

**PERSPECTIVES ON ECOSYSTEM
RESTORATION PROJECTS OF THE U.S. ARMY
CORPS OF ENGINEERS**

HEARING
BEFORE THE
**COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS**
UNITED STATES SENATE

ONE HUNDRED EIGHTEENTH CONGRESS

FIRST SESSION

JUNE 7, 2023

Printed for the use of the Committee on Environment and Public Works



Available via the World Wide Web: <http://www.govinfo.gov>

U.S. GOVERNMENT PUBLISHING OFFICE

53–890 PDF

WASHINGTON : 2023

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED EIGHTEENTH CONGRESS

FIRST SESSION

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PERSPECTIVES ON ECOSYSTEM RESTORATION PROJECTS OF THE U.S. ARMY CORPS OF ENGINEERS

WEDNESDAY, JUNE 7, 2023

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The Committee met, pursuant to notice, at 10:03 a.m. in room 406, Dirksen Senate Office Building, Hon. Thomas R. Carper (Chairman of the Committee) presiding.

Present: Senators Carper, Capito, Kelly, Padilla, and Graham.

OPENING STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. Good morning, everybody. I am happy to call this hearing to order.

This hearing room was used about a month ago for Bring Your Children to Work Day. The room was full of children of our staff, Democrats and Republicans. We had just a lovely time and a lovely celebration.

I think we have, this is like, somebody got the memo a little bit late, but Eric, I think your son is here, and he is 14. He looks like he is about 44. What a big guy. We are going to watch to see if his lips move when you speak. There you go.

For those of you who are not children of our witnesses, we welcome you as well.

I am happy to call the hearing to order. Today, we are here to conduct, as you know, oversight of one of the U.S. Army Corps of Engineers' primary missions: That is ecosystem restoration. The Army Corps of Engineers' work to support commerce through navigation and flood control is, I don't think it is an overstatement to say, the backbone of our economy. It is a big part of what we do in this Nation.

Still, addressing the toll that this commerce takes on our environment is, and will continue to be, a top priority for us on this Committee and also a top priority for the Army Corps of Engineers.

From large scale, multi-decade initiatives to small, focused projects, the Corps' ecosystem restoration work is critical. It has been and it remains critical. This is especially true as climate change continues to threaten communities, wildlife, and our economy, all of which depend on healthy ecosystems.

As many of us know, the biennial Water Resources Development Act, known as WRDA, establishes the authorities to the Corps' fu-

ture work. In the 1986 WRDA, Congress first directed the Corps to lead ecosystem restoration efforts for the Upper Mississippi River, laying the foundation for an expanded environmental restoration role for the agency.

In every WRDA since then, Congress has expanded the Corps' ability to address critical ecosystem restoration. From the Great Lakes to the Gulf Coast and from the Chesapeake Bay to the San Francisco Bay Delta, communities across our country have benefited from this important work.

Most recently, we expanded the Corps' definition of ecosystem restoration in WRDA 2022 to include factors such as climate change and coastal and riverine restoration.

Last month, Assistant Secretary Connor sat right there, and he testified before our Committee that the Corps' budget request for fiscal year 2024 included more than \$650 million for aquatic ecosystem restoration, the most ever in a budget request. The growing amount, paired with the more than \$1.9 billion in the Bipartisan Infrastructure Law, highlights Congress' ongoing commitment to the Corps' work.

These funds, however, are only the tip of the spear when it comes to the long term needs of the Army Corps in this regard. Today's hearing will help us better understand the current size and scope of ecosystem restoration needs and what more our Committee, this Committee, can do to address community environmental restoration efforts.

The Corps' ecosystem restoration portfolio includes roughly 140 ongoing ecosystem restoration construction projects and studies. These initiatives focus on restoring the landscape and hydrology to more natural conditions and connecting the restoration and navigation projects, a win-win not just for our environment, but also for our economy.

For example, let's take Poplar Island in Maryland. Poplar Island could be Popular Island, in Maryland, but it turned out almost to be a nonexistent island in Maryland, but it was originally home to more than 1,000 acres in size and home to a small community of residents. From 1846 until recently, the island has slowly eroded, as some of you know, from what it was down to about four acres. Imagine that: Four acres.

Thanks to the Corps' work pairing dredged materials from Baltimore Harbor and channel maintenance projects with environmental restoration, Poplar Island has been restored from four acres to more than 1,700 acres today. The project exemplifies how the Corps' ecosystem restoration mandate supports the economic activity we depend on from our ports and harbors while creating wetlands and wildlife habitats, and according to Senator Cardin, it is a beautiful place to visit. I am sure when he arrives, he will reaffirm that.

Today, we will hear more from our witnesses about the Corps' role in specific ecosystem restoration efforts. That includes the Everglades in Florida, along with Tres Rios in Arizona, and the Crab Bank Seabird Sanctuary in South Carolina. Before we do, let me offer a couple of thoughts on each of these efforts, and then turn it over to Senator Capito.

First, there is the Corps led Everglades restoration, which includes Lake Okeechobee, the second largest freshwater body in the contiguous United States. If Senator Stabenow were here, she would tell us that Lake Michigan is No. 1.

The effort in Lake Okeechobee is the largest ecosystem restoration effort in the Corps' Federal portfolio. According to the Corps, these Federal investments in Florida are generating annual cost savings of over \$300 million by preventing flood damage to property while fortifying water supply infrastructure and protecting fish and wildlife.

Next, there is Tres Rios in Phoenix, Arizona, an aquatic ecosystem found in the desert that unifies flood control, ecosystem restoration, and recreation. This project includes an engineered levee as well as the restoration of over 1,200 acres of wetlands, hiking trails, nature trails, and much more. These wetlands are critical for a State that is going through a historic drought.

Last, but not least, there is Crab Bank Seabird Sanctuary. I love that, Crab Bank Seabird Sanctuary in South Carolina. This project is considered a landmark legacy of the Charleston Harbor Post 45 Deepening Project. The deepening work from below the water resulted in the dredged materials for 42 acres of prime nesting ground above the water for over 15 species of shore and seabirds, another win-win.

Let me just close, if I could, by thanking members of our staffs and for the great work that you all did on WRDA 2022. I hear, not every day from our colleagues, but frequently from our colleagues, Democrat and Republican, from across the country, their gratitude for the work that this Committee does.

I know that, as hard as you and I work, we know we couldn't do any of this without the great work of our staffs. I wanted to just say that again.

We look forward to hearing from each of you today on your experiences with the Corps and what more Congress might be doing to support those critical efforts. Our hearing today will also help inform our oversight efforts and future legislative action on ecosystem restoration, specifically as we gear up for WRDA 2024, I can't believe we are about ready to start this again, which is just around the corner.

With that, I am happy to turn it over to Ranking Member Senator Capito for her opening remarks.

It is good to be with you. Welcome.

**OPENING STATEMENT OF HON. SHELLEY MOORE CAPITO,
U.S. SENATOR FROM THE STATE OF WEST VIRGINIA**

Senator CAPITO. Thank you, Chairman Carper, for calling today's hearing.

Since 2014, the Committee has kept to a biennial WRDA schedule, authorizing water resources projects and setting national policies for the Civil Works Program, as the Chairman was saying. I look forward to continuing that track record next year. It does seem like déjà vu all over again. I think we just did this.

The EPW Committee also plays an important role overseeing how the Corps executes these authorities and funding provided by the Congress. Today's hearing will focus on one of the Corps' main

mission areas, which is aquatic ecosystem restoration. This hearing will allow us to learn more about the successes and challenges of three of the Corps' aquatic ecosystem restoration projects.

I would like to extend my appreciation for our witnesses here today. I look forward to hearing your perspectives on these matters.

Lessons learned from completed and ongoing projects are critical to informing what, if any, modifications are needed to the Corps' existing authorities in future WRDA legislation. When designed appropriately, aquatic ecosystem restoration projects can play an important role in restoring critical habitats while also mitigating loss of property and life.

The scale of these projects varies greatly across the country, and the Corps uses different authorities and programs to carry them out. Large scale projects are not the only option for protecting and restoring our aquatic ecosystems.

Often, small projects or modifications to existing water resources infrastructure can yield positive outcomes to aquatic ecosystems at a low cost. This flexibility is key to ensuring that the Corps' design solutions are tailored to address the diverse aquatic ecosystem restorations of all communities. In my opinion, the three projects that are the focus of today's hearing do a good job of underscoring all of these points.

While the Corps' aquatic ecosystem restoration efforts are important, the Corps and Congress must balance these efforts with the Nation's needs under the two main missions of the Corps: Navigation and flood and coastal storm risk management. As we will hear today, win-win solutions are possible.

I am excited that Lorianne Riggin from the South Carolina Department of Natural Resources is here today. The South Carolina DNR partnered with the Corps in 2021 on the Crab Bank Seabird Sanctuary in Mount Pleasant, a beautiful spot, South Carolina.

This project was completed under the Corps' 204 authority. This authority allows the Corps to carry out aquatic ecosystem restoration projects in connection with dredging at an existing navigation project. The Federal costs of a project under this authority cannot exceed \$10 million.

For this particular project, the Corps and its partners utilized dredged materials from the Charleston Harbor Deepening Project for the replacement of the Crab Bank Seabird Sanctuary. This project, like others, faced initial challenges. However, the Corps and the non-Federal sponsor were able to adjust their game plan and find a solution that benefited shorebirds without impeding on economic opportunities for the local community.

Since the completion of the project, the small island has seen a return of shorebirds and seabirds. This project is an excellent example of how Federal, local, State, and private groups can partner together to provide meaningful, lasting results in an effective manner. I know and look forward to Ms. Riggin's testimony, because she will share this project's story in South Carolina.

Our witnesses' project specific stories will help us understand how we can balance our water resources needs and maximize the use of our taxpayer dollars. I look forward to hearing also about

the challenges and suggested improvements to existing authorities as we prepare for the next WRDA.

Last month, as you mentioned, we held a hearing on the Army Corps' fiscal year 2024 budget request and implementation of WRDA 2022 with Secretary Connor and Lieutenant General Spellmon. It was evident at the hearing that each of our States faces a diverse range of water resources issues and opportunities. I am hopeful that we take lessons learned from the projects discussed today and use them to improve water resources projects of all types across the country.

Chairman Carper, I look forward to continuing our partnership to develop the next bipartisan WRDA bill.

Again, I express my gratitude to our witnesses.

Senator CARPER. Senator Capito, thank you so much for those remarks.

Now, we are going to hear from our panel of witnesses, who will share with us their perspectives on the Corps' ecosystem restoration projects.

We are going to start off with Eric. Let me just make some brief comments about Eric. He is the Chief Executive Officer of the Everglades Foundation, an environmental nonprofit that is focused on restoring America's Everglades. He has served in this role for over 10 years, leading a team of nationally recognized scientists, educators, policy experts, and communications and development professionals.

Mr. Eikenberg and the team are committed to protecting the roughly 3 million acres of endangered habitat that is vital to Florida's economic and environmental viability.

Mr. Eikenberg, we thank you for being with us today. You may proceed with your statement that will be made part of the record in its entirety. Thank you so much. Please proceed. Welcome.

**STATEMENT OF ERIC EIKENBERG,
CHIEF EXECUTIVE OFFICER, THE EVERGLADES FOUNDATION**

Mr. EIKENBERG. Thank you.

Chairman Carper, Ranking Member Capito, and to the Committee. My name, as the Chairman mentioned, is Eric Eikenberg, and I am privileged to be CEO of the Everglades Foundation, celebrating its 30th anniversary in helping to restore America's Everglades through science, advocacy, and education. I want to thank the Committee for this hearing and for inviting me here today.

Restoring America's Everglades is producing benefits far beyond their ecological value, including driving Florida's clean water economy, protecting drinking water supplies, providing flood risk mitigation, and carbon sequestration. The U.S. Army Corps of Engineers has been an indispensable partner in this undertaking together with the State of Florida.

Thanks to recent Federal and State investments, we are at a point of incredible progress and momentum. Following congressional passage of WRDA 2000, Everglades restoration incorporates 68 separate public works projects that will store, clean, and send water south on the Florida peninsula. It is a national example of how traditional and natural infrastructure can be combined on a massive scale.

Under the Comprehensive Everglades Restoration Plan, or CERP, these projects were funded with a 50-50 Federal-State cost share. We thank Congress for their recent investments, including the funding to the Army Corps within the Bipartisan Infrastructure Law and for your recognition of the importance of America's Everglades. The Army Corps has completed several non-CERP projects like the Herbert Hoover Dike repair, and in partnership with the State of Florida, restoration of the Kissimmee River and the construction of bridges along the Tamiami Trail.

In recent years, the pace of CERP projects is unprecedented. For example, east of Lake Okeechobee, in Martin County, construction of the C-44 Reservoir is complete. East of Naples, a 55,000 acre habitat restoration project in the Picayune Strand is nearly finished. South of Lake Okeechobee, the Corps recently broke ground on the crown jewel of Everglades restoration: The EAA Reservoir. This reservoir is a national priority and a model for prudent and efficient way to fund megaprojects with taxpayer dollars.

These and other projects confirm that restoration works, and I cannot overstate the importance of these results. With improved southerly flow, we are already seeing habitats reestablished in areas of Everglades National Park that just 5 years ago were parched by drought for half the year.

As you may know, Florida's coastal estuaries have been plagued by toxic blue-green algae that closes beaches, restricts fishing, and is a harmful threat to wildlife and people. The algae blooms are fed by the unavoidable dumping of polluted water from Lake Okeechobee. The fortified Herbert Hoover Dike and the EAA Reservoir will reduce those harmful discharges by 55 percent, having a profound positive impact on Florida's tourism based economy.

Storing, cleaning, and sending this clean water south is essential to Florida Bay. Its gin clear waters and lush seagrass meadows make Florida Bay the fishing capital of the world: A body of water alive with manatees, dolphins, and a wide variety of coveted game fish. Today, however, the bay is suffering from too little fresh water.

A restored Everglades will also provide a natural defense against saltwater intrusion due to sea level rise. Flowing more water south will protect our Nation's largest mangrove forest. Restoration will also protect existing peat soils in the Everglades that enhance the sequestration of new carbon.

We are at a critical juncture. With sustained Federal and State investments, this can be the Everglades decade in which we achieve the dream of a robust, healthy river of grass following a century of development. The stakes are high, both for the 9 million people who rely on the Everglades for fresh water and for the Nation as a whole. Florida's tourism based economy depends on clean water, and our economic research shows that Everglades restoration yields a four to one investment.

Senators, you should be proud of the bipartisan progress in restoring America's Everglades. On behalf of the anglers, the realtors, the fishing guides, the business owners, and the millions who depend on the Everglades, let me say thank you, and please do not stop now.

[The prepared statement of Mr. Eikenberg follows:]



Testimony on Everglades Restoration
Eric Eikenberg, Chief Executive Officer, The Everglades Foundation
Senate Committee on Environment and Public Works
June 7, 2023

Chairman Carper, Ranking Member Capito and members of the Committee, my name is Eric Eikenberg and I am privileged to be CEO of The Everglades Foundation, now celebrating its 30th anniversary of helping restore America's Everglades through science, advocacy and education.

I want to thank the Committee for this hearing focusing on the importance of ecosystem restoration being undertaken by the U.S. Army Corps of Engineers (Army Corps), and for inviting me here today.

Restoring America's Everglades is an unmatched and vitally important ecosystem restoration effort that demonstrates how such investments can produce benefits far beyond their ecological value, including driving a clean water economy, drinking water security, flood risk mitigation (flood control) and carbon sequestration.

The Army Corps has been an indispensable partner alongside the South Florida Water Management District (SFWMD) and the State of Florida in this undertaking.

Background:

Thanks to recent federal and state investments, we find ourselves at a time of incredible progress and momentum for Everglades restoration. The bipartisan vision of Congress, as spearheaded by my former boss, the late U.S. Representative Clay Shaw, is contained, in the Comprehensive Everglades Restoration Plan (CERP), which was authorized in the Water Resources Development Act (WRDA) of 2000. CERP incorporates 68 separate public works projects that, together, are a national example of how traditional and natural infrastructure can be combined on a massive scale.

The roadmap for Everglades restoration is the Integrated Delivery Schedule (IDS), a collaborative federal-state document that lays out the path to completion and funding schedule for these projects. Continuing the investment presented in the IDS is of upmost importance to complete this critical restoration effort.

These projects are funded and constructed under a national model for partnership with a 50-50 federal-state cost share. Under this partnership, both the Army Corps and the State of Florida – via SFWMD – plan, design, and build Everglades restoration projects in a coordinated and collaborative fashion. This approach of shared investment and shared responsibility garners unparalleled communication and synchronization for the partnership.

The momentum currently underway has been galvanized by recent years of historic federal and state funding, including the funding from the Bipartisan Infrastructure Law. The execution of this funding is seamless given the strong and proven federal-state partnership.

We thank Congress for its recent investments and for your bipartisan recognition of the importance of America's Everglades. Recent funding decisions have closed the historical gap in funding and jump-started progress on the ground. It is imperative that we embrace this momentum and continue meeting the clearly defined IDS funding needs if we are to complete CERP.

In addition to funding, this complex program is reliant on policy in the WRDA each Congress. We thank this committee and its counterpart in the House of Representatives for returning to Regular Order in the consideration of WRDA legislation and for your support on needed policy provisions each Congress that are essential to advance this program. For WRDA 2024, we expect a handful of minor, but important, policy needs that will help advance Everglades restoration projects. We look forward to working with the Committee and all relevant parties by providing science and policy expertise to support these needs.

Restoration of America's Everglades doesn't impact Florida alone. Beyond the environmental and economic benefits to the country, best practices from Everglades restoration will be utilized in future ecosystem restoration projects. The success and completion of Everglades restoration will enhance the prominence and funding potential for restoration investment across the country.

To support this and other important ecosystem restoration projects nationally, Congress should continue to move the needle on funding for Civil Works construction, particularly aquatic ecosystem restoration. Everglades restoration is a prime example of how investments in this infrastructure can produce significant benefits and value beyond the environmental impacts.

Progress to Date:

Since 2019, 55 Everglades restoration projects or project components (both CERP and non-CERP) have broken ground, reached a significant milestone or been completed. Thanks to bipartisan investments, the Army Corps has completed several major non-CERP projects, such as restoration of the Kissimmee River, repairs to the Herbert Hoover Dike and completion of bridges along the Tamiami Trail.

In addition, progress is moving forward on a number of critical CERP projects including the massive C-44 Reservoir east of Lake Okeechobee that will store and clean basin runoff for the St. Lucie estuary. A 55,000-acre habitat restoration project in the Picayune Strand east of Naples is also nearly finished.

Ground has also been broken on the "crown jewel" of Everglades restoration, the 10,500-acre "EAA Reservoir" that will sit south of Lake Okeechobee in the Everglades Agricultural Area (EAA). An adjacent 6,500-acre engineered wetland will soon be completed by the state.

Originally authorized in WRDA 2000, this vitally important reservoir is now on track for completion by 2030. Once constructed, the reservoir will hold an average of 120 billion

gallons of freshwater and will serve the needs of the Everglades, agriculture and the people of South Florida.

The 6,500-acre wetland, constructed by the State of Florida, is pivotal in removing nutrient pollution from the water. Prior to Congressional reauthorization in WRDA 2018, the State of Florida Department of Environmental Protection issued a Secretarial Order for inclusion into the Army Corps' Chief's Report demonstrating that non-negotiable water quality standards will be met once reservoir construction is complete.

As a mega project, we applaud the decision to use the incremental funding clause to construct the EAA Reservoir in the most prudent, efficient and safe manner possible. This will bolster its status as a banner example of our nation's commitment to invest in ecosystem restoration projects that yield significant value.

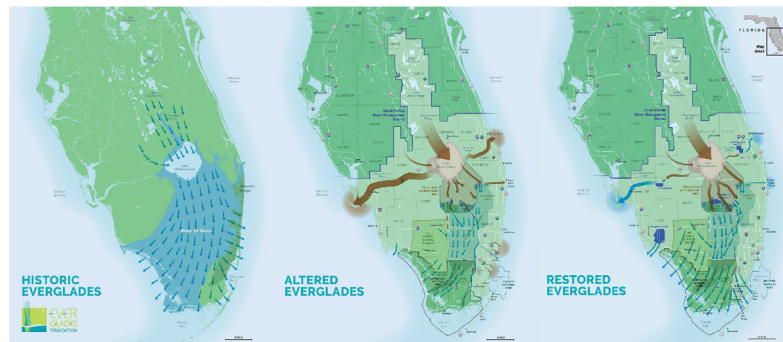
Benefits:

Everglades restoration projects provide significant benefits:

Habitat Restoration. With the improved southerly flow of water has come restoration of plant and animal species that are iconic to the Everglades. In Everglades National Park, habitats are being restored in places that, just five years ago, were parched by drought for half the year.

Reductions in Algae-Causing Discharges. Florida's coastal communities are plagued by perennial toxic blue-green algae from Lake Okeechobee. It is a noxious green slime that closes beaches, restricts fishing and is harmful to wildlife, pets and even humans. These algae blooms are fed by the unavoidable dumping of polluted water from Lake Okeechobee into the estuaries for flood control purposes.

As illustrated in the map below, alterations to the flow of water redirect 1.7 billion gallons each day away from its natural path through the Everglades and Florida Bay and instead into the coastal communities on the east and west coasts of Florida.



This phosphorus-laden water threatens Florida's "Clean Water Economy" in a 16-county region that contributes \$548 billion to the state's GDP.

This clean water economy consists of real estate, tourism and outdoor recreation. Diverting algae-causing, nutrient-laden water to the coastal estuaries imposes a direct cost on the region's residents and tourists. Research shows that poor water quality reduces economic activity, decreases the value of real estate, minimizes tourism spending and harms public health.

The EAA Reservoir, complemented by the strengthened 143-mile Herbert Hoover Dike, will reduce toxic discharges by 55 percent. It will have a profound, positive impact on Florida's tourism, real estate and recreation sectors.

Further, the new Lake Okeechobee Systems Operating Manual, scheduled to be implemented later this year, will enable the Army Corps to more equitably manage Lake Okeechobee's water.

Following a thorough and transparent process with extensive public input, the Army Corps set a positive course for the next phase of Lake operations. Once implemented, it will significantly reduce harmful coastal discharges and increase the flow of much needed freshwater to the Everglades.

Strengthening Public Drinking Water Supply and Improvements to Florida Bay. The polluted water that is now being dumped into our coastal estuaries will instead be stored, cleaned and sent south to nourish America's Everglades, the source of freshwater for 9 million people.

This water will ultimately flow further south to Florida Bay. Its gin-clear waters and lush seagrass meadows makes Florida Bay the "Fishing Capital of the World," a body of water alive with manatees, dolphins and a wide variety of coveted game fish.

Today, however, Florida Bay still faces salinity challenges: not enough freshwater is flowing into the Bay.

Economic Benefits. Everglades restoration brings vital economic benefits to the nation itself.

Research shows that Everglades restoration leads to a 4:1 return on investment. This means that for every dollar we invest in restoration, we reap \$4 of quantifiable economic benefits including water to drink, water for a diverse range of businesses and water for our unique ecosystems.

Additionally, restoration reduces the economic harm associated with harmful coastal algal blooms and provides global benefits by sequestering carbon year-round.

Environmental Benefits. The increased southerly flow of water will protect our aquifers from saltwater intrusion and provide necessary freshwater to Florida Bay. A restored Everglades provides a natural defense against saltwater intrusion due to sea level rise. Flowing more water south will protect our nation's largest mangrove forest.

Restoration will also protect existing peat soils in the Everglades and enhance their sequestration of new carbon. The Everglades peat soils remove and store enormous amounts of carbon from the atmosphere.

The massive size of the ecosystem points to the significance of the carbon bank it creates: Everglades National Park alone is 1.5 million acres and includes the largest protected mangrove forest in the western hemisphere; Big Cypress National Preserve, representing the heart of the Western Everglades, spans a separate 730,000 acres of cypress forest. This is in addition to 900,000 acres of state-managed Everglades marshes, sloughs and tree islands.

The peat soils across the River of Grass took centuries to accumulate, but they break down quickly when allowed to become overly dry. When they do, they release that stored carbon into the atmosphere. Restoring the Everglades will hydrate these peat soils, preventing their breakdown and the unnecessary release of excess carbon.

Everglades restoration also leverages significant value for other federal investments. From an environmental standpoint alone, a healthy Everglades ecosystem, including Everglades National Park has positive impacts on Biscayne Bay National Park, Big Cypress National Preserve and the Florida Keys National Marine Sanctuary.

The Everglades is home to 78 threatened or endangered species, contains 14 national wildlife refuges and 4 national parks including Everglades National Park – a UNESCO World Heritage Site, International Biosphere Reserve and Wetland of International Importance.

Don't Stop Now.

Everglades restoration is now at a critical juncture. With sustained funding, this can be the "Everglades Decade," in which we achieve the decades-long dream of a robust, healthy Everglades after a century of development.

Finally, the current Fiscal Year 2023 federal commitment to this work, \$447 million, supports **\$548 billion** in economic activity across the 16 counties of South Florida. This is an area where reductions in non-defense discretionary spending would have a serious consequential impact on the economy and the environment of the nation's third largest state.

Senators, you should be proud of the bipartisan progress in restoring America's Everglades. On behalf of the anglers, the realtors, the fishing guides, the business owners, and the millions who depend on and love the Everglades, let me say thank you -- and please, do not stop now.

###

Senator CARPER. Thank you. We won't.

Ms. Balluff, please proceed. Welcome. We are delighted that you have joined us.

STATEMENT OF TRICIA BALLUFF, ENVIRONMENTAL PROGRAMS COORDINATOR, WATER, WILDLIFE AND NEPA, OFFICE OF ENVIRONMENTAL PROGRAMS, CITY OF PHOENIX; PHOENIX, ARIZONA

Ms. BALLUFF. I appreciate the opportunity to speak before the Committee about the importance of Army Corps support for ecosystem restoration projects. I would like to thank Chairman Carper and Ranking Member Capito and especially Senator Kelly for inviting me to be here today.

The city of Phoenix is the fifth largest city in the United States and is the local sponsor for multiple U.S. Army Corps of Engineers ecosystem restoration projects associated with the Salt River, which is our main river channel through Phoenix and the surrounding cities. These projects are part of Senator McCain's Rio Reimagined legacy for the Phoenix metropolitan area. Rio Reimagined recently became the 20th EPA Urban Waters Federal Partnership location.

Historically, urban uses of the Salt River have included industrial activities, such as landfills and sand and gravel mining. The construction of Federal dams upstream has resulted in highly altered river flows, and as a result, there has been significant degradation of ecosystem values and reduced recreation opportunities.

In the arid western United States, riparian areas are estimated to be less than 2 percent of total land area, are considered the most productive habitat, and provide important water quality benefits. Seventy percent of threatened and endangered vertebrates in Arizona depend on riparian habitat along rivers.

In Arizona, it is estimated that as much as 90 percent of riparian forests have been lost. Invasive species, such as salt cedar, a highly competitive shrubby tree, are now in almost every drainage system in the Southwest. Since the 1990s, Phoenix has worked with the Corps to achieve habitat restoration and improve flood risk management on the Salt River.

The first major project to be completed was Rio Salado Phoenix, located in a historically disadvantaged area, which restored 5 miles of the Salt River and provides valuable recreation and education opportunities for the community. Downstream of this completed project are two congressionally authorized Corps projects that have not yet been completed: Rio Salado Oeste and Tres Rios. These are both ecosystem restoration, flood risk management, and recreation projects.

When combined with the completed Rio Salado Phoenix, these will create approximately 19 contiguous miles of restored river corridor through Phoenix, directly benefiting river flows, habitat, wildlife, heat risk, and access to the river in disadvantaged communities. This is why, for the last 10 years, the city has been focused on obtaining the support and funding from the Corps and our congressional delegation to complete these two projects.

Today, I would like to highlight the Tres Rios Project to illustrate the multiplicity of benefits from Corps ecosystem restoration fund-

ing. Tres Rios, when complete, will cover approximately 7 miles of river channel and the adjoining bank, including almost 400 acres of constructed wetlands, a levee, in river restoration, and effluent treatment elements.

Tres Rios's use of constructed wetlands to treat wastewater using natural processes make this a unique Corps project that help compliance with the regulatory standards while simultaneously providing quality habitat. By implementing this ecofriendly infrastructure, the city has avoided the need to spend \$375 million on additional infrastructure for the 91st Avenue Wastewater Treatment Plant.

Through the treatment and direction of wastewater, combined with the invasive species removal and native species plantings, the area supports more than 200 species of birds and other wildlife, including some species listed as threatened or endangered under the Endangered Species Act.

This habitat also provides recreational access to natural river spaces in an urban environment and offers benefits from carbon sequestration, shading, and other cooling effects, which are important heat mitigation elements in our desert city.

A substantial amount of the invasive tree, salt cedar, was removed as part of Tres Rios. This removal and the preservation and additional planting of needed vegetation reduces fire risk, both in terms of fire severity and frequency. Salt cedar removal is also beneficial to native habitat by creating a more conducive environment for native plants to germinate and grow.

The river channel through Tres Rios facilitates passive aquifer recharge by allowing water to naturally infiltrate groundwater, while the levees constructed on the north bank of the Salt and Gila Rivers protect nearby neighborhoods from flooding.

As I have shared, the benefits from Tres Rios are wide ranging from habitat to flood reduction to recreational opportunities. The city of Phoenix is appreciative of the many benefits that have come from collaborating with the Corps, and we fully support the Corps' mission in undertaking and completing ecosystem restoration, particularly in the Southwest.

This year the Corps' Los Angeles District has been working on a post authorization change report to update the cost for the remaining phases of Tres Rios. The city of Phoenix will be seeking an authorization for construction in the 2024 WRDA bill to complete Tres Rios's in river restoration and trailheads.

Thank you very much.

[The prepared statement of Ms. Balluff follows:]



Tricia Balluff

City of Phoenix Environmental Programs Coordinator

Testimony Before the

Committee on Environment and Public Works

Perspectives on Ecosystem Restoration with the U.S. Army Corps of Engineers

June 7, 2023

Introduction

The City of Phoenix is located in the Sonoran Desert and is the fifth largest city in the U.S. and the 14th fastest growing metropolitan area in the nation. Its residents enjoy 300 days of sunshine and have access to the largest municipal park system in the nation *consisting of* 48,000 acres of parks and preserves.

Phoenix Water is one of the nation's ten largest potable water utilities and is the largest potable water provider in Arizona, serving 1.7 million customers across 540 square miles and providing wastewater treatment services for nearly 2.5 million people.

The City of Phoenix is the local sponsor for multiple U.S. Army Corps of Engineers (Corps) Civil Works ecosystem restoration projects associated with the Salt River, the main river through Phoenix and surrounding cities. Phoenix has firsthand experience of the significant benefits that can arise from a partnership with the Corps Civil Works division for ecosystem restoration.

The Salt River channel runs through Phoenix, just south of downtown. It has a mosaic of land uses and varies in width from approximately 500 feet to more than 3,000 feet wide. Typical uses in and along the Salt River include landfills, sand/gravel mining, and other industrial activities. Upstream regulation via the construction of federal dams has resulted in a highly altered river flow regime. This upstream regulation and long-running land use along the river has resulted in significant degradation of ecosystem values and reduced public benefit.

Three Phoenix Corps ecosystem restoration projects are congressionally authorized for the Salt River. When all three are complete, they will create a combined 19 contiguous miles of restored

river corridor through the City, directly benefiting river flows, habitat, wildlife, water quality, recreation, and surrounding underserved and protected environmental justice populations. This is why, for the last 10 years, Phoenix has been focused on obtaining the support and funding necessary to complete the remaining projects – Tres Rios and Rio Salado Oeste.

Riparian Areas in Arizona

In the arid western United States, riparian areas along perennial and intermittent rivers and streams are estimated to be less than 2 percent of total land area, and account for approximately 0.4 percent of Arizona's total area. These riparian areas generally support typical river vegetation such as cottonwood/willow galleries. Despite the small total land coverage, riparian areas are considered the most productive habitat in North America and provide important benefits. An estimated 70 percent of threatened and endangered vertebrates in Arizona depend on riparian habitat along rivers (Johnson 1989). Riparian vegetation acts as a buffer, helping to reduce the influx of non-point source pollution into rivers and streams, a significant benefit to water quality (Zaimes, 2007). Riparian corridors are important wildlife movement corridors, particularly in urban areas where they can act as connecting corridors between undeveloped areas. This wildlife movement is important in supporting a healthy biodiversity and ecosystem and promotes genetic diversity in both plants and animals, strengthening those populations.

In Arizona and New Mexico, it is estimated that as much as 90 percent of riparian forests have been lost (Ohmart and Anderson, 1986). The outsized impacts of riparian areas in the community compared to their size make them particularly rich and productive targets for ecosystem restoration.

Arizona also has many xeri-riparian areas, or vegetated corridors along the region's ephemeral washes. These washes generally only have water flowing through them during and immediately following a rainstorm. Although these washes do not have continuous or long-term flow, they support xeri-riparian corridors that have a higher density of trees (such as palo verde, mesquite, and ironwood) and other vegetation than the surrounding upland desert, providing important wildlife habitat and movement corridors.

Prior to development and upstream regulation, the Salt River through Phoenix was a perennial stream with cottonwood/willow stands, in-river wetlands, and other typical riparian features with a median annual discharge of 950,000 acre-feet (Thomsen and Porcello, 1991). With the regulation upstream, the Salt River now presents a patchwork of ecosystem types, depending on the quantity and consistency of water flow in each reach of the river.

City of Phoenix and U.S. Army Corps of Engineers Ecosystem Restoration Overview

Since the 1990s, Phoenix has engaged with the Corps to achieve positive change in the Salt River. This has resulted in three congressionally authorized projects in the river for which Phoenix is the local sponsor. Brief summaries of Rio Salado Phoenix and Rio Salado Oeste are

below, followed by a more in depth look at Tres Rios as an example of the multiple benefits of these types of projects.

Rio Salado Phoenix Ecosystem Restoration Project Summary

Rio Salado Phoenix, an ecosystem restoration and flood control project, was the first major river ecosystem restoration project to be completed in Phoenix with the City as the local sponsor. A feasibility report for Rio Salado was completed in 1997, and the project was authorized by Section 101(a)(4) of the Water Resources Development Act (WRDA) 1999 (Public Law 106-53). Phoenix and the Corps signed a Project Cooperation Agreement for construction of Rio Salado Phoenix in 2001. This project restored five miles of the Salt River just south of the downtown core from 28th Street on the east to 19th Avenue on the western end.

The low flow channel was improved to a 200-foot-wide, 15-foot-deep channel capable of carrying up to 12,200 cubic feet per second (cfs) of flow. Continuously present surface water supports willow/cottonwood riparian and wetland habitat along the low flow channel. Moving laterally across the river cross-section away from the low flow channel, the restoration gradient transitions from the willow/cottonwood galleries to the xeri-riparian habitat that provides significant value in the arid southwest, including mesquite bosques, before moving to upland species on the banks of the river. In all, approximately 595 acres of xeri-riparian, riparian, and wetland habitat was restored in the five-mile stretch of river.

This section of the river was lined with multiple historic landfills, and the Rio Salado Phoenix project removed approximately 1,185 tons of tires and 138,572 cubic yards of debris and waste from the river. Over 76,000 trees, shrubs, and forbs were planted. Rio Salado Phoenix was completed in 2009. Since construction was completed, over 150 species of birds and other wildlife have been observed in the area. Species protected under the Endangered Species Act are now using the area. The threatened yellow-billed cuckoo has been documented in the xeri-riparian habitat at Rio Salado for several years; and in 2021, an endangered bird, the Yuma Ridgway's rail, was observed in a Rio Salado wetland pond for the first time. Use of this area by these species is a clear indicator of the progress of the restoration project in providing long-term habitat value. Now, schools and universities utilize the area for education and research, over 40,000 people visit Rio Salado Phoenix each year, generally via one of the several trailheads constructed as part of the project and use the maintenance roads as trails for walking and biking. Thousands more volunteer every year to help keep Rio Salado beautiful, and the project provides strong ongoing community value and recreational benefits. With the vegetation and surface water, Rio Salado Phoenix also provides an oasis of shade and cooling in our hot, urban environment.

Rio Salado Oeste Ecosystem Restoration Project Summary

Rio Salado Oeste is a congressionally authorized project in WRDA 2007 (Public Law 110-114) that has not yet been constructed. This project will continue the work of the previous project, Rio Salado Phoenix, starting at 19th Avenue on the east to 83rd Avenue on the west, restoring

approximately eight miles of the Salt River through a Phoenix industrial zone with closely neighboring underserved and environmental justice communities. While some initial design was completed, the project was placed on hold in 2009 until 2022, when the Corps received Work Plan funding to continue work on this project. In coordination with the Corps Los Angeles District, Phoenix is entering into a new cost-share agreement to complete a General Re-evaluation Report (GRR) for this project. This project is a particularly important part of Phoenix's Salt River ecosystem restoration plans, as the critical connecting piece between Rio Salado Phoenix and Tres Rios. When all three of these ecosystem restoration projects are complete, it will result in approximately 19 miles of contiguous restored river through the heart of urban Phoenix.

Tres Rios Ecosystem Restoration Project Summary

Given a unique opportunity to manage a perennial (drought resistant) water source within the arid region of Phoenix, Arizona, Phoenix teamed with the Corps, Environmental Protection Agency (EPA), the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, Arizona Game and Fish, Flood Control District of Maricopa County, the Arizona Department of Environmental Quality, and numerous other stakeholders, to create a solution to effectively use the treated effluent from the largest wastewater treatment facility in Arizona. The Tres Rios project encompasses the confluence of the Salt, Gila, and Agua Fria rivers, and runs from 83rd Avenue on the east to the confluence with the Agua Fria River on the west. This project not only establishes and restores important and historical habitat along the banks and within the Salt and Gila river channels, but also provides flood control to neighboring communities and proactively integrates water quality improvement, stormwater management, and water conservation and reuse.

Phoenix is the local sponsor for this project, which was authorized in Section 101(b)(4) of the Water Resources Development Act of 2000 (Public Law 106-541). The project has included multiple phases, including constructed wetlands, mesquite bosque, a levee, and in-river restoration. To date, multiple phases of this project have been completed, with the most recent phase completed in 2012. Awaiting additional funding, unconstructed phases have been on hold since that time.

Even partially complete, Tres Rios is a strong benefit to Phoenix and the surrounding community and provides important public benefits. Professional associations, groups, and visitors from across the country and the world now visit Tres Rios to learn about this successful project.

Highlights of Completed Tres Rios Phases

- Largest constructed wetland system receiving municipal effluent in the Southwestern U.S.; 250 acres and designed to receive up to 450 million gallons per day (MGD)

- Provides: attenuation of flows, emergent marsh habitat, submerged and floating aquatic plants, native riparian islands and banks around wetlands, and effluent polishing (particularly nitrogen and residual chlorine)
- Overbank Wetlands (approximately 130 acres); a 2.5-mile gravity-fed series of wetland ponds
 - Provides: wetland and aquatic ecosystems, riparian communities, improved flood control, conveyance of reclaimed water for downstream uses, passive recreation and fishing, and education and community benefits
- Flood Control Levee on the north bank; approximately 2.3 miles
 - Provides: flood zone protection for neighborhoods on the north bank of the Salt and Gila rivers east of the confluence with the Agua Fria River
- In-River Restoration (partially complete); approximately 2.5 miles of in-river restoration in the Salt and Gila rivers
 - Provides: low flow channel conveyance improvements for flood risk management; invasive species removal; wetland, aquatic, and riparian ecosystems; passive recreation and fishing; and conveyance of reclaimed water for downstream uses

Benefits Overview of Tres Rios

A few of the benefits experienced by Phoenix and the surrounding communities through the construction of Tres Rios are listed briefly below. The benefits highlighted in italics are carried forward for further discussion in the following sections.

- *Improves effluent water quality; the treatment wetlands polish treated effluent to further remove nitrogen, whole effluent toxicity, and total residual chlorine*
- *Expands native habitat and provides consistent discharge to the Salt and Gila rivers to sustain and improve existing aquatic, wetland, riparian, and xeri-riparian habitats*
- Provides flood control through levee establishment and improved hydraulic efficiency
- Conveys treated effluent to downstream users to satisfy contractual obligations
- *Provides fire risk reduction through the removal of invasive species*
- *Provides a platform for community recreation, involvement, education, and access to natural spaces*
- Sequestration of carbon through the development of biomass within the wetland and riparian areas
- Assist in reduction of the region's heat island signature by providing shade and evapotranspiration
- Passive recharge of local groundwater aquifer(s)

Wastewater Treatment

Tres Rios had its genesis in 1994, when the need for an alternative treatment solution for advanced nitrogen removal was identified pursuant to Clean Water Act National Pollutant Discharge Elimination System (NPDES) permit recommendations from the EPA. Small-scale demonstration ponds were constructed near the 91st Avenue Wastewater Treatment Plant in Phoenix and proved successful as an additional phase of treatment. Using 13 years of research and exploratory science from the adjacent prototypical demonstration wetlands, the project sponsors and the design team were able to apply the unique learning to the full-scale wetlands design.

Designs then moved forward to construct full-scale wetlands for final water finishing before discharge effluent to the receiving Water of the U.S. (Salt River). These full-scale wetlands became one of the first phases of Tres Rios to be completed.

These wetlands (known as the Flow Regulating Wetlands) were carefully designed to improve the quality of the treated wastewater produced by the 91st Avenue Wastewater Treatment Plant. These wetlands use a natural and passive method to effectively remove chlorine from the disinfected wastewater. Additionally, they help convert and remove nitrogen compounds from the wastewater. The wetlands transform ammonia through several processes into nitrogen gas, which is then released into the atmosphere. By implementing this eco-friendly infrastructure, the City has avoided the need to spend \$375 million on extra mechanical treatment equipment for the 91st Avenue Wastewater Treatment Plant.

As a result, Phoenix has a highly valuable wetlands that demonstrate the capability to engineer facilities that not only meet functional requirements and comply with regulatory concerns, but improve the environment and habitat quality while also providing community benefit.

Creates and Sustains Native Habitat

Tres Rios' use of treated wastewater effluent to support ecosystem restoration components makes this Corps ecosystem restoration project unique. Habitat restored thus far at Tres Rios includes hundreds of acres of wetland and riparian habitat on the north bank of the Salt River and in the Salt and Gila river channels. Similar to Rio Salado Phoenix, the cottonwood/riparian habitat is focused along the wide low flow channel within the larger river channel with habitat transitioning to xeri-riparian and mesquite bosque habitat moving laterally away from the low flow channel.

Through the treatment and direction of effluent discharge, Tres Rios provides a consistent flow of water to the Salt River that sustains and improves aquatic, wetland, and riparian habitat. Combined with the invasive species removal and native species plantings that occurred, this has resulted in Tres Rios designated as a "Globally Important Bird Area" by the Audubon Society.

Capturing the diversity of the arid southwest's riparian and xeri-riparian ecosystems within Tres Rios expands the functional use of the ecosystem restoration effort. As a result, the area

currently supports more than 200 species of birds and other wildlife, including species listed as threatened or endangered under the Endangered Species Act.

The removal of stands of saltcedar, a highly competitive and invasive tree that has now invaded nearly every drainage system in the arid southwest, will be beneficial in the short-term and long-term to native habitat. Short-term, removal of saltcedar gives native riparian species the space and opportunity to grow with a competitive advantage. Long-term, saltcedar secretes salt at a high rate which is deposited on the soil and can be a deterrent to native plant species. Removing saltcedar may allow the soils to attenuate over time and make the area more conducive to continued native vegetation germination and growth.

Riparian habitat also provides many additional benefits that are sometimes overlooked, including improving water quality in rivers, increased evapotranspiration and lower heat, filtration of nutrients through plant uptake, and benefits to surrounding and visiting community members.

Fire Risk Reduction

Removal of invasive species has provided critical fire risk reduction for the region. As mentioned previously, a competitive invasive species in the arid southwest is the saltcedar (*Tamarix* spp). Saltcedar is a shrubby tree that grows in dense patches, is more tolerant of a diversity of soil conditions than many native riparian species, and also results in a significant amount of vegetative debris accumulating in the understory. When fire occurs, saltcedar can burn hot and fast. After the fire, saltcedar generally sprouts vigorously and has increased flowering and seed production, allowing it to recover from fire more quickly than many native riparian species. This exacerbates the loss of native biodiversity as saltcedar replaces native vegetation and creates a growing fire risk in southwest riparian areas.

Tres Rios removed a substantial amount of saltcedar, particularly within the river channel. This removal and the preservation and additional planting of native riparian vegetation improves fire risk both in terms of fire frequency and severity.

Recreational Benefits

Tres Rios provides co-benefits to the community by providing access to natural riparian spaces in our urban environment, which social sciences research indicates provides important physical, mental, emotional, and social benefits to individuals, our community, and the City. The community also benefits from the carbon sequestration, shading and evapotranspiration effects of ecosystem restoration, which are important heat reduction elements in our desert city.

The success of Tres Rios has drawn visitors from across the country and the world, resulting in economic benefits to area businesses and knowledge-sharing in the scientific community. Tres Rios has been used for multiple research studies, including at least one tracking behavior of the threatened Yuma Ridgway's rail.

Although not the primary purpose of Tres Rios, with excellent birdwatching, fishing, biking, and walking opportunities and the heat reduction benefits that come with vegetation and the river, Tres Rios offers plentiful enticements to the community to get outside and connect with nature.

Next Steps for Tres Rios

Although close to completion, Tres Rios was on hold from 2012; however, the project received \$1.8 million in Community Project Funding in fiscal year 2022 for the Corps to complete a Post-Authorization Change Report (PACR) to update the costs necessary to complete Tres Rios. Future steps and anticipated benefits include:

- Continuing improvements to the low flow channel for flow conveyance and native riparian habitat in the river
- Continuing removal of aggressive and high fire risk invasive species
- Continuing improvements to native biodiversity and wildlife habitat
- Increasing local community access to a natural space

The Corps Los Angeles District has been working for the past year on the cost update for the remaining phase of Tres Rios. Phoenix looks forward to the benefits of this project multiplying further when the project is authorized in the upcoming WRDA 2024 bill to complete the Tres Rios project.

Conclusion

Phoenix anticipates the benefits we have already seen from City's other ecosystem restoration projects, to expand even further upon completion of Tres Rios and construction of Rio Salado Oeste. When these three ecosystem restoration projects are complete, there will be approximately 19 miles of contiguous restored river habitat through the heart of Phoenix, multiplying the benefits beyond what any one of these projects achieves on its own. These projects are all part of Rio Reimagined, the 20th EPA Urban Waters Federal Partnership location and are a top priority for Phoenix Mayor Kate Gallego.

Phoenix is appreciative of the many benefits that have come from collaborating with the Corps Civil Works team on ecosystem restoration projects, and we fully support the Corps' mission in undertaking and completing ecosystem restoration, particularly in the southwest. Ecosystem restoration benefits not just the city directly involved, but the broader community and region.

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Senator CARPER. Thank you very much.

Ms. Rigglin, welcome. Good to see you. Thank you for joining us.

STATEMENT OF LORIANNE RIGGIN, DIRECTOR OF ENVIRONMENTAL PROGRAMS, SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

Ms. RIGGIN. Thank you so much.

Chairman Carper, Ranking Member Capito. I am so excited to be here today to share with you the success of the Crab Bank Ecosystem Restoration Project in South Carolina.

For the record, my name is Lorianne Rigglin, and I am the Director of the Office of Environmental Programs for the South Carolina Department of Natural Resources. I have been with the agency for 17 years and have had the pleasure of working with many interested conservation partners, the surrounding Mount Pleasant community, and the U.S. Army Corps of Engineers Charleston District to help oversee the Crab Bank Ecosystem Restoration Project.

Crab Bank is a dedicated heritage trust property and a seabird sanctuary managed and owned by the South Carolina DNR. It is located in the Charleston Harbor near the mouth of Shem Creek in the Mount Pleasant community. Crab Bank was originally formed with the placement of dredged material in the 1950s.

However, over time, due to wave action, tropical storms, and hurricanes, this important seabird sanctuary eroded away. In the early 2000s, Crab Bank was approximately 23 acres, but by 2017, Hurricane Irma came and washed away the remaining half-acre of high ground in the early fall, which removed any opportunity for nesting birds the following summer.

Prior to Hurricane Irma, the island served as an important predator free refuge for a variety of State Wildlife Action Plan conservation priority species. Although all these species may not nest on the island each year, here are a few examples that have nested here at Crab Bank: Brown pelican, royal tern, sandwich tern, gull-billed tern, black skimmer, laughing gull, American oyster catcher, willet, snowy egret, and tricolored heron.

Besides providing nesting habitat, the sanctuary provides winter loafing and feeding habitat for numerous species, including large flocks of shore birds that roost on the island at night. Of the 65 seabird, shorebird, and wading bird species, collectively known as waterbirds, that utilize South Carolina's coastal habitats throughout the year, 47 are listed in our State's Wildlife Action Plan as high conservation concern. Three are federally listed, and four are State listed. These waterbirds nest in colonies with thousands of other birds laying their eggs on the ground.

Crab Bank is one of the few places on the coast where these species can come nest undisturbed from human presence. This is incredibly important, as lack of nesting habitat may be limiting shorebird population stability and growth. Research shows that shorebird and seabird populations have shrunk overall by 70 percent in the last 50 to 70 years, with an accelerated decline during the last three generations for most shorebird species.

The coast of South Carolina is the most rapidly developing area of our State, and much of this is occurring along our shorelines, which has the potential to further decrease abundance and dis-

tribution of coastal water birds throughout their life cycle. In addition, increased recreational use along our shorelines further limits available nesting habitat. Thus, restoration of Crab Bank was an extremely high priority for the survival of many coastal water birds.

The South Carolina DNR had an incredible, once in a lifetime opportunity with the deepening of the Charleston Harbor to partner as a non-Federal sponsor with the U.S. Army Corps of Engineers Charleston District under Section 204 of the Continuing Authorities Program to restore Crab Bank and support shorebird populations.

Construction on Crab Bank was completed in 7 weeks in 2021. Approximately 660,000 cubic yards of dredged material was placed with varying elevations to diversify habitat. This increased Crab Bank in size from less than half an acre to 80 acres total, with 32 acres of available shorebird and seabird habitat above mean high water.

As of June 5th, 2023, the overall projects expenditures cost shared 65 percent to 35 percent between the Federal Government and South Carolina DNR have totaled \$695,939. The purpose of the project included restoration and enhancement of an important seabird sanctuary, protection of the salt marsh located near Crab Bank, and development of wildlife viewing and shorebird educational opportunities for Shem Creek ecotourism and the greater Charleston area.

Through the Water Resources Development Act, the South Carolina DNR and the U.S. Army Corps of Engineers were able to successfully meet all the goals of this project. In 2022, Crab Bank provided nesting habitat for 107 pairs of least tern, 192 pairs of gull-billed tern, 283 pairs of black skimmer, and 8 American oyster catcher pairs.

I am happy to share today that nesting activity is in full swing for 2023, and there have been two nesting pairs observed so far of the State threatened Wilson's plover.

The South Carolina DNR is thrilled with the benefit that the Water Resources Development Act authority provided to restore Crab Bank. This project was of great benefit to the public by supporting shorebird conservation and the beneficial use of the material dredged from the Charleston Harbor.

The South Carolina Department of Natural Resources would like to encourage the Committee to continue to provide authorization for important ecosystem restoration projects like Crab Bank.

In closing, thank you for the opportunity to share the success of Crab Bank. This incredible project will have a lasting and important impact on waterbirds and the citizens and visitors to South Carolina for generations to come.

[The prepared statement of Ms. Riggin follows:]

Chairman Carper, Ranking Member Capito, and members of the Committee, thank you for the opportunity to address you today and share the success of the Crab Bank Ecosystem Restoration project in South Carolina.

For the record, my name is Lorianne Riffin, and I am the Director of the Office of Environmental Programs for the South Carolina Department of Natural Resources. I have been with the agency for 17 years and had the pleasure of working with many interested conservation partners, the surrounding Mount Pleasant community and the U.S. Army Corps of Engineers' Charleston District to help oversee the Crab Bank Ecosystem Restoration project.

Crab Bank is a dedicated Heritage Trust property and a seabird sanctuary managed and owned by the South Carolina DNR. It is located in the Charleston Harbor, near the mouth of Shem Creek and the Mount Pleasant community.

Crab Bank was originally formed with the placement of dredged material in the 1950s; however, over time, due to wave action, tropical storms and hurricanes, the important seabird sanctuary eroded away. In the early 2000s, Crab Bank was approximately 23 acres, but by 2017, Hurricane Irma washed away the remaining 0.5 acre of high ground in the early fall, removing any opportunity for nesting birds the following summer.

Prior to Hurricane Irma, the island served as an important predator-free refuge for a variety of State Wildlife Action Plan conservation priority species. Although all species may not nest on the island each year, examples of species that have nested on the island include: brown pelican, royal tern, sandwich tern, gull-billed tern, black skimmer, laughing gull, American oystercatcher, willet, snowy egret and tricolored heron. Besides providing nesting habitat, the sanctuary provides winter loafing and feeding habitat for numerous species, including large flocks of shorebirds that roost on the island at night.

Of the 65 seabird, shorebird, and wading bird species, collectively known as waterbirds, that utilize South Carolina's coastal habitats throughout the year, 47 are listed in the State's Wildlife Action Plan as high conservation concern, three are federally listed and five are state listed. These waterbirds nest in colonies with thousands of other birds, laying their eggs on the ground. Crab Bank is one of the few places on the coast where these species can come nest undisturbed from human presence. This is increasingly important as lack of nesting habitat may be limiting shorebird population stability and growth. Research shows that shorebird and seabird populations have shrunk overall by 70% in the last 50 to 70 years with an accelerated decline during the last three generations for most shorebird species¹.

The coast of South Carolina is the most rapidly developing area of the state and much of this is occurring along shorelines, which has the potential to decrease abundance and distribution of coastal waterbirds throughout their life cycle. In addition, increased recreational use along our

¹ Smith, Paul A., A.C. Smith, B. Andrew, C.M. Francis, B. Harrington, C. Friis, R.I.G. Morrison, J. Paquet, B. Winn, and S.Brown. 2023. Accelerating declines of North America's shorebirds signal the need for urgent conservation action. *Ornithological Applications*, 2023, 125, 1–14.

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State of the Birds 2022. <https://www.stateofthebirds.org/2022/wp-content/uploads/2022/10/state-of-the-birds-2022-spreads.pdf>

shorelines further limits available nesting habitat. Thus, restoration of Crab Bank was an extremely high priority for the survival of many coastal waterbirds.

The South Carolina DNR had an incredible, once in a lifetime opportunity with the deepening of the Charleston Harbor to partner as the non-federal sponsor with the U.S. Army Corps of Engineers Charleston District under Section 204 of the Continuing Authorities Program to restore Crab Bank and support shorebird populations.

Construction on Crab Bank was completed in seven weeks in 2021. Approximately 660,000 cubic yards of dredged material was placed with varying elevations to diversify habitat. This increased Crab Bank in size from less than 0.5 acre to 80 acres total, with 32 acres of available shorebird and seabird habitat above mean high water. As of June 5, 2023, the overall project expenditures cost-shared 65/35% between the federal government and South Carolina DNR total \$695,939.

The purpose of the project included: restoration and enhancement of an important Seabird Sanctuary; protection of the salt marsh located near Crab Bank; development of wildlife viewing and shorebird educational opportunities for Shem Creek ecotourism and the greater Charleston area.

Through the Water Resources Development Act, the South Carolina DNR and the U.S. Army Corps of Engineers were able to successfully meet all the goals of this project. In 2022, Crab Bank provided nesting habitat for 107 pairs of least tern, 192 pairs of gull-billed tern, 283 pairs of black skimmer and eight American oystercatcher pairs. I'm happy to share today that nesting activity is in full swing for 2023 and there have been two nesting pairs observed of the state threatened Wilson's plover.

The South Carolina DNR is thrilled with the benefit that the Water Resources Development Act authority provided to restore Crab Bank. This project was of great benefit to the public by supporting shorebird conservation and the beneficial use of the material dredged from the Charleston Harbor. The South Carolina Department of Natural Resources would like to encourage the Committee to continue to provide authorization for important ecosystem restoration projects like Crab Bank. In closing, thank you for the opportunity to share the success of Crab Bank.

Supplemental Information – Crab Bank Ecosystem Restoration Project

South Carolina Department of Natural Resources

Project Name & Location

Crab Bank Seabird Sanctuary

Crab Bank is a dedicated Heritage Trust Property and a Seabird Sanctuary managed and owned by the South Carolina Department of Natural Resources (SCDNR) located in the Charleston Harbor, near the mouth of Shem Creek (Appendix 1).

Purpose of the Proposed Project

The purpose of the renourishment of Crab Bank would be to provide:

- restoration and enhancement to an important Seabird Sanctuary supporting seabird nesting, foraging and loafing;
- protection for the salt marsh located across the Shem Creek channel from additional waves and wake in the Charleston Harbor; and
- a wildlife viewing and educational opportunity for Shem Creek ecotourism and the greater Charleston area.

Crab Bank was originally formed with the placement of dredged material in the 1950s that eroded significantly over time due to wave action, tropical storms and hurricanes (Appendix 2). In the early 2000s, Crab Bank was approximately 23 acres; in 2017, Hurricane Irma washed away most of the remaining high ground, removing any opportunity for nesting birds at this Seabird Sanctuary in 2018.

Prior to Hurricane Irma, the island served as a predator-free refuge for nesting, resting and foraging for a variety of State Wildlife Action Plan (SWAP)² conservation priority species. Although all species may not nest on the island each year, examples of species that have nested on the island include: brown pelican, royal tern, sandwich tern, gull-billed tern, black skimmer, laughing gull, American oystercatcher, willet, snowy egret and tricolored heron (Appendix 3). Besides providing nesting habitat, the sanctuary provides winter loafing and feeding habitat for numerous species, including large flocks of shorebirds that roost on the island at night.

Although Crab Bank is a small island, it has large potential to provide needed habitat for birds that are in decline. Of the 65 seabird, shorebird, and wading bird species, collectively known as waterbirds, that utilize South Carolina's coastal habitats throughout the year, 47 are listed in the SWAP as highest or high conservation concern, three are federally listed and five are state listed. Shorebirds are of highest conservation concern due to small and highly threatened global populations. Shorebird populations have shrunk by 70% across North America since the 1970s³. The coast of South Carolina is the most rapidly developing area of the state and much of this is occurring along shorelines, which has the potential to decrease abundance and

² <https://dnr.sc.gov/swap/>

³ Munro, Margaret. "What's Killing the World's Shorebirds?" *Nature*, January 4, 2017.

<https://www.scientificamerican.com/article/what-rsquo-s-killing-the-world-rsquo-s-shorebirds/>

State of the Birds 2022. <https://www.stateofthebirds.org/2022/wp-content/uploads/2022/10/state-of-the-birds-2022-spreads.pdf>

distribution of coastal waterbirds throughout their life cycle. In addition, increased recreational use along our shorelines further limits available nesting habitat.

South Carolina provides important habitat for large numbers of seabirds, shorebirds and wading birds. Efforts to conserve birds in South Carolina will help region-wide populations rebound. Seabirds, such as pelicans, terns, skimmers and gulls gather in large groups to nest together in colonies during the breeding season. South Carolina has approximately 25% of all brown pelicans nesting on the Atlantic coast and some of the largest colonies of skimmers and terns in the Southeast. Shorebirds are some of the world's most amazing migrants. Many species nest in the arctic and sub-arctic zones of the globe and spend the winter in the Southern Hemisphere. During their travels, they stop in large groups to rest and fuel themselves to sustain their migration. South Carolina provides both migration stop-over sites for flocks of thousands of these birds and wintering grounds for birds that do not travel as far south. For example, South Carolina winters, over a third, of all American oystercatchers on the Atlantic and Gulf coasts of the United States and is the most important wintering site for this species.

As one of five seabird sanctuaries on South Carolina's Coast and as a National Audubon Society Globally Important Bird Area, Crab Bank serves as an instrumental area for seabirds and shorebirds, especially brown pelicans, skimmers and terns (Table 1). Additionally, Crab Bank serves to dissipate wave energy, thus protecting the salt marsh (Essential Fish Habitat) to its east, on the edge of the Town of Mount Pleasant. Nestled near the mouth of Shem Creek, Crab Bank is a popular wildlife viewing area, especially during nesting season, for the ecotourism outfitters, from the local Shem Creek area and the greater Charleston area, that provide paddling, paddle-boarding and recreational fishing trips (Appendix 4). One of these outfitters, Coastal Expeditions, provides educational tours via paddle trips for school groups within the Charleston area. Since 2013, 9,000 middle schoolers have paddled around Crab Bank for free, thanks to grant funding for science education. The opportunity to benefit the USACE Charleston Harbor Post-45 Deepening Project and shorebirds by renourishment of Crab Bank with dredged material is a positive arrangement for all.

Table 1. Seabird Nesting Numbers for Crab Bank (2009-2017)

Species	2009	2010	2011	2012	2013	2014	2015	2016	2017
Black Skimmer	51	112	53	79	8	10	50	33	0
Brown Pelican	907	74	722	463	304	517	647	360	93
Gull-Billed Tern	13	89	42	0	62	0	9	0	0
Royal Tern	1466	1032	2661	1581	1140	1337	1677	1630	1955
Sandwich Tern	6	0	320	475	347	240	603	297	20

Table 2. Seabird Nesting Numbers for Crab Bank First Nesting Season Post-Restoration (2022)

Species	2022
American Oystercatcher	8
Black Skimmer	283
Gull-Billed Tern	192
Least Tern	107

Project Description

Construction on Crab Bank began the week of September 13th 2021 and was completed November 4th, 2021. It took 7 weeks to complete with 53 workers working 24/7. Approximately 660,000 cubic yards (equivalent to 660,000 washing machines or 66,000 dump trucks) of compatible material was placed, with areas of various elevations, for diversity of habitat. This increased Crab Bank in size from less than 0.5 acre to 80 acres total, with 32 acres of available nesting and loafing habitat above mean high water (Appendix 5). Dredged material excavated from the Charleston Harbor navigation channel was transported via pipeline and discharged. Once established, shore-based mechanical equipment was utilized to build temporary containment berms and spread the placed material.

The total project expenditures* to date are as follows:

	Federal (65%)	Non-federal (35%)	Total Costs
Feasibility Phase	\$259,941		\$249,941
Design & Implementation Phase	\$286,864	\$149,134	\$435,998
Total Project Expenditures*	\$546,805	\$149,134	\$695,939

*As of June 5, 2023. Project requires final cost share balancing and financial closeout.

SCDNR will continue to manage Crab Bank for birds as a Heritage Preserve and Seabird Sanctuary.

Project Development

Over the last few years, SCDNR has worked closely with the USACE during the environmental review process on the Charleston Harbor Post-45 Deepening Project. As a part of that process, SCDNR requested that Crab Bank be considered as an option for the beneficial use of dredged material. However, following analysis, the renourishment of Crab Bank was not the least cost alternative for the dredged material. Due to interest expressed by SCDNR, local ecotourism outfitters from Shem Creek and various conservation organizations, the USACE Charleston District pursued, with SCDNR agreeing to be the non-Federal Sponsor, an opportunity to cost share the renourishment of Crab Bank under the Water Resources Development Act Section 204 of the Continuing Authorities Program. A detailed project report can be found at:

<https://www.sac.usace.army.mil/Portals/43/docs/civilworks/post45/Cap%202024/Charleston%20Harbor%20CAP%202024%20Feasibility%20Report.pdf?ver=2018-05-09-150058-073>

Project Benefits

The coast of South Carolina is the most rapidly developing area of the state and much of this is occurring along shorelines, which has the potential to decrease abundance and distribution of coastal water birds throughout their life cycle. In addition, increased recreational use along our shorelines further limits available nesting habitat. The use of dredged material to renourish Crab Bank would enhance and prolong the existence of this important refuge for coastal birds to loaf and forage, as well as nesting habitat for brown pelicans, several species of terns, and other wading birds.

Additionally, Crab Bank serves to dissipate wave energy, thus protecting the salt marsh (Essential Fish Habitat) to its east, on the edge of the Town of Mount Pleasant.

Due to its prominent location in the Charleston Harbor and its proximity to Shem Creek, Crab Bank plays a vital role in the ecotourism economy. In a recent study on “The Economic Contribution of Natural Resources to South Carolina’s Economy⁴” published by Clemson University, coastal tourism brought in \$9 billion per year to South Carolina.

Although going ashore Crab Bank is prohibited to protect the birds, it provides an opportunity for seabirds to be observed from the water without disturbance to nesting activities and behaviors. The island’s proximity to the mouth of Shem Creek and its sheltered location in Charleston Harbor make it a safe destination for kayakers launching on nearby Shem Creek. This accessibility provides a unique opportunity for scientific study of seabird ecology. Many graduate projects have focused on understanding seabird ecology by viewing nesting activity via kayaks at Crab Bank. This type of research is essential for conservation of seabirds, yet can be difficult, costly, and disruptive to bird behavior at more remote sites.

Crab Bank is a popular wildlife viewing area, especially during nesting season, for the Shem Creek ecotourism outfitters that provide paddling, paddle-boarding and recreational fishing trips. One of these outfitters, Coastal Expeditions, provides educational tours via paddle trips for school groups in the Charleston area. Since 2013, 9,000 middle schoolers have paddled around Crab Bank for free, thanks to grant funding for science education.

The visibility and access to view wildlife at Crab Bank provides an opportunity for the connectivity between man and the environment, fostering stewardship and a desire to protect these coastal resources.

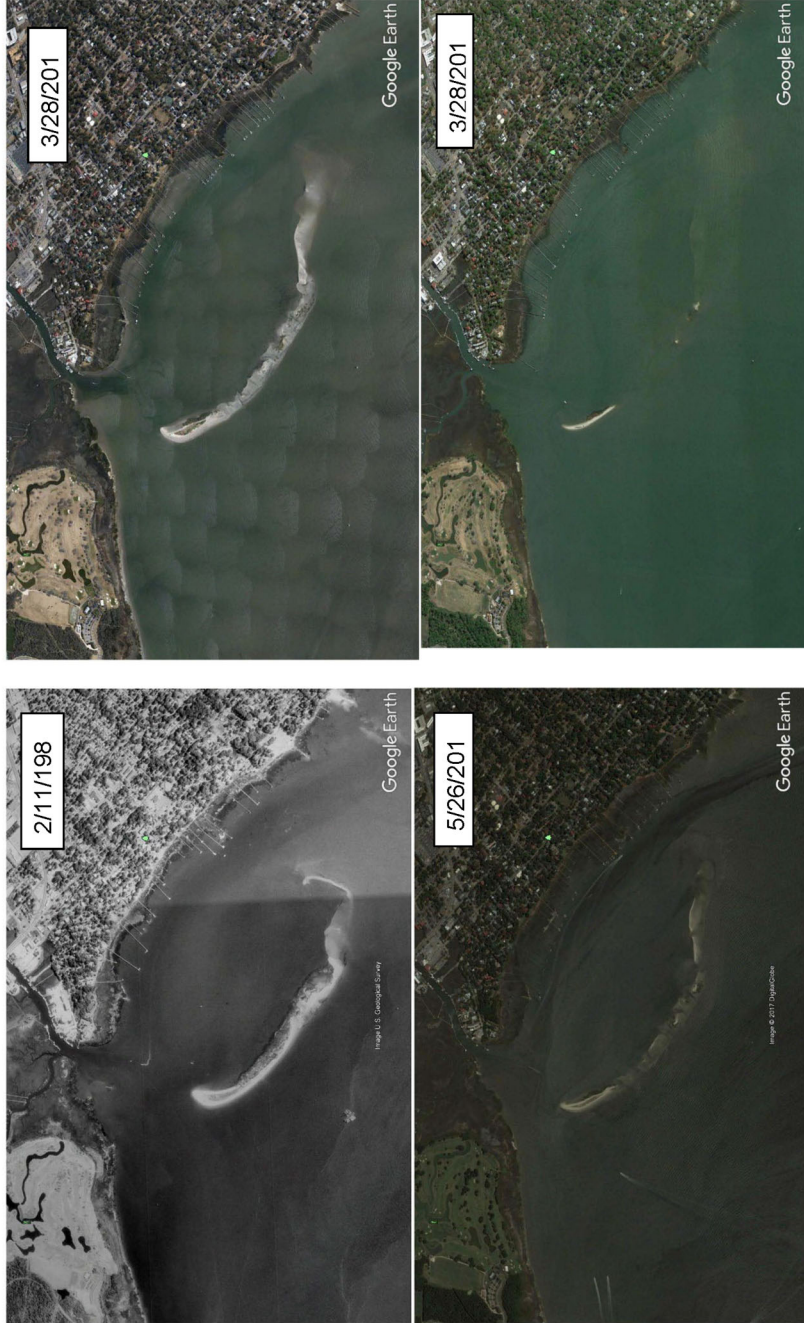
Crab Bank Seabird Sanctuary Nesting Season 2022 Highlights may be viewed here:
<https://www.youtube.com/watch?v=JlQWxo63eeA>.

⁴ <https://www.dnr.sc.gov/economic/EconomicContributionsSC.pdf>

Appendix 1. Location of Crab Bank



Appendix 2. Erosion of Crab Bank



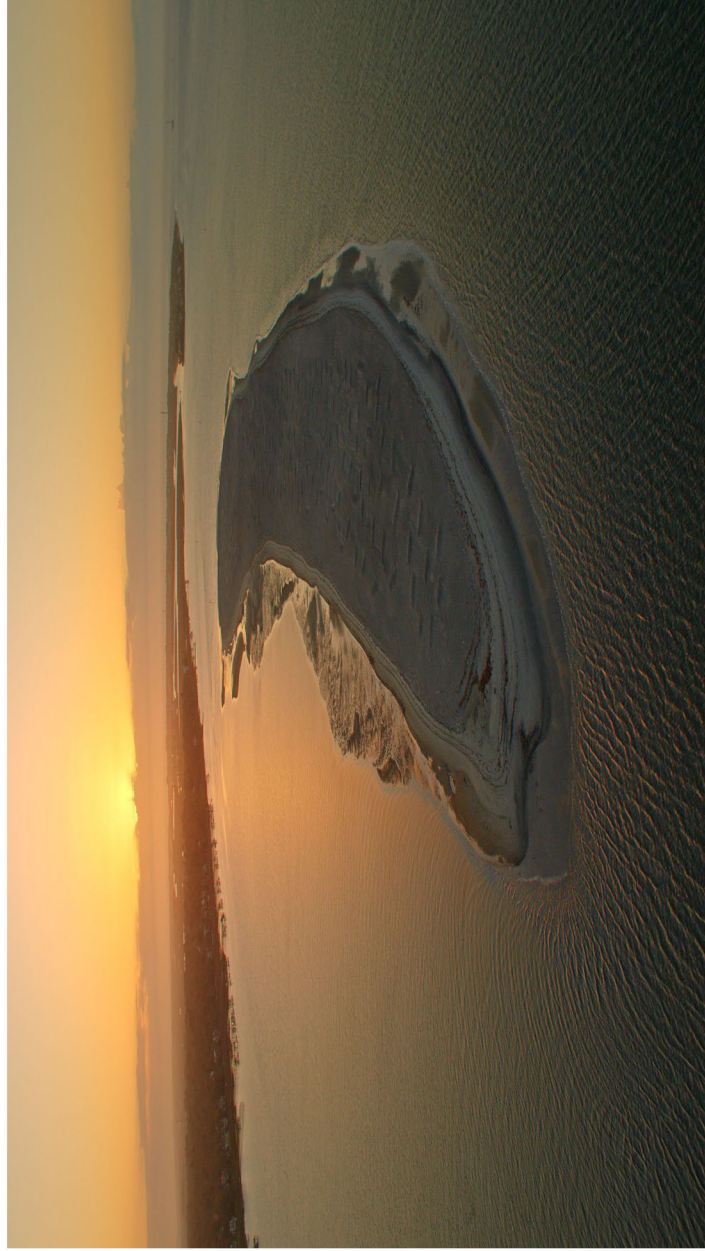
Appendix 3. Nesting Terns & Brown Pelicans 2015



Appendix 4. Historic Image of Crab Bank View with Shem Creek



Appendix 5. Image of Crab Bank Post-Construction





Senator CARPER. Thank you.

Thank you all for your testimonies.

Ms. Balluff, you mentioned John McCain in your testimony, didn't you? Our former colleague, he and I were naval officers and served together in the Vietnam war. He was a great hero, and later, he and I were elected the House Representatives together the same day, joining forces again in the House and then later, in the U.S. Senate.

He was not a member of this Committee, but he was someone who cared a lot about the environment. Take just a minute and talk about his involvement in the project, if you will, that you just discussed, very briefly. What did John do? What was his role?

Ms. BALLUFF. Yes, Senator Carper, thank you. I am happy to do that.

Senator McCain really spearheaded what is called the Rio Reimagined Initiative in Phoenix, and he has been very supportive of all of the ecosystem restoration that has been happening throughout Phoenix but also in surrounding cities.

Rio Reimagined really came to be because of him. It is a 56 mile stretch of the Salt and Gila Rivers through the Phoenix metropolitan area that involves many different cities, Tribal Nations, and nonprofits, educational institutions such as Arizona State University for example, that have all come together to collaborate and look for ways to work together to improve the overall river corridor through this metropolitan area for the benefit of all of our citizens.

Senator CARPER. Good, thank you. This Memorial Day, we celebrated the 50th anniversary of the return and release of hundreds of Vietnam POWs. POWs were released by the Vietnamese all those years ago. We celebrated their lives.

John McCain and I and John Kerry worked together with former President George Walker Bush to get the Vietnamese government to turn over information on hundreds of additional missing in actions from the war that led to the normalization of relations between the United States and Vietnam. They are now one of our top 10 trading partners in the whole country, and U.S. Navy vessels call on Vietnamese ports, and we have remarkably strong economic and actually, defense relationship with them.

That is a bit far outfield, but I can't let the mention of John's name go by without saying some of that.

I like to quote Mark Twain from time to time. He said a lot of things that are worth remembering. One of the things that he said is that the two most important days of our life are the day we are born and the day we figure out why.

I understand in your life that there is an interesting twist to that story, and that quote has a special meaning to you. When did you figure out why you were born? What career might you have been in?

Ms. BALLUFF. Was that question directed at me, Senator Carper?

Senator CARPER. Yes. OK, wrong witness.

We will try Ms. Riggan, same question. When did you figure out why you were born? Then we will come back and figure out why Ms. Balluff was born.

[Laughter.]

Ms. RIGGIN. I would say, there are lots of whys. The most recent why is my 9 year old son, but early on, as a child, I had a strong desire to make a difference in this world, and my strong desire was to make a difference for natural resources. I learned that at a very early age that that is where I needed to focus my energy, and I have a lot of it.

Senator CARPER. I believe you do.

Ms. RIGGIN. And so, in eighth grade I sent a letter to the South Carolina Department of Natural Resources requesting information about what kind of jobs I could do for the State and serve the State and its citizens and the natural resources. They provided me some information, and I ran with it, got a degree and got my foot in the door, and I have been there ever since.

Senator CARPER. Good.

I am going to turn to Mr. Eikenberg, whose son is actually sitting back in the first row, over his right shoulder, his 14 year old son.

We welcome both of you today.

For folks, young people, it might be like his contemporary in high school or maybe in college or not. Why should his generation, your son's generation, care about what we are discussing here today? Why is it relevant in their lives?

Mr. EIKENBERG. Mr. Chairman, thank you for that question. In the spirit of bipartisanship, I do want to take a moment to acknowledge your former colleague, Senator Bob Graham. When the Everglades restoration was passed in the year 2000, he worked with my former boss, Congressman Clay Shaw, to ensure that that was a bipartisan effort, and it continues to be that way to this day.

Senator CARPER. That is great.

Mr. EIKENBERG. For children, watching our body politic to find our environmental issues where we can come together in a bipartisan way, I think it is a great example for the next generation.

I will just say that 10 years ago, from my perspective, watching what was billed as the "lost summer" in Florida due to algae outbreaks stemming from the Army Corps discharging water from Lake Okeechobee. It rallied voices that had not been at the table: Business leaders, tourism officials, realtors. These men and women became the foot soldiers in ensuring that we have restoration that we can not only do it this generation, but then pass it on to the next generation.

For me, that was a moment to realize that what we are doing is greater than ourselves, but we are able to pass it on soon to the next generation.

Senator CARPER. Good.

Bob Graham and Clay Shaw, two good friends. It is nice to hear their names again. Bob Graham was a Governor of Florida and also a United States Senator from Florida for many, many years.

When I was thinking of running for the U.S. Senate, I went down to Florida to meet with him, have breakfast, and he arranged for me to meet some folks down there. I remember that I asked him, I said, when you had the opportunity to be a U.S. Senator, when you had the opportunity to be Governor, which job do you prefer and why?

He said, you know, to use the football analogy, he said, when you are the Governor, you are the quarterback on the field, calling every play. When you are the United States Senator, you are the general manager sitting up in a box, watching the game.

I said, well, which do you prefer? He said, well, I like to be on the field calling every play. He said, every team needs a good general manager. Besides, the seats are pretty good. The seats are pretty good.

With that, let me yield the floor to the Senator from West Virginia.

Senator CAPITO. Thank you, Mr. Chairman.

Ms. Riggan, let's talk about the Crab Bank Seabird Sanctuary. I have trouble saying that whole thing at once.

I know it was a public-private partnership. Can you talk about the public-private partnerships, both in this case, and others that you see in your State and how they really help to get the completion of the projects?

Ms. RIGGIN. Absolutely, happy to.

When we first started with the Crab Bank project, we had a short timeline. We were in 2019, and we had a feasibility report that gave us an estimate of what the total cost of the project would be, which would have required the State to have \$1.4 million sitting, waiting, and ready.

Given budget constraints, we figured out we needed some help, and so we also already had conservation interest groups, like the Coastal Expedition Foundation, which is a nonprofit arm of a local ecotourism outfit, the Coastal Conservation League, Audubon South Carolina, that had the expertise to help fundraise.

Under the State's statute, we have something called the Non-Game and Natural Area Statute that allows the South Carolina Department of Natural Resources to receive funds for the purpose of non-game management. We utilized that funding opportunity under that existing State statute and the expertise of our conservation partners to help us rally within the community to help leverage additional funds to bring to the table, so that we were sitting, waiting, and ready for that \$1.4 million, had that been the ask of the Department of Natural Resources of the non-Federal sponsor.

In addition, as we were on that short timeline of just 12 months, Audubon South Carolina went out and applied for a National Fish and Wildlife Foundation grant to help supplement funding cost as well, and that was a one to one match ratio, so that was a \$1.4 million ask that we all had to come up with a \$700,000 match. We pulled that all together to have enough funding that we needed.

Plus, that allowed us to springboard future projects from that existing pot of money that we have now created as the Coastal Bird Conservation Program. Crab Bank was a starting block for that additional funding to go further for shorebird conservation.

Senator CAPITO. Right.

I am sure, Mr. Eikenberg, you have jumped through a few hoops yourself, trying to figure these things out, the public-private partnership portion.

Mr. EIKENBERG. Senator, it is a key part of where we are today with Everglades restoration. Certainly, the Corps working with the non-Federal partner, in this case, the South Florida Water Man-

agement District, but bringing a multitude of other stakeholders to the table.

I want to applaud the Corps for allowing those differing voices to be heard and to be taking that feedback. I would submit to you that this issue, restoring the Everglades, has become a national model. Thanks to the Congress in 2000, you set out a plan. We know the problem; we have a solution, and we are working in a collaborative way to make sure it is successful.

Senator CAPITO. I will go back to Ms. Riggins. Are there any additional authorities that you feel would allow the Corps to better assist non-Federal partners? The reason I think that is important is for the examples that you all have put forward, but we have heard some rumblings sometimes, having dealt with the Corps myself, sometimes, needing a little bit more assistance for them to be able to help their non-Federal partners.

Did you find that was a challenge or not, are you finding that?

Ms. RIGGINS. I did really find that was a challenge from the CAT 204 perspective. I think planning assistance with the States' program, which is something else that the Corps does, that would be another avenue where they need additional support to provide help.

I know within the Charleston District there is a long list when the State comes to the Corps and says, hey, I have an interest and need your expertise on these items. I think that is an area that probably additional support could be given to help them address a lot of the planning assistance for the State's request.

Senator CAPITO. Does anybody else have a comment, Ms. Balluff, on that particular issue, any other authorities the Corps might need to better assist non-Federal partners?

Ms. BALLUFF. Yes, I certainly agree with Ms. Riggins.

One other thing I would add is that additional resources for the Corps, once the Civil Works project is complete is sometimes very useful as things come up over time with these ecosystem restoration projects to continue to work with the Corps on them and finding solutions can be quite a useful exercise. I would add that.

Thank you, Senator Capito.

Senator CAPITO. Thanks.

Mr. Eikenberg, do you have any other comments?

I have to go to another hearing, here, and so I am going to apologize. I am going to leave after I hear from Mr. Eikenberg.

Mr. EIKENBERG. Senator, any opportunity where the non-Federal partner could maybe get out ahead on a particular portion of a project. The Corps has demonstrated a willingness to let the South Florida Water Management District do that, and it speeds up the implementation. We appreciate the Corps being at least willing to do that. If there is additional authority to allow that to occur in a greater manner, we would certainly support that.

Senator CAPITO. Thank you all.

Senator CARPER. We have been joined by a couple of fellows from out west.

We are delighted you could come. One of our witnesses brought a 14 year old son with them today.

Would your son raise his hand, sir?

Go ahead, raise your hand. There you go. You have some people up here.

I think Senator Capito has a couple of sons. I have three sons, and Alex has, I believe, three, two? Three. Your guys are a little bit younger.

Senator PADILLA. Three sons as well, and all three will be on summer vacation as of this Friday, so please pray for us.

[Laughter.]

Senator CARPER. You are in our prayers. Right now, you are recognized, any questions you want to ask. Thank you.

Senator PADILLA. Thank you, Mr. Chairman. These conversations are all too timely, I think, as a lot of us in the field know the significance of a recent Supreme Court ruling that limited the scope of the Clean Water Act, and more specifically, the Federal Government's ability to protect thousands of miles of rivers, streams, creeks, and adjacent wetlands throughout the western United States.

At the California State Water Board, this is how they framed the last month: Wetlands provide an important buffer and filter, protecting our Nation's waters. But in the semi-arid watershed, most will not be able to satisfy the Corps' requirements for a "continuous surface connection to bodies that are 'waters of the United States' in their own right, so that there is not clear demarcation between waters and wetlands."

Ms. Balluff, given your role in the city of Phoenix, are there particular challenges posed by an increasingly arid West for aquatic ecosystem restoration projects? And I guess the bigger picture question here is, how important is ecosystem restoration just for the restoration of habitat, but for the economic health of communities as well as water quality, recreational opportunities, et cetera?

Ms. BALLUFF. Yes, thank you, Senator Padilla. Yes, it is very important, and it is also challenging in the desert Southwest.

But ecosystem restoration, I would argue, especially along our rivers, is one of the most valuable things that we can do in terms of ecosystem restoration. These riparian areas are some of the most productive and rich areas and have the most benefit. They also draw a lot of economic interest in development along the banks, as well.

So it also draws a lot of people into the river and really helps them connect with nature, which I think we know from social sciences, really provides a lot of mental and emotional and social and physical benefits to our communities. So while it is a challenge, I think it is a challenge well worth pursuing.

Senator PADILLA. Great. I know in your testimony you mentioned that the genesis of the Tres Rios Ecosystem Restoration project was the need to treat wastewater discharges.

As a native of Los Angeles, I know all too well the challenges of restoring aquatic ecosystems in a highly paved urban area like Los Angeles. Thanks to many years of hard work, as well as funding from the Bipartisan Infrastructure Law, the U.S. Army Corps of Engineers and the city of Los Angeles is making progress to restore historic riparian and freshwater marsh habitat along 11 miles of the 52 mile long Los Angeles River.

Referencing back to the Tres Rios project, in brief, how is that impacting drought resiliency? I assume it has been helpful. I assume there has been progress. Anything you could highlight, and then once again more broadly, what advice would you have for western cities looking to improve water quality and to restore habitats while facing all the same challenges?

Ms. BALLUFF. Thank you, Senator Padilla. I am going to try and remember all those questions. You may have to refresh me on a couple.

[Laughter.]

Senator PADILLA. How is that project working, the Tres Rios project? How is it working?

Ms. BALLUFF. Tres Rios was originally contracted, as you say, to treat wastewater effluent. The water is treated at our wastewater treatment plant, then it goes into these constructed wetlands that actually help to polish and finish, remove some nitrogen and chlorine attenuation, things like that, to meet Clean Water Act requirements before we then discharge it into the river. In fact, all of the water that supports the Tres Rios ecosystem restoration does in fact come from that wastewater treatment plant.

So all of the water from that wastewater treatment plant is beneficially reused, which I think is one of the really great aspects of this, and a really good way to use water, especially in a time of drought. Because it is not only going into the ecosystem, it is going downstream and being used in other ways downstream as well.

Senator PADILLA. Again, given that experience, whether it is design, whether it is funding sources, what advice would you have to other jurisdictions throughout the West dealing with the same changing climate, the same water supply challenges?

Ms. BALLUFF. I certainly know that the wastewater treatment process that we engaged in with the constructed wetlands saved us hundreds of millions of dollars in terms of what we would have otherwise had to spend. So simply from a financial perspective it made a lot of sense.

But also the benefits that we accrue from the flood attenuation, flood risk management, from the ecosystem restoration and the visitors we get from not only around the world, but also from our local community and across the United States make this a really valuable project.

So certainly, we have found it extremely beneficial. I would definitely advocate for looking at ways to have those multiple uses of water that provide those multiple benefits we have seen from Tres Rios.

Senator PADILLA. Excellent. Thank you so much.

Thank you, Mr. Chair.

Senator CARPER. That was an interesting description of the work that you have done out there. It is really ingenious and highly commendable.

Senator Kelly, good to see you. Others have been noting, with respect to some of these issues, looking forward to the future of our planet, that we have a dog in this fight, these fights. We also have children and grandchildren. You have both.

Senator KELLY. Thank you, Mr. Chairman.

Senator Padilla was a great lead in to me. But I will first defer to my colleague on the other side of the aisle if he is ready.

Senator CARPER. I am sorry, jump right in.

Senator GRAHAM. Thank you, Senator Kelly.

Welcome, Ms. Riggan. How are you doing? I appreciate your coming to the Committee.

Mr. Chairman, thank you for having the hearing, and to my colleagues.

Senator CARPER. I am trying to figure out how to say this, the entity down in South Carolina. We are tripping over it pretty badly. But we will get it down.

Senator GRAHAM. I was very much involved with you, I was impressed with how you brought people together to Crab Bank. It is a place for birds to nest, right? It was a win-win with the city of Mount Pleasant, the DNR, the Corps of Engineers. If you could, just tell the Chairman a little bit about the project. What was the key to bringing people together?

Ms. RIGGIN. Thank you, Senator Graham. I appreciate the invite to be here, and I appreciate the support from your staff as well today.

I think the key to the hurdle that we ran into were concerns regarding the project. Crab Bank sits at the mouth of Shem Creek. There was some concern from the community, when you hear you are going to put 660,000 cubic yards of material, they have concerns about where that material is going to go.

So we had an opportunity with the Corps of Engineers, thankfully the dredging timelines worked out that we were able to go and rerun a coastal model to help provide some data as to where the material would go.

As well, when we went through the feasibility process, we had 25 different alternatives of a footprint that we were looking at for Crab Bank. So because we had so many choices on the table, and we had additional data in time, we were able to calm the fears and concerns of folks about where that material was going to go and make sure that it was going to stay on Crab Bank.

But I think the key to that is just people being open and honest and the continued communication between not only DNR working with the town of Mount Pleasant, but also the Army Corps of Engineers sitting down with the town of Mount Pleasant, that we were all coming at it together, knowing that we had the goal in mind for this island for shorebird conservation. And everybody bought into that idea. We just had to make sure that everybody was comfortable with how we were going to go about doing that.

I think it is just open and honest communication and often.

Senator GRAHAM. Our office was a part of that, and I want to echo that I appreciate the role you played, and the DNR, and all the agencies involved, State, local and Federal. I think it was a win-win.

Thank you very much.

I appreciate your giving me a chance to speak, Senator Kelly.

Thank you, Mr. Chairman.

Senator CARPER. We are delighted that you could join us. Thanks.

Senator Kelly, you are on.

Senator KELLY. Thank you, Mr. Chairman.

I want to extend a very special welcome to Tricia Balluff, who is joining us today from the city of Phoenix.

I want to follow up on Senator Padilla's comments and questions about Tres Rios, and the vision for a renewed Salt River in the Phoenix area. That was championed by my predecessor, Senator John McCain.

Also, I want to acknowledge the work of Mayor Gallego of the city of Phoenix that they have done to advance these projects in partnership with Federal agencies, including the Army Corps.

So these projects that we already talked about a little bit show how investments made by the Corps and their local partners can improve water quality, recharge aquifers, and support water conservation, even in a desert. There were a few of these benefits that I want to discuss.

You talked first about hundreds of millions of dollars of savings in water treatment costs. I think it was about \$375 million.

Can you explain how that project on the Tres Rios wetlands and the water, how it has saved the city? Specifically, how has that project saved the city \$375 million?

Ms. BALLUFF. Thank you, Senator Kelly. Thank you for having me here.

Yes, absolutely. Back in the late 1990s, I would say, there were new Clean Water Act requirements through the Environmental Protection Agency for discharges of wastewater into waters of the United States that were going to necessitate some significant infrastructure investments in our existing wastewater treatment plant. And we had been working with demonstration wetlands to see how they would effectively treat this to these levels.

It turns out it was really effective. So in partnership with the Corps through Tres Rios, we created these full scale, really significant hundreds of acres of wetlands that are actually functionally for treatment through passive removal of nitrogen, through soil processes, through plant processes, and also through the attenuation of chlorine levels as it moves slowly through these wetland ponds. The sunlight helps to dissipate the chlorine, helps us to meet our standards.

Senator KELLY. Does that mean since it is downstream, so the wetlands are downstream of the wastewater plant, does that mean you can push water through the treatment plant faster? Is it less energy costs? Where is the financial savings coming from?

Ms. BALLUFF. The financial savings is the avoided costs of the infrastructure that we would have had to construct otherwise. In terms of energy costs and timelines, I would have to check on that.

Senator KELLY. So you have to build less infrastructure because you have this downstream wetland?

Ms. BALLUFF. We did not have to build hard infrastructure because of the wetlands.

Senator KELLY. Another benefit I want to mention here is the recreational use of those wetlands, Tres Rios, fishing, hiking, and there are others. Certainly maybe even now with the amount of water that is there, kayaking.

Can you explain how the next phase of Tres Rios will enhance the recreational benefits of this project, and what else will Phase 3(c) of the project include?

Ms. BALLUFF. Thank you, Senator Kelly. I am happy to.

Right now, the maintenance paths are used as trails by folks who come visit. There are no trailheads, it is not technically open to the public per se, because there are no formal trailheads for them to enter through. So the number of people who can come in at one time is pretty limited. And it is really only at one location.

In Phase 3(c), part of the finishing phases of Tres Rios is to construct some trailheads along the Tres Rios, so that it really opens access and a lot more people can come and enjoy it, especially those from neighboring communities. The rest of Phase 3(c) is really finishing up the in river restoration on the western end of the Tres Rios property, down to the Agua Fria River.

Senator KELLY. Can you confirm that the reason the city and the Corps can't begin work on this next phase of the project is because there is not the authorization from Congress yet?

Ms. BALLUFF. That is correct, yes.

Senator KELLY. Mr. Chairman, I hope that in the next WRDA bill, we can include that authorization, so they can finish Phase 3 of the Tres Rios project, and the city can move forward on this project.

I am out of time, but I have another question.

Senator CARPER. Go ahead, please.

Senator KELLY. Ms. Balluff, I think in your opening testimony you may have talked about a little bit more of the Salt River ecosystem. I wasn't here for that. Can you explain to the Committee the issue of the salt cedars on the Salt River, and what risks they pose to the city and the region?

Ms. BALLUFF. Yes, thank you, Senator Kelly.

Salt cedar, for those of you not in the Southwest, you may not be familiar with it. It is a highly invasive shrubby tree. It forms in really dense stands, and it creates, it has a lot of litter and debris that fall off of it, also secretes a lot into the soil, it drops a lot of salt into the soil. So it creates these highly saline soils and also creates a really high fire risk.

It also recovers really well from fire risk, more than our native species. So it really does push out a lot of our native habitat and creates a monoculture, which also creates a lot of risk in terms of fire and disease and other detrimental things to the ecosystem restoration.

Senator KELLY. What has the city of Phoenix done to try to remove these salt cedars?

Ms. BALLUFF. It is a very difficult problem plaguing a lot of agencies across the Southwest. Tres Rios removed a lot of salt cedar; it was huge benefit to the river in that area.

But it is an ongoing challenge. We do continually remove. We also try to replant with native species whenever we remove, so that they can have some competitive advantage, to be able to take root and outcompete the salt cedar as it tries to resprout.

Senator KELLY. What can the Army Corps do to help?

Ms. BALLUFF. More projects to help remove salt cedar would be fantastic.

Senator KELLY. Is there any innovation out there, is there anyone trying to, instead of remove it, and I know there is always a risk in doing this, but are there any pilot projects that are taking a different approach?

Ms. BALLUFF. Senator Kelly, I am not aware of any pilot projects. I think where we are at right now is trying to find the appropriate balance of managing salt cedar, increasing native habitat, but accepting that probably there is going to be some level of salt cedar in our Southwest systems, and how can we manage that and keep it to the minimum possible.

I think really the most effective method is when you remove, you replant with native species. And if necessary, salt tolerant species, and gradually attenuate the soil so that you can then have more of the riparian species you are looking for.

Senator KELLY. How did we wind up with this plant in the Southwest?

Ms. BALLUFF. Many, many decades ago, it came in from Eurasia, is my understanding, it was introduced for multiple reasons, flood control and I believe even aesthetic reasons. It can be quite beautiful when it is flowering, unfortunately. I believe that is how it came in. Then of course, it is highly competitive, so it kind of took off and spread on its own.

Senator KELLY. Thank you.

Thank you, Mr. Chairman, for the extra time.

Senator CARPER. Thank you, and thanks for bringing your witness with you. Very interesting and very helpful.

We started off, I asked Mr. Eikenberg to think out loud for us at the beginning of our hearing why should young people the age of his son, kids in high school and maybe beyond high school, why should they care about the issues we are discussing today. He shared some thoughts with us.

The same question to Ms. Balluff. Why should young people in high school going off into college, off into the world, why should they care about these issues?

Then Ms. Riffin, the same question.

Ms. BALLUFF. Thank you, Senator Carper. It is a great question.

I think there are a few different reasons for this, one of which of course is do we want our kids to inherit a world in which our rivers are dry and dusty in the Southwest, with nothing in them but landfills and sand and gravel pits. I think we probably want more for them. And I think they want more for themselves.

I think also as we go out into these areas and we experience the benefits of them that come to us, especially for those in college, who might be having to study for a test or something.

But in all reality, from a water quality perspective, from a fire risk management perspective, the benefits to our surrounding area, to our air quality, to our water quality, they are significant. These riparian areas provide a lot of filtration benefits that we can't really get without really expensive infrastructure otherwise.

So in terms of cost effectiveness, these are a really cost effective way to help achieve some of our goals for quality.

Senator CARPER. Good. Thanks for that.

Ms. Riffin, any thoughts?

Ms. RIGGIN. Just to add, people should care because this is our home. We read about habitats and ecosystems in textbooks, but we don't often put ourselves as we are in that habitat, we are a part of that ecosystem.

The more that we can take care of it, the more we care about it, the more that we all are stewards of it, the natural resources professionals aren't lifting the heavy load alone, we are carrying it together to protect our air, our water, our landscapes, so that it is not just a cool place to go hike that we are going off to visit, it is a place that supports our clean air, our clean water.

So the why is because we are here, and we are part of that ecosystem.

Senator CARPER. Every now and then we are fortunate to have a leader of another nation come to Washington, to Capitol Hill, and speak at a joint session of the Congress. We usually meet in the House chamber because it is bigger than the Senate chamber. And we have House and Senate members there.

One of the more interesting speakers in recent years has been the President of France, President Macron. He came and spoke to us, not in French, but in perfect English. One of the things he said to us in his speech, he talked about our planet. And he said, this is the only planet we are going to have, he said, there is no planet B. This is it; we have to take care of it. I will never forget that.

I use that line a whole lot since I heard it from him. He was a special guest at a state dinner hosted by President and Mrs. Biden, and I got to see President Macron again. I told him about that line and reminded him how he had used that and how I have stolen it and never given him any credit for it. He said, we have a special word in French for people like you, who use our best material without acknowledgement.

[Laughter.]

Senator CARPER. My staff has given me a question, I have a bunch of questions I will ask, but I will lead it off with this one, so I don't get in trouble with them.

The environmental benefits of the Corps' ecosystem restoration portfolio, including those projects that we are talking about here today, clearly show a response to climate change through increasing resilience. And at the same time, these projects promote the economic health of the communities that you represent and that I represent and Senator Capito and others represent, through activities such as navigation, agriculture, and ecotourism.

I will start with you, Ms. Riggan, and we will go to your right, please. It would be helpful if you would lead us off, take a minute or two to elaborate for us on the challenges and the opportunities, challenges and opportunities in partnering with the Corps on ecosystem restoration. Clearly, something is working, and working right. But I know we can always find room for improvement.

If we could start with that, and we will come down to Ms. Balluff and then Mr. Eikenberg, please. Any thoughts?

Ms. RIGGIN. Crab Bay was my first ecosystem restoration project, so I don't have a ton of experience under my belt. But I think the more we can do those types of projects, the better we are all going to end up being, and the more we give the flexibility to the Corps

to be able to work with those non-Federal sponsors to accomplish those goals.

A lot of times there are very rigid timelines, very rigid points at which the project is managed. The more flexibility that we have to develop a project which allows us to go back and do things like we did with rerunning a model, provide additional information or go further and monitor the project post-construction, so that we have some data to support future successes and document what we accomplished so that we can learn from it and use that to replicate in other projects.

Senator CARPER. Good. Thank you.

Same question, Ms. Balluff.

Ms. BALLUFF. Yes, thank you, Senator Carper. I think that flexibility is probably one of the most important things that we can gain with the Corps. I think they have so much capability in their offices, and they have, at least in our district, I know they have a lot of passion for these projects. We have just had such wonderful working relationships with the folks in the Los Angeles District. We are really grateful for them and for their efforts.

Certainly, I think I mentioned this before, but after the fact, long term, allowing the Corps the flexibility to stay involved in the restoration projects that they do perform, so that when things come up, we can circle back around to them, and they would have the resources to be able to work with us to fine tune and shift things as needed. As we are finding and discovering more information as we move along these projects, it would be incredibly helpful.

Senator CARPER. All right, good. Thanks.

Mr. Eikenberg, with the Everglades in mind, same question. Elaborate a bit for us if you would on the challenges and the opportunities in partnering with the Corps.

Mr. EIKENBERG. Mr. Chairman, I mentioned that this issue is a national model. It has taken time to get to that point, 23 years now into the process of a restoration effort between the Army Corps and a non-Federal sponsor, the State of Florida.

I do want to give a plug for the regular order on the Water Resources Development Act. Having the ability for the Army Corps hearing issues on the ground, understanding the importance of having those authorizations or those tweaks, those refinements, there is an integrated delivery schedule that the Army Corps of Engineers and the South Florida Water Management District have outlined. It takes us through the end of this decade. It is clear, it demonstrates exactly what needs to occur.

But there are moments when both sides, along with stakeholders like the Everglades Foundation, offer suggestions for WRDA bills to be available again, enable and ensure that these projects come to fruition. We have come a long way. The ability not only to preserve a drinking water supply for a growing population but these added benefits, these economic benefits that come with this, the issues relating to storing and sending water south, recharging an aquifer that is the drinking water supply now for almost 6 million people.

And then alone the benefits of pushing against sea level rise and saltwater intrusion. This issue covers the gamut and having the Army Corps of Engineers identifying the challenges and not back-

ing away from them and seeking assistance from NGOs or the State of Florida to assist in that regard. I salute the Corps from Jacksonville to Atlanta to Washington in making this effort again a national model for the Nation.

Senator CARPER. Good. Thank you.

Speaking of sea level rise, as a Senator from the lowest lying State in the United States, our State is sinking, the seas around us are rising. Not a good combination. We have a special concern about the climate changes driving sea level rise, land subsidence, and flooding in our State and other States on the coasts.

According to Climate Change 2023 Synthesis Report Summary for Policymakers from something called the Intergovernmental Panel on Climate Change, the largest driver of climate change is carbon in our environment, resulting in unprecedented rising global temperatures and corresponding extreme weather events. The same report, however, also points to carbon reduction benefits associated with ecosystem restoration.

Mr. Eikenberg, would you please explain for us how the Everglades project is helping to address the root causes of climate change through environmental restoration? Please also explain for us the significance of the climate mitigation and resilience benefits seen in the Everglades thus far.

Mr. EIKENBERG. Mr. Chairman, I think it is important to point out that the Everglades itself, these organic peat soils in the Everglades have been sequestering or capturing carbon for centuries. It has been building over time. As we continue to move in the direction of hydrating these wetlands, again, this is a massive plumbing project in Florida to redirect the way freshwater flows. And by storing, cleaning, and sending that water south, you are rehydrating wetlands, a massive wetland forest, a significant wetland area within our world.

The ability to hydrate those wetlands sequesters carbon. It takes off roughly about 230,000 cars off the road just in freshwater wetlands, and the climate benefits of keeping those wetlands hydrated.

We are also seeing benefits along the coasts, the mangroves that surround the Florida peninsula also add a tremendous benefit on a carbon bank which the Everglades is. And by having that head of fresh water flowing down to the Florida Keys through Everglades National Park, down to Florida Bay, it is recharging the Biscayne Aquifer. That porous limestone within the Everglades, the fresh water permeates through that limestone and pushes eastward. And it acts as a buffer, it pushes against saltwater intrusion.

The issues along South Florida's coast with sea level rise, you cannot abandon, we cannot abandon the issue of restoration within the Everglades to deal strictly or solely with the climate concerns along the coast. They both are interconnected. It complements it, and that is why with the Army Corps of Engineers, the State of Florida is moving in a very aggressive way to see this restoration, the adaptation, the mitigation issues that come with it are very positive.

Senator CARPER. Good. Thank you. Thank you for that.

Ms. Balluff, we have already talked about the question I am about to raise. You may want to add to what has already been said with regard to this. We understand from your testimony that the

Tres Rios project repurposed treated wastewater in the restoration of some 1,200 acres of wetland in the desert, quite a noteworthy feature. In addition to these wetlands and restoration features, the project provides for flood protection and local recreation.

Please share with us, supplement what you have already said, and anything else you might like to add, how this unique project came together with the diverse group of stakeholders that traditionally do not work with the Army Corps of Engineers. What were some of the challenges in setting up this creative approach to ecosystem restoration? And if you could think of how some of those challenges were overcome, that would be welcome, too.

Ms. BALLUFF. Thank you, Senator Carper. I was actually not involved with the very beginnings of Tres Rios, so I don't have any first hand knowledge of that.

But I do know that a very significant group of stakeholders was brought together, including not just the U.S. Army Corps of Engineers, but also the Environmental Protection Agency. Again, we had to meet those Clean Water Act requirements, and U.S. Fish and Wildlife Service, Gila River Indian Community, and others. And it has been a really successful partnership.

I would say it has even expanded since that time. So as we have been working to get continued authorization to complete Tres Rios, we have an entire collaborative group of stakeholders representing private parties, nonprofits, State and local agencies, and Federal agencies that are all coordinating together to make this happen, including the Arizona Game and Fish Department, and Arizona State University and the Rio Reimagined Project.

I would say that has given a lot of strength to our efforts, because it has allowed these different perspectives to be brought in. It has also allowed for everyone's ideas and thoughts to be heard ahead of time, so that we can figure out the right solution and the right path forward to achieve a solution that makes people feel like they are achieving what they want to, like they are getting what they want out of this project and what they need out of this project. And that has been really helpful.

Senator CARPER. We want them to feel like they have been listened to.

Ms. BALLUFF. Yes, it is absolutely, incredibly important. Also to have their ideas implemented into the project is really important.

Senator CARPER. Good. Thanks. If I could, I would like to ask Ms. Riggins to talk with us about a dynamic system. I will set up the question by saying, maintaining your project like the Crab Bank requires the stakeholders to think about a long term project plan and lifecycle challenges and costs. Water is a dynamic force, as we know, and comes with erosion and other shifting environmental factors.

Recognizing that restoration does not stop with one investment, what considerations go into approaching long term success of a restoration project such as Crab Bank? And are you thinking about next steps to preserve or maybe to alter the project to ensure long term viability?

Ms. RIGGINS. Building a seabird or shorebird island is tricky. By nature, those types of ecosystems are dynamic. We have five seabird sanctuaries off the coast of South Carolina, and all of them

are ebbing and flowing and changing with tides and storms. And that is just part of it. That is what those seabirds and shorebirds really like. They also really like our beaches, but we like our beaches, too, and the two of us combined don't go well together.

So building Crab Bank, while there was a \$1.4 million price tag initially, everybody found the value in providing any available nesting habitat, knowing that shorebirds and seabirds are in crisis. We wanted to ensure that we could provide the habitat as long as we could, knowing that Mother Nature is going to do what Mother Nature is going to do. There are going to be tropical storms, there are going to be hurricanes that are going to change the footprint of that island.

But if we get one successful nesting season, last year we had 500 nests, and that does not count individual chicks in each of those nests, that matters. That counts. So the investment from the Department and the community and the conservation partners, we need all the available nesting shorebird habitat that we can.

We know that the project was modeled that given the past history of the current storms, it should last for 50 years. There is hope that maybe there will be additional dredging material opportunities in the future as we know there are limited places for dredged material to go. But it has to be the right sediment composition for us to be able to add it back to the island to maintain that in the future.

So while 50 years may seem like a short amount of time, if we get back to historic numbers of Crab Bank in the five to ten thousands of nests, it is worth it.

Senator CARPER. All right, good. Thank you for that response.

I have another question for each of you. Then at the very end of the hearing, I am going to ask you, is there a question you wish you had been asked but you have not been asked. You can tell us what that question might be, and then if you will, answer it. It will take us a few more minutes to get to that point in the hearing.

If I could, in the meantime, Mr. Eikenberg, a question with respect to process. The Everglades, as we know, is a complex program, very complex program, comprised of a whole lot of projects. They range in size, they range in scope, they range in objectives.

Please describe the input that the Everglades Foundation and its partners provide to the Army Corps of Engineers for the Everglades restoration process in order to ensure that restoration proceeds in a timely way and meets intended outcomes. Do you as a stakeholder in the process feel that your voice is heard?

Mr. EIKENBERG. Mr. Chairman, to the second portion of your question, the answer is yes. The ability as an NGO to be able to go to the Corps with the expertise that the Foundation has, we have tremendous expertise within the science of the Everglades. A lot of this is modeling. It is hydrological modeling, it is ecological modeling, it is economic results.

To be able to run those scenarios with a variety of assumptions, the Army Corps has their process, the South Florida Water Management District has theirs. And at the Everglades Foundation, we are proud to be able to do the same thing, the same type of modeling.

To then be able to go to the Army Corps with suggestions, to think differently over here or over there, and to have that ability to sit across a table and express those results and realize that it is being heard, it may not make the final result. But 9 out of 10 times, there are different portions of what is being recommended, not just by us but also by the other partners, from Audubon Florida to the Sanibel Captiva Conservation Foundation, Captains for Clean Water and countless others who are expressing the desire to see this project come to fruition.

I want to give a shout out to Colonel Booth in Jacksonville, the commander of the district. He is accessible, he travels throughout Florida to make sure voices are being heard. Again, the economic return on this, we heard about the population of wading birds or shore birds coming back. The example for the Corps on their work in the Kissimmee River, that flood plain has returned, the wading bird population has come back in droves.

The same Army Corps that dug the channel south of Orlando that drained that flood plain in the 1960s, for it now to be fully restored, the meandering Kissimmee is back, that is an example of the Army Corps understanding not just the ecological returns but also the economics. The ecotourism benefits to the State of Florida and to the Nation are tremendous.

That is kind of how we see it as it relates to an organization that is at the table and has a voice in this process.

Senator CARPER. Thank you for that. Did you say Captains for Clean Water?

Mr. EIKENBERG. Yes. It is a group that was founded in 2016 when there were some algae outbreaks around Fort Myers. And Mr. Chairman, I will tell you, anglers, boat captains, those who make a livelihood on the water, I was standing on a boat in 2016 and a gentleman said, I don't know where your office is, but you're standing in mine. And my office is closed because of the way water is being managed in Florida.

So they have come to the table with realtors, chambers of commerce, this is a business. It is an economic message as much as it is ecological. And those groups and others are having a tremendous impact.

Senator CARPER. We have a local chapter of Captains for Clean Water on this Committee. Senator Kelly and I are both retired Navy captains. We are very interested in clean water.

Mr. EIKENBERG. Thank you for your service. Yes, sir.

Senator CARPER. I have one other question for Ms. Balluff. It deals with a general reevaluation report. I think there is an acronym for that, GRR. I understand that there are some remaining construction features for the Tres Rios project, with a reevaluation of the project underway to address increased costs in the next steps.

Could you tell us a little bit more about the phasing of the project and your work with the Corps to ensure benefits are seen without all of the features completed?

Ms. BALLUFF. Yes, thank you, Senator Carper.

Yes, there is a Post Authorization Change Report underway right now for a cost update for the final phases of Tres Rios to be completed. But in the meantime, many of the phases of Tres Rios have

been completed, including the levee, which is already providing vast benefits to the neighboring communities that are removed from the flood plain as a result of construction of that.

There is also of course the treatment wetlands that we talked about that are already providing the benefits for water quality that was released into the river. We also have overbank wetlands and some in river restoration that people can access, and they do. They come over from across the Nation and all over the world to fish and to birdwatch. There are over 200 species of birds. We have pelicans in Arizona, in Phoenix, because of these wetlands.

So there are significant birdwatching opportunities. Audubon Arizona does surveys along with Game and Fish for us. We have threatened and endangered species there.

So we are definitely, we have conferences come out from across the Nation and across the world to look at Tres Rios and see what has been accomplished here and see the success of the project. So it is definitely being noticed. And we look forward to that notice increasing as we complete it and open up those trailheads and the rest of the in river restoration.

Senator CARPER. Good. Thank you.

Early in the hearing, I asked you, and then I found that I should have asked Ms. Riggan, when she figured out in her life why she was born. She gave us a great answer about it being, eighth grade when the light went off in her head.

Ms. Balluff, when did you figure out why you were born?

Ms. BALLUFF. I think it took me a little bit longer. I played around with a lot of different reasons, I guess, for why I was born.

Senator CARPER. I was born to play third base for the Detroit Tigers. They had different ideas.

[Laughter.]

Ms. BALLUFF. Yes. I really came to it in college. I was in college, and I was trying some different majors out, and ended up in forestry at Colorado State University. It really clicked with me. My love of the outdoors and my appreciation of what nature gives me personally and what I could then do to support it right back is really what brought me to it.

Senator CARPER. That is good.

Mr. Eikenberg, same question. When did you figure out, and your son will be interested in this, when did you figure out why you were born?

Mr. EIKENBERG. I think my moment was in high school. I attended Marjorie Stoneman Douglas High School in Parkland, Florida. My 11th grade government teacher, Doug Pierce—

Senator CARPER. You still remember his name, he would be pleased, if he is listening in.

Mr. EIKENBERG. I hope he is. If not, I want to send him this clip.

Doug Pierce is the person who got me interested in policy and public politics and the importance of government service. I watched my mentor, Clay Shaw, who spearheaded the Comprehensive Everglades Restoration Plan through Congress in 2000. I got to see first hand as a native Floridian, Clay Shaw, the importance of balancing the environment with economic development in Florida.

We have been doing this for years, Mr. Chairman, as you note, decades, generations upon generations have either messed it up,

and now we are fixing it. For me to be able to be here in Washington in years past to see how this process works, to understand the bipartisan nature of the environment, conservation, regardless of our party affiliations, we all unite for clean water, clean air, healthy wetlands, drinking water. The Everglades is the perfect example for all of that to come together.

Not only am I proud that my son Patrick is here with me, but I have three other children. And the example that we are doing within the Everglades is the example to pass on for future generations. Doug Pierce was the key for me back in 1993, 30 years ago. I hope that anyone listening to this message of hope and success around the environment, across the country, engages them to be a part of something bigger than themselves.

Senator CARPER. Great. Thank you for that.

Doug Pierce, if you are out there, thanks very much. You gave a big assist on the play.

Now we are going to close out with this. I will ask you each to give us a question that you wish you had been asked but were not. If you had been asked the question, how would you respond?

Go ahead, Ms. Riffin.

Ms. RIFFIN. Thank you, Senator Carper.

I really can't think of anything that I would like to share more about the project. I am excited that I was asked to be here today to share the success of Crab Bank. I am thankful for the support of all of the conservation community entities that helped raise money for the project to help us get here.

I am excited to share, and I touched on it a little bit earlier, about the fact that Crab Bank was so much more than just that one project. By building the relationships with the conservation community and others and highlighting the need for support for shorebird, seabird, wading bird conservation, we had the ability to establish the South Carolina Coastal Bird Conservation Fund that has allowed us to do even more.

We have around \$400,000 in the fund that helps us leverage Federal grants to continue and further shorebird conservation for the future. And fingers crossed sitting back here for the Recovering America's Wildlife Act, and hoping that we will have a steady, constant, consistent funding stream to support nongame wildlife management in States across the country like we do with the Wildlife and Sportfish Restoration Program.

Senator CARPER. Thank you.

Ms. Balluff, what would you have like to have been asked that you weren't?

Ms. BALLUFF. I would have love to have been asked what is next after Tres Rios.

Senator CARPER. What is next after Tres Rios?

[Laughter.]

Ms. BALLUFF. Thank you, Senator Carper, for asking that excellent question. I am happy to respond to it.

What is next after Tres Rios is Rio Salado Oeste, which is a really important ecosystem restoration project in the Salt River that will connect our completed Rio Salado Phoenix, which is our completed ecosystem restoration project, with Tres Rios.

Right now, we have about an 8 mile gap in restoration between those two projects. Rio Salado Oeste will fill that gap and will give us 19 contiguous miles of restored Salt River through Metropolitan Phoenix, through surrounding disadvantaged communities.

Senator CARPER. How many miles did you say, 19?

Ms. BALLUFF. Nineteen contiguous miles of restored river, once all three of these projects are complete. We are very excited. We did get, the project got work plan monies for the Corps to start working on the general reevaluation report for Rio Salado Oeste. So we are getting that underway and are really excited for the next steps on that project as well.

Senator CARPER. Good. Thanks. Good question.

Mr. Eikenberg.

Mr. EIKENBERG. Mr. Chairman, I think the question of will we ever finish Everglades restoration. We hear that. I will be brief.

I think the answer is yes, I know the answer is yes. And by the year 2030, the remainder of this decade, with critical projects that are being planned and are ready for construction, we will do that. Then we shift to perpetual protection. Because again, the next generation is going to have to ensure that what we have fought for, these remaining 3 million acres of Everglades that we are protecting, survives.

So we know the problem. We have the solution.

What I want to also highlight, Mr. Chairman, is the political will has really stepped up in a manner that is delivering this. This is a mainstream issue now. And the ability from the President and the Congress to the Governor and the State legislature, everyone is moving in the same direction. There is massive momentum around Everglades restoration.

This is a national treasure. It is America's Everglades. With your help and those on the ground back in Florida, we will get it done.

Senator CARPER. That is great. My colleagues hear me say probably too often, bipartisan solutions are lasting solutions. That is just another way of saying part of what you just said, I think. Most helpful.

I have some boilerplate language I am going to use in just a minute before we close out the hearing. I ride a lot back and forth from Delaware to Washington to come to work, every day almost. Another guy who used to ride the train a lot was Albert Einstein. Albert Einstein, I don't know if he was in Princeton, maybe in Princeton where he taught. He would get on the train and go to New York, get on a train and come to DC. He rode the train a lot.

One day he got on the train, and he started looking for his ticket, and he couldn't find it. He was looking in his coat, his trousers, he looked in his briefcase, couldn't find it. The conductor came along and said, Dr. Einstein, we know who you are, don't worry about it. You are fine, you don't have to worry about it.

The conductor walked away to go to the next car, and he turned around and looked back at Dr. Einstein again, Dr. Einstein was down on his hands and knees looking for his ticket. The conductor ran back and said, Dr. Einstein, you don't have to worry about it. We know who you are. We know who you are.

Dr. Einstein looked up at him and said, "I know who I am, too. I just don't know where I am going."

[Laughter.]

Senator CARPER. One of the best ways to figure out where to go is to find out what works and do more of that. One of the things I think works is regular order. That term has been used a number of times. It is one of the things that Senator Capito and I think our colleagues, both Democrat and Republican on this Committee, agree.

We like regular order. We like working with States. We love working with the Army Corps of Engineers, and we have oversight of them. They do great work in our State and 49 other States as well. We are in their debt.

Speaking of Albert Einstein, a lot of people remember he once said, the definition of insanity is to keep doing the same thing over and over again and expect a different result. That is a good quote.

But my favorite Einstein quote is, in adversity lies opportunity. In adversity lies opportunity. That is a great one. I use that one every day. There is plenty of adversity in our States and our country and our world. But there is also opportunity. The key is to find in that adversity the real opportunities. I think that is part of what we are talking about doing here today.

Finally, I would like to say, find out what works, do more of that. You all have given us some great examples of what works, so we can be inspired by you and learn from what is going on in your States. We applaud you for that.

Now to the boilerplate. Before we adjourn, some housekeeping. Our Senators, our colleagues, will be allowed to submit written questions for the record by 4 p.m. on Wednesday, June 21st, that is 2 weeks from today. We will compile those questions, send them to each of you. We are going to ask you to try to reply to us by Wednesday, July 12th. We will follow up with this information and these dates.

I will ask the majority staff, anything else? Minority staff?

I just want to say to our staffs, these hearings don't just happen. They happen because we have great staff members. They help figure out who would be good witnesses to bring in and get everything coordinated and provide us with just an enormous amount of support and help. I say to all of you, thank you very, very much.

To those of you who spend your life, this is a big part of your life, what you do, you are not just doing it for yourselves and your family, you are doing it for the rest of us, we thank you for that. We are inspired by you and encouraged by the work that you do.

With that, this hearing is adjourned.

[Whereupon, at 11:38 a.m., the hearing was adjourned.]

[An additional statement submitted for the record follows:]

STATEMENT OF HON. PETE RICKETTS,
U.S. SENATOR FROM THE STATE OF NEBRASKA

I write to remind you of the Army Corps of Engineers' priorities. I am aware the purpose of this hearing is to discuss the ecosystem restoration branch of the Corps. However, I would be remiss if I failed to highlight my concerns about the Corps' mismanagement.

As Governor, I came to view the Corps as an impediment to progress and an organization that failed to prioritize taxpayers in their decisionmaking.

The Corps' failure to consider taxpayers is demonstrated by the critical shift in the management of the Missouri River in 2004. The Corps sought to restore the Missouri River's ecosystem and create habitat for threatened and endangered spe-

cies. This prioritization led to litigation from landowners in Nebraska, Iowa, Missouri, and Kansas.

In *Ideker Farms v. United States*, the court found that the notching of dikes and revetments, as well as the reopening of the historic chutes, which allows the river to meander and erode the bank, created potential flood impacts. These changes to the river, combined with increased reservoir storage and releases of threatened and endangered species from the dams during high river stages, have caused or contributed to flooding since 2007. I implore the Corps to operate in accordance with the priorities in the 1944 Flood Control Act.

Nebraskans want to see people and communities put first, and we would appreciate the opportunity to work together to rebuild bigger and better than before to keep people safe. It's one of my major priorities on this Committee and in the Senate. The Army Corps must get its house to support that mission.

I urge my colleagues to work together to regain the original priorities of the Army Corps of Engineers to protect people and property.

