DOTS WEBINAR: FISCHER
Moderator: Courtney Chambers
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Courtney Chambers: At this time I'd like to introduce today's speaker who's going to share Modeling and Conservation Planning, the Corps of Engineer's Contribution to the Recovery of the Interior Least Tern.

Dr. Richard Fischer is a research wildlife biologist in the Environmental Laboratory at the U.S. Army Engineer Research and Development Center. He has served as the president of the National Military Fish & Wildlife Association and is currently the Environmental Laboratory's wildlife team leader, the program coordinator for the Department of Defense Bird Conservation Program and lead for the ERDC Threatened and Endangered Species Team. Rich's expertise and research interests include avian ecology and management on Department of Defense lands, riparian zone ecology, restoration and management on military installations and civil works projects and development of modeling and management approaches for threatened endangered species.

More about Dr. Fischer can be found in his bio posted with the presentation and recording of today's meeting once again on the DOTS Web page for your reference or to share with colleagues who are unable to attend our live meeting today. We're very happy to have you sharing with us today, Rich. At this time I'm going to give you the presenter rights. We'll enter listen-only mode and then you can begin.

Recording: All participants are now in listen-only mode.

Dr. Richard Fischer: All right well thanks for the introduction Courtney and welcome everybody. What a pleasure it is to be able to talk this afternoon and share a story that's really been over a decade in the making.

And Courtney read my title. I've got a little subtitle there that I think if I could title the whole presentation differently I would say it's how the Corps of Engineers' R&D program is providing science support and using inter-agency cooperation as well as cooperation with an NGO to work towards the delisting of the interior population of least terns. And that's primarily what I'm going to be talking about today.

Just to give you an overview, I will start with giving you a history lesson going back to 2003 and some of our initial work with American Bird Conservancy - I'll refer to them as ABC - and also talk about some of the work that we've done with the Fish & Wildlife Service, all in collaboration to recover this endangered species.

And then I also want to provide an overview of Section 7(a)(1) of the Endangered Species Act, something that we're really focusing in on now within the Corps of Engineers. And I want to talk about how we use the power of the act under that section to help achieve recovery.

So our focal species is least tern. And just a little bit about their biology and ecology, least terns are colonial, meaning that they nest in colonies of varying sizes. They eat forage fish and they nest on bare ground in a variety of open habitats on rivers and along coasts, primarily on bare sand substrates found on sandbars, river islands and beaches along the coast although they will nest on a variety of other types of substrates.

In terms of least tern populations in North America, there are three populations, two of which are federally listed under the Endangered Species Act. The first population is the California least tern which includes the population that occurs in Southern California and Western Mexico.

The interior population which is found along interior rivers also listed as endangered. And then the Atlantic Coast population which is not federally listed and includes birds along both the Atlantic Coast, Gulf Coast, and within the Caribbean.

In terms of numbers, there's about 14,000 California least terns, nearly 18,000 interior least terns, and about 54,000 Atlantic Coast population least terns.

So what is an interior least tern? The population of least terns that nest on large rivers in North America are those that are known as the interior least tern. And the biological definition of least tern -- as the Fish & Wildlife Service puts it -- is any least tern nesting more than 50 miles from the Gulf Coast and on interior rivers.

In terms of their ecology, they can be pretty long lived. Some have been documented living over 20 years. They're a highly mobile species, migrating to and from breeding habitats in North America to their wintering grounds in Central and perhaps South America. And they're highly adaptable and they really have to be because of changing river conditions from year to year.

Some years have very favorable conditions and they may go a couple of years with flooded habitat conditions. So they have to be adaptable and they have to be mobile and able to move around to find suitable nesting habitats if it's available.

So interior least terns nest on large rivers, primarily in the Northern and Southern Great Plains and the lower Mississippi River Valley. And there are eight rivers with populations of least terns that exceed 500 adults, either Mississippi, Red, Arkansas rivers and variety of rivers in the Northern and Southern Great Plains.

And by far the lower Mississippi River has the majority of interior least tern breeding populations. So what is the problem? These are things that we've identified over the last decade and certainly the concerns with conflicts with federally listed species and the Corps of Engineers have been going on for more than forty years now since the inception of the Endangered Species Act in 1973.

And the least terns occur within five Corps of Engineers divisions in 11 districts. And because they co-exist on rivers with navigation and large engineering projects they often conflict with our mission areas.

The Corps of Engineers cost to monitor and manage habitats and to comply with biological opinions hovers somewhere around the $8 to $10 million cost per year. So they are among probably the top five or six species within the Corps that we spend the bulk of our native species funds on.

There has also been no formal recovery team in place since the recovery plan was - or since the species was listed in '85 and the recovery plan was written in 1990 there's been no formal recovery team to address some of the recovery goals.

And recovery really can't be secured without doing a thorough evaluation of the population consequences of all the different types of threats that are out there for interior least terns such as flooding, predation and various types of

human disturbance, particularly under alternative management strategies that might be available.

So I want to start by giving you the current status of our work. And I'm going to - even though it's a history lesson per se, I want to start with the current date and give you an idea of where things stand with the tern. And then I'll go back in history and talk about how we got here.

We're at this point on the brink of a Fish & Wildlife Service petition to delist the interior population. And based on everything that we hear and the work that we've done, that petition to develop a final - or to develop a rule rather - for delisting does appear to be imminent.

If the Service is successful in removing ESA protection from the species then it no longer will be listed as a federally endangered species. The consequences of that are it eliminates Section 7(a)(2) which is formal consultations between the Corps and the service and a large percentage of the cost associated with compliance with biological opinion.

We will have safeguards that will remain in place through Section 7(a)(1) of the Endangered Species Act which I'll talk about later as well as a post-delisting monitoring plan that will be in place to ensure that population does not move towards extinction by any means.

And finally the least tern if delisted would still receive federal protection under the Migratory Bird Treaty Act.

So let me go back in history now, back 13 years ago to 2003 when I and my team were starting in the DOER Program and addressing conflicts between coastal engineering projects and a wide variety of shoreline dependent birds.

And our work was primarily focused on identifying potential conflicts and looking for solutions to these problems.

And when we got started we quickly realized that there were many coastal engineering projects - beach nourishment and sand mining and river outlets and so forth - that were really experiencing a lot of project delays, narrowed environmental windows, etcetera, because of many bird issues.

So since 2003 the EDRC EL has partnered through contract with American Bird Conservancy to investigate the effects of Corps activities on high priority birds.

And it was through the foresight of Mr. Joe Wilson in headquarters Corps of Engineers that we entered into discussions with the president of ABC, Mr. George Fenwick to see if ABC would be interested in working with ERDC as a neutral third party to assist us and to help identify where our engineering projects could potentially be modified or enhanced to incorporate bird conservation objectives.

So we began our work in 2003 with Dr. David Pashley and Casey Lott, and both of these guys were really instrumental in bringing together priority bird conservation objectives and issues with our coastal engineering community within the Corps of Engineers.

And so our work initially focused on coastal birds and identifying and solving conflicts between shoreline engineering and some of these high priority shoreline dependent birds.

I just have to give a good plug to Casey. Casey has been working with me as a contractor since 2004 and really has been the main driver in our capability to

identify issues, to help assist in leading workshops, building two population models, and publishing really an extensive array of technical reports, technical notes, and journal articles. And I'll highlight some of those here shortly.

So in essence our collaboration with American Bird Conservancy and Casey has been a major factor in our success with both coastal birds and with the interior population of least terns. So Casey if you're listening, thank you.

So during the coastal bird area - or the bird era of our work - from 2003 to about 2006 we facilitated three regional workshops along the South Atlantic Coast, the Gulf Coast and the North Atlantic Coast resulting in two technical reports that really describe a lot of the work that was done in bringing together the engineering and the bird conservation community.

ERDC and ABC also hosted a workshop on Gulf Coast snowy plover conservation. And we had a report published on that effort.

And then from 2007 to 2009 the Corps provided ABC funding to look more closely at the effects of beach nourishment and coastal dredging on the distribution of a variety of bird species like plovers, terns, and skimmers in Florida.

And that work resulted in the creation of a GIS that in great detail illustrates the distribution of birds relative to the distribution of coastal engineering projects. And that was a highly useful document for some of the work done by the South Atlantic Division in terms of working with the Service on biological opinions.

And then we produced really a plethora of other publications that were more (unintelligible) scoped and focused on the effects of engineering on shoreline

dependent birds, birds during fall migration, and some work with Audubon and (unintelligible) bird observatory on developing specific techniques.

So in 2005, we realized that there was a great opportunity perhaps to work on conservation of the interior population of least terns, so we really turned our focus towards the interior population and put all of our efforts toward that species.

And initially that effort focused on coordinating monitoring efforts for least terns across 11 districts, 4 or 5 divisions, 19 states, 4 Fish & Wildlife Service regions, really involving a lot of folks. And the highlights of this era between 2005 and 2007 were two range-wide monitoring workshops, the first range-wide survey of delisted populations and the creation of a fairly extensive database to handle all of the data associated with the monitoring.

Let me mention a few things now about the recovery plan and recovery status of the least terns. When the tern was listed in 1985 it was thought that there were only just shy of 2000 adults distributed throughout the breeding range. And specific recovery goals and objectives were identified in the 1990 recovery plan in order to recover and delist the tern.

These included habitat protection, establishing management plans, increasing range-wide population to about 7000 individuals and maintaining that population for ten years. And as you can see in the lower right hand part of the screen there, there were also drainage specific targets that were established in the recovery plan for the major rivers that had least terns.

So this is the data showing the distribution of known colonies going way back to the 1950s which at the time was the result of some very incomplete surveys throughout the breeding range. So what, 60-some-odd years ago, terns were

being surveyed but it wasn't known - or all of their breeding locations were not known.

So numbers of terns that were reported, some of these historic efforts, were probably significantly lower than what they actually were. This is the abundance in distribution when the tern was listed in 1985. And again it was an incomplete snapshot of the entire breeding range but was based on the best available information at the time.

In order to really get a handle on what the actual population side was during breeding season and what the distribution of birds were during the breeding season, the ERDC (unintelligible) American Bird Conservancy and Casey was conducting an extensive and coordinated range-wide inventory throughout the entire known breeding range of the interior least tern.

In the last two weeks of June and the first week of July in 2005, Casey was able to rally over 140 different participants from state agencies, federal agencies, NGOs and others to participate and contribute to the first ever complete range-wide survey of least terns - interior least terns.

And the primary objectives of the survey were to provide a minimum count of the number of adult interior least terns occurring in North America during the breeding season, document their distribution and the distribution of nesting colonies and to describe the types of habitats that are being used for nesting.

Just to give you a few numbers of what was involved, survey crews during that three-week period covered nearly 5000 river miles. They surveyed 22 reservoirs, 62 sand pits, 12 industrial sites, 2 rooftop colonies, and about 16,000 acres of salt flats. Pretty extensive and amazing effort to inventory that much habitat.

As a result of that effort, grand total of terns, adult terns in the population, was 17,591 - I'm sorry, 17,859. And you can see there in red how the distribution of terns was - or how the numbers were distributed among the major river drainages relative to the target within the recovery plan.

For the specific drainage targets you can really see that the counts were either very near or in some cases greatly exceeded the recovery targets listed in the plan, particularly for the lower Mississippi River, but really a four-fold larger number than what the recovery plan target was.

So from the monitoring data and what little is known about least tern disposal based on limited mark recapture data, we were able to identify 16 discreet breeding populations and 47 subpopulations throughout the range. The four main populations that you see there highlighted in bold on the map accounted for nearly 98% of all adults.

So back to history here, from 2007 till 2010 we spent an extensive amount of time investigating threats and improving our understanding of tern ecology. This included investigations of sandbar nesting habitat relative to vegetation succession and hydrology, the first of which has significant influence on the ability of terns to find suitable habitat, and hydrology which drives habitat creation, habitat maintenance and certainly influences nests during high water, during flooding.

We also worked to develop an individual based model or an IBM of least tern reproduction. Talk more about that in a minute.

So several publications resulted from this work, primarily through work that Casey Lott had with the Tulsa District and supplemented with funding from the Corps of Engineers DOER Program.

The third publication that you see listed there focused on range-wide availability of habitat and essentially showed that habitat availability during the - what we call the post-regulation era or after band construction. Habitat availability does not limit tern populations, and this has been a real significant finding as we move forward towards a more intensive meta- populations model effort on a range-wide scale, again which I'll talk about more in a minute.

So this IBM is called tern colony and this is a Web-based model. It's online and available for users to explore different habitat and different management scenarios.

The model simulates reproduction of all individuals within a virtual least tern breeding population on large rivers below multi-purpose dams. Breeding seasons are simulated and daily time steps and model users can specify different habitat input, representing a range of nesting habitat conditions from excellent to bare to degraded as well as the ability to add restoration sites like sandbars to simulations to understand how different scenarios of habitat creation might affect regional reproduction.

And this model has really been instrumental in assisting with our capabilities to develop a more extensive range-wide metapopulational model that I'll talk about in a few minutes.

These are the publications that came out of tern colonies, very extensive written documentation on how the model was developed, how inputs were

prepared for different model applications. And then there's a very extensive model description.

Two thousand eleven was a real turning point in our work. And I like to call this the Paul Hartfield era. In 2011 the recovery lead for the least tern was transferred to Region 4 in the Southeast and that included the responsibility for completing the five-year status review which is required for all federally listed species. And that job went to Mr. Paul Hartfield in the Jackson, Mississippi field office.

Paul's a biologist with the Service and really has extensive knowledge of river systems and the organisms that inhabit those river systems. So Paul immediately became a part of our team and essentially was the driver moving forward with our work towards recovery of the interior population.

In 2012 we assembled most of the interior least tern expertise from agencies, universities, NGOs, etcetera, at a workshop in Alton, Illinois. And our goal was to bring all this expertise together to do a comprehensive review of the current status of least terns to review issues and options available to meet recovery goals and also certainly to promote least tern conservation.

And one key objective of the workshop was to identify knowledge gaps that are preventing us from moving forward with a potential delisting petition. And I know this slide's kind of wordy but the major outcomes of the workshop were many. But some of the key points are highlighted here.

And probably most importantly is Number 1, development of a range-wide metapopulational model so that we could really examine how terns basically operate in terms of reproduction with habitat and other types of disturbances on the population within a management context.

There was also a need to compile and summarize the entire plethora of monitoring data that were out there to give us a better idea of distribution throughout the range. That works out as a real turning point as well because it led to a lot of important information that fed into the five-year status review that Paul undertook in 2012, ’13, and ’14.

The five-year status review was published and that is available online. The three main recommendations that came out of the status reviews are extremely important because although - and I guess I didn’t mention the status review recommends delisting but there are three major action items that need to occur before the Service would consider a delisting petition.

The first of those is the metapopulational model. The second is development of conservation plan, what we call Section 7(a)(1) conservation plan to cover a majority of the range of the least tern, and finally to develop a cost effective post-delisting monitoring plan.

So in 2014 we really refocused our work to address pre-requirements of the five-year status review. We proposed to work with the Service to establish formal conservation management agreements, so 7(a)(1) plans with Corps of Engineers divisions to encompass at least 75% of the breeding range, second to develop the range-wide metapopulational model and third to complete the post-delisting monitoring plan.

But we really focused our efforts on those three recommendations. I’ll talk first about conservation planning. And I hope that many of you are aware now that Corps of Engineers has a program in place within ERDC to address the use of Section 7(a)(1) conservation planning for federally listed species recovery.

And I'd be glad to talk with any of you offline about that program. But really the genesis for this came out of recommendations from Paul Hartfield and it was through Paul's recommendations that we started to use the power of Section 7(a)(1) for tern recovery.

So just very briefly I'm sure all of you are familiar with Section 7 of the Endangered Species Act requires federal agencies to consult with the Service and utilize their authorities to recover endangered species. Section 7(a)(2) deals with basically formal consultation and ensuring that actions of the federal agencies are not likely to jeopardize the continued existence of those species.

Section 7(a)(1) is a relatively unknown and little used section of the act that addresses proactive conservation and recovery needs of listed species relative to our federal programs. And so this has really been the section of the act that we focused in on.

The Section 7(a)(1) allows the Corps to be proactive in our consultations with the Service rather than reactionary. There is the likelihood of reduced surprises and conflicts. Under 7(a)(1) we commit to doing the actions that we very likely would be predisposed to undertake anyway under 7(a)(2) and under a biological opinion often and reduce the likelihood of future 7(a)(2) complications and certainly has the opportunity to reduce jeopardy biological opinions.

And 7(a)(1) provides a much greater likelihood of species recovery rather than the 7(a)(2) route which is primarily designed just to maintain a baseline.

The use of 7(a)(1) for species recovery by the Corps dates back to actually 2001 when the Mississippi Valley Division initiated consultation with the Service in an attempt to use the power of proactive conservation and river management to transform the primary threats associated with channel engineering into the primary conservation tools for their recovery, so pretty neat stuff.

Three species were involved in this particular effort - the fat pocketbook mussel, pallid sturgeon, and of course the interior least tern. As an example of this kind of proactive forward-thinking conservation work, many of you are probably aware that dikes along the lower Mississippi River have been instrumental in creating nesting habitat for least terns.

So to promote better habitats for all three listed species, the Corps began putting notches in the dikes that alter hydrology and led to the formation of side channels that separated dike fields from the shore line. This type of dynamic feature within the river created favorable habitat for sturgeons, for mussels, and a host of other aquatic species.

But for our least terns, it also isolated tern habitat within the channel and reduced access to predators from the mainland. This low cost management tool really has been instrumental in promoting least tern populations on the lower Mississippi River.

All of this work culminated in a 7(a)(1) conservation plan for the division and the lower Mississippi River and it really provides a formal mechanism for the Corps to conserve habitat when funding is available.

It also greatly reduces the likelihood of any future jeopardy biological opinions on the three target species and it serves as a template and a guide for

development of future similar plans. And we're using the Mississippi plan as a template for 7(a)(1) plans in the other divisions for the least tern.

The Corps and the Fish & Wildlife Service both recently sent out memos to the field directing us to enter into these 7(a)(1) conservation management agreements to proactively conserve listed species and to develop 7(a)(1) conservation plans where feasible. So we have guidance from the Corps, from headquarters, as well as the Service as (unintelligible) and so the headquarters for both agencies is really promoting the use of 7(a)(1) species recovery.

Our next major undertaking and probably the biggest undertaking was the development of a range-wide metapopulational model. So Casey Lott along with Todd Swannack of ERDC EL have been the lead in developing the metapopulational model, basically to examine population persistence across the species geographic range to identify possible source populations and evaluate the effects of various management actions such as habitat creation, vegetation management, or predator control.

So this is really a synthesis and flow chart of the tern pop model that's in development right now basically showing - if you follow along from the upper left hand side - that the terns arrive on the breeding ground. They identify and evaluate potential nesting sites after arrival. And then they use site selection criteria to choose a nesting site.

They then attempt to breed and are either successful or experienced failures. And some terns die and some survive. And those that survive make decisions about site fidelity and whether to return to the same site the following year. There are very extensive model inputs based on a large amount of empirical data. And those boxes are on the outside of the flow chart there highlighted in red.

And then some pretty extensive behavior models are tested against patterns and empirical data. So the model allows users to explore a real wide range of management scenarios including predation, disturbance, flooding and habitat creation.

We very much look forward to having that model finished in the next month or two and being able to explore lots of different management scenarios, many of which were proposed by folks within the Corps of Engineers and districts and divisions that were interested in specific management scenarios.

And finally the last prong in the three-part recommendation from the five-year review was the development of a post-delisting monitoring plan. And we recently completed that plan through work with American Bird Conservancy and Dr. Jon Bart, a biostatistician formerly with USGS. And that plan is currently in final review and recommends standardized methods based on colony size, whether it's a large or a small colony.

The plan recommends surveying one third of the range-wide population every year rather than trying to survey everything every year, such that the entire population is surveyed every three years. And very importantly this design has nearly 100% power to detect long-term population declines. So we're working to have this published in the next year in a peer-reviewed journal.

So this brings up to current day, back to 2016. And this is basically our action plan for delisting. With a very robust metapopulational model supporting science from range-wide monitoring and the development of 7(a)(1) conservation plans within our Corps of Engineers division along with the peer-reviewed science contributions that we and others have provided, there's

a very tangible possibility that the Fish & Wildlife Service will delist the interior population of least terns.

So once the Service has all the products from our work this year, they can initiate a delisting rule for publishing in the Federal Register and we very much look forward to that.

Finally I'll just finish with a few bullet points here on benefits in terms of how this work has really benefitted the Corps as a whole. Return on investment, you know, certainly the Corps of Engineers and the DOER Program have invested several million dollars in our efforts. But we feel like the future return on investments will hopefully be in the tens if not hundreds of millions of dollars over the next couple of decades.

Secondly the potential to delist and support the mission, reducing cost of ESA compliance greatly enhances the Corps' ability to meet mission requirements, allows us to redirect dollars elsewhere where they could be put to better use.

Our modeling efforts allow the Corps and others to better understand the consequences of different types of management strategies on rivers and will provide the ability for users to look at those different types of management strategies and alternatives based on specific needs within drainages or within districts.

Our work also promotes adaptive management strategies that are measureable and not only that but will promote the persistence of the interior least tern populations or as the meta-populations.

And finally and very importantly our work will hopefully illustrate how Section 7(a)(1) of the Endangered Species Act can be a powerful tool to

recover federally listed species and certainly reduce the likelihood of non-jeopardy biological opinions when we see fewer remaining listed.

So with that, Courtney, I'll turn it back over to you. You can open up the lights and I'd be glad to take any questions. And my contact information is below there. Certainly feel free to give me a call or shoot me an e-mail if you have any questions or issues that we don't address on the call today. Thank you.

Courtney Chambers: Excellent. Thank you very much Rich. That really was a great story and just a lot of wins for everyone involved. Okay at this time I will open up the phone lines.

Recording: All participants are now in interactive talk mode.

Courtney Chambers: Okay so feel free to ask Rich a question. If you're more comfortable typing it, use the chat feature or make sure you unmute your phone line if you're going to speak.

(Rod): This is (Rod) from Portland. I had two questions if I might be able to do that.

Courtney Chambers: Yes please.

(Rod): Yes what a good presentation, Dr. Fischer. Thanks. First question is the stress on the population for the species, was it due to river regulation or more of an element of waterway improvement through engineering features?

Dr. Richard Fischer: That's a great question. So over the history of our work and others' work, some of the main stressors were things like predation, human disturbance, and impacts of hydrology on habitat.

One thing that I didn't mention was that Casey and some of his colleagues did an extensive analysis of habitat availability during the post-regulation era, so over the last several decades. And the main conclusion out of that was that habitat is not limiting for the interior population.

So in terms of operation of rivers by the Corps and operations of dams, it has very little impact or very little stress on the least tern population. And really the tern population is so resilient that it can withstand multiple years of flooding because they're so adaptable and so mobile.

So maybe I've kind of worked my way around your question but, you know, in terms of stressors there are many but because of the adaptability to terns, most of them really aren't that important. They may be on a drainage specific level but in terms of their importance on a range-wide scale, you know, the terns are doing quite well despite all of the threats and impacts that they have to them.

(Rod): Thanks.

Dr. Richard Fischer: Does that answer your question?

(Rod): It does. I think you addressed it. Then the focus on the element of dikes, you mentioned dikes and you put notches in dikes.

The question deals with are these dikes that are like spur groins or wing dams that you're putting holes in so that lateral flow can come along and dissipate accumulated sediments? Well whatever the case is, it would be good to have examples of desirable or beneficial morphology in terms of how it would be better to have - for this bird species as opposed to how it was before.

Dr. Richard Fischer: Yes absolutely, and I believe a lot of those dikes are bendway weirs and some of the other in-stream features. And I'm sure that Memphis District and Vicksburg District have some engineering specs for how those notches were created.

And if you can download the (MVD) 7(a)(1) conservation plan I think it will detail how those notches operate and what the benefits are to the listed species. So it's really been a win-win and they're very inexpensive to do. Engineers have figured out how to put those notches in the dikes without having any impacts on the verity of those structures. So yes it's been great.

Courtney Chambers: All right, any other questions for Rich? Rich I had a quick question. Regarding the three populations, I think I saw it as one of the needs for more monitoring perhaps. But are the populations very interactive or fluid? Do they mix up very much or are they pretty much - if they nested interior last year they'll come back to that same spot?

Dr. Richard Fischer: Yes great question Courtney. So the California population is for the most part isolated, probably not much movement from a year-to-year basis between California population and the interior and Atlantic Coast.

In terms of movement between the interior population and coastal populations, there is some. But the degree to the movements between those two populations is relatively unknown because there have been very few studies, you know, banding studies looking at dispersal and movements either within a year or between years. So we don't have a lot of good information relative to how much mixing there is.

But it certainly does happen and we just don't know to what degree it does. And it's a very expensive proposition to not only figure or determine what the movements are between the coast and the interior but also movement among drainages by breeders within and among breeding seasons.

Courtney Chambers: Just with the abundance of the Atlantic population, that would seem to be something that would be pretty interesting I guess if they were more fluid I guess.

Dr. Richard Fischer: Even though... I was just going to say even though there are, you know, a substantial number of Atlantic and Gulf Coast birds, they're still kind of in trouble. They're declining and it's primarily based on availability of bare sand for them to nest as well as a lot of the human disturbances.

Courtney Chambers: Okay, thanks.

Eric Summa: Hi there Dr. Fischer. I've got a question. This is Eric Summa from Jacksonville District. I understand from your presentation that you guys developed a population dynamics model. And from your presentation I gathered that that was a 7(a)(1) decision overall. Could you just confirm that?

And two, understand that you guys had a lot of support from the DOER Program. What advice do you have for folks that are out there in the field that are utilizing project dollars, O&M dollars, or construction dollars when they want to make a 7(a)(1) decision like helping the Service develop a population dynamics model when funds are limited to either the O&M program or the construction program?

Dr. Richard Fischer: Yes now good question. Model development is not cheap. We've spent, you know, a fair amount of money over several years to develop a model. And

it's not necessarily a 7(a)(1) activity, although you could put it under the 7(a)(1) umbrella. My recommendations to the field would be to come to me as a resource for or a test program which is designed to look at opportunities for 7(a)(1).

And I think what we have to offer is some tools that we're developing and building now that hopefully will provide an indication of kind of how important a particular species is relative to the Corps and you know our program and mission areas and perhaps what the likelihood is of gaining some traction under 7(a)(1) as opposed to kind of the status quo.

I would say nationwide, there are certainly species that we spend a lot of money on and are overall a big impact on our mission. But they're certainly species within districts, kind of on a localized scale that are having some impact as well.

So I think there are a lot of things to consider before you launch into a 7(a)(1) program that need to be considered and perhaps we could have that conversation offline. And I'd be glad to do that with anyone who's interested in 7(a)(1).

Eric Summa: Thank you.

Courtney Chambers: Rich, on the topic of the Mississippi River habitat conservation plan that you all did, is the fact that it had the pallid sturgeon, the fat pocketbook mussel, and the interior least tern, is that - would you see that as a common thing or did it just work out to where those three species all benefit from similar conservation management strategies?

Dr. Richard Fischer: Yes so I need to give acknowledgement to Jack Killgore and Todd Slack who were primary authors on that effort. They came at the district and division from the standpoint of fish. And then we brought the tern to the table.

And really that's the first 7(a)(1) plan of that magnitude that the Corps has developed. And it just so happened that it was multiple species and it worked out quite well because all three species basically inhabit the river and different parts of the river and sandbars.

So moving forward, and particularly with the least tern, our future 7(a)(1) plans in Southwestern Division and Great Lakes/Ohio River Division will be single species. They'll be focused only on the tern, just for simplicity. But the 7(a)(1) plans as highlighted in the MVD plan certainly can be multiple species. I would not discourage that.

But, you know, in terms of simplicity it would be easier to keep it to one species.

Courtney Chambers: Got it. Thanks. All right we still have some time if you have a question. I'll give you another couple of minutes to think and ask.
Okay well Rich it sounds like we've exhausted the questions for now. Do you have any final comments before we end today - or suggestions I guess?

Dr. Richard Fischer: I guess just like to thank the DOER program, Dr. Todd Bridges, the DOTS Program, Cynthia Banks, (Doug Clark), Cynthia's former predecessor and then all the folks that have been involved in the work - Casey to Paul, American Bird Conservancy and a whole host of others, Todd Swannack.

We really look forward to moving forward with our work, with 7(a)(1) plans and with the model and hopefully showing the Service that the species has

been recovered and work towards a delisting rule which ultimately will be good for the species and save the Corps a lot of money.

And then I guess the final thing I'll say is we really would like to use our process here for the least tern and apply that to the degree that we can to other species and look for opportunities to do the same, again saving the Corps of Engineers money and promoting conservation and long-term recovery and persistence of a lot of the species that impact our missions.

Courtney Chambers: Very good. Thank you Rich. Thanks for sharing that success and that example. And hopefully we can see greater cost savings and benefits to species in the future from that plan that you all laid out.

Participants, we're grateful that you all are able to join us today and we hope that you'll join us again soon. Please watch for your Webinar announcement from Ms. Cynthia Banks, the DOTS Program director, and we hope you all have a wonderful afternoon.

Dr. Richard Fischer: Thanks a lot, appreciate it.

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