**US ARMY CORPS OF ENGINEERS**
**Moderator: Courtney Chambers**
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**12:25 pm CT**

Courtney Chambers: Alright, at this time, I'll give you today's speaker on mitigation and planning, Elliott Stefanik is currently a biologist, planner and project manager in the Environment and GIS branch at the St. Paul District. He has 16 years of experience working on complex, multi-use water resource projects including work with the Corps of Engineers and private industry. Elliott's primary focus has been on fisheries and aquatic habitat related issues with project experience in the upper Midwest and Northern California. He leads plan formulation for ecosystem restoration studies as well as interagency teams including local, state and federal representatives. He conducts habitat evaluations and impact assessments for biological resources on multi-use water resource projects as well as conducts cost effectiveness, incremental cost analysis. He prepares reconnaissance and feasibility level reports, as well as documentation to fulfill requirements under NEPA, Endangered Species Act and Clean Water Act. He also conducts Agency Technical Reviews and participates in value engineering studies as well as provides advice to project development teams on plan formulation and ecosystem restoration projects, habitat evaluation methodology, and impact assessments.

This information about Elliott can be found in his biography posted on the learning exchange with the rest of today's meeting documents. Okay, Elliott, we are very happy to have you with us today. And at this time, I'm going to give you the presenter rights. And you can begin your presentation.

Elliott Stefanik: Thank you, Courtney, going to wait here one second for it to pop up.

Courtney Chambers: Okay.

Elliot Stefanik: There it is. Okay, I wanted to thank folks for joining us today. What we're going to do is talk about mitigation planning and all the different things that go into that. And as Courtney mentioned, I'm going to break this up into 2 parts. The first part of the presentation, we'll talk about the conceptual side, the policy that requires mitigation planning, the steps we have to go through and the things that we're going to want to include as part of our mitigation planning process.

The second half then what we'll do is we'll walk through an example where mitigation planning has been used in a planning study and look at how it was done and make sure that we're meeting our policy requirements and our regulatory requirements for the way that we implemented that mitigation relief, planned out that mitigation. We'll certainly have time for questions at the end. And as Courtney mentioned, we'll also take a brief break in the middle right before we get into the case study example where folks have questions they can certainly ask them.

Please feel free to ask questions. I want this to be informative. I don't want this to be death by PowerPoint. So as you have questions, jot them down, make a mental note. And then we'll certainly discuss those either at the midpoint of the presentation or once we - once we wrap at the end. So with that we'll go ahead and get started. First we'll talk some of the policy of mitigation planning.

As with all things in the Corps of Engineers, we are directed by policy and regulation. And mitigation planning is certainly no different. And within this slide, we're going to touch on some of the key pieces of policy that drive and direct our mitigation requirements, the most important of which are the bold

items that you see at the bottom of the slide. But first I want to touch on the first 2 bullets up front because they are also important to be aware of.

They're both CFRs. The first is 33 CFR Parts 325 and 332. And this is the compensatory mitigation requirement for aquatic habitat, okay. And this is something that drives our regulatory side of the Corps of Engineers. And so because we have an interest in regulating ourselves somewhat in the way that we regulate the public, it's very good to be aware of this. However, again, please note that this is a CFR regulation that is - that pertains to the regulatory side of the Corps, okay.

So it's important to be aware of it, important to recognize that it's out there and how the regulatory side treats the public. But also recognize too that it's not the ultimate policy that we have to follow in terms of our mitigation requirements. Similarly 40 CFR 1508 mitigation discussion from CEQ. You want to be familiar with that as was well. But the 3 most important policies that derive what we do from a mitigation planning standpoint for civil works are the 3 items that I have at the bottom.

They include the planning guidance notebook, ER1105-2-100. And section 2036 of WRDA 2007. And if there's one document that you want to make sure you're familiar with, it's the implementation guidance for Section 2036 brought by headquarters in 2009. That is the policy that directs us for our specifically authorized projects whenever we're considering mitigation.

So I would strongly encourage you if you haven't done it, get a hold of that implementation guide and be familiar with it. Now I recognize too that there's a lot of similarities between the guidance for 2036 and what we have in the planning guidance notebook. And in fact for CAP studies, we actually will

refer back to 1105-2-100 for the mitigation requirements specific to CAP. But there's a lot of similarities between the 2.

And I would strongly encourage you to be familiar with the planning guidance notebook and certainly the implementation guidance for 2036 because that really drives - it really lays out what our requirements are for mitigation planning while we're working through our Corps projects.

Okay, types of mitigation. There's 3 important things that we have to do with mitigation. And it's important that we do these in this particular order. A lot of times people want to jump right away to number 3, item no. 3. But it's important for us to work through this in a sequential process. First and foremost, we want to avoid the impact to the extent practicable, okay. Once we've avoided the impact as best we can, then we want to try to minimize that impact by modifying our action. And then once we've done 1 and 2, we can certainly go to number 3 which is for any remaining significant impacts doing some different level - some additional mitigation to reduce the level of impact to below significance, okay.

And there's different ways you might do that. You can certainly restore the habitat that you're directly affecting. You can compensate by restoring a similar nearby habitat type, okay. And that's often times what we do for mitigation. And lastly, and this is one that people often don't think about. But you could reduce or eliminate an impact by preserving or maintaining resources over the course of your project life.

So if you have a nearby habitat that is potentially going to be degraded in the future, you can actually protect that habitat from degradation, figure out what that overall benefit it and use that as a part of your mitigation. You can do that too as a part of your overall mitigation strategy. Okay, I apologize for the

texty slide, but it's important to walk though this because there's a couple of important points here that I want to make very clear as we work through this.

First bullet - appropriate mitigation should be included for each alternative plan. So whenever you're working on a study, it's important to consider mitigation not just for the overall project but each alternative plan that you're looking at should have mitigation included as appropriate as a part of that plan. Secondly, planning should demonstrate damages to all significant ecological resources have been avoided and minimized to the extent practicable. And then any remaining unavoidable damages have been compensated to the extent possible. Now you'll look at that and recognize that there is all kinds of grey language in there. My point here is not to demonstrate that there's a lot of wiggle room to potentially get us out of mitigation requirements. That's not at all what I'm suggesting here. But what I am suggesting is there's a lot of interpretation that goes into this in determining what is or is not a significant resource, what is or is not a significant impact. And whether we've done an adequate job of reducing that impact to less or significant levels, okay,

And that's something that you'll have to work through carefully with you PDT, the environmental folks on your team working with the rest of the PDT and in collaboratively with our agency partners to try to get our arms around the real level of significance that we're talking about with our impacts and whether or not we're doing an adequate job of avoiding, minimizing and then mitigating for those impacts, okay.

So just recognize as you work through this, there's a lot of interpretation that's involved. And there isn't necessarily a black and white rule for where you have or have not met a particular threshold for significance. Lastly, projects will utilize mitigation to compensation for non-negligible impacts to the

extent incrementally justified. Now we're going to talk about the incremental analysis here in a little bit. But just recognize that in addition to trying to adjust - address impacts from an ecological standpoint, we also have to factor cost into the mix, okay. And we have to recognize the different increments of benefits that we get from different mitigation actions and make sure that we're not doing more than we need to, less than we need to or perhaps extending further with our mitigation than we need to. We need to make sure that our mitigation is incrementally justified. And we'll talk about that incremental analysis here in just a little bit.

Okay, mitigation plans within your decision document. As you're working through a study, you're going to be writing a feasibility report or some decision document. You will then have mitigation plans that are going to be included for each alternative where it's needed. These are the types of things that each mitigation plan will itself need to include. And what you're going notice here on subsequent slides is there's going to be some repetition. Make note of that because those are the points that are really important to grab onto, okay.

Number 1, we want to make sure that we have identified specific mitigation objectives for whatever it is that we're working on. We want to make sure that we specify success, metrics or criteria with which we can measure our mitigation effectiveness and determine has our mitigation worked. Three, there's a strong interest in trying to do the mitigation within the watershed where the impact occurs. That doesn't mean that you have to do it within that watershed. But if you're going to be outside of the watershed, you want to include justification explaining why it is that the mitigation is occurring outside of where that impact is occurring, okay. And then certainly, you want to talk about the type, the amount of habitat, the characteristics of the habitat

being restored. You need to include a monitoring plan to evaluate the effectiveness of mitigation.

And then lastly, the real estate needs describing the lands and interest to be acquired if needed to implement your mitigation. It's important for mitigation to be an adaptive process when we work collaboratively with our sponsors, our agency partners and what not to implement our mitigation plans. And these mitigation plans again should include monitoring until successful, okay. And to do that we want to use our metrics and criteria that we established in monitoring to measure those metrics.

Identification of the entity responsible for monitoring, okay. Who's going to do it? We want to establish the consultation process with the appropriate partner agencies to determine mitigation success, alright. And you're really laying the groundwork for working with our agencies to verify if our mitigation has worked and when our mitigation is complete. And then lastly, we need to develop contingency plans. Should mitigation either prove ineffective, not work as well as we had hoped or potentially if our impacts prove to be worse than we originally anticipated in our decision document, okay. Either way, you want to have a contingency plan identified or path identified explaining how you're going to rectify that mitigation deficiency that you may identify down the road as a result of your monitoring.

As far as the monitoring itself, the monitoring of mitigation and actions, this is going to be a part of your monitoring plan which again is part of the overall mitigation strategy that you're going to have for each alternative. Again, when you're monitoring, you're targeting those specific standards and metrics that you've identified. I'm hammering on that because it's important. Realize that headquarters is going to be looking for those performance metrics within your mitigation plan.

When you designing your monitoring plan for mitigation then, you need to include the specific methodologies you're going to use. The period, these are the frequencies for monitoring, the cost and then ultimately the responsible parties. Who's going to be the entities doing the monitoring? Your decision document should also discuss how that data is going to be evaluated to determine mitigation success. You collect this information and it should be targeted answering very specific questions that really is going to evaluate your mitigation effectiveness. And then lastly, the appropriateness and content of your monitoring plan and really your overall mitigation plan is subject to ATR and IEPR. And as much as sometimes people groan about the need for ATR and IEPR, it really can be a good thing especially when you're working on complicated projects, controversial projects, if you've got mitigation needs that are very detailed and complex.

Having another entity or 2 do a review is always a good thing because it helps you know and feel comfortable that you're on the right track, okay. So recognize that your mitigation plans and your monitoring plans are going to be a part of that ATR and potentially IEPR process. Okay, so how do we plan for our mitigation actions? In simplest terms, this ends up being very, very similar to how we plan for our ecosystem restoration studies. There's a ton of similarities here, okay.

Recognize that when we're planning for mitigation, we need to consider multiple mitigation alternatives. We have to look at a range of mitigation alternatives to accomplish our mitigation much as you would look at a range of alternatives for doing an ecosystem restoration project. And this then requires you estimating the cost and the benefits of each alternative for your mitigation.

How do you evaluate mitigation actions? Well really you're using the same habitat based methodology as you would for an ecosystem restoration type project, okay. Now we want to quantify both our impacts and our mitigation needs. And then ultimately have those balance out to a number of zero to know that you've met your mitigation requirements or at least to the point where the impacts are less than significant.

And you work through those with a similar HEP type process or another approved methodology. I've got a typical HEP type example here on the screen for you where you would look at the area of your impact times some type of equality factor over a 50 year project life which would generate your average annual habitat units. You can consider habitat function as long as you can quantify it, okay. And then ultimately recognize too that whatever method you're using is subject to the same model certification requirements that we would use for our ecosystem restoration studies, okay.

So you want to make sure you're meeting those model certification requirements as well. As you work through this, then you'll have cost and benefits for each mitigation alternative. And then you're going to crank that through the same cost effectiveness and incremental cost analysis as you would for any other study. And I've got the 2 figures over the right hand side of the screen.

Please recognize you're going to have to go through this. And I'm telling you this because the folks at headquarters are going to be looking for the CE and IC of your mitigation alternatives to know that you've considered a range of options and have picked one that ultimately is most justified, okay. So please realize you're going to have to work through these same processes much like you would a typical habitat restoration type study.

And then lastly and I know this can be hard. But we want to make sure to the extent possible that we're ensuring our projects are neither under mitigating or over mitigating our impact. And I know sometimes with the uncertainty of our habitat models, some of the uncertainty of mitigation, it can be a little bit of a grey area as to whether or not we're you know hitting our mark so to speak exactly our mitigation needs.

But to the extent that we can, we want to try to ensure that we're using tax dollars reasonably and we neither under mitigating or over mitigating. Okay, some special considerations here and these are spelled out in 2036 for WRDA. Bottomland hardwood forests are mitigation in-kind to the extent possible and then 2 important points here for wetlands. One, wetland habitats should have impacts fully mitigation no net loss. And then again, it's trying to regulate ourselves somewhat in the way that we do the public.

The other is that whenever we are looking at wetland mitigation needs and we're looking at their range of alternatives, we have to include wetland mitigation banks in that range of alternatives if there is a bank within - within the immediate area that would meet the needs of the mitigation, okay. That's not to say that we have to pick a wetland bank or we have to use wetland banks. But we are specified to put wetland banks in the mix as far as one of our alternatives when evaluating mitigation needs for wetland impacts. Okay, some additional considerations. Mitigation should be implemented concurrently with major project features where practical. That's always a good thing to do. It helps build trust within your interagency team. And it's always good to implement our mitigation concurrently where possible.

It's important to remember to include your mitigation costs as a part of the total project costs, okay. So we include the construction of our mitigation, any O&M we do for the mitigation as well as for our monitoring. All of that gets

factored in as a part of the total project cost which then is a part of the overall BC ratio that we do for any of our big picture planning studies, okay.

So make sure that we're including those mitigation costs as part of the overall whole. And then again, mitigation planning and assessment is done in partnership and collaboration with our partner agencies, okay. And we want to do that to the fullest extent practical. And it's good if you can to include them throughout that entire process. Even going with the impact assessment, working it through the planning for mitigation, the evaluation of the monitoring results and determination of whether or not our mitigation has been successful.

It's always a good idea if you can to include our partner agencies as a part of the process because they can certainly help you out with their expertise and what they can bring to the table. Okay, common mistakes with mitigation planning. For better or for worse, I do a lot of ATR on planning documents and so I see a lot of mitigation plans. And these are some of the things we see come through that are in area or perhaps a little weak in terms of mitigation planning.

So I wanted to highlight those here and certainly make note of these. You know number 1 is failure to avoid and minimize prior to compensating, okay. And so what we want do within our decision document is try to demonstrate that we've done what we reasonably can to avoid and minimize an impact. And don't immediately go just for the mitigation approach through you know restoring a habitat or trying to restore the habitat we're directly impacting.

Make sure that we address how we are avoiding and minimizing first as a part of that. And then that will lead into the mitigation discussion for what additionally we need to do to reduce our impacts. We frequently do not see

multiple mitigation alternatives evaluated and gone through the CEICA process. Okay, so please recognize that when you're working on a project, you can't pick one mitigation action and go with it, okay.

You need to look at a range of mitigation options. Understand the benefits and the economic costs with those and crank them through the CEICA. You have to do that because headquarters is going to be looking for it, okay. Also when we're dealing with mitigation especially for wetlands okay, please do not use ratios when you're trying to determine your amount of mitigation that you need.

Our mitigation needs must be habitat based. Do you use ratios. Okay, we still see that frequently coming through with projects. You want to make sure your success for criteria are clearly stated. That's often a weakness that we see. Another thing is a failure to coordinate the models that we're using with the eco PCX, okay. So when we're using models to access our impacts and project out the effectiveness of our mitigation take those models and run it through the PCX just to verify what we need in terms of model certification.

Those folks will work with you. They'll help you as best they can. But we need to make sure that we're meeting the requirements for model certification when we work through our mitigation planning. And then lastly, I see a number of reports come through that reference 33 CFR 325 and 332 as our mitigation policy for civil works projects. And again, that CFR is specific to our regulatory program. It's really good to be familiar with it. There's a lot of similarities between that and our mitigation requirements. But that is not the policy that directs us for civil work projects on implementing mitigation, okay. That's going to be the planning guidance notebook. And more recently, Section 2036 of WRDA 2007. So make sure that you're referencing that policy to direct your mitigation needs and your mitigation planning and not

necessarily or not I should say 33 CFR 325 and 332. Again, it's good to be familiar with it. But recognize that we're - that we are bound to follow the guidelines of the planning guidance notebook and WRDA 2007.

Okay with that, I want to jump into eventually a case study example of mitigation planning. But I wanted to take a few minutes here to break. I want to see if folks have any questions. If you want to ask questions now, that's fine. If you want to hold until the end, that's fine too. But I wanted just to take a moment here to ask questions if folks have them. And get some discussion going.

Courtney Chambers: Great, thanks Elliott. That sounds like a good idea. If anybody has questions, be sure to take your phone off of mute so that we can hear you. Or utilize the chat feature. And again, if you don't mind, send that message to everyone so we can all see the question.

(Cindy Barker): Hello. This is (Cindy Barker) over at POD. Elliott, I was wondering if you could talk a little a bit about how you see some of the mitigation alternative analysis being adjusted under smart planning and trying to be quicker, better, faster.

(Elliott): See that's a great question and headquarters asked that as well. I was kind of scratching my head when they asked it. I think the short answer is Yes, we still need to go through all the steps that that we usually do but yes, we need to do it quicker, faster and more streamlined.

Probably what we need to do is work through the same type of steps but try to rely more on existing information, more on professional judgment and whatnot to weed through the list of alternatives.

You know, I'm thinking back through the smart planning process and different milestones. Certainly we still have trouble with the range of alternatives, narrow that down and come up with essentially your TSP for mitigational alternatives. What you're probably going to need to do is base that more on existing information and professional judgment and perhaps what you even need to do is if you run into a snag where there's some uncertainty that caused your judgment what we could actually do is even include that right in the risk registry.

Describe the issue that we're struggling with, we decided to go in this direction for these reasons and then include those as part of your vertical team review. If people have a problem with it at that point it could warrant more detailed evaluation or more time to assess your particular mitigation needs.

But I think what we need to do is follow the same requirements that we have but recognize we probably have more flexibility in terms of using professional judgment, existing information as best we can to try to streamline that process and get that list down from three or four or five or however many alternatives you're looking at down to the one mitigation option that you're ultimately going to select. Then you can do that more detailed evaluation of the one mitigational alternative that you ultimately choose for your mitigation plan.

(Chamine Jackels): This is (Chamine Jackels) from the Seattle district. I have a question. So if you have a large general investigation that's looking at a number of alternatives do you have to come up with mitigation plans and monitoring plans for each alternative and then look at different mitigation alternatives within each alternative? Or do you just do that for the tentative plan or the preferred alternative?

(Elliott): Okay, you would need to develop mitigation plans for each alternative that you're going to analyze because you have to generate cost for that. But again, what you could do is whether you're following smart planning or the traditional planning approach probably influences the amount the level that you put into evaluating that range of mitigation alternatives.

But the short answer is yes. You need to identify the mitigation needs for each alternative because there's a cost associated with that and monitoring needs that are associated with that and that gets plugged into each individual alternative that you're looking at. And if you had a specific example we could certainly discuss it off line if you want to but the short answer is yes, you need to include mitigation planning for each alternative that you're looking at within your study.

And then again, looking at it from a smart planning perspective once you identify that one mitigation alternative that's most preferred, your basically your TSP of your mitigation alternatives then you could do more detailed planning of that specific mitigation alternative defined to design the cost, the monitoring, so on and so forth.

(Sean Michaels): This is (Sean Michaels) from the New Orleans district. I hope I can ask this question correctly. When we do our feasibility studies and whatnot we have a period of analysis so we can come up with our costs and things like that. When the local sponsor takes over the project they take over the O&M in perpetuity or as long as the project is authorized or functions.

With mitigation - I know we have to consider mitigation banks - but mitigation banks don't always list in perpetuity, they have a certain - some of them down here on the coast are wetlands or marshlands for 20 years and some are different periods that they arrange with fish and wildlife service and

EPA. So is the local sponsor, are they supposed to maintain the mitigation feature in perpetuity with the project or if they go to a mitigation bank -- I mean what I like a mitigation bank is we just write a check and walk away essentially.

(Elliott): That's a really good question and I can't say that I bumped into that specifically but we would have an obligation to mitigate for those impacts as long as the project is creating those impacts. So if you have a project that's going to go into perpetuity and those impacts continue year after year after year you'd want to have mitigation in place that is working effectively to remove that impact.

If for some reason you have a wetland bank - you'll have to forgive me because I'm not real familiar with wetland banks - but if you have a bank for whatever reason is only good for 20 years then I think you would have to in some way account for the fact that you're going to have additional time after that bank goes away where that impact could resurface.

You probably need - I'm just thinking out loud here - but you'll probably need to factor that into your overall analysis of mitigational alternatives. One option may be that, hey look we can mitigate for this impact for the first 20 years but after that the potential benefits go away as the mitigation bank does and therefore your benefits stop. And all of a sudden you might only have benefits through about the first half of your planning horizon or as alternatives would have benefits theoretically throughout the entire 50-year-period.

So just thinking out loud here I think we would have to mitigate for our impacts as long as they're present and if you have mitigation bank that's going to go away after some period of time you're going to have to account for that within your analysis. And if you do still go with the mitigation bank I would

think you're going to have to implement something after that 20-year-period if those impacts are continuing into the future.

(Sean Michaels): Okay. Well just to let you know what happens here is our marsh is most of it is going away and I'm trying to remember the big hurricane project down here that we're trying to mitigate for. The idea I think with the wetland banks, the coastal wetland banks is that over time they would degrade anyway so you just replace the benefits over that time. What would remain at the end of your planning horizon. If that makes it any sense.

(Elliott): Sure.

Courtney Chambers: Hey, (Elliott) we've got several questions over here in the chat feature if you want to jump in and try to address those. From the Pittsburgh district they mentioned that monitoring can be expensive, are monitoring costs necessarily part of the mitigation incremental cost analysis?

(Elliott): Yes, they're included as part of your averaging of cost. So you have to factor those monitoring costs in as part of the mitigation cost and part of your overall project cost as well.

Courtney Chambers: Okay great. The next from (Tim Lewis). He wanted to know what level of quality assurance and quality control is getting imposed on project monitoring.

(Elliott): That's a good question. That probably is open to your agency team. I'm not sure if I have a very specific answer to that. I can only tell you what I have done myself. This doesn't necessarily apply to mitigation but certainly to some of our baseline monitoring for some of our impact areas.

We give agencies the ability to participate in that process, to go over the protocols we're going to use, the field techniques we're going use and we really include them as part of the process for planning, monitoring activities and actually being able to be onsite when monitoring is occurring to verify that we're doing it correctly.

The short answer is I'm not sure we have specific QA, QC protocols we have to follow but certainly what you would want to do is work collaboratively with the interagency team to come up with a way that everyone is comfortable with that the work that you're doing is being done adequately to answer the questions that you need to answer.

Courtney Chambers: All right, thank you. Then again from Pittsburgh, what are the land acquisition policies related to mitigation?

(Elliott): Good question. I'd have to look back to see specifically what our real estate requirements are. I think the general gist is we try not to go down the road of condemnation for mitigation needs but I can't say that's an absolute rule. You certainly would want to talk to the folks from your real estate people on your PDT to verify what you need in terms of outright acquisition versus what you can do versus an easement.

I know, I think the preference is to have it in ownership because obviously that makes the easiest not just for construction but then doing post-project surveys to verify that your mitigation is working and also do post-project monitoring. But I don't believe that's a requirement. Obviously you would need to have an easement of some kind at the minimum so you can get on the site for inspections to do monitoring and that type of activity.

But I want to check first with real estate to verify if there's a specific requirement there for purchase versus easement when we're not only building the project but then doing our subsequent follow-up monitoring in the future.

Courtney Chambers: All right, thank you. From (Leigh Skaggs), he had two questions here. We frequently see resource agencies expecting ratios to meet mitigation objectives. What do you think is that basis for this expectation?

(Elliott): I would assume it's because of our regulatory background and the fact that ratios are still used so heavily as a part of regulatory process and understandably so people see us as the Corps of Engineers and yet we have the regulatory side that does one thing and then the planning side, the civil works side that does something different.

I can only speak from experience it is an area of rub, an area of contention. People wondering why the heck wouldn't you use the ratio you require the public to do that, you're doing in these other places. But the bottom line is we have to work with those folks to get them to understand that we have to follow our policy which requires it to be habitat-based and requires us to figure out what is the quality or function of this particular habitat. And now let's do what we need to, to replace that to a level that is the same as what we're impacting without using ratios.

Courtney Chambers: Okay, and the second part of his question which we should probably conclude with until you get to finish your presentation.

He wanted to know if you could speak quickly to the different types or categories of mitigation such as the difference between mitigation for fish and wildlife resources versus endangered species impacts.

(Elliott): Oh boy. I guess I'd want to know a little more detail about what you're looking for there, (Leigh).

(Leigh S.): Thanks, (Elliott). I appreciate your great response on the first one. That's an issue that we deal with a lot, and it is that education process. But sort of in a related fashion we have sort of this different expectations based on the kind of resource. So again, and since some of this may be my limited background but we kind of have to go through this education process where we say what we need to do, we have impacts to different kinds of resources.

In some cases we go through, we show the range of all mitigational alternatives and go through CICA and say we have to justify it based on again as you were saying functions impacted and the costs of the different alternatives to compensate for that. But in other cases where it's sort of like it's a hard and fast like they're more intransigent in terms of what they will allow because of the threat of jeopardy opinion or something like that when it comes to taking endangered species.

And so we just anyway it sort of seems like we have different kinds of mitigation analyses and we sort of work through it I guess a little bit kind of ad hoc or something and I was just -- I think so far what you've outlined is a terrific protocol for how to do mitigation and I was just hoping that we had some other examples like, oh, this is what we do when it comes to a special category of impacts that we have to compensate for.

(Elliott): Yes, I'm following you more now. Certainly for our wetlands' impacts we've got a little more specificity in what we have to do. Some require a little more specificity as to having it to be in kind of mitigation for wetlands we want knowing that loss. Beyond that it kind of gets into an, I would think, a case by case basis. I mean certainly for T&E species, at that point if you have impact

on T&E species you're almost certainly into a consultation process and then you're going to have a very detailed back and forth of what you have to do either to modify your project or you come up with a reasonable and prudent alternative that both the Corps and either the fish and wildlife service or (unintelligible) can agree to.

I'm thinking that in some cases there's more specificity there for wetlands and (unintelligible) as far as what we need to do. Otherwise, it's probably more on a case by case basis for what needs to be done to drop an impact down to a level that's acceptable to folks. Maybe in the future a little more specificity in our policy would be good but as of right now I think we've got a little more flexibility which can also be good too to verifying what really the impact is and the amount of mitigation that we need.

(Leigh S.): Great. Thanks so much. We'll follow up with more examples in the future I guess.

(Elliott): Sure.

Courtney Chambers: All right (Elliott) if you would like to go ahead and proceed into your case study that would be great.

(Elliott): Okay and I will move as quickly as I can to get this done to leave us a little bit of time at the end for questions.

Okay. We have a big flood project here in St. Paul district. It is on the Red River of the North, which is the border between eastern North Dakota and western Minnesota. It is going to benefit not only Fargo, North Dakota but also Moorhead, Minnesota. We are looking at this project to reduce flood damages and we've gone through our entire plan formulation process. What

we determined was the most feasible option was a diversion channel to divert waters around the city.

It's great for moving flood waters but when you put a control structure into the river - which we would need to do - it has the potential to impact fish movements, fish migration and fish passage. That alone is a concern. On the Red River of the North where we're doing this the federal government and the Corps of Engineers has implemented, I believe five different projects to improve fish passage.

So now we're also impacting a river where we spent a lot of money to try to improve conditions through our 206 program to benefit fish passage. So we've got a project that could potentially undermine some of those previous efforts.

Again, we have a diversion channel, we have a big control structure that we need to put into the river so we worked through our mitigation process. Number one, can we avoid the impact? Unfortunately based on the plan formulation and everything that we've done we can't avoid it. We have to put a control structure in the river. So we can't avoid. Can we minimize the impact? Absolutely. There's a couple of things we've done. For one, we've put wider gates on our control structure and you see kind of a schematic there on the right side for that. By putting wider gates on it assures that we have low velocities through the control structure and fish will be able to migrate through freely whenever the project is not operating. What we also have done is incorporate a series of flood walls and low level levees inside of town, inside of the area we are protecting.

Now you may be wondering why the heck are you doing that if you're building a big diversion channel. Well by doing this we can operate the flood project less frequently. So the flood project operating at say a three-year flood

event can now operate at a ten-year flood event. So what we've done is we've reduced the amount of time that the project would operate and thus reducing the overall impact that could happen to fish passage as a result of the project. And again, all these different features are included as a part of our project costs for different alternatives.

So we've avoided and we've done a whole lot to minimize. Do we still have to do initial mitigation? Well what we identified at EIRS is that based on input from all of our agency partners there was a potentially significant impact remaining to fish passage.

I know myself I was not 100% sold on it but when we worked collaboratively with our agency partners there was still a fair amount of concern that existed that especially for some large bodied fish like lake sturgeon that only spawn once every several years it was important to have fish passage during those key migration periods if at all possible.

So due to the uncertainty with the level of impact and the concern from our agency partners we decided to go ahead and pursue additional fish passage as a way of reducing that last increment of impact. So we have to establish some mitigation objectives. Basically we're going to provide improved fish passage to offset remaining potentially significant impacts. And the mitigation needs to replace a similar level of common activity lost by the project.

So what did we do? We looked at a whole range of alternatives and what we basically looked at is several dams that we could implement fish passage at. And we looked at them throughout the watershed and considered each dam as it's own separate alternative. We then went through a process to estimate the cost and the benefits of putting fish passage in at several dams. I actually have them listed up there in that table on the right hand side.

We looked at a number of different locations. We assumed a rock rapids style fish-way. I've got some pictures somewhere in my presentation here but that's basically a series of rapids that goes from the top of the dam down to the bottom.

I should note that most of these in fact all of these are low head dams. They're typically ten feet high or less. So we have lots of examples we can draw from. We could use existing information to approximate what those costs would be for construction and then we looked at the benefits of fish passage at each of those sites based on the best available information. We cranked that to our CE and ICA and we get the figure that you see in the lower right hand side, which is one dam that ended up being far and away the best overall option for mitigation.

The reason why you see Drayton Dam as a best buy so far over to the right away from everything else is that dam is at the very bottom of the watershed. It is the last dam on the main stem of the Red River that does not have fish passage. So what happens is it captures all the benefits from further up in the water shed and so you get a location with a supreme amount of benefit for the overall cost which is why you see that flow on over so far on the right side.

And by looking at Drayton Dam and selecting that one as our mitigational alternative, we've got an option on not only the same watershed but it's on the same river where the impact is going to occur. It clearly was our most cost effective option for accomplishing our mitigation.

So did we meet our requirements? Specific mitigation objectives? We identified those during the planning process. Specific metrics or criteria? I haven't touched on those here. It is very difficult for fish passage because fish

passage is kind of a squishy thing but we are confident and we've been able to quantify that we have restored the level of connectivity in this case actually above and beyond the impact we have as a result of the project now.

I mentioned earlier we don't want to try to over-mitigate and spend too much money but in the case of fish passage - at least the one's we looked at as sort of an all or nothing proposition - and so what you have is a huge amount of benefits that in this case far and away exceed what we have in terms of our impacts from our projects. I think we can faithfully do that again because it's sort of an all or nothing proposition and the cost of Drayton Dam was in line with all the other alternatives that we looked at.

Location. Our mitigations on the same river where the impact is occurring so that's good. We are restoring a same or again more habitat function that is impaired.

For a monitoring plan we have developed a monitoring plan for evaluating effectiveness and I'll touch on that here in just a second. And lastly, we've got a description of the real estate needs which for this project is relatively easy. It's basically the dam and the land immediately adjacent around that that will allow for construction and post-product monitoring needs.

And here is our adaptive process with mitigation and monitoring. Our monitoring for fish passage is likely going to include a telemetry study over multiple years at Drayton Dam and also within our overall project area to verify what the impacts are from our project.

We've got a rough cost estimate of $2 million included. Responsible parties include USACE and our project sponsorship. Our metrics to measure success are still being fleshed out but likely are going to include some type of

percentage of fish that were able to effectively pass with our rock rapids fish-way. To my knowledge this is still sort of an evolving thing where there hasn't been a lot of detailed evaluation on the effectiveness of rock rapid structures.

We're pretty confident they work well but to know whether or not we need to pass 60% or 80% or some percentage of fish that accumulate in the tail water, those specific numbers haven't been nailed down and so we're actually trying to do that as a part of our project.

We're going to evaluate the results of our monitoring, collaboratively as an agency team and then lastly for some reason we're not passing as many fish as we hoped, our next step is probably to modify the rock rapids for itself.

For example one of the things you can do is try to make the rock rapids longer, flatten the slope out and reduce your velocities and make it easier for fish to migrate upstream. So our contingency plan is to manipulate the rock rapids fish-way to make it more conducive for fish migration if in fact we do our monitoring and find that it's not as effectively as we had hoped.

Okay that was a whirlwind example but it was an example of planning for mitigation put to work. I guess with that, I will certainly take questions either on the case study we just did or overall on the entire presentation for mitigation planning.

Courtney Chambers: Great. Thank you (Elliott). Right quick, there were a few regarding that example that were mentioned here in the chat feature. I think one of them was sent to me from (Barbara Cisneros). She wanted to know what methodology was used to estimate habitat benefits for the mitigation alternatives.

(Elliott): Is this specific for fish passage?

Courtney Chambers: For the CEICA.

(Elliott): Well what we did in our case study is we had available to us some IBI scores for assessing stream health and stream quality throughout the watershed. So we had a huge benefit in that we had an estimate of overall stream health both below and above several of the dams that we looked at.

We were able to work with PCX to come up with an acceptable way of applying that IBI score to the habitat area that we had to really generate our habitat units. So in this particular case we were able to come up with a way of estimating habitat quality and thus habitat benefits for each of the dams that we considered for fish passage.

Courtney Chambers: Great, okay. There is another in the chat feature here while everyone else is maybe getting their thoughts together. This is from (Chamine).

There are some impacts that cannot be mitigated for. Can an alternative be eliminated based on inability to mitigate for its impacts?

(Elliott): Yes, if there is another practicable solution, if there is another solution that you can use that has a more acceptable level of impact and meets all of your project needs that would probably be the desired direction to go.

However it is possible where you may be forced into a situation where you have to select an alternative plan that does have mitigates that cannot be mitigated for. Or there are tradeoffs involved you can't fully match the mitigation. That can certainly happen. It doesn't mean we are forced to abandon that particular alternative but obviously we need to be very thorough in our documentation in explaining why we have selected the least

environmentally damaging possible alternative and disclosing that through our process and our 401 report process.

So it doesn't mean that we are forced to look for alternatives where there are no impacts or there are less impacts but we need to be very thorough if we do get to a point where there are impacts that are significant, that are not mitigable for with our projects.

Courtney Chambers: All right, thank you. At this time if anybody has any questions in the audience and they would like to ask them be sure to take your phone off of mute first. Thanks.

(Chamine Jackels): I'll ask another question. This is (Chamine) from the Seattle district.

So if you have different alternatives that would use different models because the impacts are different do you have to get all of those approved for through the Eco PCX? Or again, would you just have the one model approved that's associated with your TSP?

(Elliott): If you're using the models to make planning decisions then yes you have to have them approved through the Eco PCX.

Now you can use models that are already approved for national or local use but again it's always good to identify the models you're going to use and run that by the PCX just to verify that you're following all the modeling requirements for planning.

Courtney Chambers: All right, any other questions? People must have squeezed them in in that intermission session I guess, (Elliott).

(Elliott): Either that or I killed them with death by PowerPoint.

Courtney Chambers: Oh I don't know, I think you kept it pretty interesting I think. It seemed to be a very applicable topic for everyone.

(Betty Peak): This is (Betty Peak) from Omaha district. We did the ATR and are continuing to do the ATR for the design documents for Fargo/Moorhead.

I heartily recommend if you're interested in trying to figure out a good design for a fish passageway to look at the methodology that was used for Fargo/Moorhead and the design of their fish-way. We were very impressed with it here in the Omaha district when we did the review.

(Elliott): Thank you.

(Betty Peak): I am the economics and recreation reviewer but I also have a Bachelor's and Master's in biology and the biologist was equally impressed with the designs.

(Elliott): Cool. Thank you. And certainly I would offer to folks if you guys have any questions at any point not just later today but down the road don't hesitate to pick up the phone and give me a call.

I'll help you as best I can and again sometimes when you're dealing with the issue of significance and whether or not you've done enough for mitigation it's not always black and white. So if you have any questions either on the policy side or the example side don't be afraid to give me a call and I'll help you out as best I can.

Courtney Chambers: All right, thank you very much (Elliott). Also everyone if you'll notice in the lower right hand corner I posted the link to the archives presentations

where this meeting as well as (Elliott)'s bio and the PowerPoint can be found if you need to reference it at a later date or would like to share the information with someone who was unable to attend today.

Okay if there are no other questions, if you do just please speak up and we'll be sure to get it. We've got a few more minutes here but I'll begin wrapping up.

(Elliott) thank you very much for taking your time and sharing your experience and your knowledge with us today. And participants thank you for joining us.

I hope you will be able to join us for our next meeting. It's currently scheduled for Tuesday, May 21 and the topic is going to be environmental flows by (Kyle McKay). He works here at ERDC in the environmental laboratory.

And also if you would just take a few more minutes if you called in as a group and let me know how many of you participated today from each of your districts. I would greatly appreciate it. Again, thanks (Elliott) and I hope you all have a wonderful day.

END