S2E2: Watersheds: The Long Flight Back

The Gulf Podcast

Introduction

[Gawlik]: The story of how I got interested in ecology and birds, like many people, can be traced back to a family member. So, my case, very young, I was following my grandmother around who took a weekend birding class at the local university, and I was interested in birds, had a propensity for being able to identify them by sound and just kind of went from there.

[Gawlik]: My name is Dale Gawlik, and I'm the Endowed Chair for Conservation and Biodiversity at the Harte Research Institute. My research expertise is with water birds mostly, and I do research on water birds in the context of wetland restoration and management.

<<a few musical notes as a short interlude[1]>>

[Brown]: Today on The Gulf Podcast, I've enlisted Dr. Dale Gawlik [pronounced Gav-lik]—and the laughing gulls and other sounds of Oso Bay—so we can learn more about one of North America's largest and rarest birds, the whooping crane. These unique and beautiful birds spend the winter in the bays and estuaries of the mid-Texas Coast.

This is Jen, by the way, and I'm the creator, writer, and producer of The Gulf Podcast. Student production assistant Alyssa Lucas helps out, and funding for the Watersheds series comes from the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University-Corpus Christi. I should tell you, though, that the views and opinions expressed on this podcast may not represent the views and opinions of the Harte Research Institute or Texas A&M University-Corpus Christi.

In season two, we're exploring the importance of freshwater inflow and coastal water issues. Birds on the coast need good habitat and fresh water, whether they are residents or coming or going.

[Gawlik]: Well, there's the two most important ingredients, right, the water, while sort of water is part of the habitat, for the majority of the water birds we have here in the coast, they depend on these shallow water lagoons and estuaries and the wetlands that are associated with them to provide food. The islands are very important as nesting sites, and they also serve as migratory habitats for huge numbers of birds that come through for winter south of here and breed north, Canada, all the way to the Arctic, so these habitats are really important here.

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[1] Lee Rosevere, "Curiosity," *Music for Podcasts – The Complete Collection*, April 6, 2021, https://leerosevere.bandcamp.com/track/curiousity-2. This song is licensed under a Creative Commons attribution license (CC-BY).

Chapter One: The Journey to Texas

[Brown]: Whooping cranes are essentially the original winter Texans. Each year, they make an incredible journey down here to Texas for our mild winters. And we have the last remaining wild population of whooping cranes in North America. They're called the Aransas/Wood Buffalo population and they almost went extinct in the 1900s.

<<slow string/piano with electronic music slowly building in[2]>>

These cranes spend their summers nesting and rearing young in Wood Buffalo National Park in Canada. It's a massive national park—it's actually the second largest national park in the world—and it's located on the border of northern Alberta and southern Northwest Territories. That's almost to the Arctic Circle.

There, the whooping cranes nest in shallow wetlands and marshy areas surrounded by boreal forest. They lay two eggs, but usually only one chick survives. The crane pairs raise their chicks in the extended daylight of the north and beneath the dancing glow of the aurora borealis.

As the light fades in September and October, the crane families begin their long migration to Texas. They fly almost 2,500 miles from northern Canada to the Texas Coast.

On the journey southward, the cranes travel through the farms and prairies of Saskatchewan, North Dakota, and South Dakota, stopping along the Missouri River, then the Platte River in Nebraska, then other national wildlife refuges, wetlands, and farm ponds as they venture through the southern plains.[3] They arrive on our shores in November.

<<music fades out>>

[Gawlik]: On the wintering grounds, whooping cranes eat primarily blue crabs and small fruit called a wolfberry. It's found in coastal marshes, salt marshes, but people have quantified their diets. They'll say, "Well, geez, they really eat lots of different stuff as well," so they eat, you know, invertebrates like dragonfly larva, things like that, and pretty much anything they can catch, but the two big items, if you had to pull two items out, it would be blue crabs and wolfberry.

Chapter Two: The Long Flight Back

<<slow string/piano music fades in[4]>>

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[2] Lee Rosevere, "Going Home," *Music for Podcasts – The Complete Collection*, April 6, 2021, https://leerosevere.bandcamp.com/track/going-home-2. This song is licensed under a Creative Commons attribution license (CC-BY).

[3] For more on the migration corridor and its changes over time, see Aaron T. Pearse, et al., "Delineating and identifying long-term changes in the whooping crane (*Grus americana*) migration corridor," *PLoS ONE* 13, no. 2 (Feb. 2018): 1–15.

[4] Rosevere, "Going Home."

[Brown]: Chapter Two: The Long Flight Back

[Gawlik]: The whooping crane is really a neat story from a conservation perspective because, you know, it's this really charismatic bird. It stands in five feet tall. It's white. It's got this red crest and really interesting behaviors and people like it because it's monogamous and it seems to have to have a lot of the values that people like, right? It takes care of its young for a long time, they're fiercely protective. So, really interesting birds from that perspective. <<music fades out>> They have historically wintered on the Gulf Coast and, over time, their numbers dwindled as we converted prairies to agriculture fields, and we hunted them before they were protected in the early 1900s.

[Brown]: During this time, whooping cranes almost went extinct. Cranes used to be found throughout a broad stretch of the North American continent, but this narrowed considerably.[5] By midcentury, only a small population remained, the ones who wintered at the recently created Aransas National Wildlife Refuge. In 1942, the refuge manager only counted fifteen adult cranes.[6] It was so bleak, that scientists for a time didn't even know where these last remaining cranes nested in Canada. That's quite the detective story, and I think one for a future episode.[7]

At any rate, with a lot of work from both nations, whooping cranes began their long flight back from the brink of extinction.[8] The next step came a bit later, the plans to create a second self-sustaining population elsewhere.

[Gawlik]: There is the Aransas Wood Buffalo population, which we have already mentioned. That's like the last remaining natural one, but the recovery plan says, "Well, if you don't have a thousand wild whooping cranes in that population, we would also consider it recovery if you could establish 160 whooping cranes in another population, in an eastern population," and so that's what a lot of the effort has been focused on, is trying to get another population or two established outside of that Wood Buffalo-Aransas population, and there's been a number of different efforts to get a population started...and so now there are two populations, one that migrates from Wisconsin to the Gulf. That's producing offspring on its own and that's very exciting and then the other one is a non-migratory population in Louisiana and that's producing offspring. So, those two are right now probably our best hope for getting a second population of whooping cranes established.

[Brown]: And how the recovery team got that first population established is a great story.

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[5] See Robert Porter Allen, *On the Trail of Vanishing Birds* (New York: McGraw-Hill, 1957), 73.
[6] Allen, 74.
[7] See Allen, Faith McNulty, *The Whooping Crane: The Bird That Defies Extinction* (New York: E. P. Dutton, 1966), and Kathleen Kaska, *The Man Who Saved the Whooping Crane: The Robert Porter Allen Story* (Gainesville: University Press of Florida, 2012).
[8] See McNulty and Robin W. Doughty, *Return of the Whooping Crane* (Austin: University of Texas Press, 1989).

[Gawlik]: One group was set up to help the introduction of an eastern population of whooping cranes and that was the one that breeds in Wisconsin and then winters along the Gulf, and, uh, there were some decisions to be made about what's the best way to make that happen, but to get the birds, the juveniles, down to the wintering area, they used ultralight aircraft, and the pilot was dressed as a crane, believe it or not (Brown laughs), and it flew all the way from Wisconsin to the Gulf Coast dressed as a crane stopping along the way and the juveniles followed down to the Gulf.

<<musical interlude[9]>>

Chapter Three: Birds and Coastal Economies

[Brown]: Along the way, the public has become fascinated with cranes, myself included. Every January before I start teaching in the spring, my friend Keren and I take a trip up the coast to search to see big trees and whooping cranes. This year, I thought it would be a perfect time to record crane calls for the podcast. When we got to the spot, just down the road from the Aransas National Wildlife Refuge, we found seventeen cranes.

<<sounds of cars and motorcycles and children playing>>

[Brown]: But they were impossible to record. It turns out, finding these rare and amazing birds brings crowds of people—and loads of money—to the coast each year. For coastal economies dependent on tourism, the value of birds is significant.

[Gawlik]: You know, I'm an ecologist by training so lots of elements of nature interest me, but I've noticed over my career, and even and early on, that people like birds, right? They value them. I mean, all aspects of nature are worthy of study and understanding, but birds were different in some ways because people put such high value on them. They spent thirty-two billion dollars in 2021 watching birds globally and five to six billion per year feeding them. Well, those are remarkable statistics, right? And that shows that we really do value birds.

[Brown]: So when whooping cranes suffer, so too do coastal economies and small towns along the coast. And that's exactly what happened back in 2008 and 2009.

<<musical interlude[10]>>

Chapter Four: Things That Live in the Mud

[Brown]: Before I get into that, though, let's pause and switch gears to talk about water and some important coastal processes important for whooping crane populations. We're going from cranes, one of the most charismatic animals on earth, to some of the most uncharismatic animals, all of the curious organisms called benthos that live near the bottom of bodies of water. Benthos are essentially tiny creatures that live in the mud.

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[9] Lee Rosevere, "Curiosity."
[10] Lee Rosevere, "Curiosity."

[Montagna]: There's shrimpy things called crustacea, a variety of arthropods, tanaids, and small shrimps, and then, of course, there are the worms. They're the dominant group. These are the annelids, so they're related to, like, the earthworms you see in your lawn, but they're all polychaete worms. So the marine worms are all the polychaete worms, and they're different from the things in your lawn in that they have little, they're called parapodia, they're like little swimming legs. So each segment will have a little leg, and there are a variety of them because they exploit every kind of food web and niche possible. So, some are just ingesting mud and literally stripping organic matter out of the mud. Some are eating other organisms. Some act like shrimp, they have tentacles they put up in the water column and they take particles out of the water column. So, the worms are incredibly diverse so they're the largest group, most dominant group, most diverse group, and finally, you've got the mollusks, and we've got lots of different kinds. We have snails. We have clams. Those are the two dominant ones, the snails and the clams, but there are some other ones like the tusk shells. So, imagine a snail with a straight shell (laughs) and, of course, the mollusks have very diverse feeding groups as well. Some are just browsing the surface looking for materials that have fallen on the bottom of the ocean and some are filter feeding again, or suspensive feeding, eating particles that are in the water column. And of course, the most famous mollusk is an oyster (laughs). The most famous crustacean is the shrimp. So, two of these things grow to size that have become commercially exploitable, and as you might imagine, those two species are some of the most important bioindicators we look at all the time.

[Brown]: That's Dr. Paul Montagna, Chair for HydroEcology at the Harte Research Institute and our guide for the Watershed series. As a coastal scientist who studies freshwater inflow, he's studied a lot of benthos and even has a benthic copepod named after him.[11] Copepods, by the way, are weird little crustaceans that live in water and are really common. Copepods and other benthos even help scientists like Paul monitor freshwater inflow.

[Montagna]: You know, it's interesting. Obviously inflow is freshwater mixing with saltwater, which means the big changes are occurring in the water column. The salinities are changing. The nutrients are changing. When the nutrients are there, the phytoplankton can bloom, the phytoplankton of course feed the entire food web. But, you know, all of that is incredibly ephemera.

[Brown]: With inflow, outflow, and incoming and outgoing tides, water conditions constantly change in our bays and estuaries.

[Montagna]: So the question is, well, how do we just take the pulse of the ecosystem?...Kind of like when you walk into the doctor's office and he takes your temperature or measures your pulse, right? How have you been doing? Well, the answer, I think, is to look at the things that

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[11] Jisu Yeom, Melissa Rohal Lupher, and Wonchoel Lee, "Four New Species of Zosimeidae (Copepoda: Harpacticoida) from the Southwestern Gulf of Mexico," *Diversity* 14, no. 3 (2022): article number 198. https://doi.org/10.3390/d14030198.

live in the mud. Why? Because they're fixed in place yet they're sampling and integrating what's going on over their head 24/7/365 (laughs). They're always affected by the conditions above them and they literally integrate everything that's happened since the last time that you visited them and so by looking at the critters that live in the mud, we can literally take the pulse of the ecosystem once a month, once a quarter, at larger intervals in time, and they're literally telling us, "Oh, here's what's been going on since the last time I've seen you" (laughs). And so even though they're not something that's charismatic or very large or in the public eye, it turns out they're the most sensitive indicator of change in the environment over time and so that's why I've always focused my research on the bioindicators for inflow on the kind of things that live in the mud.

[Brown]: The other thing about freshwater inflow, if you remember from the last episode, is that it has an indirect relationship to fish and other organisms. So inflow defines estuary conditions like salinity and sediments and other things and those estuarine conditions drive productivity of plants and animals.

So what happens when there's a lack of freshwater inflow? And that raises the salinity and leads to other changes in coastal habitats? And those conditions, in turn, cause a decline in certain species of plants and animals, things like blue crabs and wolfberries and other foods that whooping cranes love to eat in Texas?

You'll find out on the next episode of The Gulf Podcast, when whooping cranes go to court.

<<musical interlude[12]>>

Next Time

[Montagna]: Next time on The Gulf Podcast.

[Jim Blackburn]: We had six lawyers. When we got into the court room the first day, I think there were twenty-four lawyers on the other side. We had stirred up a hornet's nest.

Credits and Disclaimer

[Brown]: Thanks for listening to The Gulf Podcast! You can follow us on Instagram and Facebook as well as read episode scripts and listen to oral histories interviews on our digital archives. Music in this episode came from Lee Rosevere. This is Dr. Jen Brown signing off to grade papers during finals week.

[12] Lee Rosevere, "Curiosity."

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