

Recording: This conference is being recorded.

Amy Echols: Good morning. We have some folks on the phone today?

(James Luwan): Yes, this is (James Luwan) of ODSW.

Amy Echols: Hi, (James).

Woman: (Unintelligible) WDSW.

Amy Echols: Thank you. You don't have to introduce yourself, I just wanted to make sure that the phone line was active and working. Are you able to see the screen for the webinar?

(James Luwan): I can see it.

Amy Echols: Good, thank you. That's the technical check we need. We're going to start in just a moment or two. We'll give a few folks time, you know, we'll give them five minutes extra and then we'll launch.

(James Luwan): Sounds good.

Amy Echols: Okay, good morning again. We'll go ahead and start this webinar. Welcome to the first of two informational webinars for the Draft and Environmental Impact Statement Management Plan to Reduce double-crested cormorant probation of juvenile salmonids in the Columbia River estuary.

We've already done a phone check and we've done a webinar check to make sure you can see the opening slide. And in a moment I'll go through the process for asking questions and setting up chat if needed.

We ask that if you haven't signed into the webinar yet that you do so that we can account for the number of attendees and understand the interest - interests that are represented by your participation. It's not required but it is helpful for us.

My name is Amy Echols. I'm with the Portland District US Army Corps of Engineers and I am this webinar's facilitator. My job is to help you learn about the draft environmental impact statement and provide an opportunity to ask questions about the context of the project, the process that has taken us to this point, and to understand the alternative presented in the EIS including the preferred alternative.

I will also work to ensure the presenters provide helpful information to you and respond to questions clearly. During this webinar we will accept questions and have some discussion but please note that we will not be taking public comments during this session.

We will provide contact information for sending written comments so that you can contribute to a decision that best reaches our project goal.

Our second webinar is next Monday at 2:00 pm, that's July 21. Are there any other technical issues at this point? Everybody's on the phone and seeing things well enough?

(James Luwan): Yes.

Amy Echols: Okay, as with any meeting - go to the next slide. As with any meeting there's some process information to share. I ask that you keep your phones on mute so that we have the best audio for both participants and the presenter.

We do have a master mute function so if things get noisy in your background we will mute you and if we forget to put it - take it off mute please - somebody will let me know.

To submit questions, in this AT&T process you'll see at the top of your screen there's a little pull down menu where it says viewing corps EIS desk. If you click on that green little menu bar it will pop up a participant, a chat, and - let's see what the other one is, a couple of other functions.

The participant lists - if you are familiar, will show you all the folks who've signed in, at least how they're signing themselves in, maybe not their real names. And then you have an opportunity to chat with those people or chat with us as the host.

You also have an opportunity to raise your hand, which is over on the participant's box. If you open up the participant's box there's an opportunity to raise your hand. And we will watch for those hand raises to know when questions are going in.

We will entertain clarifying questions for the most part during the presentation, things that will help you get a clearer understanding of what's being presented, discussions, or more deep questions about bi-ops - you know, depth sort of stuff. We will hold those until the end.

You can go ahead and send them in. My facilitation team will take notes, we'll keep track of that. If there's a burning, burning question go ahead and ask it again if we have per chance missed the urgency on it.

We will watch time, consolidate questions as needed, and we will provide referrals to other folks in the room or on the phone who are experts to help to answer questions you may have.

Any process questions at this point? Okay, I will now turn the meeting over to (Joyce Casey), our lead presenter, and she will introduce herself and other key staff in the room and on the phone.

(Joyce Casey): Thank you, Amy. Good morning everyone. My name is (Joyce Casey) with the Corps of Engineers. Thank you so much for taking time out of your morning to participate in this webinar and to listen to the presentation and get a better understanding of what we're proposing.

We appreciate you all taking the time to be here so that you can better understand what we're proposing to do and help us make it a better proposal by listening, thinking about it, and providing us with comments.

So we're going to talk about our environmental impact statement, which you're going to hear us also refer to as an EIS, that's our abbreviation for it. We want - as Amy said, we want to answer your questions and help you understand what we're proposing to do.

You can - afterwards you can feel free to submit written comments. We are recording this session but we are not taking testimony or formal comments as part of this webinar.

Participating with us today we have representatives from several other agencies and all of these agencies are cooperating agencies with us except for the National Marine Fishery Service or (NOAA) fisheries. And so we've all been working together to help look at the problem that we're trying to address in the estuary and develop alternative ways to resolve the issues.

So we have myself from the US Army Corps of Engineers. (NOAA) fisheries is represented by (Richey Graves). The US Fish and Wildlife Service is represented by (Michelle McDowell). And we also have on the phone representatives from the Oregon Department of Fish and Wildlife and the Washington Department of Fish and Wildlife.

So really my purpose in sharing that with you is to let you know that we have a good range of folks here to answer your questions that you may have today.

I want to talk a little bit about the reasons why we're doing this environmental impact statements and give you a little bit of background to help you understand.

The Corps of Engineers operates several multi-purpose dams on the Columbia River. And those dams affect fish that are listed under the endangered species act. And so the National Marine Fishery Service has a role in giving the Corps of Engineers rules about how we can operate those dams. And we get that in the form of a document called a biological opinion.

In the biological opinion there's something called a reasonable and prudent alternative, Section 46 of that reasonable and prudent alternative has directed us to develop and implement a management plan to reduce the cormorant colony, the double-crested cormorant colony at East Sand Island to between 5,380 and 5,939 nesting pairs of birds.

The term of that biological opinion runs from 2014 - so earlier this year we were directed to take this action and we have to implement that action by 2018.

The scope of this particular reasonable and prudent alternative is specific to the action on the cormorant colony at East Sands Island and it does not address larger scale issues such as changes in how we operate the dams or dam removal.

The biological opinion itself is comprehensive and covers many other facets besides simply looking at management of double-crested cormorants on East Sand Island. And I wanted to just walk through this with you very briefly to help you understand that context.

So in addition to avian predation at East Sand Island, the biological opinion directs us to look at other avian predation and other predation issues on the Columbia River. We're doing a lot of work in cooperation with the Bonneville Power Administration to improve and restore salmon habitats, particularly in the lower Columbia estuary.

We've made numerous changes to how we operate the dams so that salmon can pass more successfully. And we've invested a lot in construction projects on the dams so that we've made physical changes to them to allow fish to pass more easily.

We also have a comprehensive research program to look at these changes, to monitor them, and to make suggestions for how we can do even better in terms of the Columbia River and the dams and how they operate as a system to be optimal for fisheries.

I'd encourage all of you who are interested in learning more about this to visit the website, SalmonRecovery - all one word, SalmonRecovery.gov, which is the one stop shop for all information about salmon recovery efforts in the Pacific Northwest.

We're having a few technical difficulties with the presentation so I'm going to pause for just a moment.

Amy Echols: Sorry about that. It actually brought up a question, is there anybody who's just on the phone and not on the webinar because that helps us know where questions might be coming if people don't have a chance to raise hands through the webinar.

So if there's anybody who's on the phone but not on the web, please nod yes where I can hear you. Okay, so everybody's on the web, helpful.

(Joyce Casey): Great, great.

Amy Echols: Okay, so we're back online. Thank you for your patience.

(Joyce Casey): Thank you. I'm sorry about that. I want to talk a little bit more specifically about reasonable and prudent alternatives 46, that as I say, we were directed to implement in the 2014 bi-op.

As I stated, the goal is to develop and implement a management plan that would result in reduced cormorant predation in the estuary and the goal would be a colony size between 5,380 and 5,939 nesting pairs.

This is a reduction of about 56% from what the average colony size is right now and would result in a consumption rate on steelhead, that's the species of most concern so it's the one that we measured, that is equivalent to the base period. And the base period is a period of time - several years ago that was used as a good average and basis for comparison.

We expect that achieving that colony size in that range will increase steelhead survival - so those out migrating steelhead - juvenile steelhead as they go past East Sand Island through the lower Columbia estuary. We expect that reducing the colony size will increase their survival through the estuary by about 3.6%.

And that is roughly equivalent to the same kinds of improvements that we have made for juvenile salmon migrating through our dams. So our proposal here would result in an improvement for steelhead survival that is equivalent to passing through one of our dams.

To give you a concept, this graph shows the diet composition of double-crested cormorants and what percentage of it is actually juvenile salmon. The orange or yellow line that runs across the blue bars gives you an idea of what the average is over the period of time between 2004 and 2012. So you can see there's been some variations but on average 12% of the double-crested cormorant diet is juvenile salmon.

I want to make sure everyone is aware of the geography that we're talking about here. On this map you can see States of Oregon and Washington and the Columbia River estuary and if you look very carefully up in the upper left corner of the larger diagram there is a - sort of a red dot in the river. And that's shown in more detail in the inset map. So that is East Sand Island.

East Sand Island is about 60 acres in size. It's a naturally occurring island that has been used by the Corps of Engineers as a placement site for dredge material.

And the Corps of Engineers does maintain East Sand Island through some rock armoring because having it there directs flow in such a way that it helps us maintain the federal navigation channel. During the nesting season there are approximately 60,000 birds on the islands that are consumers of fish of one form or another.

On the blowup that you see in front of you right now you get a closer idea of what the island looks like and that area on the western end of the island that is predominantly sand is the area where cormorants nest. And that's delineated in - with the yellow line. And there's a slightly larger red line and that gives you an idea of the parts of the island that the cormorants use.

As I said during the nesting season there is upwards of 60,000 birds on the East Sand Island. These are some of the more common species there. There are multiple gulf species, brown pelicans, the (Caspian turn), and there are also (brunt) cormorants on the island.

A little bit more about the double-crested cormorant, it's native to North America and to the Columbia River estuary. The nesting season for double-crested cormorants overlaps with the peak out migration of juvenile salmon and steelhead. And the double-crested cormorant is protected under the Migratory Bird Tree Act.

I'd like to share with you some information about the population - the western population of double-crested cormorants. For comparison here you can see the population in 1990 versus 2009.

The lower portion in the darker blue shows the western population of double-crested cormorants outside the Columbia River estuary and the upper portion in the lighter blue shows the portion that resides in the estuary.

So what you can see here is that overall the population of the western population of double-crested cormorants has increased in that period between 1990 and 2009. The bulk of that increase - in fact, all of the increase has been due to the growth of the colony at East Sand Island.

I'd like to talk a little bit more about the impact of double-crested cormorant predation. It has been a significant source of mortality to juvenile salmon in the Columbia River.

To give you an idea, over the last decade or so the average annual consumption of out migrating smelts - by double-crested cormorants has been about 11 million smelts a year, that's been higher in some years, lower in others. This has been as much as 18% of the population of out migrating endangered species act listed species.

The lowest survival rates for juvenile salmon have been in the lower portion of the estuary. And the steelhead consumption has been about 4% higher than the base period that I referred to earlier, which was analyzed in one our previous biological opinions. And so what we're trying to do here is reduce the consumption by about that amount to get back to the way things were in previous years.

A little context, in 1989 the double-crested cormorant nesting colony on East Sand Island was first documented with fewer than 100 breeding pairs. And since then there has been quite an increase.

In 2013, we documented about 14,900 breeding pairs with an average over the last decade of about 12,000 - a little over 12,000 breeding pairs. So there's been quite a dramatic increase of the colony size on East Sand Island.

Again, you can see this here with the black horizontal line - I'm sorry, that's the line that shows the - gives you the number for predation, that 11% that I referred to a moment ago.

So you can see it varies over time but on average basis we're looking at about 11 million smelts consumed by double-crested cormorants in the vicinity of East Sand Island.

Recognizing that this was going on, what has the Corps of Engineers been doing? This is a little bit hard to see but you can note on this slide there are four maps of East Sand Island. At the top 2012 - 2010, I'm sorry, 2011, 2012, and 2013. The black areas indicate areas like where the cormorants were nesting in those different years.

And what you can see in 11, 12, and 13 are efforts by the Corps of Engineers to manage the island to control the areas where the cormorants nested. Essentially what we did is offer them increasingly less area in which to nest by installing dissuasion senses which are shown in the gray on the map.

And then what we did was we studied what happens. We were trying to understand if we gave the cormorants less area to nest in would they move elsewhere to nest? Would they be less successful in nesting? Would they consume fewer out migrating salmon?

The bottom line is what happened was the cormorants just kept nesting. They kept coming back and they kept nesting and they were loyal to that area. Even if they left the island they stayed in the lower Columbia estuary. And we're speculating that this is because the food source there is so abundant for them that it's a very desirable area for them.

One of the concerns that has been raised and one of the things that - why we conducted those studies that I mentioned in the previous slide is what happens if the cormorants leave East Sand Island, where will they go? Will we simply be moving a predation problem somewhere else.

What this map shows here is the States of Oregon and Washington. The black dots indicate either current or historical double-crested cormorant colonies. The white circles around those dots represent the areas that the birds forage for food within.

The colors indicate the level of concern that the states have about cormorants either being in or moving into those areas because of other resource issues, say other endangered species act listed fish that might be present in the area.

So you can see that there's small amount of area up in Northwest Washington - sort of Olympic Peninsula area where there's less of a concern. But otherwise, there's a fair level of concern throughout the region about the potential impact of double-crested cormorants leaving East Sand Island.

So that's one of the things that we took into account when we analyzed the impact of the different alternatives.

And the next slide gives you a close up. This graphic is in the environmental impact statement as well.

Woman: Okay, how do you raise hands? Damn it, well - it's on.

Amy Echols: Okay, (Charlene)?

(Charnell): Hi, it's (Charnell).

Amy Echols: (Charnell), sorry.

(Charnell): Yes, sorry, we've had trouble with getting audio here but my question on the previous slide where you showed the historical and current - correct. There is no color coding for the coastal cormorant nest sites. And I wondered with ODFW's concerns are there?

Amy Echols: (James)?

(James Luwan): Yes, I'm here.

Amy Echols: Would you like to address (Charnell)'s question about the map indicating coastal areas?

(James Luwan): Yes, so any area north - well, any of the northern really two-thirds of the state you're dealing with federally threatened coastal (Coho) kind of the southern part of the state where - among other things there's a big concern for (unintelligible) in the northern two-thirds of the state.

And southern third of the state - it's both spring and summer Chinook and also wild steelhead. So basically Oregon's - what you see is significant concern for most of the State of Oregon because Oregon has a lot of fish of concern - conservation concern.

So that's sort of driving what we think is a significant risk. It's basically are there fish there that are of federal or state conservation concern.

Amy Echols: Thank you. Did folks hear his response?

(Joyce Casey): I did.

Amy Echols: did anybody else have trouble hearing it who would like to hear it again? It was a bit faded, (James), so I'm just checking with folks.

(James Luwan): Sure, yes, no problem.

Amy Echols: Everybody good with hearing that and understanding it? Okay. No dissention. Carry on then, thank you for your question.

(Joyce Casey): All right, I'm going to shift gears a little bit to talk some of the details about the environmental impact statement. Before I do that I'd like to talk a little bit about the different alternatives and how we're going to decide between them.

So the things that are important to us in making the decisions are the greatest certainty of meeting the requirements that we have in the biological opinion, feasibility and the cost of implementation. We want to select an action that we believe can be implemented and can be implemented cost effectively.

Obviously we're looking at impacts to other protected species, we don't want to solve one problem to create another. The biological opinion is - mandates that we address this goal by the end of 2018 so that's another important consideration for us. And lastly, anything that the Corps of Engineers decides to do we must have the legal authority to actually undertake.

I'm going to now describe the alternatives in the environmental impact statement. There are four alternatives that were analyzed in detail. The first is the no action alternative that's required by law and serves as a basis for comparison with the effects of the action alternatives.

The second alternative, Alternative B, has a nonlethal focus. And I should say that we've divided all of these alternatives into two phases. The first phase is Years 1-4 and that's focused specifically on short-term compliance with the 2018 bi-op.

And Phase 2 is more of a maintenance phase where we would look to maintain the colony size.

So Alternative B has a nonlethal focus, the primary actions would be hazing and dispersal to reduce the colony size. And it would be limited egg take associated with that.

Alternative C has a lethal focus, the primary action would be culling of the population to achieve the colony size that we've been directed in the bi-op. And the way we would implement that is we would implement it - it wouldn't all be one fell swoop the first year. We would conduct some culling in the first year.

We would see what happened, how did the population respond, and each year we would make - we would manage it adaptively to make a decision about what would need to be done in subsequent years. Again, keeping in mind our target - our goal for 2018.

Alternative D would also be a culling program but we would exclude nesting as well. And then for all of the alternatives other than no action - so Alternatives B, C, and D; once we've reached the colony size of somewhere between 5200 and 5900 nesting pairs we would make modifications to East Sand Island inundating a portion of the island to reduce the available area for nesting with the goal of maintaining that colony size without a lot of further intervention on our part.

In the draft EIS we have identified Alternative C as our preferred alternative for a couple of reasons. We feel it best meets our purpose and need. Our purpose and need being to achieve the goals of our PA 46 by 2018. It's the most technically feasible. It's the one that gives us the best assurance that we will actually accomplish what we are proposing to accomplish.

And it minimizes long term environmental effects of dispersal so it minimizes impact to other species. And it's more cost effective than the other two action alternatives.

I hope that in thinking through this information we've helped you see that this is a complex issue. We need to balance the needs of double-crested cormorants and improving survival of fish listed under the endangered species act while minimizing impact to other protected species and minimize just moving the problem around, shifting consumption to another area.

In looking at the effects and the alternatives we're also considering socioeconomic impacts such as commercial and tribal fisheries. This is also a very large project area. It addresses the entire Columbia River estuary, over 160 river miles.

So there's a lot of factors that we are looking at in making a decision and a lot of things that we would appreciate hearing from all of you on to help us in crafting that complicated decision.

With that, I'm going to turn it back over to Amy to review the schedule and the rest of our public input process.

Amy Echols: Okay, before we go on are there any questions by phone? We only - (Charnell), your little hand is up on the participants. I assume that that was from your previous one.

(Charnell): Probably, this is new to us so we're technically deficient over here.

Amy Echols: That is okay, we are learning one hand at a time. Okay, so that slide here for the EIS schedule, you'll see where we are now is the midst of the comment period. We are in the - we are now in the middle of our first webinar. We have completed our first open house.

We have another webinar Monday and the next open house is Thursday in Astoria. Public comment period closes August 4 and we are taking written comments and we'll have a slide in a moment to post that contact information for you so please prepare your material and send it to us.

And August - September, October we'll be considering the substantive comments to provide us information that support either new information, something we may have missed, bring to light an element that may be considered as we get to a final alternative - a final decision.

And then October we'll post notice of the final EIS in the final register. The record of decision is anticipated to be signed by the end of the year.

Implementation of the action, the preferred - the selected alternative would be in March of this next year and the completion or the achievement of the goal, the RPA 46 goal, by the end of 2018.

Now if I've missed anything here on the table - I'm checking in with you all. We're good? Okay. So as I said, we're looking for comments and input to help us get to a final management plan.

And you'll see a list of bullets there, some of the things we're looking for, accuracy of information, new information relevant, and even a reasonable alternative to what we have presented, stuff that has some meat to it is always welcome and to engage in that exchange of information that (unintelligible) through this comment period.

(Charnell): This is (Charnell). I'm raising my hand. Okay, can you hear me?

Amy Echols: Yes, we can.

(Charnell): Okay, I had a question. I know that Portland Audubon requested a comment period extension because of the complexity of the situation and I wondered if that was being considered.

(Joyce Casey): (Charnell), this is (Joyce). It is being considered and I hope to let everyone know about that by the end of this week.

(Charnell): Okay, that will help staying up all night and trying to get a comment in in 45 days. And also, I had approached a few people at the open house regarding information that was lacking in the EIS - draft EIS. And what we particularly are interested in is the raw or base data taken from cormorant (unintelligible) content so that public analysis can be made.

(Joyce Casey): So be sure in your written comments to include that request so that way it will be part of the record that you ask for that information.

(Charnell): Okay.

Amy Echols: Was there a discussion about getting her anything before the comment period? Nothing there? Okay, that's fine. Okay, so let's move on to - most of you have likely seen this so far. It's how to submit your comments, either in writing by traditional mail or by email. We have an email box set up for this, cormorant EIS - that's cormorant EIS and then the end of our email there.

You can view the EIS and learn more about the cormorants on our website. And it - there is a link on the front page and there's also a link under current projects and then down to cormorant EIS.

There's also a great deal of additional information on SalmonRecovery.gov. if you haven't been there I encourage you to look. It's a lot of background on the bi-op and many of the actions by federal agencies to date that have cumulatively resulted in some survival increases across the system - across the federal Columbia River power system.

So if you're not familiar with the other actions and you want information about the timing and the successes and the challenges and the money that's been sent there - spent there, SalmonRecovery.gov is a very keen resource for that.

And then in closing, before we go into some more open question and discussion, there's the - just the information on the last webinar and open house there for you, in Astoria and then the webinar next Monday.

Okay. So then last slide we have, we'll be here for a little bit, is the question and discussion opportunity that we will facilitate. There are eight folks on the webinar - or that have signed in. There may be others who haven't who are participating.

I would like to go ahead and open it on the phone rather than using the chat or the Q&A box on the webinar since there's not a lot of us. If there are many more people out there who have not signed in that couldn't - that you want to participate you might want to do so so we know you're there.

(Vickie Ann): Okay, I'm a participant. Can you hear me?

Amy Echols: Yes, have you signed in?

(Vickie Ann): I haven't signed in. I haven't been able to because of the Java requirement. My...

Amy Echols: Certainly, well, welcome. We're glad you're here. Is there anybody else aside from this lady who's spoken up here who's on the phone but not on the webinar? Okay, so let's go ahead and do as much as we can by phone. You're welcome to submit a question via the webinar so that we can get the right person ready to respond. Feel free to do that.

But I'll go ahead and try to facilitate this via phone. I have (Brad), (James), (unintelligible) and (W James) as well. (Jazz) or (Jaez), (Sandra Jonkers) - (Sandra) is from the Washington Department of Fish and Wildlife. (Charnell), (Skiles) - S-K-I-L-E-S, and (T Lors). And then this lady who's here. So just a few of us.

(Vickie Ann): Okay, my name is (Vickie Ann) and I do have a question. I attended the meeting in North Portland and I feel that the format used during that meeting was very restrictive.

And I'm wondering if the next meeting that there could be at least a short window of time with an open question-and-answer period because when I was there in the room with a lot of different people they were clustered in small groups.

So I didn't get the pleasure of learning other people's feelings on this issue except for the small group I was dealing with as I moved from group to group. I couldn't hear other people's questions because they were going on in small areas.

Amy Echols: Okay. I appreciate that feedback, that's really good to know about different formats and how well they work and don't work. So as we prepare the arrangements and the agenda for next Thursday we will keep that in mind and see if there is a way to set that up considering the facilities we had and the potential number of people. So we'll take that into consideration, thank you.

Okay. Anybody else have a question or a point for discussion? We'll give you a few minutes as you ponder what you heard.

(Charnell): This is just for general questions. This is (Charnell), right.

Amy Echols: Yes, (Charnell).

(Charnell): Okay, so the objective is to increase adult abundance of salmon and recruit per spawners - okay, I've been doing a little bit of reading. But I wanted to see if someone could discuss density dependence in relation to competition for

habitat that hasn't fully been brought back to standards. So density dependence is my question.

Amy Echols: Okay, we are - thank you for the question and we're looking at - (Richey Graves) from (NOAA) fisheries is going to take a gander at that one, okay?

(Richey Graves): I'll take a stab at that, good morning, (Charnell). Nice to talk to you again. So density dependence is a term that's used to describe when in effect there are constriction points for productivity of a species. In the case of salmon there can be density dependence with restricted areas for spawning.

Streams can be limited in their productivity because of spawns - limited spawning habitat. It can be restricted because of limited rearing habitat. It can be restricted because of a host of things.

And density dependence typically means that for many populations that there are more juvenile than there are habitat to hold them and - on the freshwater side of the system. I think this is what you're getting at. Is that - am I warm?

(Charnell): Yes, well, it would be at both ends - at both the (unintelligible) end and also the returning adults. You understand? So it would be spawning habitat and/or habitat that promotes growth.

(Richey Graves): Yes, so in general wild populations of endangered species act listed salmon and steelhead are not facing density dependent effects in fresh water habitat, that's typically not the case.

There have been some recent years with very high abundance where we have seen some density dependent effects we think, that's articulated pretty well, we believe, in the biological opinion. We were looking at our base years

versus the last two or three years when - as you've probably seen in the newspapers we've enjoyed some fairly robust returns of adults.

The factor that's affecting that is probably not limitations on adult spawning habitat. My understanding from talking to folks at our science center is a lot of that habitat is facing - one key period of time for (unintelligible) is the late July/August period when flows are really low, that seems to be one constriction point for (unintelligible) species is you have to have enough habitat for juveniles to have places to go, pools, shade, all that kind of stuff.

Another constriction point is actually over winter. A lot of streams, especially in the higher elevation environments they can ice up and water levels are - you know, because of all the snow and everything there tends to be - it's actually kind of a dry time of year for some of those streams.

So that's another place where there can be basically too many fish for the amount of habitat there is to grow fish. And you can get some density dependent effects there. Those come in two flavors, there's density dependent effects can result in mortalities, outright losses of fish; and there's density dependent effects that can result in what we call sub lethal effects, which could be something like just reduced growth rates, right.

So those density dependent effects can affect the long term viability of fish populations because we know from a lottery surge, the smaller fish tend to survive at lower rates through their migration the following year than bigger fish do.

So with respect to the bird colonies themselves and whether or not they are factors for density dependent effects, (NOAA) fisheries does not believe that what's happening with the birds is really a density dependence issue.

For the most part we believe that juvenile (unintelligible) that have reached - have passed through the migration corridor and reached areas that far down the estuary are pretty healthy.

We don't think that there's a lot of sick or injured fish down there that are being picked off, which would be compensatory mortality. We think the fish that get down there all have basically an equal shot of surviving the ocean environment and coming back as adults.

So I know others feel differently but that's what we feel when we've looked at the information.

(Charnell): And how is that determined?

(Richey Graves): How is that determined? It's determined by knowing from other research survival studies and things like that, how far downstream fish that are injured tend to die or drop out of those populations.

(Charnell): Okay.

(Richey Graves): There's a lot of survival studies where fish - well, most of the survival studies in fact at the damns groups of fish are intentionally euthanized and released downstream to make sure that dead fish aren't floating - dead fish with tags aren't floating down stream because those could pollute our estimates.

We need to know that only live fish reach certain points down river to validate assumptions in those models that we use to estimate survival. So we've got a pretty good handle on that we feel.

(Charnell): Okay.

Amy Echols: Okay, thanks, (Charnell).

(Charnell): Thank you.

Amy Echols: Are there other questions to US Fish and Wildlife Service, (NOAA) fisheries, the Corps, or the two states who are available to you today? Okay, so another thing you can do is that email address if you have a clarification question about something you hear today.

Feel free to ask it to that email address and/or participate in next week's call, send in a question there that you may come up with between now and then. We encourage that.

Okay, so with that we will post a transcript of this webinar to our website when it is available. We don't yet know what the timing is on that. We'll also post a transcript of next Monday's webinar. So if you want to come back to what (Joyce) said, feel free.

We also will post the slides to this webinar likely after next Monday's - there may be a tweak or two now that we've walked through it more detail so we'll post that after the second webinar. Did someone join us or did someone leave?

Okay, so thank you. We'll see if there's anything else to share. I don't believe so. Remember August 4 is the deadline for comments. Thank you for listening and learning with us today. And we'll go ahead and signoff.

Woman: Thank you everyone.

Amy Echols: Bye-bye.

Man: Great, thank you.

END