in the '80s Alaskans hunted gray whales using black powder that could cause a wound like the one on Scarback?

A. I was not familiar with that.

Q. So if that were true, it could indicate that Scarback maybe just went as far as Alaska and it wasn't

farther than that; is that correct?

A. Yes. What I tell my people about Scarback -- this is what I have said to many, many hundreds of people over the years, because they ask how she got her wound. I said my gut feeling, but I don't know for sure because I wasn't there, I says, my gut feeling is that she was up in Alaska feeding or up in the Artic feeding, and she got hit by what one of the researchers thought was an exploding harpoon, and that was so devastating to her that she no longer made that long migration.

And what I believe, and I really need to dive the data to know this 100% for sure, what I believe is that Scarback is one of the first or maybe the first, one of the first PCFGs. Because when I've talked to the old fisherman off Depoe Bay, they said they don't recall any whales hanging around in the summer at all, zero. They said this is a relatively new phenomenon. They said that they just started noticing this -- I think the first time a guy said he saw a whale in the summer was 19- -- well, it was in the mid-'80s. And so knowing that Scarback brings her calves back, which I have documented -- I have seen that with my own eyes and documented that, I believe that -- you know, she has been so important teaching all those calves over the years to come back only, only to the region of the PCFGs, and then, you know, she was wounded

and it's like, I'm not going up there again. I mean, I don't know this for sure. Again, I am guessing this. But again, there's a possibility.

Because people say, well, why do some whales decide not to go up there? And I'll say, well, I know for a fact the calves come back. And I've said to them maybe, you know, and this is a hypothesis, maybe because a number of these whales have had some type of wound or some type of, you know, like orca attack or got hit by boats. You know, whales that got attacked by orcas, I mean, that could occur anywhere, but there's two primary areas: Monterrey Bay and Unimak, or Unimak Pass. And so if they got attacked in the past going up into the Arctic and Chukchi Sea off the -- in the Aleutians there is a narrow pass that a lot of the gray whales go through to get up into the Arctic. Maybe, just maybe these whales are like, well, you know -- and we don't know; we don't know what whales think, but I'm -- this is a hypothesis. Maybe I got hurt on -- like one whale, Zebra Stripe, she got cuts on her back. I've never seen her fluke, so maybe that prevents her from fluking. Maybe she can't make that long journey. You know, maybe these are the whales that are whales -- first of all, calves of females, but also the adults, maybe they are whales that, you know, somehow got injured and now they're like, you know, I don't have to go

as far; I don't have to make that longer journey. I can feed longer, you know, I don't expend as much energy, it's not as cold in the waters off the northwest coast, so I'm not losing as much energy, you know, through the water. I'm not traveling as far so I'm not losing the energy that way. And, you know, I'm getting enough of a food resource that I can sustain the reserves that I have now.

I mean, Jonathan mentioned in his talk, he said he feels that right now the PCFGs are at carrying capacity. I wrote that down. That was one of his statements. So again, you know, if -- you know, we can't -- it's going to displace the whales that we know. I mean, if we have a big event and all these -- we'd have this other influx, and if in fact Jonathan is correct that we are at carrying capacity, what's going to happen to those whales that just know this area?

You know, if they haven't been in Alaska, you know, they're not familiar with that, that's not the cultural knowledge that the calves got from their mother, you know, what's going to happen if we are at carrying capacity? And, you know, we have an influx of additional whales and now it's like, oh, yeah, a new whale will come in and take the place of that one. Well, we're going to displace some whales and some of those whales are going to be dying then, if in fact that is true.

Q. So two things I'm taking out of your -- the testimony you just offered. One, the areas where there is high risk of harm to a whale, whales are most likely going to want to avoid, and that could include hunts, that could include strike attempts, anything that causes pain?

A. I think that could happen. I can't say for sure, but I do think that could happen.

Q. But you've seen something similar on a smaller scale when there have been satellite tagging events that you witnessed and a whale goes away and doesn't back for a few days?

A. Yes.

Q. Okay. And during that time, they're going away presumably from their food source where they're taking in important nutrients for their long-term survival?

A. Well, my problem, my problem when a whale leaves an area -- so these whales, the PCFGs, know where the best food supplies are. As I've mentioned numerous times, it's not just, oh, there is a mysid shrimp swarm or they also feed, of course, on crab, and opportunistically they feed on anchovy. I mean, they're opportunistic feeders. But my -- I really think most of the feeding that's occurring along the northwest coast are in these mysid shrimp swarms. Salmon also eat them. Salmon, rock fish eat them. I mean, these swarms are so incredibly important. We

have no idea how important these mysids are. I mean, they're so important.

So let's just say you had a disturbance of a whale; it was being chased. Okay. And where it was feeding was the best area, the best amount of food. Let's say there were a lot of -- female mysid shrimp, they have brood patches; they're brooders. They'll have up to 30 young per pouch, and this is all I've done in my research. And so now we have these big fat females that have higher lipid contents than a juvenile, and they're bigger.

When I've dived in these mysid shrimp swarms, you see adults in an area and you see them -- you see the adult female/male mysids in the same swarm. They're usually homogenous. There's usually only one species of mysids. Once in a while you get Homeomysis and Neomysis mixed, but not a lot. Normally they're -- one will be on the top, one will be a little higher than them, but still right above the bottom.

So, but going back to what I was saying. So now you have this great food source. You have this area off, let's say, Flat Rock in Depoe Bay. Tons of fat female mysids, that, you know, they have these big brood pouches. The whales are getting high lipid content, which they need, that is transferred into their blubber. So they're getting that.

Now there is some type of disturbance, they leave the area. Now they're looking for another area. So not only have they been disrupted when they're feeding and taken away from their feeding, but now they're also trying to find another area away from that disturbance that they can get the right amount of food, the big fat female mysids that have the brood pouches. Because the juvenile mysids, they're so tiny, a lot of times when they try to take them in, they'll pfff right out of their baleen. I've done that experiment. I've tried, you know, taking different samples and, you know -- I'm not a whale so I'm not nearly as efficient as a whale, but I've done that. And also, Duffus, Dr. Duffus has also documented that.

And so, anyhow, now they're going to an area that has a poorer food supply, and they might not get their correct caloric content in that new food supply. So that's another issue.

So, yeah, you know -- yeah, they come back because they know that's a good source for food. And Jonathan and I are on the same page, that they go where the food is. I 100% agree. But it's more than that. It's what kind of food, how thick the food is, what age, the density. There's so much more involved.

Q. Excellent. And so you also mentioned whale culture and the cultural learning; is that correct?

A. Yes.

Q. Is this a concept that you came up with?

A. No, no, no. This is not one that I came up with at all. Matter of fact, and I'm hoping to go to all these conferences, but the Convention of Migratory Species, they're -- many scientists around the world now are thinking that this is something that's happening with baleen whales. And so they're thinking that, you know, they're -- this information is being passed on not only mom to calf, but maybe even individuals.

Now I don't know, I haven't -- I'm not an expert in this, so I'm just going to tell you what little bit I know. And again, just a little bit, so I'm no expert. Just put that in the record. But bubble net feeding of whales up in Alaska, it is each member that are feeding in that bubble net, has a certain position. And there's a lead whale that makes a certain call, and that triggers all these other whales to come together and do this bubble net feeding.

Now that's cooperative feeding, of course, amongst baleen whales. And I'm just wondering if one of those lead whales dies, you know -- and I don't know the answer, but this is my thinking. You know, what's going to happen, like the lead whale that makes that call, it's like, oh, this is the time that we all need to come up and

eat these anchovy or herring or whatever it may be. So this cultural knowledge -- and I'm by no means an expert, but I have seen that being passed on. For example, Scarback teaching her calves, and other -- Morisa teaching her calves. So I do think there's something to that. And I think, again, in the next few years we're going to be learning a lot more about that.

Q. And you're not the only one who thinks there's something to that. You said the Convention on Migratory Species --

A. Yes.

Q. -- that they've adopted this as a -- for consideration long term.

A. Oh, yeah. There's been a number of conferences now that are, you know -- they have that in a couple of their different agendas.

MS. PRUETT: Thank you. That's all I have.

MS. NEWELL: Thank you.

THE COURT: I guess we're at lunch. So we'll bring -- both sides wish to recross? I just note that so -- we'll be -- we'll do this -- again, come back after lunch, and -- for a brief period of time?

MS. IMAKI: We may or may not. We'll have to decide --

THE COURT: Oh, you haven't decided yet. Okay.

So you'll be available after lunch and we'll -- so we will reconvene at 1 o'clock.

MS. IMAKI: Thank you.

THE COURT: Okay. Thank you very much. We're in recess.

(Off the record from 12:00 p.m. to 1:00 p.m.)

THE COURT: Okay. We're back on the record.

Any further questions for Ms. Newell?

MS. IMAKI: No, Your Honor. NMFS has no further questions.

THE COURT: And none from Makah, right?

MR. SLONIM: Correct. No questions.

THE COURT: Okay. Ms. Newell, thank you very much for your testimony.

MS. NEWELL: Thank you.

THE COURT: All right. You may call your next witness.

MR. SOMMERMEYER: Thank you, Your Honor. Sea Shepherd calls Dr. Stella Villegas-Amtmann.

(Whereupon,

STELLA VILLEGAS-AMTMANN, Ph.D.

was called as a witness, and after having been duly sworn, was examined and testified as follows:)

DIRECT EXAMINATION

BY MR. SOMMERMEYER:

Q. Well, I had good morning on here, but now it's afternoon. Good afternoon, Dr. Villegas-Amtmann.

A. Good afternoon.

Q. Are you nervous today?

A. Yes.

Q. Oh, you'll be fine. Can you please state your full name and spell it for the record?

A. Stella Villegas-Amtmann, V-i-l-l-e-g-a-s, A-m-t-m-a-n-n.

Q. What is your current work address?

A. 130 McAllister Road, Santa Cruz, California.

Q. And what is your present occupation?

A. I am an associate researcher at UCSC, and a lecturer UCSC, and an adjunct at Cabrillo College.

Q. And so do you teach classes?

A. I do.

Q. Okay. And where do you teach classes?

A. I teach at UCSC at the molecular and cellular and developmental biology department, and I teach at Cabrillo College.

Q. And are you testifying as an expert in this proceeding?

A. Yes.

Q. Can you please describe your -- you've given us a little bit of a snapshot, but describe your educational

background.

Q. So I have a bachelor's degree in biology at the University of -- National University of Mexico, UNAM, and then I have a Ph.D. in ecology and evolutionary biology working with physiological ecology of marine mammals at the University of California, Santa Cruz. And a post-doctorate with working with animal behavior department at University of Bielefeld in Germany, working with more physiology and ecology of marine mammals. And another post-doctorate at UC Santa Cruz working with bioenergetics of whales, at the Department of Ecology and Evolutionary Biology.

Q. Thank you. And do you have any peer-reviewed scientific papers?

A. I do.

Q. And how many do you have?

A. About 19.

Q. And what do they principally concern or is there a common topic?

A. They're all on marine mammals, different aspects.

Q. And so in conjunction with your work have you been involved in research projects?

A. Yes.

Q. And what kind of research have you been involved

in?

A. So I've been involved in aspects regarding ecology, foraging behavior, diving physiology, bioenergetics, metabolic rate with pinniped sensitization.

Q. Okay. I was going to ask you what the focus of the research was. It was pinniped sensitization?

A. Yes.

Q. Okay. With respect to bioenergetics, do you use that to study concerning gray whales or how do you -- how does it go together with gray whales?

A. Yes. So the bioenergetics aspect of my work was to apply the bioenergetic models to consequences of disturbance to marine mammals, specifically cetaceans.

Q. And what kind of disturbances do you assess?

A. So the disturbances, we were assessing where -- aspects in which an animal or a whale would lose energy for foraging opportunities and how that disturbance would affect their life history patterns, such as reproduction and survival and calf -- weaning a calf.

Q. Was there a particular focus of your studies?

A. We were focusing on gray whales, on female gray whales particularly.

Q. And why did you -- why was your focus on female gray whales?

A. So the females are the age class in the

population that matters most for population growth or population decline. And they are the animals in the population that are going to consume the most energy because they get pregnant and then they are nursing a calf, and they have a limited amount of time in which they can consume that energy before they migrate to breed and then go back. And so, we focused on females for that reason.

Q. I think you partially answered this already, but what in particular were you investigating with respect to the female gray whales?

A. You mean disturbance? Or can you say the question again?

Q. Yeah. What in particular were you investigating as to the female gray whales as to energy?

A. Yeah. So we were investigating -- we developed a bioenergetic model basically estimating the amount of energy that it requires to be a female gray whale and undertake all the life history patterns that they have, such as migration, reproduction, lactation. And so, we estimated the cost in calories or megajoules and that's the energy cost. And then we applied the model to assess the effects of disturbance, of anthropogenic disturbance on that energy budget.

Q. And so you were looking at the consequences of

energy loss on the female gray whales?

A. Yes.

Q. Okay. And what consequences in particular were you looking at?

A. So we look at different disturbance scenarios. We focused on the foraging grounds, disturbance at the foraging ground. So disturbance while they were feeding, and the scenarios where -- on different aspects of the life stages when the female was pregnant or when a female was with a calf nursing or when a female was -- a single female with no calf and no pregnancy.

Q. And did you -- you said you had two gray whale studies or did you have -- how many gray whale studies with bioenergetics did you have?

A. So we did two with gray whales.

Q. And one was in 2015?

A. Yes.

Q. And what was the focus or objective of that study?

A. So the 2015 study focused on developing a bioenergetic model for the Eastern North Pacific gray whales, and building the -- estimating the consequences of disturbance.

Q. And for that study were there any -- I assume there were some unknowns. In science there are always

unknowns, but -- we have a lot in this proceeding. But were there any primary unknowns in that study?

A. Yeah. So when we put together the bioenergetic model, we took physiological parameters from the literature, and there were a few parameters that we didn't know, such as some physiological parameters like tidal volume, which is the amount of air that they get into their lungs. And that relates to determining the energetic costs that they need for minimum, let's say the metabolic rate. And some of the other unknowns where -- stages where we didn't know how long a female, a particular female would stay at the foraging grounds or migrating or at the breeding lagoons, like following individual animals. Like, we took that as an average of sightings of when the females are seen in the area, but -- so some of those would also be unknowns.

And also, some of the other aspects that we couldn't incorporate into the model where -- body condition, for example. We know that there is animals that have been observed with different body conditions, but we couldn't find a way to link a number to the body condition into the model. So we couldn't get what, what does it mean in terms of caloric content or energy that the animal has regarding the different body conditions. So that's one thing that we couldn't incorporate as well

into the model.

Q. And then a second study was in 2017?

A. Yes.

Q. Okay. And what was the objective of that study or the focus?

A. So for that study we applied the bioenergetic model we developed for the Eastern North Pacific gray whales, we applied it to the western population, and estimated the two different models: The western population breeding in Baja, California and another population potentially or hypothetically breeding off of the western Pacific Coast off of China, and developed the same assumptions for and predictions for disturbance scenarios.

Q. And for that study were there also some unknowns you had to deal with?

A. Yeah. So for that study we had a little bit more unknowns, specifically regarding the population that we said that hypothetically breeds in China, because there not a lot of data available, and so a lot of those parameters for the model had to be taken from other populations.

Q. And I think you've addressed this already, but I was going to ask you how you deal -- how you dealt with the unknowns, but I think you used some other data and

proxies to deal with them.

A. Yeah. So we used -- when the data was available for other populations, we used the one that more closely matched the one that we were looking at. And for the physiological parameters we used data from other, some other -- other species, a related species or, in the case, for example, of tidal volume, where we have the data for younger calves but not for older calves, we developed linear regressions and estimated the data in that way.

Q. Is foraging particularly important to female gray whales, foraging?

A. Yes.

Q. And why is that?

A. So the females are the ones that are going to consume most of the energy in a population. And it's particularly important for the females because in order for them to have a successful reproductive event, they need to acquire all the energy they need at the foraging grounds. And they are only at the foraging grounds for a limited amount of time, so 6 months or so out of the year. So in order to fulfill all their year life stages, what they go through in a year, they acquire that energy in that limited amount of time.

Q. Okay. Thank you. Did your bioenergetics model include certain assumptions related to disturbance?

A. Yes, it did.

Q. And what assumption was included?

A. So for our disturbance assumptions, we were taking into consideration that a disturbance would cause the animal to stop feeding or cessation of foraging, and that was translated into energy losses. So those energetic losses were then translated into how would that effect that female. And we looked into different ways in which it could effect the female by altering their reproductive success, for example, losing a calf or weaning a calf at an earlier age or, ultimately, if the energy loss was big enough, the survival of the female itself.

Q. I believe in your study you refer to these as, quote, "biologically significant disturbances." Is that --

A. Yes.

Q. Okay. So in your papers, the 2015 and '17 papers, you describe a 4% threshold for a threshold for energy loss. Can you describe the significance of this 4% loss, this 4% threshold?

A. Yeah. So the 4% was the result we obtained from our first disturbance prediction, and that prediction was based on a female that was pregnant at the foraging grounds. So the female that is pregnant at the foraging

grounds will be the animal that needs most of the energy because we were considering that an animal that is pregnant would need to acquire all the energy necessary for her maintenance plus the maintenance of the fetus that is growing, plus the energy that she needs to sustain that calf once the calf is born, so lactation costs, all up until the time that she goes back to the foraging ground.

And so the -- yeah, so then the female would have to acquire all that energy at the time, at the limited amount of time that she's at the foraging grounds, and be able to get back to the foraging grounds with the energy that she has in store, basically.

Q. And so how does the 4% figure in?

A. So, yeah, so then that 4% was a result of the energy that would then, if you take away from that whole budget that the female has for that year, it could cause the female to forgo the pregnancy. Right? So if you start off with a full tank, let's say, then you can fulfill all of your energy requirement to grow the fetus, to grow the calf, and then to nurse the calf. But then if you start taking that energy out of your budget, then the female is going to prioritize her own survival rather than the survival of the fetus. And so, if you take that 4%, it could cause the animal to not reproduce that year.

Q. Thank you. So in this proceeding, the witness for the Makah Tribe, Mr. Scordino, testified that according to your research there must be a minimum of 10 days of lost foraging before a pregnant female will abort a calf. So let's take a quick look at --

MR. SOMMERMEYER: Could you pull up SV-3. Take a quick look at where he apparently derives this interpretation. SV-3 is down -- yeah.

MS. PRUETT: Okay. SVA-3. Sorry.

MR. SOMMERMEYER: That's all right. And go to page 15. And scroll down a little bit to the bottom. It's going to go bottom of the first column to the top of the second.

MS. PRUETT: Sorry. I'm trying to make it larger.

MR. SOMMERMEYER: Okay. So go down --

MS. PRUETT: Yep.

BY MR. SOMMERMEYER:

Q. Okay. So in this -- is this -- oh, yeah, actually -- I'm sorry. We should have you identify this paper.

MR. SOMMERMEYER: Do you want to quickly go to the top and we'll come right back.

BY MR. SOMMERMEYER:

Q. So do you -- it should be on the screen next to

you. Do you recognize this paper?

A. Yes.

Q. This is your 2015 analysis?

A. Yes.

Q. With bioenergetics?

A. Yes.

MR. SOMMERMEYER: So -- sorry -- go back. And for the record, it's -- again, it's SVA-3, to her rebuttal declaration.

BY MR. SOMMERMEYER:

Q. So at the bottom, I'll just read it. It says: "Energy loss from our model can be translated to days of disturbance via various foraging reduction scenarios. For example, assuming 1 day of disturbance equals 1 day of lost foraging, and females forage the entire time at the foraging grounds, 10 days of disturbance equals a loss of 5% of the energy" -- we'll go to the top -- "required to successfully complete Phase 1. In this case, 10 days of lost foraging will result in an unsuccessful pregnancy."

Do you agree with Mr. Scordino's interpretation of this paragraph?

A. So this was an example, not -- I don't agree that it should be interpreted in that way because the context in which it was written was as an example of how the bioenergetic model could be applied. So it says there

that it's an example and it assumes that 1 day of disturbance equals 1 day of lost foraging, and the females are foraging for the entire time they're at the foraging grounds. So it's just an example of how you can apply it when you have that information available.

But in our case, we are not talking about the percentage of time that the females spend foraging when they're at the foraging grounds or how many days out of the whole time that they are at the foraging grounds they forage. So if -- assuming that they forage every single day and 1 day of disturbance or one disturbance cessation of foraging for 1 full day, you can translate that into days. But it was just given as an example, because we don't have that data to say this is a fact, this is what happens.

Q. So it's essentially also assuming then that the female whale has a full tank, as you say?

A. Yes.

Q. Okay. So in your expert opinion do you believe that the application of the 4% threshold would be different for, for example, an energetically depleted pregnant female arriving in the Makah U&A during its northward migration?

A. Yeah. So that 4% -- so when we did the study, we provided the numbers with 95% confidence intervals. So

we incorporated uncertainty in all of the parameters, and so that 4% is actually a range between 1.6% and 6%. And so that means that an animal, depending on the situation of the animal, the size and the body condition, could range from losing 6 to 1 percent could affect the pregnancy of the female.

And so, the thing that we weren't able to incorporate in the model was body condition, as I said before, and depending on the body condition of the animal, they are going to be able to sustain a greater amount of energy losses or less than that. And so, let's say that an animal is in an emaciated condition or with very poor body condition, that disturbance is going to affect the female in a greater way than a female that has, for example, better body condition or more energy reserves.

Q. Okay. Thank you. So even assuming that a 4% threshold would be appropriate for such depleted whales, must the energy be lost all at once or can you reach the threshold gradually over time?

A. So our model was simulated based on the foraging grounds, on lost foraging opportunities or cessation of foraging. But we stated that the model could be applied to any sort of energy losses along their migratory route or in the breeding grounds. So if they start off with a full tank and a whole budget to accomplish all those

phases, right -- the migration, the breeding, and then back again north migration -- that energy loss could be either at the foraging grounds and not acquire all the energy that they needed to begin with, or that energy could be lost along the way, right, on the migration or in the breeding grounds. And so if they lose that energy out of their budget because they are away from their foraging grounds and they cannot replenish that energy, then you will see consequences.

Q. So such as energy lost gradually through exposure, to other disturbances, for example, on their northward migration?

A. Yes.

Q. Okay. So when or -- excuse me -- does when in terms of time of year a particular disturbance takes place make a difference?

A. So as we stated in the paper, depending on the time of the year, disturbance could affect the whales in a different way. Disturbance at the beginning of the foraging season, for example, would potentially be -- cause a greater effect because the animals at that point have been fasting for 4, 5 months or more. And so, when they reach the foraging grounds, they are in their worst body condition, right? And so, a disturbance at that point could give them less leeway to lose energy before

they face consequences or the effects of disturbance, rather than if it happens, for example, later when the animal has already replenished a little bit of the energy.

Q. Okay. Are there any particular gray whales that would be more susceptible to disturbance than others?

A. So in our model, we show that because the pregnant females are the ones that require most of the energy, the pregnant females are the ones that are more susceptible for losing energy, because those are the ones -- their results of a disturbance in areas, the ones that if they lose about 4% will range between 2 to 6%, they could forgo their pregnancy or abort the calf and not reproduce that year. The females that are nursing calves are also vulnerable because they are also a tight, energetic budget because they need to produce the milk and nurse the calf. But the ones that are most vulnerable are the pregnant females.

Q. Okay. Great.

MR. SOMMERMEYER: Actually, I'm sorry, I meant SV-3. Sorry.

UNIDENTIFIED SPEAKER: 3?

MR. SOMMERMEYER: SV-3, yeah.

UNIDENTIFIED SPEAKER: We were on 3.

MR. SOMMERMEYER: Yeah. Sorry.

UNIDENTIFIED SPEAKER: You want to stay on 3?

MR. SOMMERMEYER: Yeah. We got to go back to 3, and go to -- let's -- actually go to -- we've already -- okay, so that's SVA-3 again. Page 3. Okay. Can you make the diagram big then? Thank you.

BY MR. SOMMERMEYER:

Q. So, Dr. Villegas-Amtmann, can you look at Figure 1 and kind of just describe what that is first?

A. So Figure 1 is describing the duration of the stages of female gray whales over a 2-year reproductive cycle. And so, it describes how long the female, whether she's pregnant or not, how long she stayed at the foraging grounds, at the breeding grounds, and the duration of the north and the south migrations.

Q. What does it indicate with regard to the pregnant female gray whales?

A. So for the pregnant whales, it shows how they start their southbound migration in mid-November until the end of December. And then their north migration would be from mid-March till the end of April, beginning of May, and their arrival at the foraging grounds from beginning of May, and they stay on the foraging grounds until about like mid-November.

Q. Thank you. Are you familiar with the time period covered by the, what's called the even year hunt proposed by NMFS in this proceeding?

A. Yes.
Q. And what is that time period?
A. They propose to hunt from, I believe December 1st from the previous year until May 31st of the even year, correct?
Q. Right. The 31st, you said? Yes.
A. Yeah, May 31st.
Q. Right. So given this timing, will that hunt have a negative effect on pregnant female whales, gray whales?
A. Well, based on their migratory patterns and their arrival times at the foraging grounds, they would overlap for about a month. So they would potentially overlap the hunting season with the female -- with the pregnant females at the foraging grounds.
Q. And so, and would there -- what would be the negative effect of that overlap?
A. Well, pregnant females, like I said before, are the most vulnerable in the population because they -- with a little bit of energy loss, they can have consequences, like not bringing -- not successfully producing a calf that year. And so, that is just basically overlapping those pregnant females that are the first to arrive at the foraging grounds with a potential disturbance.
Q. So how easy is it to identify a pregnant gray

whale?

A. I believe it's not possible. When we were trying to get data from respiration rates for the different females, from pregnant or non-pregnant females, because that would make the model -- well, that would be a variable in the model that would give us a little bit more information about the energetic requirements of the different life stages, but I couldn't find any paper that where they could record breathing rates of females in their different life stages, let's say a pregnant versus non-pregnant. So I think it's not possible.

Q. Thank you. In your opinion, would a pregnant female gray whale that is subject to a biologically significant disturbance be able to alleviate the associated energy loss by feeding or resting?

A. So I think that will depend on when the disturbance happened. So if the disturbance happened outside the foraging grounds, the animal is not going to be able to replenish their energy stores because there's no food once they leave the foraging grounds.

If it happens at the foraging grounds, yes, potentially they could go find another foraging area, foraging patch, and replenish their energy stores. But by resting, no, because by resting you don't get back that energy that you lost. So you basically need to -- if you

lose part of your energy that you need for that budget for that year, you would need to replenish it to compensate.

Q. Okay. So, also in your opinion, if environmental conditions have reduced foraging opportunities, would that fact impact a gray whale's ability to alleviate the negative energy consequences of a disturbance?

A. Can you repeat that question?

Q. Sure. So, in your opinion, if environmental conditions have reduced foraging opportunities, would that fact impact a gray whale's ability to alleviate the negative energy consequences of a disturbance?

A. Yeah. So environmental variability and climate change, so we are not sure how those things affect the prey resources of the whales. If there is disturbance in a particular foraging patch or foraging area, they could potentially move to a different foraging area and continue foraging, but we don't know how the environmental change might affect the distribution of their prey resources, if they're going to be able to find another patch soon enough and with a good enough quality of food to replenish those energy stores that have been lost. And also another example would be animals that are foraging a certain depth, if they move from one patch to another one, the location of the foraging patch is also important. Because

if they go to a patch that is located in deeper water, that implies greater diving effort for the females and it's more energy that they need to spend foraging at that particular patch than at the one that they would've been foraging at. So, yeah.

Q. Thank you. In your opinion, if a WNP whale, a Western North Pacific whale, were subject to a hunt-related disturbance, is it more susceptible to such a disturbance than an ENP gray whale?

A. Yes. So the Western North Pacific will be more susceptible because, for one, their migration route is longer than for the ENP, so they require a little bit more energy to accomplish that migration and to get the foraging ground, and the population is smaller. So any disturbance would affect the western population in a greater matter that would do for an Eastern one.

Q. Thank you. So now let's just slightly switch topics. Did you review the testimony of Mr. Scordino and Dr. Weller concerning the Chukotka native hunts of gray whales?

A. Yes.

Q. Did you review the reports from the Russian federation scientist attached to Mr. Scordino's and Dr. Weller's declarations?

A. Yes.

Q. So from your review of these documents and testimony, in your opinion do the Russian reports support the conclusion that there is no evidence that Chukotkan hunts cause shifts in gray whale distribution or abundance?

A. Based on what the reports that I read, I found that there is no way to link that conclusion with the data that is given, because they weren't focusing their report on behavioral responses of the animals, or they weren't particularly looking at the effects of the hunt in that population. They were just assessing -- to my understanding, they were just assessing the patterns of the stock of the whales.

Q. Do the reports actually make any reference to the effect of the Chukotkan hunts on gray whales?

A. Can you repeat that question?

Q. Yeah. Do the reports actually, do they actually make any reference to the effect of the hunts on the gray whales in the area?

A. No. I couldn't find any information where they were looking specifically at the effect of the hunt.

Q. Okay. So now, for the sake of argument only, let's assume that the distribution and abundance of gray whales in the vicinity of the Chukotkan hunts are unaffected by the hunts of gray whales. If this

assumption were true, do you have an explanation for why the distribution and abundance would not change?

A. So I think that based on their migratory route and depending on whether the Chukotkan area is an important area for the animals to replenish their energy stores, let's say, on their migration north or on their pathway to reaching other foraging grounds, they are -- the gray whales are very much consistent in their migratory routes. And so, if they -- if these animals are going north and they already having depleted energy stores and they need to replenish those energy stores, they might not afford physiologically that extra cost that will cause a deviation from their migratory route or not stop over at that foraging ground in particular if that's an important foraging ground for them. And so, they might just consider exposing themselves to the disturbance in order to prioritize their survival.

Q. So it's a good restaurant in a bad neighborhood?

A. Yeah, probably.

Q. All right. Let's take a closer look at one of the reports.

MR. SOMMERMEYER: Can you put Exhibit 23, the first Scordino declaration, on the screen? And, I'm sorry, go to --

BY MR. SOMMERMEYER:

Q. So for the record, this document at Exhibit 23, the first declaration of Jonathan Scordino, Dr. Villegas-Amtmann, have you reviewed this document? It's on your screen there, too.

A. Yes.

Q. Let's turn to page 7, Figure 4. So the figure in -- the table in the lower left, the lower left table, what is that depiction here?

A. That table is showing the percentage of yearlings that are being harvested in the different regions that they're harvesting the whales.

Q. And so what conclusions do you draw from this table?

A. So what I can see from this table is that there were no yearlings taken in the central region and then in the western area where whaling was happening, that the percentage of yearlings that they hunted over the years declined from 2007 to 2010.

Q. And do you have any conclusions, any observations based on this table?

A. So that paper did not specify or discuss the data or interpret these results. And so one thing that I can think of is either they are not targeting yearlings anymore from 2007 to 2010, they stopped for some reason on purpose catching yearlings, or the other explanation could

be that the number of yearlings decreased over the years because the females are producing less calves. Right? So the potential disturbance to the females would make them not reproduce as often, and then there's less percentage of the yearlings being recruited in the population in the following year. So --

Q. Thank you. Believe it or not, one final question for me for now. So based on your review of the materials in this proceeding and in your expertise, in your opinion, should a waiver be granted to the Makah Tribe?

A. So based on what we found in our model, that there are a lot of unknowns to link the effects of anthropogenic disturbance to biologically significant effects on the gray whales. We identified that there are a lot of data that -- like the distribution of their prey, behavioral responses, for example, of how the animals react to a disturbance, right, if they are able to compensate of the disturbance by moving to a nearby foraging patch or if that disturbance affects them in a different way, because we don't know how easy it is for them to find another patch of the same quality. We also don't know how many days they can forage or they forage when they're at the foraging the grounds, the frequency. There are some studies that have shown that there are some

behavioral responses to disturbance, but those studies haven't linked quite yet physiological effects.

So I believe that we need more information on how the animals are affected by these disturbances, how they affect their lifecycle, right, their reproductive rate. And because at this moment, the whales are also experiencing the UME and they're faced also with environmental changes that we don't know what environmental changes are going to mean for the whales. So for some, it might mean that they are going to have more foraging grounds open for them, but for some it might mean that the distribution just changes and then it will make it harder for the animals to reach those foraging grounds. So I think there's a mix of a lot of unknowns and data gaps that in a precautionary way, I would -- I wouldn't suggest to input another source of disturbance at the moment until we know a little bit more about the effects of the disturbances they're already facing.

MR. SOMMERMEYER: Thank you very much. No further questions.

CROSS-EXAMINATION

BY MS. IMAKI:

Q. Good afternoon, Dr. Villegas-Amtmann.

A. Good afternoon.

Q. My name is Caitlin Imaki, and I represent NOAA

Fisheries. I'm one of the attorneys for NOAA Fisheries in this matter. So I have some questions about your declaration and the associated exhibits, and a few follow-up questions from your testimony that you just gave. I'll try to speak clearly, but if you don't understand my question for any reason, please ask me to rephrase or repeat.

Dr. Villegas-Amtmann, what was your goal in preparing testimony today?

A. My goal for preparing the testimony?

Q. Preparing your declaration.

A. Well, my goal was to give my expert opinion on disturbance of gray whales based on the work that I've done with bioenergetic models of gray whales.

Q. And when did Sea Shepherd retain you to testify in this case?

A. I believe they contacted me in June.

Q. June of this year?

A. Yes.

Q. Okay. And what was your reaction when they explained to you what this case was about?

A. So I wasn't very familiar with the case. I read a little bit about it, and because they were interested in the work that I did with the bioenergetic models of the gray whales, I agreed; I agreed to provide my opinion.

Q. Okay. And did you understand your role to be as an advocate for whales in this case?

A. Yes.

Q. How many hours did you spend preparing your declaration?

A. I don't know. Like anywhere from maybe 30 hours or less. Like I'm -- I didn't keep count, but I would say roughly somewhere around there.

Q. All right. And who wrote the first draft of your testimony?

A. I did.

Q. Would you please describe for us the level of involvement of counsel in editing or reviewing your testimony?

A. So Sea Shepherd provided me with documents, the declarations of Scordino and Weller, and they provided me with the documents, the purpose of hunts, documents from the Makah and the cited papers. And -- yeah, based on that, I prepared a draft of my testimony, my declaration. And then they just provided comments on it, and we just emailed like back and forth.

Q. Okay. Did they provide you any other documents other than the ones you named?

A. Yes. I believe, yeah; they provided me with a ton of documents, so -- yeah.

Q. Do you recall any others that they provided you with, or the nature of those documents?

A. So papers mostly, and the declarations and the proposed rule agenda, and other documents of the sort.

Q. Okay. And when you say papers you mean scientific journal articles?

A. Yes.

Q. Okay. And the proposed rule is the proposed rule and regulations that NMFS has proposed; is that correct?

A. I can't say because I don't remember exactly what ones, so --

Q. Okay. Do you know whether you reviewed the Proposed Rule and Regulations before you worked on your declaration?

A. Yes. So that's the -- I believe that that's -- I don't remember the name, but I believe that's the Proposed -- I have it here. Yeah, that's the one that talked about the odd year hunt and the even year hunts?

Q. Those are discussed in the Proposed Rule and Regulations, but I'm not sure if that's --

A. Yes.

Q. -- the same document.

A. So yeah. Yes, I have that document.

Q. All right. And you mentioned that you exchanged

some emails with counsel. Can you explain the nature of their edits to your declaration?

A. They forwarded my declaration when it was done. I included more information than the one that was included in my final declaration, because I was -- maybe I was going too broad in other subjects that weren't specifically more to direct my -- the paper, the scientific papers that I wrote. And so some of those were shortened, cut out from my declaration and -- yeah.

Q. Did they provide any other comments on the substance of your declaration, citing or eliminating some sections?

A. They might have provided some comments or opinions that I also agreed with, and -- yeah, for including in my testimony.

Q. Okay. Thank you. Did you receive help or assistance from anyone else preparing your testimony or your declarations today other than counsel for Sea Shepherd?

A. No.

Q. Okay. Thank you. If I may ask, did Sea Shepherd compensate you for preparing testimony in this case?

A. Not yet.

Q. Do they -- do you know whether they intend to?

A. I believe so, but we haven't like talked much about it, so -- yeah.

Q. Okay. So you don't -- you're not under contract or anything for a particular amount?

A. No. We haven't talked about a particular amount, no.

Q. Okay. All right. Let's move on to some of the contents of your declaration. At the beginning of your declaration you talk about your disagreement with Mr. Scordino and Dr. Weller, and you assert that they inappropriately discounted the effects of the Chukotkan hunt and the training approaches on gray whales; is that correct? It's approximately paragraph 7 to 9, and you repeat it again in paragraph 23.

A. That I disagree with the statements, yes.

Q. Okay. And would you please explain for us your understanding of how the Chukotkan subsistence hunts are conducted?

A. Can you repeat the question?

Q. Sure. Would you please explain your understanding of how the Chukotkan subsistence hunts are conducted?

A. You want me to tell you like what I understand from documents that I got of how the whaling happens?

Q. Based on your understanding from whatever

information you have --

A. Yes.

Q. -- your understanding of how those hunts in Russia are conducted.

A. Oh, the Chukotkan?

Q. Correct.

A. So what I -- the information that I got from these papers that were provided to me, is that they have three areas in which they hunt the whales: the western, the central, and the eastern, I believe.

Yeah. So, and they mention -- gulf, the western, central, and the eastern, where the hunts are being performed. And the area that is most intensely hunted is the western area.

Q. And is your understanding of the Chukotkan hunt based solely on these documents that you received from Sea Shepherd's counsel?

A. Yes.

Q. And so it's safe to say that you didn't do any independent research about the nature of the Chukotkan hunt prior to opining on it in your declaration; is that correct?

A. Correct. I'm just discussing the papers that were provided.

Q. Okay.

A. Yes.

Q. So based on the papers you reviewed, could you tell what kind of boats are used in the Chukotkan subsistence hunt?

A. No.

Q. Okay. And have you reviewed -- you said you reviewed the hunt regulation being proposed by NMFS that would govern the Makah Tribal hunt, correct?

A. Correct.

Q. So do you have an understanding of how the Chukotkan hunt would compare with the proposed Makah ceremonial and subsistence hunt in terms of how the hunts are conducted?

A. I'm not really familiar with the method in which the Chukotkan hunts are happening, so I couldn't say for sure that I know how they compare.

Q. Okay. And would you be surprised to learn that the Chukotkan hunts are conducted solely by motorized vessels?

A. No.

Q. Okay. And the Makah hunt, particularly the many approaches that are allowed under the regulation, if you'll -- attached to our exhibits that we submitted with the Proposed Rule and Regulation, NMFS Exhibit 1-7 and page 31. We can pull this up if you'd like, but it does

say that most of the approaches would likely involve paddle-driven canoes compared with the motorized vessels used in the Chukotkan hunt. Would that surprise you?

A. No.

Q. Okay. But you weren't aware of that information?

A. I was.

Q. You were aware of that information?

A. About the Makah hunting? Yeah, I read the proposed hunting for the Makah, and so I was aware that they were using canoes and then motorized boats to haul the whale.

Q. Okay. So the information you were not aware of was the motorized vehicle used by the Chukotkan hunt?

A. Exactly.

Q. Okay. Thank you. Dr. Villegas-Amtmann, do you know how many gray whales the Chukotkan natives have removed from the population in recent years?

A. Based on their numbers, the last year, 2010, 118.

Q. 118?

A. In 2010.

Q. And do you have an idea of how long the Chukotkans have been removing gray whales from the stock?

A. I believe quite a while, but I'm not completely

certain about when they started.

Q. Okay.

MS. IMAKI: Can you pull up Exhibit 1-7?

BY MS. IMAKI:

Q. Dr. Villegas-Amtmann, I would just direct you to the bottom of page 30. This is NMFS Exhibit 1-7 that was submitted as an attachment to Mr. Yates' declaration in this matter. And I would -- if I could just ask you to read that last sentence.

MS. IMAKI: Or actually, we need to scroll up a little so the whole sentence is visible. Thanks.

BY IMAKI:

Q. Beginning at "Since the 1950s."

A. Where is the sentence?

Q. I'm sorry. It's at the very bottom of page 30 of 89, and it's the last sentence that begins on that page.

A. Oh, yes. Yes. "Since the 1950s, Chukotkan hunters have hunted an average over 100 Eastern North Pacific gray whales per year, and an average of 126 whales per year during the past decades."

Q. Okay. Thank you. So based on this, it would seem that for nearly 70 years the Russians have removed over 100 whales from the ENP population on an annual basis; does that look to be correct?

A. Yes, it looks like --
Q. Okay. And are you familiar with how that number compares with the proposed number of whales that would be removed under the Makah ceremonial and subsistence hunt?
A. Yes.
Q. And how many whales would that be for the Makah?
A. So they are proposing to remove less whales than what the Chukotkans are removing.
Q. Are you familiar with how many whales are being proposed to be removed?
A. I have it here, but a few, 2, 10 -- yeah, I have it here, but fewer. So fewer, yeah.
Q. So you're not exactly sure, but fewer?
A. Fewer.
Q. Okay. I believe it's 2.5 per year on average.
A. Um-hum.
Q. Over 10 years. Does that sound correct?
A. Yes.
Q. Okay. So the declaration that you submitted, is it safe to say that it does not compare how these two hunts are conducted?
A. In my declaration?
Q. Yes.
A. My declaration compares that?
Q. Yes.

A. No, it doesn't.

Q. Okay. And it does not compare the number of whales that might be removed from each of these two hunts; is that correct?

A. Correct.

Q. And does your declaration cite any evidence to suggest that the Chukotkan hunt that we just discussed has actually caused any shift in gray whale distribution or abundance in the hunt area?

A. No, my declaration does not say that.

Q. Okay. And Dr. Villegas-Amtmann, are you familiar with the population abundance trends of the Eastern North Pacific gray whales stock?

A. Yes, somehow.

Q. Are you familiar with the numbers in recent years and how they've changed?

A. I believe it's increasing.

Q. Do you know how much it's been increasing?

A. It's about like 22-, 27,000.

Q. And do you understand from what level it's been increasing?

A. I don't have an in-depth knowledge of how the population trend's been going on. I just know the recent numbers.

Q. Okay.

MS. IMAKI: Steve, could I ask you to pull up NMFS Demonstrative -- I can't remember which number it is. I think it's 3. The one with the population abundance. Sure.

And I'm going to pull this up on the screen as well. It'll be easier to look at. I don't have my pointer but I think we'll be okay.

BY MS. IMAKI:

Q. So based on -- this is a demonstrative that's been submitted into evidence or submitted as part of this hearing, and it's based on evidence that's in the record. And if you would take a look at this. It begins -- this data here begins in 1967, and the whales numbered -- I'm guessing 14,000 based on that graph. And they have continued to rise until the most recent numbers, which are close to 27,000. Does that look to be about correct?

A. Yes.

Q. Okay. And you would agree that this increase has occurred despite whatever energy loss the Chukotkan hunts have had on the ENP gray whales?

A. Yes.

Q. Okay. Thank you.

I'd like to next turn to the assertion that you make in paragraph 9 of your declaration. And you assert that studies have shown -- this is -- this is evidence at

paragraph 9, that extending migratory routes or alternating migrating speed in order to avoid a disturbance is energetically costly for whales. Is that correct?

A. Correct.

Q. And you go on to assert, and I believe you spoke about this just a little while ago, that whales may essentially choose to face the risk of being hunted rather than expending energy required to change their distribution so that they would avoid the hunting area. Is that also correct?

A. Correct.

Q. Are you saying that whales can make a conscious choice to face the hunting risk or avoid an area?

A. I assume so, yes.

Q. Okay. I'd like to look at the study you relied on for this assertion, which I understand is Exhibit 2 to your declaration, and this is a study by Braithwaite et al. (2015). And as I read it, it says: Study that explains the bioenergetic model for migrating humpback whales. Do you recall that study?

A. Yes.

Q. Okay. And the model simulated energetic consequences of disturbance through increase swimming speed and increased travel distance. Does that sound

right?

A. Yes.

Q. And the model then went on to assess changes to the growth rate of calves under those two disturbance scenarios; is that right?

A. Yes.

Q. And do you recall how much additional distance the authors found that a whale would have to swim to result in a 10% percent reduction in calf growth?

A. Not off the top of my head, no.

Q. Okay.

MS. IMAKI: Rachel, could you pull page 11 of that exhibit, please?

BY MS. IMAKI:

Q. So as I understand this, not being a modeler, again this looks like it's giving an example of the results from the model, as you explained that earlier today in your testimony, how to draw examples. And it says, for example, a migration journey with an extra 850 kilometers resulted in a 10% reduction in calf growth.

So is it safe to say that based on the results of this model, they are predicting that a whale would need to swim an extra 850 kilometers to result in a 10% reduction in calf growth?

A. Correct.

Q. Okay. And do you recall whether this study made any predictions about how much a whale would need to swim in order to avoid mortality of calves?

A. I don't remember.

Q. And do you recall whether it made conclusions about mortality of females?

A. I don't remember.

Q. Okay. Do you recall whether this study discussed whether the kind of 10% production in calf growth was biologically meaningful to the population?

A. If the study addressed that?

Q. Yes.

A. No, I don't remember.

Q. Okay. Dr. Villegas-Amtmann, are you familiar with the size of the Makah usual and accustomed hunting area?

A. No.

MS. IMAKI: Okay. We can pull this up, but I will just let you know, and folks can look at NMFS Exhibit 1-7 at page 87.

BY MS. IMAKI:

Q. Would you be surprised to learn that the Makah hunt area is approximately 30 by 50 miles? Which by my calculation equates to 48 by 80 kilometers. So -- this is NMFS Exhibit 1-7. So comparing this to the previous study

that you cited for this proposition, in this case theoretically the farthest that a Makah whaling boat could displace an individual, given maximum scenario here, would be approximately 80 kilometers. Would you agree?

A. Yes.

Q. Do you think it's realistic that a whale would swim 80 kilometers to get away from a whaling team?

A. I couldn't say because I am not -- I haven't done any study to look at how the animals react to a disturbance like that.

Q. Okay. Fair enough. Do you know of any data showing that humpback whales or any other whales have diverted 850 kilometers to avoid disturbance?

A. No, I'm not familiar with the distances.

Q. Okay. Thank you. All right, I'd like to move on to your bioenergetic models that you've discussed in your declaration and earlier today, and these are Exhibits 3 and 4 to your declaration, correct?

A. Yes.

Q. Okay. And Exhibit 3 was your 2015 paper and Exhibit 4 was your 2017 paper. And you cite specifically to the 2015 paper to support your assertion that you first talk about in paragraph 10 of your declaration, and this has to do with the 4% figure that you've already discussed today. And that 4% is the projected annual energetic loss

during a year in which a female whale is pregnant that would prevent that female from successfully weaning a calf. Does that sound correct?

A. Yes.

Q. Okay. And the model described in Exhibit 3, which is the 2015 paper, goes on to predict that to affect adult female mortality, the destruction would need to result in approximately 40 to 42% loss in the annual energy budget; is that correct?

A. Correct.

Q. Now the second model that you worked on also looked at the potential consequences of energy loss, but it specifically compared the energy budgets of Western North Pacific individuals with Eastern North Pacific gray whales; is that right?

A. Yes.

Q. Okay. And that second study predicted female mortality would likely occur for a Western North Pacific gray whale if she experienced a 38 to 40% energy loss over the course of a reproductive cycle; is that right?

A. Yes.

Q. And both of the assumptions -- both of these models made a number of assumptions, some of which you spoke about earlier. And one that I understand was true for both was that the whales did not feed outside of the

foraging grounds; is that correct?

A. Correct.

Q. So for either model, is it true that any additional foraging effort or prey consumption outside of the foraging grounds would buffer the female and make her less sensitive to disturbance?

A. It would depend on the quality of the food patch. And based on the data that we reviewed for that matter, we found that there are some occasional feeding outside of the foraging grounds, but it wasn't substantial enough to be able to sustain the energetic needs of the whales to be able to accomplish all of the phases of their reproductive cycle.

Q. I see. But you would agree then that any additional foraging would buffer the female; is that correct?

A. Depending on the energy losses and depending on the amount of energy they lose and the amount of energy that they are able to replenish on those occasional foraging patches.

Q. And those may be part of the unknowns that you were speaking about earlier?

A. Yes.

Q. Okay.

MS. IMAKI: Rachel, could you pull up -- hold on

one second. Exhibit 2, page 13. I'm sorry, 3 not 2. Thanks. Yeah, page 13.

BY MS. IMAKI:

Q. So I just -- just to make sure we're on the same page, I'd like to ask you to read the sentence on the right-hand column. This is the 2015 paper, Exhibit 3.

A. Um-hum.

Q. And it's the last sentence on the right-hand column prior to the last paragraph, that starts with "Furthermore" after the citation of Oliver et al. 1983. Do you see that part of the paper?

A. Second column? Second column?

THE COURT: This is, it appears to be page --

MS. IMAKI: Yup. Rachel's going to highlight it for us on the screen.

THE WITNESS: Oh, okay.

BY MS. IMAKI:

Q. Right here. Yep, starting there.

A. Yes, yes. “Furthermore, our assumption is conservative and any prey consumption outside of the foraging grounds would buffer the female, making her less sensitive to disturbance and any associated time lost on the foraging grounds.”

Q. And do you still agree with that statement?

A. I do.

Q. Okay.

MS. IMAKI: Okay. Can you pull up Exhibit 4, page 178, please?

BY MS. IMAKI:

Q. I would like also, just for the sake of completeness, ask you to read a passage from your second, 2017 paper. This is talking about the limitations of the model. It's on page 178, the top of the second column. It actually begins at the bottom of the first column. And it starts with the "Additional analyses." Would you read that?

A. "Additional analyses will be needed to determine how disturbance affects energy intake."

Q. And continue on to the next column, please.

A. "Those efforts will need to address how the gray whales' foraging behavior could change in response to disturbance, whether they can compensate by increasing foraging effort, how much energy is lost for a given level or type of disturbance, and potential changes in food availability and/or quality over the season."

Q. Okay. Thank you. And to confirm, these are studies that are still needed; is that correct?

A. Correct.

Q. Okay. Now the model that you evaluated -- excuse me -- the models that you developed, were looking

at the energy costs of Eastern North Pacific and Western North Pacific gray whales that migrate 8- to 10,000 kilometers; is that correct?

A. Correct.

Q. And as we talked about earlier, your second paper discussed the mean energy requirements for Western North Pacific whales compared with Eastern North Pacific whales.

A. Correct.

Q. Right? And I believe you found that a Western North Pacific gray whale requires 9 to 22% more energy compared with an Eastern whale, depending on whether she is pregnant or lactating and where she migrated to breed, whether it was over in Asia or down the west coast of the United States --

A. Correct.

Q. -- is that correct? Were those differences between Western and Eastern, and then again among the Western North Pacific whales due largely to migration distances?

A. They were, yes, in part due to the migration distance. Also due to the metabolic rates of the females at the foraging grounds off of Sakhalin area.

Q. Okay. Was the migration distance a large factor in the difference in energy cost?

A. We didn't evaluate the proportion of the effect that the different parameters had on the differences of the energetic requirements. We just knew that in our budget, those were the things that were different, the migration distance and some of the energetic costs that they require at the foraging grounds. And so -- yes.

Q. What do you mean when you talk about energetic costs at the foraging grounds?

A. So we obtained data from respiration rates of females at the different stages, and that's how we evaluated. We transferred the amount of oxygen consumed based on the respiration rate into energy that the animals are consuming based on the oxygen that they're taking in. And so if they have a higher respiration rate, that means that they're consuming more energy. And then, based on that, that's how we determined the energy that they needed to basically live throughout all those phases.

And some of the metabolic rates for the females for the western population were higher at the foraging grounds, than the metabolic rates or the respiration rates that we found in the literature for the animals foraging off of the Bering Sea and Chukchi Sea. So -- yeah.

Q. So the respiration rate, but then also the migration distance?

A. Yeah, the migration distance as well. Because

the longer they spend migrating, then that's going to input a bigger energy usage for that specific stage of their life cycle compared to the other population.

Q. And it's fair to say that migrating 10,000 kilometers takes more energy than migrating 8,000 kilometers?

A. Yes.

Q. Okay. So is it also fair to say that migrating shorter distances would require less energy?

A. So that's the tricky part in the model, and when we looked at the population that is breeding potentially or hypothetically in China, we thought that a shorter migration route would mean that the energetic requirements were going to be a lot less. But there's a lot of factors that come into play when estimating those costs, because the whales, we're assuming that they're foraging in an area that gets covered with ice and the whales need to migrate. There's a limited amount of time that they spend at the foraging grounds, and so there's also a limited amount of time that they can spend at the breeding grounds before they need to go back and replenish their energy stores. So it wasn't that straightforward, just a shorter migration route will signify a lot less energetic cost because they can -- they compensate for that time either at the foraging grounds or at the breeding lagoons, and

that could imply greater metabolic rates or respiration rate at those different areas, so it could turn into a greater energy consumption overall.

Q. Okay. If it's a significantly less migration distance, it would require less energy, though; is that correct?

A. So that's what I was trying to explain, that it doesn't quite work that way just by -- because we worked the budget over a whole year, including the different stages, like at the migration, at the breeding grounds, and the foraging grounds. And so, if you reduce the energy that they require during the migration, for example, it's a shorter migration route, that means that the time they don't spend migrating, they will spend it at the foraging grounds or at the breeding grounds. And actually, the metabolic rate of the animals when they are migrating, they are the lowest. So the lowest amount of energy that they require will be when they're migrating, if they are migrating at the speed when the cost of transporting the least. And so it's not -- I guess my answer it's not that straightforward, that just a shorter migration distance. But in part, yes, it will -- like if you have to migrate for longer, then you need --

Q. More energy.

A. -- more energy.

MS. IMAKI: Can you pull up 18 at 51.

So this -- we can go to the first page if that would be helpful, actually. Sorry, Rachel.

BY MS. IMAKI:

Q. So this the exhibit that you attached to your declaration. This is Exhibit 18, Sumich 1986. Do you recall this study that you attached?

A. Yes.

Q. Okay. If you could go to page 51, please.

THE COURT: The Sumich study?

MS. IMAKI: Yes. Exhibit 18 to Dr. Villegas-Amtmann's declaration, page 51.

BY MS. IMAKI:

Q. The first sentence on this page, would you please read the first sentence -- or the first two sentences?

A. "Summer whales may gain energetic benefit by cutting short their northward migration and foraging in Oregon rather than farther Artic waters."

Q. And the next sentence.

A. "Also summer feeding can begin earlier and continue later prior to the southward autumn migration."

Q. And, I'm sorry, but one more.

A. "This benefit may be particularly crucial for calves and their mothers as pregnant females are the first

to leave the Arctic feeding grounds at the end of summer."

Q. Okay. Thank you. Do you agree with the overall general assertion?

A. Yeah, I do.

Q. Okay. Thank you. So it's possible -- I understand it's more complicated than I was making it out to seem, but it's possible then that the shorter migration distance, for example, for the summer whales -- the whales that summer off the west coast of the United States, the Pacific Coast Feeding Group, that they require less energy overall than the whales that would go all the way north to the northern feeding grounds?

A. Potentially, yes.

Q. Okay.

A. Yes.

Q. Thank you. So, so far we've talked about the potential for an increased foraging effort and shorter migration. Are there any other ways that animals could compensate for energy loss that might be caused by a disturbance?

A. So foraging elsewhere -- yeah, so I think that depends on where the disturbance is happening, what the behavior of the whales might be. So they can compensate by foraging at other patches, by moving away from the area and then going back to the area.

Yeah, if the disturbance happens where there are no food available, where there are no prey patches, then I believe they couldn't compensate that easily for that energy loss. I would just have to -- yeah.

Q. Okay. So it sounds like those are the two main things: increased foraging effort, moving to a different foraging area; potentially shorter migration routes.

A. Well, the shorter migration route, I don't know if that could be because they were compensating.

Q. Okay.

A. Because they -- so I think they have their migratory pattern pretty set, and I don't know if they could compensate by just saying, oh, I'm being disturbed, I'm going to shorten my migration route now. So I believe that those are just the life history patterns of the foraging area that they exploit, that they know that they can find food and those are just the area that the animals are frequenting.

Q. Okay. So that sounds a little different than what you were saying earlier, that they may choose to avoid a hunt area.

A. Can you put that into context?

Q. Well, I'm just trying to understand. Earlier when we were talking about your declaration and reviewing Exhibit 2, you stated that the whales may choose to avoid

a certain area -- or choose not to avoid a certain area because they would rather be exposed to the effects of the hunt than change their migration pattern.

A. Yeah. So when I was talking about that, I was saying that the whales are on a tight energetic budget. And so, if they are migrating north and they are already at the lower limit of their energy stores, and they have to stop over to replenish that energy at the area where there's a disturbance, what I was saying is that they might not be capable of diverting their migratory routes and spending more energy in that deviation to get to a different foraging area before they replenish their energy stores. So they might just -- they might compromise being disturbed or a disturbance that might happen to their survival if they know that they need to acquire food soon. So that, I think that was the point that I was getting to, that they might not be physiologically capable of saying, I'm going to pass this foraging area right now, I'm just keep going.

Q. All right. Okay, specifically with the increased foraging effort, your model didn't put that in as a variable in the model, it didn't account for those variables?

A. No.

Q. Okay. So turning back to the 4% energy loss you

discussed in your 2015 paper, do we know how much disturbance would cause this kind of energy loss?

A. That is the tricky part about the model, and the data that we identify as missing data gaps. And that was in the interpretation of the 10-day.

Q. Okay.

A. So the 10-day in there were an example if we knew, if we had those variables to put into the model or to input into the calculations, if we knew the amount of food that they consume in a day, and the amount of days that they are feeding out of the full duration of their stay at the foraging grounds, then they -- we could start to put that into -- to link that, to link the number of days. And also, if we knew the behavioral response of the animal to a disturbance. So those are some of the lacking data that we have. Like, if we knew that the animals are going to behave in this way or this other way when they are disturbed, if they are just going to stop foraging for 2 hours but then they're going to resume foraging, or if they're going to be done foraging for the day, so all of those are parameters that if we knew, then we can put a number into, yes, these amount of days they lose this amount of energy.

So the only thing that we were able to do in our model because of the lacking data was to give a percentage

of the energy loss that would impact in different ways. So if we know what their budget, if we know what the amount of calories that they need to survive and the amount of calories that they need to nurse a calf and to be pregnant and migrate, so we would take how much of that would start compromising the different stages of their life history.

So -- yeah, we could only give percentages but not translate that into actual number of days.

Q. And so you can't translate into number of days, and in turn can't assign how much disturbance would cause that amount of energy loss, it sounds like?

A. Not until we know what behavioral response is to disturbance. So some of those studies -- there are some of those studies already that have shown that they increase the respiration rate and that they increase their swimming speed or that they move away from the area, but there are, I believe, and to my knowledge, there are no studies yet that are showing -- that could link the behavioral response to a physiological effect on the animal, to be able to translate it to this is big enough to affect the whale in that way, or this is a threshold, right, when you disturb them for this many hours, then it could start really affect the whale.

So those are the missing -- the unknowns that we

have identified in our studies.

Q. Okay. Thank you. And because we don't have that data or it hasn't been fully developed to a sufficient degree that it's useful yet, that's why your model made all these assumptions; is that correct?

A. Yeah, so we made a lot of assumptions also on behavioral aspects of the animals because we don't know. For example, we don't know what the threshold is for body condition, and that's another one that we weren't able to put in the model, right? So we know that the whales have different body conditions and that was one of the difficulties to translate how skinny the whale has to be to be like more vulnerable. Or, for example, if they can store more energy than they need for a particular year, and sort of have that little bit of leeway of losing energy.

So some of those assumptions, and the assumptions also about the foraging, because we knew that based on the literature that the animals couldn't get enough of the energy reserves on the particular foraging patches that they might encounter, so we had to make the assumption of the foraging, they obtain all the energy at the foraging ground and other assumptions based on data that is not quite available or we don't know.

Q. Okay. Thank you so much. I think I understand.

So I think I know the answer to these questions based on what you've explained just now about the lack of knowledge, but just for the record: Your model doesn't quantify the energy impacts of the Chukotkan hunt on the ENP gray whales?

A. My model, no.

Q. Correct, your model. And you don't do that in your declaration either?

A. No.

Q. And similarly, you don't make any predictions about what kind of energy loss the Makah proposed hunt would have on any whales that might be approached or disturbed; is that correct?

A. Correct.

Q. Okay. So I'd like to review -- we've already reviewed one of these, but a few more of the limitations to your bioenergetic model that you discussed in your paper. Some of this you may have already touched on, but for the record, this is your Exhibit 4 again. It's page 178. I believe we already read the first one, but let's just double check.

So I think we already read the first one I was hoping to point out, which talks about -- and that's at the bottom of this page in the first column, the

limitations of the bioenergetic model. And we talked the additional amounts of foods that are needed, correct?

A. Correct.

Q. Okay. So moving on to the next issue, you talked about the data that was presented by Sychenko 2011, at the bottom of that page. It starts with the highlighted, and we'll have to scroll to the next page, but it starts right there.

A. Um-hum.

Q. And I would like to ask you to read onto the next page where it explains that whales should be able to compensate for a disturbance.

A. "Sychenko (2011) reported that Western Gray Whale forage (including feeding/traveling, feeding, and mixed behaviors) between 46 and 59% of their time at the foraging grounds." Keep going?

Q. Yes, please.

A. "Therefore, if we consider that Western Gray Whales feed a conservative 59% of the time while on the foraging grounds (which include different behaviors such as searching for food), they should be capable of increasing their foraging effort somewhat to compensate for a disturbance."

Q. Okay. Thank you. Do you still agree with this statement?

A. I do.

Q. Okay. So this would suggest that whales may have the ability to protect themselves against disturbance by increasing their foraging effort at the feeding grounds?

A. So again, this would depend on some of the unknowns.

Q. Sure.

A. And the conditions. So --

Q. But it's possible?

A. It's possible if the foraging patches and the food availability is of the same quality at the beginning and at the end of the season. And so, at -- Carrie just pointed it out in her testimony before, the prey go through a life cycle as well. And so, when they're most energy rich, at the beginning of the foraging season than at the end. And so, the whales, if they can find enough foraging patches with enough quality, they might be able to compensate. But if that energy rich prey resource is available only at the beginning of the season, then that might differ how they compensate. So again, things that we don't really know very much about to be able to say something as a fact.

Q. I understand. So similarly, if whales were to feed on their way north, for example, as they move

northward and they were to stop over and feed at the Pacific Coast Feeding Group foraging area, that may also help buffer them against any energy loss that would be caused by a disturbance; is that correct?

A. Correct.

Q. Okay. Towards the end of the column on page 179 -- this one is in a couple of different places so it's a little hard to have a succinct quote, but it's in the --

MS. IMAKI: Maybe make it just a little bit smaller. Thanks. Just a little bit.

BY MS. IMAKI:

Q. Maybe you can look at it in your paper as well, but this is where we're looking at. So I am paraphrasing this, but you explain that if the disturbance occurs when whales are spending time on activities not associated with foraging -- so I'm assuming that could be, for example, migrating, then the disturbance may not have as great of an impact on their energy requirements; is that correct?

A. Which paragraph is that?

Q. So it's within that paragraph, that large highlighted yellow paragraph.

A. At the beginning of the second column?

Q. It's in the middle of the first column. It's actually more towards the bottom of that column, and part of it is "Alternatively, disturbance later in the season

may not have as great of an impact on their energy requirements, when the whales appear to spend more time on activities not associated with foraging."

A. Yeah, so that paragraph there, the context of the paragraph, we were discussing, based on the current mitigation strategies for Sakhalin Island.

Q. Okay.

A. And that paragraph was addressing the seismic surveys for their -- yeah. So when they were going to do this study, they were saying at the beginning of the foraging season, and so we were just discussing how the mitigation strategy would be best implemented if the disturbance were to happen at the beginning or at the end of the foraging season. So we basically gave both scenarios, saying that they wanted to do it at the beginning when there's less whales present in the area, and then they we said, yes, but if they do also later in the season, they might disturb the -- if the individuals are engaged in other behaviors rather than foraging. So that was the context of that paragraph there.

Q. Okay. But it does say that when -- there may be less impact if the whales are doing things other than foraging. So would that include migration? So if a disturbance occurred during migration as opposed to while they're feeding on the grounds, that would be less

impactful energetic-wise because it wouldn't stop them from feeding?

A. Yeah. Well, these paragraphs was written in particular at the foraging grounds.

Q. Okay.

A. That whether it would be a greater impact at the beginning or at the end when they're at the foraging grounds. If a disturbance happened during migration, I think there are things to be considered. If it happened on the northern migration, for example, and it's a whale that didn't get a lot of energy resources and she's already in her last energetic -- yeah, in her last like energy resources before they arrive at the foraging grounds, and so then there's disturbance that happens right there, that will be worse or the female will be more vulnerable than if it happened in a different -- like if it happens at the foraging grounds, for example. So I wouldn't necessarily say -- yeah, I think there's a lot of things that need to be considered.

Q. Many variables.

A. Yeah, yeah.

Q. Okay. That makes sense. Thank you.

A little further down in that paragraph you state -- the last sentence in that paragraph, "If disturbance is spatially limited," would you mind reading

that sentence, please?

A. "If disturbance is spatially limited compared to the entire foraging area, whales may also alleviate some of the energy loss by moving to other regions within the foraging area, or a secondary feeding ground."

Q. Okay. Is that still accurate?

A. Yes.

Q. Okay. Are you familiar with the size of the Makah usual and accustomed hunting area compared with the entire PCFG range?

A. Not very familiar. You just showed me the Makah, but I'm not familiar to what proportion it is of the --

Q. Okay. I'd like to ask to put up NMFS Demonstrative 1, I believe, which is a map. And you can see this is -- so this NMFS Demonstrative 1, and the black dotted line outlines the Pacific Coast Feeding Group range, so there's the summer foraging grounds for this group of whales. And you can also see that cutout that's very small, is the proposed Makah usual and accustomed feeding area. So based on this and the testimony we heard earlier this week -- perhaps it was last week, we learned that the Makah usual and accustomed area is approximately 4% of the Makah usual and accustomed feeding area.

So if we think about the concept that you talked

about a few minutes ago in your model and apply that to his situation, do you think this small, limited area within which the Makah are allowed to hunt would essentially work as a buffer and allow those whales to either move maybe within that Makah usual and accustomed area or even to another 96% of the feeding group range?

A. You mean if they're disturbed within that area?

Q. Yeah, the fact that it's limited, the fact that the hunt area is limited to only 4% of the foraging area for these whales, would that act as a buffer for those whales for any disturbance that might occur within this area?

A. So again, I don't know if there's information about the prey quality feed distribution around that whole area, so I'm not familiar with how would that compare inside the Makah area to the other area. If that particular area is a hotspot and has a lot of rich energy prey, then the whales might be better foraging there than outside. And so, again, one of those questions that if we knew, then we would know or we could predict what the behavior of the animals will be like or how they would be able to compensate. So it depends on the distribution of the prey patches and -- yeah.

Q. And did you analyze the distribution of the prey patches when you submitted your testimony --

A. No --
Q. -- before you wrote your declaration?
A. No, because I believe it's not known what is the distribution of the food resources and the energy of the patches.
Q. Okay. If we assume that the prey is equally distributed, would that spatial limitation act as a buffer?
A. As a buffer, like getting out of the area and foraging in a different area?
Q. Yes.
A. Well, yeah, if there's food all over that area and all the food is equally energetically rich and accessible, I mean, at the same depth and it's like a nice hotspot area, yes, they could just move from where they're disturbed if they can find food nearby. Right, why stay here, and they'll just move, yeah.
Q. Dr. Villegas-Amtmann, you talk about in your declaration in paragraph 14 that animals that feel, quote, "hemmed in by a perceived a danger will often edge away." Do you recall this statement?
A. Yes.
Q. Do you expect whales that are approached by a hunt boat to generally move away if they perceive that boat as a danger?

A. I would assume so, but I haven't done any studies or observations to sustain the -- yeah, that's a fact, so --

Q. Okay.

A. Yeah.

Q. Is your opinion about the effects of the hunt, is it based at all on any assumptions about the prey distribution within the PCFG range?

A. No assumption what the prey distribution is within the range.

Q. Okay. We're almost finished. Are you familiar with the International Whaling Commission Scientific Committee?

A. Yes.

Q. And do you know whether the IWC Scientific Committee has reviewed the hunt management plan proposed by NMFS?

A. I don't know.

Q. Okay. So you're not aware that they determined that the proposed hunt would meet IWC conversation objectives for Eastern North Pacific, Western North Pacific and PCFG whales; is that correct?

A. I'm not particularly familiar with it, but I assume, yeah.

MS. IMAKI: Okay. I have no further questions.

Thank you.

THE COURT: Okay. We will usually -- began our afternoon break. But we'll take our break and then Makah.

MR. SOMMERMEYER: Your Honor, I'm sorry, just one thing, Dr. Villegas-Amtmann has a flight at 6:45, and so I think she needs to depart between 4 and 4:30. I don't know how much -- I don't want to limit everybody, but I just wanted to let you know that's a little bit of a constraint. That's the best we could do with flights.

MR. GOLDING: That seems like something you should have notified the parties of considering we scheduled Dr. Villegas-Amtmann today special.

MR. SOMMERMEYER: I'm terribly sorry.

MR. GOLDING: I'll see what we can do, but, you know, if we're not going to leave any issues --

MR. SOMMERMEYER: You're also aware of -- yeah, good point. You're also way over your time, so -- I don't know if there's a current time count --

THE COURT: Well, again, right now for cross-examination purposes I want to make sure we have a full record.

MR. SOMMERMEYER: Right.

THE COURT: But why don't we take a 5-minute break and then we'll start.

MR. GOLDING: I also -- I likely have between a

half hour and an hour of questions. I'm not going to go on --

THE COURT: Okay. We'll take about a 5-minute break. We'll take a short break and then we'll be back at that time. They can get ready while that's happening.

(Off the record from 2:46 p.m. to 2:55 p.m.)

THE COURT: We're back on the record.

CROSS-EXAMINATION

BY MR. GOLDING:

Q. Good afternoon, Dr. Villegas-Amtmann.

A. Good afternoon.

Q. My name's Wyatt Golding. I'm an attorney for the Makah.

You testified that you were retained by Sea Shepherd Conservation Society and Sea Shepherd Legal around June 2019; is that correct?

A. Correct.

Q. And are you a member of either of those organizations?

A. No.

Q. Have you ever donated money to either of those organizations?

A. Can you say that again, please?

Q. Have you ever donated money to either of those organizations?

A. No.

Q. When you were retained were you aware of the position of those organizations on whaling?

A. I did a little bit of research.

Q. Okay. I'm going to approach with a few public documents.

MR. SOMMERMEYER: Objection. These are the documents you provided about midnight last night, I assume? They are not relevant to the proceeding in any fashion whatsoever. They're purely public postings by Sea Shepherd. We admit we're against whaling. We're biased against whaling. What does it show? And it doesn't have anything to do with the witness.

MR. GOLDING: So I would note that Mr. Eubanks has asked every one of our witnesses as to the amount of money they've earned and whether they get a bonus. Just like money ideology can be a bias, Dr. Villegas-Amtmann works for an organization with this ideology. So we should know whether she shares it, what her awareness of it was. And Ms. Pruett has testified as a lawyer as to this position, so it's only fair that we can explore it.

MR. SOMMERMEYER: I'm not concerned about what she'll say about the documents. She's probably never seen them before. But they're just not relevant to anything in this proceedings whatsoever.

THE COURT: I haven't seen the document myself, so --

MR. SOMMERMEYER: Okay.

THE COURT: I can't tell you if it's a document that's relevant or not.

MR. SOMMERMEYER: Do you want a chance to review it and then, and rule on whether it's relevant?

THE COURT: No.

MR. SOMMERMEYER: That's one -- my understanding, that's one of the criteria we have here, one of the evidentiary limitations we have is relevancy and materiality, so --

THE COURT: Has she seen these documents -- she's seen this in her research?

THE WITNESS: No.

THE COURT: You did not see -- you didn't look this up at the webpage?

THE WITNESS: Oh, this particular --

THE COURT: Yeah.

THE WITNESS: -- statement here? No.

THE COURT: First, you can inquire as to what she knows about the position.

MR. GOLDING: Okay.

BY MR. GOLDING:

Q. So you say you did some internet research. What

did research reveal as to the organization's position?

A. I just briefly looked at the organization's website and information about them.

Q. And what did you find?

A. Well, that they are a legal organization for the rights of animals and they are -- yeah, they oppose killing of whales and -- yes.

Q. So did you understand from your research that the organizations oppose any killing of any whale for any reason?

A. Yes.

Q. Okay. And did that inform your decision to work for the organizations?

A. So they were inquiring my opinion, my expert opinion on the paper that I wrote relevant to gray whales, and what I was -- my position was based on that, providing my expert opinion on the research papers that I wrote of gray whales.

Q. But their categorical opposition to all whaling didn't cause you any concern for -- as a scientist working for them, applying the MMPA?

A. Well, they wanted my opinion, and I wrote the papers and I have my own opinion as well, and so I provided -- I agreed to provide them with what I thought about the research that I have done.

Q. And do you agree that any killing of any whale is immoral?
A. Could you say that again?
Q. Do you agree that any killing of any whale is immoral?
A. It's immoral?
Q. Yeah. Wrong.
A. I personally, I'm a vegetarian so I wouldn't even kill a cow. So I would agree -- not immoral, but I wouldn't do it. So immoral is a different context -- yeah, what you define as immoral.
Q. Do you think it's wrong for the Makah to exercise a legal treaty right to hunt whales?
A. I don't want to judge. I'm not the judge here of what people do or do not. I just want to provide my opinion on the things that I'm familiar with and the studies that I have done, so I don't -- yeah, I can't say. I can't say that.
Q. Okay. I'll move on to some more scientific questions. Do you do or have you done field research on gray whales?
A. No, not field research.
Q. Okay. So no biopsies or surveys on the water?
A. Just observations here and there, but not any biopsies.

Q. And you've never been to the Makah U&A to do research?

A. No.

Q. Mr. Scordino and Dr. Weller testified as to response to disturbance from surveys or biopsies, and they characterized that response as ranging from no response to half an hour of disturbance at the maximum. Do you have any evidence to disagree with those assertions?

A. No.

Q. Now Ms. Imaki covered a lot of your 2015 study, and so I'll -- I'd like to also talk about it and I'll try to focus on different aspects of it.

So does the study on the screen -- this is your 2015 study?

A. Correct.

Q. Okay. And on page 2, when you're describing the whales you're referencing, you talk about them foraging in the summer in the Chukchi and Bering Sea, and migrating to the winter breeding grounds in Baja, California and Mexico; is that right?

A. Correct.

Q. Okay. And so is it fair to say that your model is not focused on what we've been referring to as the PCFG whales, the whales that forage farther south?

A. No, they incorporate the foraging grounds at the

Chukchi and Bering Sea, so that whole migratory route from the Bering to the Baja, California breeding ground.

Q. Okay. But not the southern foraging grounds, say, Oregon, California, Washington?

A. No. We did not incorporate that. We didn't end our model energetic estimates based on that end of the migration route. So our end migration was up to the Bering Sea and the Chukchi Sea.

Q. Okay. And it's safe to say if you had a different end migration route, it could impact your model and the results?

A. Potentially, yes.

Q. Okay. And then, as I understand it, and I know there's both your model and kind of the application of the model, and I want to speak strictly to the model. It applies to female pregnant non-PCFG gray whales, correct? In this paper.

A. So it is -- in this paper, yes, we talk about the Eastern North Pacific gray whales.

Q. And I should have -- I jumped ahead. So Ms. Imaki focused on the 4% energy loss figure that's in paragraph 10 of your declaration, and I will as well. And so, specifically for that, the findings as to the 4%, that pertains to female pregnant foraging ENP non-PCFG gray whales, correct?

A. Correct.
Q. Okay.
MR. GOLDING: Could you go to Figure 1, please.
BY MR. GOLDING:
Q. This is Figure 1 Mr. Sommermeyer showed you. Do you recognize this?
A. Yes.
Q. Okay. And as I understand it, given all those constraints -- we're talking about foraging pregnant whales on their feeding grounds -- that is the time from May to mid-November, and that's the time when the whales are in the Bering and Chukchi Seas, correct?
A. Correct.
Q. Okay. And then your model assumes -- it just focuses on energy loss while foraging. It doesn't take into account energy loss while migrating, correct?
A. So the application of the model is that it could be used -- the energy losses could be used anywhere along the migratory routes or on the breeding grounds. So we -- the results were presented as losing foraging opportunity, but because it's an energy, a percentage energy loss, it could be also applied as a percentage energy loss anywhere else along the --
Q. Right. That's the application. But as -- in terms of the assumptions of your model and what it focused

on, it was energy loss from foraging, correct?

A. Correct.

Q. Okay. And then you -- so the time when, the only time when a Phase 1 pregnant gray whale would pass through the Makah U&A would be when they're southbound pregnant, correct?

A. Their migratory routes north might also include passing through the Makah area.

Q. But they wouldn't be pregnant at that time in Phase 1.

A. Yeah, so when they're migrating north, they wouldn't be pregnant.

Q. Okay. So the only time they'd pass through the Makah U&A pregnant is between mid-November and December in Phase 1; is that correct?

A. So -- yeah. Sorry. So the last question, when they are migrating north -- yeah, when they're migrating north, they would be pregnant if they're getting pregnant at the breeding ground. They're migrating north, and so they are pregnant and they arrive pregnant at the foraging grounds.

Q. But in your figure that would be in Phase 2, and so not captured by this 4%. Your 4%, as I understood your answer previously, was Phase 1, female, pregnant ENP, non-PCFG gray whales.

A. Yes. Yes.

Q. Okay. And do you understand that there's -- under the proposed hunt plan there's no hunting in November in any year?

A. Yes.

Q. Okay. And so what we're really talking about in terms of impacts to pregnant gray whales is the month of December. Do you understand that NMFS has assumed that, that is the time of year when it's least likely that there will be training activities, given rough seas, short daylight hours, and cold?

A. Can you repeat that again?

Q. Do you understand that NMFS has assumed in the DEIS, their evaluation is that the month of December is when there's least likely to be training activities due to short daylight hours, cold weather, and rough seas?

A. Yes.

Q. Okay. So in terms of the impacts captured or drawn by your 4% figure, they're focused on limited training in November and potential impacts of the hunt in the month of December; is that correct?

A. Correct.

Q. Okay. And during that time it's safe to say that some of the whales will not be female pregnant gray whales, they'll be male whales and non-pregnant females as

well, correct?

A. During which time? Sorry.

Q. December.

A. December -- so if they are southbound -- well, there are southbound females that are pregnant in December and November.

Q. Are there other whales as well that may be present?

A. What do you mean?

Q. So everything else besides female pregnant gray whales.

A. Yeah. Well, we focused on the pregnant females, but the timing of migration is different between the males and the -- the pregnant females and the single females. So they migrate a different time. But November and December, they will be migrating south and they will be pregnant going to the lagoons to give birth.

So I'm not familiar with the timing of the year that they would particularly be migrating along the Makah coast because this is starting off at the Bering and Chukchi Sea, but their migratory route along there starts mid-November.

Q. Okay. And the only time under your model that whales would be in the Makah U&A is when they're migrating, correct?

A. The Eastern North Pacific, yes, if they don't forage -- I am not familiar if they do stop and forage at the Makah territory or if they just continue to forage at the Bering and Chukchi Sea. But if they don't stop over, yes, it would be only during the migration.

Q. Okay. And that's outside of the assumptions that went into driving the 4% energy loss figure, because you're only looking at foraging times, correct?

A. Yeah. So, yeah, assumptions were considering the foraging grounds of the Chukchi and Bering Sea.

Q. Okay. Now you responded to Mr. Scordino and you testified with Ms. Imaki with respect to, on page 15 of the study, you posit an example, about 10 days of lost foraging could equate to roughly 5% loss of energy intake. And as I understand your testimony, that's just an example and it had some assumptions, including that whales are foraging all day and that a disturbance would disturb them all day.

Now do whales actually forage all day?

A. I don't know.

Q. Okay. And do you have reason to believe that a disturbance would actually cause them to stop feeding all day?

A. I don't know.

Q. And as I understand it, you don't have any data

or opinion as to whether the degree to which the Makah hunt would cause a disturbance; is that correct?

A. Correct.

Q. And so, you don't have an opinion as to whether that would be a biologically significant event, as your study --

A. There is no data available, so no, not known.

Q. Okay. So you don't have an opinion in your direct testimony as to whether the Makah hunt or the training or the approaches will create a biologically meaningful response, do you?

A. Correct.

Q. I want to briefly discuss your 2017 study. This refers to Western North Pacific whales, compares them to Eastern North Pacific whales. And in general terms, you found that the Western North Pacific whales are more -- require more energy because they have a longer migration path and greater metabolic rate, and so are more susceptible to disturbance; is that correct?

A. Correct.

Q. Okay. Now I believe that your finding was there is an 11% greater amount of energy usage by Western North Pacific whales?

A. That sounds about right.

Q. Okay. So it strikes me that that's much greater

than the 4% energy loss that you thought would lead to loss calves with Eastern North Pacific. And so I'm wondering how you reconcile those two studies? If this life path of the long migration causes an 11% energy loss, why isn't that causing widespread population level harm to WNPs?

A. 11% energy loss?

Q. So you testified that it takes 11% more energy for WNPs as compared to ENPs; is that right?

A. Correct.

Q. Okay. And so, if you're using 11% more energy, that's analogous to losing 11% of energy, correct?

A. No.

Q. No. Okay. Why not?

A. So the amount of energy that they -- that it would impact the western population, instead of being 4%, it was a 3.-something percent. The 11% is over the whole energy budget, so the energy for the entire Phase 1 or Phase 2, for when they're pregnant and to do all the things they need to do within that year after they foraged. So that 11% difference in the total amount of energy, but not the percentage of energy that they would lose to have an effect on their reproductive rate.

Q. As you understand the stock structure, the Western North Pacific whales, to the extent they're in the

Makah U&A, they would be there while migrating, correct?

A. Can you say that again?

Q. To the extent Western North Pacific whales are in the Makah U&A, they'd be there while migrating, correct?

A. Correct.

Q. Not foraging?

A. Correct.

Q. Okay. And so, like your 2015 model, you assumed that the disturbance that has an effect is disturbance that causes loss of foraging, correct?

A. It could be any loss of energy.

Q. In your model. Not the application, but the actual model is about loss of foraging, right?

A. So the model was -- yeah, so the model was estimated at the foraging ground.

Q. Okay.

A. But it meant energy loss. And so, we put that as energy loss, 4% energy loss over the whole budget that they had for that year. So that energy loss could mean at the foraging grounds or energy loss that they have to -- that use additional energy for, let's say, avoiding a disturbance along the migratory routes. So that is basically the same interpretation that you could use for the model, any energetic loss.

Q. But as to what you modeled, the loss was -- you were focused only on loss of foraging?

A. Loss of -- energetic loss at the foraging ground.

Q. Okay. Thank you.

A. So they --

Q. That answers my question.

A. Yeah.

Q. Okay. Now, this is a little bit of a different focus, but you didn't get into the question of why whales would take this extremely long path that appears to put them in somewhat of a disadvantage. Do you have an opinion as to that?

A. Can you say that again?

Q. Why would whales go all the way across the ocean when it costs so much more energy, these Western North Pacific whales?

A. Why do they migrate to the western --

Q. To the Mexican breeding lagoons?

A. Well, I'm not an expert on how they change their migratory routes or the population through time. The thing that I know, that we were reading about when we were developing the model was that sometime in the past there was a pure western population that was breeding off of the coast of China, somewhere in there, and that would forage

off of Sakhalin. But then there was whaling and the population was decimated, and they thought the population was extinct, but then they found a few individuals. Those individuals, because of potential disturbance or whaling along the western coast of the Pacific, diverted their migratory route to find alternative breeding ground, safer breeding ground, potentially. And so, they -- now they are migrating down to the Baja, California lagoons to breed there.

Q. Is one viable hypothesis that you read about, the idea that the whales migrate from Sakhalin to Mexico are a western feeding group of the Eastern North Pacific gray whale stock?

A. You mean that they're not genetically different? Or can you rephrase your question?

Q. Well, you cited a paper from Dr. Bickham, and I asked if one viable hypothesis is that the whales that you studied that migrate from Sakhalin Island to the Mexican breeding lagoons are a western feeding group of the Eastern North Pacific stock?

A. My expertise is not the genetics of the population, but it appears that there are some studies that have differentiated those two populations genetically. And so, but there's debate about whether they are from a different population or from the eastern

population. But that's not my expertise area, so I couldn't say.

Q. Okay. Returning to your declaration and your opining on the hunting in Russia and Mr. Scordino's testimony, as I understand it your opinion is that the whales in Chukotka may return to those areas because they're high priority foraging ground, correct?

A. That's one explanation.

Q. Okay. So despite heightened disturbance from whaling, the whales still return because that's where the food is?

A. So that's one explanation, but I don't know the real cost of it or I don't have -- like I said in the report, it's not really shown how the population -- the population status or how the population changes throughout the years in the Chukotka area.

Q. Earlier today we heard Ms. Newell testify that whales go where the food is, as a general matter. Would you agree with that?

A. Yes.

Q. Now you have some testimony in your declaration, in paragraph 18 and 21, about the changing environmental conditions. I believe that gives you some concern as to risk from disturbance. And I'm not going to ask about them specifically; I'd reference you to those.

I'd like to look to page 15 of your study and your description of gray whales. You cite a paper from Moore and Huntington, and you describe gray whales as one of the most adaptable and versatile of the mysticete, and you say that gray whales have adapted to multiple habitat changes over thousands of years; is that correct?

A. Correct.

Q. Okay. And in your understanding, how long have gray whales been on the earth?

A. I don't have a number on the top of my head, but they are very ancient.

Q. Millions of years?

A. Probably.

Q. Okay. And I believe on page 14 of your study, you referenced them as the oldest extant baleen whale species. You know they survived through at least one ice age and of course the warming thereafter; is that correct?

A. Correct.

Q. Okay. And earlier we saw a demonstrative from NMFS. I don't think we have to pull it back up, but it stands for the general proposition that the Eastern North Pacific whale, their populations have been growing over time since about the 1950s. Would you agree with that?

A. Yes.

Q. And would you also agree that there has been

varying disturbance, from the Russian hunt, from seismic activity, from shipping, from other activities, during that time?

A. Correct.

Q. And yet, the whale populations have done extremely well; is that correct?

A. Correct. But they were protected.

MR. GOLDING: That's all I have. Thank you.

CROSS-EXAMINATION

BY MR. GOSLINER:

Q. Good afternoon.

A. Good afternoon.

Q. You have a copy of your testimony up there with you?

A. Yes.

Q. I have a few clarifying questions here. On page 4, paragraph 9, you talk about the possibility that there is "a lack of shifts in gray whale distribution in the area of the Chukotkan hunt. This phenomenon may be due to the fact the whales are not able to energetically afford such shifts while migrating."

And I'm looking -- I'm asking you if you could clarify what you mean by migrating. Is it the once a year north-south migration or is it once they're at the feeding grounds, if they're moving to a different feeding ground?

So if you could clarify that, please?

A. Yeah. So I mean the north migration, particularly. If that area is a stopover for replenishing their energy stores while they're migrating north -- let's say they continue to migrate to the Arctic to forage, and the north migration, the animals will be at the lowest energetic reserves because they've been fasting for more than 4 months. And so, at that point, because they're running low on energy stores, they might not afford to divert their migratory routes to avoid that area, because that would impose an extra energetic cost, so they might just continue in spite of some disturbance.

Q. I got you. And so once they got to the feeding grounds, for instance, you talked about the possibility that they might change the area of distribution to avoid hunting. That wouldn't be considered migration in your definition either, then?

A. So once they're at the foraging grounds, no that wouldn't be considered migration.

Q. Okay. And on that same page, paragraph 11, you talk about the animals in their northward migration will be in emaciated condition when they reach feeding ground and will be eager to feed. Do you consider that all whales that reach Chukotka that -- will be emaciated? Is this across the board or it varies amongst the

individuals?

A. So I believe it would vary. It would vary on the individual, like the size of the individual and the amount of energy that that individual was able to acquire on the foraging season prior to that arrival.

Q. Okay. And if you could turn over to page 6, please, and paragraph 13, up at the top, the carryover. In the last sentence you cite a study by Williams et al. that relates to killer whales rather than gray whales. And I guess the question, I'll characterize it as to -- are you suggesting that behavioral responses of killer whales are indicative or relevant to possible responses by gray whales?

A. Yes. I think I used that example as an example of a whale response to vessels or to disturbance. And I should have probably cited one that was particular to gray whales, but that's the one that I found on whales related to disturbance, behavioral responses to disturbance.

Q. Oh, but it is possible the two species could respond differently?

A. Yeah. Well, it is possible, but, in general, I put that statement there because I had, from hearing and talking to people that are doing research on gray whales, how they also can be disturbed by research vessels or just whale watching vessels in the vicinity. So they do

respond in a similar way.

Q. Okay. Thank you. Then if you could turn to page 8, paragraph 18 at the top. And you have a critique of Mr. Scordino's testimony, that he "fails to account for the energetic costs associated with a greater foraging range." And here I think you're talking about the overall range of Eastern North Pacific gray whales; is that correct?

A. Correct.

Q. Well, you continue on to talk about particularly in the traditional foraging range where prey are no longer as abundant as they once were. So here you're talking about the full range and specifically you talk about gray whales that feed in and around the Bering Strait and Chukchi Sea. So you're mostly referring here to gray whales that migrate on up into Alaska; is that correct?

A. Correct.

Q. So you haven't done any analysis specific to the Pacific Coast Feeding Group; is that correct?

A. Correct.

Q. So this may or may not apply to them, or how do you think this would apply to the PCFG?

A. Well, in general, they follow the same migratory routes. They have the same or similar energetic requirements. I think they -- it will be a matter of

doing the model with the specific parameters of the stock in the migratory route in the PCFG area, which is a few kilometers south than the Chukchi and the Bering Sea. And so, it would vary by a few numbers, a few like the percentages, the result. And based on the analysis that we did the western gray whales and the eastern gray whales, the numbers weren't that different if you considered the 3.5 or 3.-something percent versus the 4%. So it's just a matter of tweaking the numbers, but I think that the results would be fairly similar.

Q. Even though the gray whales in the PCFG aren't expending as much as energy in their migratory path as that --

A. Correct. Because overall migratory path is not that different. I think there is -- the distance would be shorter from the PCFG to the Chukchi and Bering Sea than what is the distance between the Chukchi-Bering Sea with Sakhalin Island. And the results that we obtained from those two were fairly comparable. So that distance I feel is shorter, so I would expect that the results wouldn't be that much different.

Q. And your -- one last question here on this paragraph, which is you're talking about reduction in prey abundance up in the Chukchi Sea and Bering Sea, but that's not necessarily indicative of similar changes in the PCFG

range or in the Makah U&A particularly.

A. Well, the changes with the climate change, I'm particularly talking about the abundance and prey availability changes in the Bering and Chukchi Sea, but the climate change could also change the distribution of prey at the different areas. And I think that is one of the unknowns, that we don't know how that environmental change is going to affect the distribution of the prey at the different foraging areas of the gray whales.

Q. But your statement here in your testimony that the prey are no longer as abundant as they once were, you were referring specifically --

A. Yes.

Q. -- to the northern area?

A. Correct, to the Chukchi and Bering Sea. Yeah.

MR. GOSLINER: Thank you very much. No further questions.

THE COURT: You may --

REDIRECT EXAMINATION

BY MR. SOMMERMEYER:

Q. Just a couple of questions. Just one quick question on compensation. Do you recall having any conversations with us about stipends, travel costs, hotel costs, meals?

A. Yes.

Q. Okay. Thank you.
A. Yes.
Q. Okay. So just quickly to the Chukotkan hunts. Did it matter to your analysis how the hunts were conducted when you looked at the Chukotkan reports?
A. To what analysis?
Q. So you expressed the opinion those reports didn't have any conclusions as to the effect of the hunts on the gray whales in the area.
A. Yes.
Q. So did that analysis of those reports depend on how the hunts were conducted?
A. How they conducted the hunts to, their reports that they -- no, I don't think that they explicitly said how the hunts were conducted.
Q. You were just asked to look to see if there was a conclusion as to whether the hunts affected the gray whales, correct?
A. Correct.
Q. Yeah. Okay. So based on your expertise in bioenergetics, the PCFG that arrived in the Makah U&A to forage, would face similar energy losses to disturbance as, say, a pregnant ENP whale? Based on your expertise, what's your opinion of that?
A. Yeah, that the losses will be similar based on

my energetic model, looking at the differences between the western population and the eastern. There will be less of those differences between the PCFG and the Eastern North Pacific, so I would expect the results to be similar.

Q. Thank you.

THE COURT: All right. Yeah.

RECROSS-EXAMINATION

BY MS. IMAKI:

Q. Dr. Villegas-Amtmann, you just stated in your response to a question that you expected that the energy loss to a PCFG would compare to the same as a pregnant ENP gray whale; is that correct?

A. Correct.

Q. But you haven't done that analysis, correct?

A. No, I haven't.

Q. And so it's speculation at this point.

A. Correct.

Q. And you also stated just a bit earlier that you expected that it might cause a similar difference in energy loss or energy requirement, the 3% versus 4%, and then if we compare that with PCFG, might be similar but we don't know what kind of disturbance would cause a change in a 3 to 4 or even a 5 or 6% energy loss, correct?

A. Correct.

MS. IMAKI: Okay. Thank you. No further

questions.

THE COURT: Very well. Thank you very much for your testimony.

(Witness excused.)

MS. OWENS: I call myself.

THE COURT: Anything further for -- oh, anything further for Sea Shepherd?

MR. SOMMERMEYER: No. Sea Shepherd rests.

THE COURT: Okay. Now, ma'am, you may take the stand. Yep.

(Whereupon,

MARGARET OWENS

was called as a witness, and after having been duly sworn, was examined and testified as follows:)

DIRECT TESTIMONY

THE WITNESS: Thank you. She's offered to help put up a couple of my exhibits.

THE COURT: All right.

THE WITNESS: My name is Margaret Owens, M-a-r-g-a-r-e-t, O-w-e-n-s. My address is 612 Schmitt Road, Port Angeles, Washington 98363.

My occupation, for 38 years I've been a clay sculptor and have a handmade tile business. For 15 years I served for the curator of a small local history museum in my small rural community, called Joyce, 50 miles east

of Neah Bay. I serve on two Clallam County boards: Crescent Community Advisory Council and Clallam County Heritage Advisory Board, and on Juan de Fuca Scenic Byway Association board. I have trained for oil spill wildlife response and I'll update my Marine Mammal Stranding Network training. I attended the University of Hawaii but have no relevant credentials to report, three good kids, though.

I grew up in Brazil and India, my father being assigned to those countries in the 1950s as a U.S. advisor on public health education issues. I came to the Olympic Peninsula in 1973 and have lived here since.

I became interested in learning about gray whales in the early 1980s. I was working with clay and needed photos in order to create reasonably realistic gray whales. It wasn't that easy in the '80s; there weren't very good pictures and my whales reflected that and they looked rather turd-like. But I had to keep learning, had to keep -- and pictures became available and so it's been a 40-year quest to make a better gray whale. But perfection is never attainable. I've made hundreds of clay gray whales and I kind of really established my feeling that I knew them and wanted to always know more. So it's been a longstanding preexisting condition with gray whales.

I did submit a declaration and rebuttal testimonies, and my lengthy comments to the 2008 and 2015 DEISes are in the Reading Room as exhibits. The 2008 comments are among Chris Yates' exhibits, and my comments are with my declaration.

I do appreciate this chance to outline one more time the local concerns of I would say most of the Olympic Peninsula communities' residents. Our main issues have been the same for many years. Everybody probably is familiar with them: Threats to human life; threats to our local gray whales, both individually and as a viable population; negative impacts to our Strait of Juan de Fuca-Puget Sound ecosystem, which we believe would result from the removal of PCFG and Eastern North Pacific gray whales who feed in this great inland sea, including the small Puget Sounder group. Our other issue, harassment of all the mothers, calves and pregnant females who will migrating through the hunt area, as well as the PCFG mothers who will be nursing and caring for their calves within the hunt area.

I'll start with threats to people not involved in the hunt. The group I represent, Peninsula Citizens for the Protection of Whales, has been commenting for almost 20 years on the extreme danger inherent in the use of a .50 caliber rifle close to shore. We first raised

the issue and consulted with an army ballistics expert in 2001, the year that NMFS decided to allow hunting far inside the Strait of Juan de Fuca, bringing the rifle well within the deadly range of the towns of Clallam Bay and Seiku. Many miles of Highway 112 would also have been within the danger zone, and the hunting area would have terminated within the near-shore area of Crescent Bay, site of a popular county park and campground. The bay is also a well-known feeding site for gray whales.

After much fuss from incredulous locals, NMFS' next plan pulled the hunt out of the Strait for safety reasons. The fact that NMFS even came up with the original plan, knowing that a .50 caliber round can fly for 4 to 5 miles, calls into serious question the judgment and common sense of both co-managers. Their plan to allow 20 whales to be killed every 5 years, we also felt was irresponsible, and we felt it would likely have eliminated our local whales in under 10 years. Local opinion was that the possibility of a human tragedy did not seem to either occur to or bother the co-managers.

Now we see a similar situation on the Pacific Coast. For over 20 years NMFS has neglected to consult with the Olympic National Park. With 20 years having passed since the last coastal hunts, several superintendents have come and gone from Olympic National

Park in the interim years of no hunting. Since NMFS has never consulted with Olympic National Park, there is not, never has been, a paper trail at the park to provide incoming superintendents with vital information about how NMFS' evolving whaling plan can impact Olympic National Park, and to understand the park visitor's vulnerability when camping and hiking on the popular Pacific coast beaches during hunting seasons.

Locals understand how close the site of the 1999 kill was to the beach. When NMFS describes the hunt as taking place in the Pacific Ocean, a mental image is created of a hunt far out to sea. That has not been the case.

After years of commenting about this dangerous situation, PCPW did finally get a few responses from NMFS. In Yates' declaration, NMFS Exhibit 1 through 6, page 363, PCPW's recommendation of an offshore hunt to mitigate the .50 caliber's danger to humans is included along with NMFS' response, which is, quote, "We have incorporated the information presented in this comment in the new DEIS 2008 to provide a more complete picture of potential impacts to public safety of authorizing a Makah gray whale hunt. In addition, the new DEIS 2015 includes the alternative of an offshore hunt, Alternative 3 (Offshore Hunt), in which we selected the distance from shore, 5 miles, specifically to

avoid the potential for someone on shore to be injured by a bullet from the hunt," unquote.

But Olympic National Park itself was not aware of any of this. When Olympic National Park superintendent was asked by me if they had submitted comments to the 2015 DEIS, the superintendent replied that they had not been aware of the 2015 DEIS or the comment period or even the important relevance to Olympic National Park.

In a new comment from Chris Yates in his third declaration, page 23, "Other Matters," he explained the NMFS position regarding Olympic National Park thusly, quote: "Ms. Owens asserts in her declaration that NMFS must consult with the Olympic National Park regarding the proposed waiver in regulations. There is no statutory requirement for NMFS to consult with the Olympic National Park," unquote. However, NMFS did consult with the Clallam County Environmental Health, Clallam County Sheriff's Department, Universidad de Baja California, Washington State Department of Health, Washington State Police, among others. That's from the list of preparers and agencies consulted. Absent from the list, those responsible for the safety of the people who will be closest to the actual hunts and in actual danger, the on-site managers of Olympic National Park.

We here at ground zero find this to be somewhere

between puzzling and unconscionable. If such a hunt results in human injury or worse, architects of the risky plan will bear full responsibility. NMFS will need to explain to the world why they had not kept the .50 caliber gun with its deadly 4 to 5 mile range at least 5 miles off the coast.

I'm not here to speak for Olympic National Park, but park leadership may have strong feelings about park visitors being placed, without notice from NMFS, in real danger. Hunt crews voluntarily take the calculated risks in this dangerous pursuit. Olympic National Park visitors are involuntarily placed at risk, risks they have not been warned of.

We appreciate being allowed to raise this issue. Human safety should always be paramount in any decision making where risky activities are contemplated. Locally, safety on the coast is not an abstract concept. The danger of injury or death pertains to our families and friends as well as to the great number of park visitors who help keep the local economy alive each year. New topic: Threats to the local whales and local ecosystem is kind of our next topic.

Catherine, if you would put the Salish Sea picture. We kind of set the stage for this topic. I'm trying to avoid calling it that, and I've modified my

verbiage, but this is labeled as Salish Sea.

So you can this, inside the black outline, that large inland sea ecosystem. Separate and really distinct from the California current ecosystem, but an area that is highly utilized by PCFGs and ENPs, all in and up and around. Lot's of feeding areas all around in there. So we certainly expected it to be analyzed as an impactable ecosystem in this case.

So I'll launch into first the local whales. Our concerns about local whales are an emotional topic when whales return over and over to the same places over long stretches of time. There is a sense of knowing them. This may not be Chris Yates' definition of science, but it is human nature to observe and come to understandings about nature. It's second nature to people aware of and interested in their environment. Familiarity breeds interest, curiosity, caring, and a desire to protect.

You can switch to the Whale Trail, please.

The great majority of residents and visitors to the regions along the inland waterways of the Strait of Juan de Fuca and east to Seattle consider every sighting of any whale to be a spectacular and never to be forgotten experience. Whales are shared community assets that provide substantial benefits. Nature in general enhances our well-being and whales additionally improve the

environment itself.

We believe that the lethal removal of even one gray whale from our environment is a detriment to we, the people, and to the environment. The near-shores of the Strait are the rearing and migratory corridors for a number of struggling species that are the focus of federally funded restoration and protection activities. The gray whales who feed in the Strait of Juan de Fuca waters and east most of the year are providing valuable environmental services in the near-shore. They're plowing and their wastes provide needed nutrients at not cost or effort to us. Life along the shore would be poorer without them, for people and fish. This is no time to willfully harm this delicate struggling environment.

The Whale Trail is an organized placement of signage at places where whales can be seen from shore. I proposed the sites on the Strait at gray whale feeding sites, where, from shore without harassing whales in boats in any way, you have a chance to see whales from all of those locations all the way out to the Cape, there's signage, beautiful signage.

Personally, I have for nearly 40 years watched for and seen very often the gray whales in our midst. I've sketched them, painted them, photographed them, and made hundreds of clay grays. Our kids grew up with the

same sightings and did their own artwork.

With a fisherman, boat captain husband, our family spent much time on the inland waterways of the Strait and beyond. Gray whales and orcas were by far the most frequently seen species in the 1980s and '90s. Just as we thrilled to see the resident orcas, we also became aware of the presence of the local gray whales. These whales have given us decades of joy. We want both groups so to survive and thrive.

Working and serving on boards in the tourism industry for nearly 20 years, tells me we are not alone. The great majority of residents and visitors to the Olympic Peninsula treasure their encounters with the gray whales of the inland waters.

The genetic uniqueness of the PCFG portion of the ENP gray whales increases the importance of these local whales. Their elimination would eliminate their unique genetic traits and lineages from the world's already diminished population of gray whales. We have always felt that in the event of an arctic oil spill or food collapse, the Pacific Northwest feeding areas could be important refuges of survival. The long-held memories of these feeding areas really should be preserved.

It's well-documented that feeding habitats can remain abandoned after a sub-population of whales has been

extricated due to whaling, quote, "possibly due to the loss of cultural memory of that habitat," unquote. Clapham et al. (2008).

It's not known whether the removal of only 8 female whales every 10 years will leave feeding sites abandoned along the Strait. The loss of local whales will leave gaping holes in our environment and in our lives. The old mother, CRC 175, is remembered sadly by local people and maybe by her whales friends, too, including a whale that we adopted in 1999, CRC 178, who was seen over and over and over again over the years with CR 175.

Next topic: Harassment of pregnant nursing mothers.

With a near-shore hunt, pregnant whales and lactating whales will always be in or near the harassment zone from March through December. I have personal knowledge of their early arrival, as our family for over 20 years has spent 3 to 4 days at La Push in mid-April. I've seen, sketched and photographed the mothers and calves that arrive in La Push in early spring, and I've kept many articles that describe the whales' arrival and document calf sightings beginning in late March and increasing into April, tapering down in numbers in May. I have a lot of those clippings in my exhibit.

And I've attended every early spring whale

welcoming ceremony held by the children and elders of the Quileute Tribe. Many articles are included in my rebuttal exhibits about the whale welcoming ceremony which coincides with the early arrival and documents and the sightings of the mothers and calves in those early months in La Push.

We must assume that these mothers and calves are also present in the hunt area in the early days of spring. It would be inhumane to allow the proposed level of harassment to be inflicted in the vicinity of these sensitive animals. It is the success of the mothers and calves that holds the hope for the future of the gray whales. With summer food supplies under stress, these mother gray whales are desperately in need of spring nourishment at the least expense to their depleted energy reserves. It's not enough to say the mothers and calves will not be targeted with harpoons and guns. They must be given the wide berth that they need to eat, nurse, communicate with their young, keep calves in the shallower water that's less conducive to orca attack. They must not be driven off the nursery grounds.

There's only one sensible solution to all of these important problems, a robust application of the precautionary principle adopted by the UN Conference on Environment and Development. The precautionary principle

urges caution when making decisions about systems that are not fully understood. It should be applied where risks are potentially high and not easily calculable. There is not evidence of adequate caution in the proposed in plans. It is a high stakes gamble with unknown consequences.

We strongly believe that the current hunt plans pose high risks to the local whales and environment of the Strait of Juan de Fuca and connected waterways. The migrating and resident mothers and calves of the WNP, PCFG and ENP, and the human men, women and children camping and hiking in Olympic parks coastal wilderness strip.

If there must be a hunt, take it offshore. We would not support that hunt, but we believe it would do less local harm.

Could you put up my last picture?

What we do support are the words and philosophies of the founder of the Sierra Club, John Muir --

Langley Whale. It's just a nice picture from right around here, from right by Langley. Look at that. Wouldn't that be awesome to be one of those people standing on that beach? And that's a whale with a name. They're all known and named. That could be Earhart. You know, she was the founding mother of this group. She was the first to come here many, many years ago.

So to repeat myself, but I'm almost at the end, what we do support are the words and philosophies of John Muir, founder of the Sierra Club, who said, quote, "Nature's object in making animals might possibly be first of all the happiness of each one of them."

Thank you for this opportunity.

THE COURT: Very well.

MS. OWENS: Humble opportunity to speak for the whales.

THE COURT: Are there any questions for Ms. Owens? NMFS?

MS. BEALE: We have no questions for Ms. Owens.

THE COURT: The Makah?

MR. GRUBER: No questions.

MS. OWENS: You can. I can take it.

THE COURT: For MMC?

MS. OWENS: I can, honestly.

MR. GOSLINER: No questions.

THE COURT: No questions. All right.

Well, thank you very much for your testimony.

MS. OWENS: Oh, thank you.

THE COURT: Okay. About how long will your direct be or -- I know we're going into tomorrow with this one, I guess.

MR. GOSLINER: We can definitely get -- we might

be able to get it in today -- we'll hopefully get it today. I don't know how many questions people have.

THE COURT: Why don't we try. Okay?

MR. GOSLINER: Yeah.

(Whereupon,

MICHAEL TILLMAN, Ph.D.

was called as a witness, and after having been duly sworn, was examined and testified as follows:)

DIRECT EXAMINATION

BY MR. GOSLINER:

Q. Good afternoon.

A. Good afternoon.

Q. I'd address you by name but we haven't introduced you yet. So would you please state your name for the record?

A. My name is Michael Tillman.

Q. And could you spell your last name, please?

A. T-i-l-l-m-a-n.

Q. Thank you, Dr. Tillman. What is your occupation?

A. I am one of the three presidentially appointed commissioners that comprise the Marine Mammal Commission.

Q. And what is your address?

A. 4340 East-West Highway, Bethesda, Maryland.

Q. And that's the commission office, correct?

A. That's correct.
Q. Thank you. Could you briefly summarize your educational background?
A. Yes. I obtained a Ph.D. from the University of Washington in 19- --
Q. '72, I believe.
A. '72. Educational background?
Q. Yeah, educational background.
A. I'm going to stop there.
Q. Okay. And your specialty was as a?
A. Oh, I was in fisheries science. Sorry. I wanted to --
Q. Okay. Thank you. And could you also describe your employment history and particularly as it relates to activity of the International Whaling Commission?
A. I was hired into the National Marine Fisheries Service in 1972. I was hired to be in a -- as a fisheries research scientist, and with a specialty in stock assessment. And I went to work for the Northwestern Alaska Fisheries Science Center, as it was called in those days, and did assessment of commercial fisheries stocks.
In 1974, after the Marine Mammal Protection Act was adopted, the Center established a new marine mammal division and I moved there, and undertook stock assessments of the stocks of whales that were being

commercially utilized. And progressing along, I became the, eventually the deputy director of that division, and then director of the National Marine Mammal Laboratory, when it became designated as such.

And, let's see. All through these times, I started IWC activities. Beginning in 1974, I started attending the IWC Scientific Committee, and that's where the assessments I did at that time, North Pacific stocks of whales, came to the fore. And having served on a number of committees and other activities for the Scientific Committee, I eventually became the chair of the Scientific Committee and served a 3-year term there.

Go back to my career, I eventually became the first chief scientist in the National Marine Fisheries Service. That was in 1988. That was followed 2 years later, when there was a reorganization because of a new director, I became -- I was asked to be his deputy. So I was a deputy director of the National Marine Fisheries Service. Following that, I became the director of the Southwest Fisheries Science Center. And at that time, that was 2004, I was appointed the Deputy U.S. Commissioner for the International Whaling Commission.

So on my retirement in 2004 --

Q. So if you retired in 2004, let me interrupt you. You were appointed -- yeah, I think you said you were

appointed as deputy commissioner in 2004, you were appointed deputy.

A. 1994.

Q. Oh, '94. I'm sorry. I --

A. '94. I'm sorry.

Q. Thank you. I'm sorry to interrupt you. I guess in the interest of moving forward, it's safe to say that you have a long career with the National Marine Fisheries Service with considerable experience and specialty in whaling issues and IWC issues in particular; is that a fair assessment?

A. I have 30-year career in Fisheries Service and the majority of which was -- majority to attend IWC meetings. And after retiring, the Fisheries Service retained my services to act as a senior advisor to them. And then in 2010, of course, I was appointed to the current position I am in. I served on the U.S. delegation for IWC as a part of my responsibilities. So I have over 45 years of experience working on IWC matters, particularly with respect to aboriginal subsistence whaling.

Q. And could you briefly describe your experience with aboriginal subsistence whaling in the various positions you've held within the IWC on that issue?

A. Well, as I said, I was the deputy commissioner

of IWC. Prior to that I served as the scientific advisor to the commission or to the delegation. And as a member of the Scientific Committee, served on a number of IWC activities. In particular there were two working -- special meetings, working groups that developed the underpinnings for management of aboriginal subsistence whaling.

And -- well, let's see. After I -- do you want me to get into my experience with the Makah Tribe?

Q. I'll hold that in abeyance, and we'll see if questions come up. But you also served as the chair of the IWC's Aboriginal Subsistence Whaling Working Group; is that --

A. Yes. I did that for about 6 years.

Q. And so, again, suffice to say you're -- you have a long tenure of experience on this issue and particular expertise in aboriginal subsistence whaling and the history of the ICW's development of management in that area?

A. Yes. That's true.

Q. Okay. Let's move on from your experience to why you filed testimony. And you were responding to a statement in Mr. Schubert's initial declaration that said -- he stated that, "Although the IWC approved the United States' request for a gray whale catch limit on behalf of

the Makah Tribe in 1997, and four additional times since, AWI has never concurred with these decisions." And in your view, is that relevant to this proceeding --

A. No.

Q. -- or to IWC management?

A. No, I don't believe it's particularly relevant. IWC is the body that makes the decision on whether or not a given hunt can be aboriginal subsistence on whether the needs request is satisfactory or not. It doesn't depend on the views of a particular government or individual. It really depends upon how government, how the IWC acts upon a particular proposal. And it does that, either adopts a provision either by voting on it, which three-quarters majority is required, or else by adopting it by consensus. There is a rather protracted attempt to adopt things by consensus.

Q. And has the IWC made a determination that the Makah Tribe does have a nutritional subsistence and cultural need for gray whales and whale products?

A. Well, there's a long history involved with that. Do you want me to go through that?

Q. It's all in your written statement.

A. Yeah. Okay.

Q. So, yeah, give me the short form answer, please.

A. Well, in 2007, the Makah proposal was submitted

as part of Tribe proposal with the Russian Federation. And the Commission -- it was controversial, and there was -- well, as I said, we worked towards consensus, and to get the consensus we needed to have it adopted, and we had to accept some language to the scheduled amendment that said -- well, it was along the lines of whose traditional needs and, you know, something like --

Q. I believe the exact language here, from your statement, is whose traditional aboriginal and subsistence needs have been recognized. Was that the --

A. Yes.

Q. -- does that sound correct?

A. That's about right, yeah.

Q. Yeah. So, and just --

A. So we were -- we had to accept that language in order to get it through by consensus. There was no vote. It was adopted by consensus. But afterwards, the United States understood and believed that that meant that the need had been -- need of the Makah Tribe had been recognized and that the scheduled provision had been adopted.

Q. And just to clarify, that was in 1997, correct?

A. '97, yeah.

Q. Yeah. Okay. And what, if anything, has happened subsequently to clarify -- as you said, there was

some ambiguity over whether or not the Makah's needs had been recognized. What's happened since 1997 to clarify that issue?

A. To explain your question, the piece of language that had to be added to the schedule amendment left some ambiguity. Some, a few countries believed that it gave them ability to come back to the topic of whether their need was legitimate or not. And -- so this was the '97, so the next -- was 2002, as I recall. It came up again. But again, it was adopted by consensus, but it had the same piece of language in the schedule amendment. It's done by consensus.

And then an unusual thing happened. In 2003, the Commission appointed a small working group, decided that the various schedule amendments pertaining to aboriginal subsistence whaling, the various hunts, if you will -- not hunts -- the various stocks that were under the aboriginal subsistence whaling regime had different language in them and there was a desire to bring it into consistency. So that working group did that and referred it out in 2004. And amongst the things they did was to propose that the -- that piece of language be dropped.

And that was discussed by the Commission. The United States view that was expressed was that a -- two points. I mean, it was the government to submit the

needs, decide upon the need and submit it. And then it was then up to the Commission to determine if that was adequate or not. Anyway, the arguments, we carried the day and that language was dropped and it has never reemerged since in any rules since that time.

So our view is that the -- there is no question about the legitimacy of this schedule amendment. And the Makah Tribe meets the requirements of the aboriginal subsistence whaling procedure.

Q. And IWC has since that time adopted additional gray whale catch limits?

A. Yes. In 2007, 2012, and 2018.

Q. And have any of those schedule amendments returned to that preexisting language?

A. No. As I said, none of them -- no, that language was completely dropped in 2007.

Q. Okay.

A. In 2004.

Q. And in the context of this proceeding, why is this a relevant issue, that we're even talking about it here?

A. Well, it has to do with the requirements for a waiver. This one of the requirements, is whether the waiver of the regulations follow, are in accordance with the International Convention for the Regulation of Whaling

in the way the International Whaling Commission implements the aboriginal subsistence whaling procedure by its belief upon history that I present in my testimony. It is quite clear that the waiver is in order.

Q. Okay. Thank you. Here's something that came up today. In your testimony you discuss past efforts to secure gray whale catches and talked a little bit about Alaskan natives and activities in the 1970s and '80s; is that correct?

A. Yes.

Q. And, but you didn't say anything about the hunting methods that were used. Is that also correct?

A. In my testimony?

Q. In your testimony.

A. No.

Q. So you disagree kind of with the characterization that was made earlier today, that you did talk about hunting methods?

A. Yes. I disagree with that. I haven't talked about hunting methods at all.

Q. Okay. Thank you. And then I'll call your attention, and unfortunately the Commission doesn't have an exhibit to put up, but this came up yesterday, and this is an exhibit that all the parties have. It's the letter that the Commission wrote under its responsibilities under

Section 103(d), and this is the letter dated 11 July 2017, where the Commission provided its advice to the National Marine Fisheries Service. And the quote that was used yesterday, and has been used elsewhere in this proceeding, and this is the third paragraph of that letter, and it says: "Our overall impression" -- our being the Commission -- "Our overall impression is that the draft regulations are based on the best available science concerning gray whales and are appropriately precautionary."

I don't need to ask you a question. That's what this says. But does the Commission letter say anything else that's relevant on this point?

A. Well, that was the conclusion. I'm not sure what --

Q. Well, specifically, the -- well, I'll ask you this or just enter it into the record. The letter then goes on to say: "The Commission believes the draft documents lay out a prima facie case that the requirements for granting a waiver under the MMPA have been met and recommends that NMFS proceed with issuing a proposed rule and scheduling an administrative hearing." So, again, that's just a recitation. So --

A. Hence the Commission did that.

Q. Yeah.

A. In consultation with its committee scientific advisor.

Q. So, in reading those two sentences together, would you agree that what the Commission was trying to say in that letter, and you being a commissioner or one of the decision makers, the Commission was trying to say, yes, we think your initial case is sufficient in terms of the best available science and the precautionary nature to go forward with this proceeding?

A. That's correct.

Q. Okay.

A. To get these proceedings.

Q. But that's not -- doesn't mean that the Commission has the opportunity to amend that depending upon what it hears at this hearing or in the briefs. That occurred --when we made this statement, you hadn't seen any of the arguments from other parties; is that correct?

A. That's correct.

Q. So this is kind of a moving -- potentially moving target and an open question; is that also a fair characterization?

A. That's correct.

Q. Okay. And then the Commission presumably will be reviewing this initial assessment as it reviews the record and briefs the issues in the future; is that also a

correct statement?

A. That's correct.

Q. Just one other thing is that you are, as you said, one of three commissioners, I believe you stated that?

A. Yes.

Q. And how are Commission decisions like set forth in the record, the letter that I just read, how are those decisions made?

A. Well, we come to a consensus.

Q. We came -- we being the three --

A. In each level we take a count. We take a count of the Committee's scientific advisors might have to say on a particular issue. And this is how -- we come to a decision based -- well, I was going to say consensually.

Q. But there's a consensus among the three commissioners?

A. Yes.

Q. You are the presidentially appointed people responsible for making the decisions.

A. Yes.

Q. So would you -- so presumably you would not be in a position to speak for the Commission at this proceeding absent consulting with the commissioners and consulting with the Committee of Scientific Advisors, as

you indicated is required?

A. I could not speak about what we were likely to decide. I can speak about the testimony that I prepared and submitted. I did that.

MR. GOSLINER: I think that's all that I wanted to cover. I turn him over to cross-examination.

THE COURT: All right. Thank you.

MS. BEALE: We have no questions.

MR. GRUBER: I do have a few questions, Your Honor.

THE COURT: Okay.

CROSS-EXAMINATION

BY MR. GRUBER:

Q. Good afternoon, Dr. Tillman.

A. Good afternoon.

Q. As the former chair of the IWC's Scientific Committee and a long-time leader of the U.S. delegation to the IWC, is it fair to say that you have an in-depth understanding of the level of scientific expertise present in the Scientific Committee?

A. Yes.

Q. How would you describe that level of expertise?

A. Well, it's highly regarded, considered to be the premier body for whale science.

Q. In the world?

A. In the world.

Q. Is the advice of the Scientific Committee an important factor in the positions taken by the United States at the IWC?

A. Yes, it is.

Q. And did the U.S. delegation consider the Scientific Committee's advice regarding the proposed Makah hunt management plan prior to the 2018 IWC meeting where the gray whale catch limit amendment was proposed?

A. Oh, yes.

Q. And regarding the gray whale caps limit proposal at that meeting, did the United States and Russia jointly request an increase from an average 124 whales per year to an average of 140 whales per year?

A. Yes.

Q. Do you recall the reason for that requested increase?

A. It was primarily to accommodate the Russian Federation.

Q. And any particular reason that the Russians had provided?

A. Well, my recollection is it had to do with the problem they called the stinky whale problem. You know, to accommodate their problem. Let me explain that. Some of the whales they catch have an odor that makes them non-

palatable. And it's a small number, but nonetheless they wanted a way to accommodate that, and that's why the number went up.

Q. Did they also explain that they had an increase in need?

A. Oh, yeah. They continued to express that the hearing. I mean, you know --

Q. Was the joint request by the Russian Federation and the United States approved by the Commission at that meeting?

A. Yes.

Q. And that increased catch limit applies for a 7-year block from 2019 through 2025?

A. Yes.

Q. Do you have any reason to doubt that the Chukotkans -- doubt the Chukotkan hunters' statement of an increase in need or other reasons for that increase?

A. No.

Q. Do you have a general familiarity with the Russian Federation's hunt by the Chukotkan natives?

A. Yes.

Q. Based on your familiarity with that hunt, do you have any reason to doubt that the Chukotkan hunters have the capability to hunt up to 140 whales per year?

A. Yes, I believe they could. In fact, they would

like to have a larger catch limit than that.

Q. Even larger than 140?

A. Yes.

Q. Do you think that it's likely that the Chukotkan natives will expand their hunt to utilize the larger number of whales approved by the IWC?

A. I'm not -- I don't know what they'll do. They have the capability to take more than 124 whales. I know that.

MR. GRUBER: Thank you very much for your testimony, Dr. Tillman. No further questions.

THE COURT: All right. Sea Shepherd? Or AWI?

MR. EUBANKS: We're just conferring. One moment.

MS. PRUETT: We won't be asking any questions.

THE COURT: No questions?

MS. OWENS: I will. If I --

CROSS-EXAMINATION

BY MS. OWENS:

Q. Sir, believe me, I barely feel that I should even be asking you any questions, but I did meet you in early 2000. You probably don't remember.

A. Yes, I remember.

Q. Oh, you do remember?

A. Oh, yeah.

Q. Okay.

A. I was out in Port Angeles.

Q. It was. We appreciated you taking the time.

A few questions to tap your IWC knowledge. Could you just briefly the explain the need satisfaction factor used by the IWC in deciding aboriginal subsistence quotas, and basically whether it was part of this quota decision most recently in the Makah whaling request? The need satisfaction factor.

A. I'm not sure I follow what you're saying. Each country submits on behalf of its -- I'll explain it like this. Each country submits on behalf of its hunter group, native hunter group, a statement as to what the estimated need is. That need is apparently -- the government depends upon the hunter group to develop that estimate and present it to the government, and then he presents it to the IWC on its on behalf. In the case of the Makah Tribe, it's based on five whales, which is in accord with one in each of the five historic whaling villages.

Q. Yes. I do understand that. I think I'll quote something had the question come to my mind. So, "The Scientific Committee generally endorses the plan that best satisfies the need requirements, even if another management plan is more conservative, i.e., causes less depletion of the relevant population."

And what I was reading was describing that as the need satisfaction factor. But it's -- we can go past that. I know about the need statements, but I'll --

A. I don't know where that statement came from.

Q. Okay. We'll go on from that. In Yates' fourth declaration, page 4, there's kind of a gray area that's identified that's bothering me. And I'll quote it: "If NMFS were to determine that a single Western North Pacific gray whale were struck or killed during a tribal hunt, all hunting would cease, unless and until," quote, "additional measures" -- well, my quote -- "were imposed to prevent such an event from recurring."

So this is a very vague spot in the plan, and I know you can't tell me a decision, but I'm just wondering if you have any thoughts on how that would be resolved? What additional measures would be imposed to make sure another western whale wasn't killed?

A. I couldn't say.

Q. I'm speculating. I mean, what comes to my mind would be an increase in the PCFG allowed takes, and I'm hoping that's not the case.

A. Well, that's your view. I don't --

Q. That is my view.

A. Okay. They'd have to develop whatever the plan is that they have and various agencies and entities would

have to take a look at it and decide whether it was reasonable or not.

Q. It's so vague that it does concern me.

MS. BEALE: Just for the record, Your Honor, I'd like to note that this question perhaps is being directed to the wrong witness --

MS. OWENS: Well, as advisors. You know, I was wondering if already knew what the advice would be on that.

THE WITNESS: No, we're not --

BY MS. OWENS:

Q. Okay. I'll just move quickly to -- and I'll just cut this to be my last one. I understand it's part of the MMC job description, is to advise the Executive Branch on marine mammal issues. Could describe what consultations have been done with the current administration on this issue? You know, are they aware of it? Do they have opinion? Are they following this? I know we are just the other hearing going on, but just briefly what is the Executive Branch feedback to you on this?

A. Well, we've consulted with NOAA and the State Department. Those are the two major agencies that we deal with this on this issue.

Q. So not with per se the White House?

A. No.
Q. As a presidentially designated committee?
A. No.
Q. Okay. That's probably good. Okay. I'll throw one more question.
MS. OWENS: Does anybody else have a question? I don't want to -- okay.
BY MS. OWENS:
Q. One more. I've read a little bit about the CIE, the Center for Independent Experts, and I know that they're an independent group that sometimes weighs in, you know, on scientific issues for NOAA, maybe -- I think I've read that they consulted on the Cook Inlet beluga problems. What with the stalemate in the stock designation issue -- do you think they were consulted or should be consulted? Or why wouldn't they be consulted?
A. What stalemate? What stalemate are you talking about?
Q. Well, the equivocal ambiguity of whether the PCFG should be designated as stock or not designated as a stock. Chris Yates described it as equivocal, which kind of tells me, you know, 50/50. What breaks that stalemate? And I wondered why the Center for Independent Experts wasn't called in?
Because I can read you their mission statement,

which is they were established by NOAA, quote, "to routinely provide external, independent and expert reviews of the agency's influential science used for policy decisions. It satisfies peer-review standards. CIE is a proven process that strengthens equality and credibility of the agency's science and improves stakeholders' trust that the agency is basing policy decisions on the best scientific information available." It sounds like a custom-made problem for the CIE.

MR. GOSLINER: Again, I think she's asking the wrong witness. She says this is something that NOAA does. I guess she could ask this witness if the Commission considered recommending that NOAA avail itself of this process.

MS. OWENS: I just think Dr. Tillman would know everything. The God of knowledge.

BY MS. OWENS:

Q. You know, but you're not the right person to ask, but --

A. Irrespective of whether I know everything, I have to work with other people in this room determining what our position is and what we're going to do about it. And we have a Committee of Scientific Advisors that we have great trust in and they are the body we utilize in most of our -- virtually all of our decisions.

MS. OWENS: Okay. Thank you very much.
THE COURT: Anything from AWI?
MR. EUBANKS: No questions, Your Honor.
THE COURT: And --
UNIDENTIFIED SPEAKER: No questions.
THE COURT: No questions? Okay.
Thank you, sir. You may --
(Witness excused.)
THE COURT: Is there any more evidence to come in? Does NOAA need -- is NOAA going to -- is NMFS going to be putting in any rebuttal or any other evidence?
MS. BEALE: No, we rest our case.
THE COURT: In order to finalize everything, do we want to meet tomorrow to make sure we've got everything -- I also want to make sure we have some evidence, some information in the record concerning your motion concerning the amendment to the regs. And can we deal with that tomorrow? I know people -- I know everyone's getting ready to get out tonight. But we have to -- I want to ask the parties about make sure we've got the time for when we'll be putting out the transcript and allowing public comment and allowing the briefing. And I just wanted to go over some of the rule issues. And I don't know if we've got time to do that tonight.
MS. BEALE: Your Honor, do you propose that the

witnesses also be present or would that be just for --

THE COURT: The witnesses don't have to be. I think right now we're at the point here where if we can just meet to make sure we have -- that everyone's on the same page as to the next procedures so we can move this along quickly. So do you want to meet tomorrow again at 9 or be able to finalize everything?

MS. BEALE: Sure.

THE COURT: Okay. So I thank you. We got all the evidence in. We'll have a hopefully about a half hour session in the morning, and everyone can get home. Okay.

Thank you. We're in recess.

(Whereupon, at 4:39 p.m., the hearing in the above-referenced matter was recessed, to reconvene, Thursday, November 21, 2019, at 9:00 a.m.)

CERTIFICATION

This certificate is valid only for a transcript accompanied by my original signature required on this page.

I hereby certify that the proceedings in the matter of Proposed Waiver and Regulations Governing the Taking of Eastern North Pacific Gray Whales by the Makah Tribe, Docket No. 19-NMFS-0001, heard on Wednesday, November 20, 2019, before the Honorable George J. Jordan, Administrative Law Judge, were recorded by means of audiotape.

I further certify that, to the best of my knowledge and belief, page numbers one to two hundred forty-three constitute a complete and accurate transcript of the proceedings as transcribed by me.

I further certify that I am neither a relative to nor an employee of any attorney or party herein, and that I have no interest in the outcome of this case.

In witness whereof, I have affixed my signature this 16th day of December, 2019.

Kay Maurer
Transcriber

CERTIFICATION

This certificate is valid only for a transcript accompanied by my original signature required on this page.

I hereby certify that the proceedings in the matter of National Oceanographic and Atmospheric Administration, Docket number 19-NMFS-0001, hearing heard on Wednesday, November 20, 2019, before the Honorable George J. Jordan, were recorded by means of audiotape.

I further certify that, to the best of my knowledge and belief, page numbers one to two hundred forty-five constitute a complete and accurate transcript of the proceedings as proofed/corrected by me.

I further certify that I am neither a relative to nor an employee of any attorney or party herein, and that I have no interest in the outcome of this case.

In witness whereof, I have affixed my signature this 21th day of January, 2020.

Sally S. Gessner

Sally S. Gessner, CER
Certified Electronic Court Reporter