

Lauren Walker:

They are so adaptable and so opportunistic. They find a way to live and survive and be successful in all of these really harsh places, right? And they make it work. Their ingenuity in doing that is really impressive and inspiring, I think, sometimes.

Kristin Oxford, Host:

Welcome back to the Voices of Greater Yellowstone, where we share the stories and science from the Greater Yellowstone Ecosystem. We are releasing this special episode on Halloween, and it covers a topic we've been wanting to do since we started this podcast back in 2021. To fit with the spooky theme of the day, we are spending some time with one of Greater Yellowstone's most enigmatic and charismatic creatures. If you've been to Old Faithful in Yellowstone National Park, you've definitely seen these beautiful, surprisingly large black birds that seem dead set on making mischief. That's right, we are talking ravens. Ravens can be found throughout Greater Yellowstone and are members of the corvid family, which also includes crows, magpies, jays, and more. These birds are known for their intelligence, mimicry skills, and penchant for taking advantage of and robbing unsuspecting Yellowstone visitors. But beyond giving tourists plenty of stories, what role do ravens play in this remarkable ecosystem?

Today we're chatting with Lauren Walker, wildlife biologist and former member of the Yellowstone Bird Program. While at Yellowstone, she initiated a monitoring avian productivity and survivorship banding station, and participated in many avian research projects, including some focused on ravens. Lauren's also written scientific papers including population responses of common ravens to reintroduced gray wolves and recreation changes the use of wild landscapes by corvids. So safe to say she's the person you want to chat with about Greater Yellowstone's ravens. We cover a lot of fascinating ground today, including how to tell the difference between ravens and crows, what we know about the intelligence of ravens and their relationships with wolves, and some fun facts even us raven nuts didn't know. All right. Let's hop into ravens, Yellowstone's clever corvids.

Lauren Walker:

So I am Lauren Walker. I'm a bird biologist, and I have a graduate degree from the University of Washington studying wildlife ecology.

Kristin Oxford, Host:

Wonderful. So tell us a little bit about how you found yourself, where you are now. Go into a little more of your academic and professional journey to becoming a wildlife biologist.

Lauren Walker:

Yeah, a lot of people ask me now like, "Oh, were you always into birds as a kid?" And I think I always appreciated being outdoors, but I was not a birder when I was younger. After undergrad, well, so in undergraduate I studied geology and biology. I thought I was going to do paleontology and dig up dinosaurs, this was my dream. And then I went to work for an environmental consulting company after undergrad and did some paleontology work, but we also did a variety of other stuff, and one of the folks that worked there was an ornithologist and we had some bird related jobs doing nest surveys and things that I really grew to love it. And then after a few years I pursued grad school and decided to try to study birds.

Kristin Oxford, Host:

Awesome. I love that and I love that you called out that people always ask if you were always into birds 'cause that was definitely going to be one of my next questions, which is like, "Tell me about your bird-obsessed childhood." But no, that is actually in some ways even more interesting that you found yourself there and decided to tug at that thread a little bit, so I love that. So this podcast is of course focused on the Greater Yellowstone Ecosystem. So let's talk a little bit more about your time as a wildlife biologist in Yellowstone National Park since I know that you worked in Yellowstone for a number of years as part of the park's bird program. So starting with just like, what is Yellowstone's Bird Program? What's its goal? And what was your role in that project?

Lauren Walker:

Yeah, so I joined the Yellowstone Bird Program in 2016, and I was there for about four and a half years. The park has a mandate to have an understanding of what's going on with the animals and the vegetation and just in general with the park. And there are a variety of different work groups within the Yellowstone Center for Resources, which is where all these the umbrella over all these different groups. And there's a bison group and a vegetation group and a wolf group, and then there's a bird group. And there's lots of other small folks in there as well, there's a hydrologist, there's a GIS team, there's all these different people.

The bird program has a really vast mandate. There's a lot of different species that fall under that. The wolf team gets their whole group of people and they study one species, but we have a mandate to study a lot, and it's basically to both monitor how these different species and species groups are doing throughout the park, but also to respond if we see a population decline or some other issue that we need to address to try to boost up these birds in the park. And the park service doesn't do that for every issue. Climate change is this weird amorphous thing where we're like, "Well, it's human caused," or most people think it's human caused, but it's hard to have a direct connection. But if there's a direct human impact to a bird or a bird species and we can do something about it, then that's when the Bird Program steps in to give those birds a boost, if we can.

Kristin Oxford, Host:

What would be an example of a direct human-caused impact to birds that you would see in a landscape like Yellowstone National Park?

Lauren Walker:

Yeah, so I mean a classic example would be DDT Silent Spring, the whole release of this chemical throughout the country, not just in Yellowstone that really impacted mostly larger birds, raptors, pelicans. So amongst the species in Yellowstone, there was big declines of bald eagle, osprey, peregrine falcons, and peregrines were actually extricated from the park completely.

Kristin Oxford, Host:

Oh, wow.

Lauren Walker:

And an action that the park took in the 1980s was to establish some hack sites to release captive-reared peregrine falcons. So that's a good example. We also close certain areas of the park, like certain trails when we know there's species nesting nearby or that might be particularly sensitive nesters to folks walking on the shoreline. So things like that to help ensure that they can nest successfully.

Kristin Oxford, Host:

Okay, interesting. So when you are studying birds in Yellowstone, what are you actually doing? Are you laying on your back in the grass, looking at the sky, waiting for birds to go by? Are you looking at camera traps like they do with wolves and cougars? What is your day-to-day monitoring activity look like?

Lauren Walker:

It varies a lot. So there are definitely days where we sit in the grass and wait for birds to fly by. And so a lot of the spring and the fall is looking at either raptor nesting or raptor migration, and we spend a lot of time doing that. So we have places where we have known bald eagle nest, known osprey nests, peregrine falcons that are nested on the same set of cliffs for decades. And so we monitor those sites every year and just try to keep track of whether those birds are nesting or whether those nest sites are being used, we don't know if it's the same birds or not, and then whether they're successful or not, how many young they are able to fledge out of the nest.

So we'll find a hillside nearby or whatever that we can get a view with binoculars or a spotting scope, and we keep an eye until we see some sign of a bird coming in and out of the nest ledge or a parent bringing food to the young, things like that. And then we also, in the summer, we do similar types of breeding monitoring for trumpeter swans, common loons, some other sensitive species that breed a little bit later than the raptors. And again, it's the same idea where we have known sites. Swans are pretty noticeable, they're big, they're white. So we try to do a comprehensive understanding of where they are in the park. We do a lot of aerial flights to do surveys from the sky, but we also have ponds where we expect them to show up every year where they usually do and they usually nest.

And so we go and see how successful they were this year, how many young they were able to fledge. And then we do habitat monitoring for songbirds, or habitat specific monitoring. So we have point counts set up in forested areas, and we do different types of forests. We have point counts in grasslands, we have point counts in riparian areas, and those point counts are just designed, they're a standardized way of measuring how many birds are there and how many different species are there. So we can compare year to year if we're seeing big trends and diversity or big trends in individual species abundance.

Kristin Oxford, Host:

Yeah. Okay. So pretty wide range of approaches there then. That all sounds so interesting and cool.

Lauren Walker:

A little bit of everything. Yeah.

Kristin Oxford, Host:

Yeah. A little bit of everything, love that. You've mentioned now quite a few specific bird species. Do you know roughly how many different species of birds live in or maybe pass through Yellowstone?

Lauren Walker:

Yeah, I think the approximate count of species that we think are breeding in the park is around 150.

Kristin Oxford, Host:

Oh, wow.

Lauren Walker:

And then species that have been seen, documented, have moved through the park during migration, I think it bumps up to about 300, so it's quite a few.

Kristin Oxford, Host:

Yeah. Do you have any particularly memorable moments or stories from your time at Yellowstone?

Lauren Walker:

So I was telling you a little bit before we started recording about my previous experience. I mostly had worked with songbirds before coming to the park, and so the opportunity to closely monitor raptors and some of these waterbirds that I had never really worked with before was really interesting to me. And one of the things we did in the park, and I think it's still ongoing, is releasing trumpeter swan signets in the fall to try to boost the swan population. And so I got to help a few times carry a swan signet out to a river in the park and get to release it into the wild and see it swim with the group that we released it with, it's captive-reared siblings, and it was really rewarding.

Kristin Oxford, Host:

Oh, that sounds amazing. So today in honor of October, I would say we want to spend a little bit of time with you talking about one of greater Yellowstone's most fascinating and charismatic avian residents, and that would be the raven. So starting with some very basic basics, what is a raven?

Lauren Walker:

A raven is a large black bird. They're actually the largest songbird, so that's a fun fact for you.

Kristin Oxford, Host:

I love it.

Lauren Walker:

When you see them in person up close, it's memorable. They're very large and they make a statement. They're wide ranging. They all use a ton of different types of habitats, climates, ecosystems, so they can be found pretty much anywhere in the world on any of the continent other than Antarctica. And they have a really diverse diet. They will eat anything from seeds and fruit and insects in the summer to scavenging, carrying in the winter. They're predators. They'll steal songbird eggs. They're pretty opportunistic, so they can deal with a lot of different scenarios, different habitats, different resources, whatever's available to them. They're pretty impressive.

Kristin Oxford, Host:

Yeah, interesting. First, I did not know that they were even a songbird or categorize as songbird. So that fact that they're the largest songbird hit me as surprising on two levels. So I love that. Of course, we have to ask you the million dollar question, which is something that, when we asked listeners for questions, it came up many times, but don't worry listeners, we already prepared ourselves to ask this one, which was, how are ravens and crows different?

Lauren Walker:

So superficially, they look similar, right? They're just all black birds, but ravens, again, they're much, much bigger, so that's a big clue. If you saw them next to each other, you'd be like, "No way. Obviously these are different birds." The ravens have a much chunkier bill, but also just thicker, if that makes any sense. They tend to have longer throat feathers. So a lot of the times when they call out or they stretch, you can see these long feathers on their throats like hackles. So that's something that distinguishes them from crows. And when they're flying or they're spreading their tail feathers out, you can see that their tail makes a V shape as opposed to a crow, which is more of a curve at the end of the tail, more of a C shape. Beyond that, crows can be found in areas where ravens are, but in general, you see crows aligning themselves more with urban and suburban areas, and ravens align themselves more with rural agricultural areas where there might be some people, but you don't generally see them in a downtown city area. Habitat can sometimes be a good clue.

Kristin Oxford, Host:

Yeah, no, I love that. That's wonderful. I love your V versus C distinction on their tail because I'm like, "Oh, C for crow and V for raven."

Lauren Walker:

Yes.

Kristin Oxford, Host:

It's a little bit of stretch there, but let's go with it.

Lauren Walker:

No, I say that in my head all the time.

Kristin Oxford, Host:

Perfect. Awesome. Okay, great. So you kind of, I think, already hit on this because you talked about how ravens are found in all continents apart from Antarctica and that they're opportunistic, but we know that they're found throughout Yellowstone National Park, Grand Teton National Park, and really the Greater Yellowstone Ecosystem as a whole. So we're wondering what makes this ecosystem a good one for ravens?

Lauren Walker:

Yeah, it's a good question because you look at Wyoming or Northwestern Wyoming, you say it's a pretty harsh habitat to live, especially in the winter, right? There's not a lot of food opportunities. And so how do these birds do it? They don't typically migrate south like you think of a lot of other songbirds doing. But Yellowstone and Grand Teton offer this unique balance where there's people still, even throughout the winter, even in areas of Yellowstone that are closed all winter, you still get some employees working there, there's trash to eat occasionally. There are resources, right? When wolves were reintroduced into the park in 1995, that brought this whole other level of potential food resources for ravens in the winter.

Wolves provide food year round. I mean, they kill things year round to eat. You can't just eat in the winter, but in the summer, their kills decompose relatively quickly, and for ravens, there's lots of other food opportunities. They're not as reliant on those. But in the winter, those kill sites freeze and they might survive for weeks and provide this persistent food opportunity for lots of other scavengers, not

just ravens, but bringing wolves back to the ecosystem really provided this balance of, "Oh, there's not just food in the summer, there's consistent and reliable food across the landscape year round."

Kristin Oxford, Host:

That is so interesting. I never would've thought of that as wolves as acting as these providers for other species by being there throughout the winter months. The topic of wolves and ravens comes up a lot together. Can you tell us anything else about the more unique relationship between wolves and ravens?

Lauren Walker:

There are a lot of anecdotal stories about the relationship between wolves and ravens and how ravens maybe follow wolves. I've heard that ravens mimic wolf howls. There are all sorts of stories about how they interact and there's some mutualistic benefit there. I've heard ideas about injured elk on the landscape, and ravens are calling the wolves in to kill it for them, all sorts of things that may or may not actually be happening. But it's really interesting 'cause these stories are persistent throughout modern culture and then going back to a lot of Native American stories about relationships between these species. So it's clear that there's some important relationship there. And primary one is that wolves are being this food resource for ravens year round.

And they rely on wolves to not only provide these carrion opportunities, but also they see wolves as a sign of like, "Oh, we recognize this food resource. This is not scary. This is something we expect. This is how it's supposed to happen." Ravens are really, we call it neophobic, so they're often very cautious about new scenarios and new things on the landscape and even new food resources. And so, if you just went out and threw an elk carcass on the landscape, ravens might fly over it and look at it, but they're be like, "I don't know. I don't know about that. I haven't gotten a signal that this is a safe place to eat from." And so they don't necessarily come down to eat it, but if there's wolves at it, then they'll say, "Oh, that's how it's supposed to be."

Kristin Oxford, Host:

Interesting. Oh, that's so fascinating. So clearly there's something going on there between ravens and wolves, perhaps even beyond this. Like you described wolves as being providing a food source for ravens throughout the winter, but more study might be needed on that one.

Lauren Walker:

There's a lot of study. Yeah. There's a lot of places to go, and a lot of folks are working on it.

Kristin Oxford, Host:

Cool. Very interesting. Another thing that comes up often when people are talking about ravens is their intelligence. So can you characterize their intelligence for us? Maybe where do they rank in the animal kingdom related to their smarts? How can we tell that they're intelligent creatures? What's that about?

Lauren Walker:

Yeah, so one way that biologists try to measure intelligence in animals is by a brain to body size ratio. And if you look at different groups of animals, so you look at fish and insects and birds and mammals, birds and mammals typically have larger brain sizes relative to their bodies compared to all these other groups of animals. Amongst mammals, primates have larger brains, and then humans have the pinnacle brain size to body size ratio. If you look at some other mammals, like porpoises have exceedingly large

brains for their body size, and we recognize them as very intelligent animals also. Amongst birds, corvids and parrots, their ratios aligned very closely with the primate line. So they're not human intelligent, but they are maybe chimpanzee intelligent. For American crows, they're brain to body size ratio is very close to a chimpanzee, which is when you look at what they can do and they use tools and they can solve puzzles, and a lot of corvids can do this, that makes sense. Other primates do these same tasks.

Kristin Oxford, Host:

You mentioned the word corvids, so just to clarify, that's the family of birds that ravens, crows, magpies, I think, belong to. Is there anybody else in that group?

Lauren Walker:

Yes. So the jays are in there. So Stellar's jays, blue jays, and Clark's nutcrackers.

Kristin Oxford, Host:

Okay.

Lauren Walker:

And in Yellowstone also, Canada jays.

Kristin Oxford, Host:

Okay, awesome. So we've got a whole little pack of smarties in that group.

Lauren Walker:

Yes.

Kristin Oxford, Host:

Awesome. Cool. So I mean, speaking of the intelligence of ravens, I happen to know that our producer Emmy has a bit of a story about getting robbed by a raven in Yellowstone once. So I don't know, Emmy, if you want to come off mute and tell us that story. I think it would be awesome.

Emmy Reed:

Well, I will say luckily I didn't get robbed, but I did get, my bag did get assaulted by a raven. My family and I were snowmobiling on the roads in Yellowstone during the winter. And I was very aware that ravens can get into backpacks. And so I was like, "Okay, let's..." When we would stop to get off of the thermal feature that all of our stuff was covered up or we were taking it with us. And somehow my backpack got smushed at the bottom of all of our bags and cold weather stuff. And there was a five-inch area where a raven may be able to get in, but I was like, "There's no way. There's no way." I don't have any food in my bag. We're just going to go check out this thermal feature and come back. And it was going for maybe five minutes. It was right by the parking lot, and it was just some steamy stuff, so we came back.

And wouldn't you know, there is this beautiful large black bird just hanging out by our snowmobile and is just hanging out, and I see a little pile next to it. I was like, "Crap." So I'm running in the snow as fast as I can. And of course it's not really phased by me, but when I get a little closer, it's like, "Ah, okay, I'll leave." Again luckily I didn't have any food in there, but it had opened that little area, grabbed my

zipper, opened it up, it pulled out an extra hat that I had, I think it pulled out an extra pair of gloves that I had, and then it pulled out this little container I had of aquifer, like a little tube and had punctured a hole right through that and maybe decided like, "Oh, this isn't worth it." And then he just was hanging out till we got back. And so I was like, "Well, it's freezing cold and windy, and now I definitely didn't want to use that tube of aquifer on my face." So I had very chapped lipped and face the rest of our trip.

Kristin Oxford, Host:

You would've been fine.

Emmy Reed:

I totally should have. And then I just realized like, "Ah, I am just in awe of getting outsmarted by a bird and really underestimating him and being like, "There's no way, man. There's no way he can get it." And he got in there and I was glad he just didn't fly off with my hat 'cause then I would've been cold later that day.

Kristin Oxford, Host:

I love it. I like the idea that he was going in there to take your hat, your gloves and your aquifer to put them all on.

Emmy Reed:

He's like, I'm going to be so fashionable and ready for winter. So yeah, that was where I felt I had been so ready to combat the raven's mischievousness, and I realized I am no better than anyone else.

Lauren Walker:

You were outsmarted.

Emmy Reed:

Yeah, I was.

Lauren Walker:

No, it's a very common story. I mean it's a story I've heard before, something very similar. I was mentioning earlier, even in the winter, there are some people that go into the interior of Yellowstone. And if they're not employees that are stationed there, they're probably, I mean, even if they are employees, they're traveling by snowmobile. And the birds know, they recognize the sound of them and they'll follow them. And they know that people probably have food in there. And I have heard stories of, I mean, ravens stealing all sorts of stuff, like people's keys, people's wallets, whatever. Sometimes you think they see you and they're like, they know that you want whatever they've taken back, and it's all purposeful somehow. And I don't know, but you can see a little glint in their eyes sometimes.

Kristin Oxford, Host:

They're like, "We got to give these folks a good story."

Lauren Walker:

"Let's have some fun."

Kristin Oxford, Host:

Awesome. Well, thanks for sharing that, Emmy. That was amazing. So Lauren, when we were, I swear not creepily but definitely Googling you to learn more about your work, we found this amazing photo of you holding a banded raven, like a prized chicken in a parking lot somewhere in Yellowstone, which Emmy is going to go ahead and drop on our podcast page if anyone wants to check that out. Lauren, can you tell us a little bit about that day and what research you were conducting with that bird?

Lauren Walker:

Yeah. So one of the great things about working with the Yellowstone Bird Program is we have all these monitoring projects. We get to go all over the park and work with all these different species. But we also work with outside researchers that want to come into Yellowstone and do more in-depth hands-on research that our own team can't necessarily do just logistically. And so there is a team of folks, John Marzluff from the University of Washington, who was my graduate advisor, and then Matthias Loretto. He was from Max Planck Institute of Animal Behavior in Germany. We're coming to Yellowstone to try to catch ravens, band them, but also attach transmitters to some of them to track movements around the park, see what they could figure out, what habitats they were using in the summer versus winter for birds that belonged to breeding pairs versus unpaired birds, males versus females.

But also in the context of now that wolves are in the park, how do ravens utilize areas where there are wolves and could we use these transmitters to figure out if there is maybe a closer relationship with wolves? And there are wolves out there that have GPS collars, we have birds now that have transmitters, maybe we can see some of the, "Oh, this raven was following that wolf pack," or something, some of those behaviors. So that was the general idea behind that research. It's ongoing. They're working on writing up some stuff right now, but that bird was, I think that one was down at, I think that bird in that photo we caught down by Old Faithful. And so I'm thinking it was November, so the roads had maybe just closed to the public, so there wasn't a lot of people around.

It hadn't been that long since the roads have been open. And so we put out some bait and they catch them with rocket nets. So you put bait out and then have the rocket net hidden off to the side, and you can detonate, or not detonate, you can shoot the net off remotely from a distance. You hide in your car if it's cold enough or you hide behind the building or whatever, and peek around the corner, and wait for the birds to come in, and then hopefully you can set off the net and you can catch them.

Kristin Oxford, Host:

Wait, so rocket net, is that literally what it sounds, like you shoot a net at the bird and it expands?

Lauren Walker:

Pretty much, yeah. So the idea is that the birds on the ground and we bait them in with all sorts of enticing frozen Costco pizza, white bread, whatever it is that a raven wants to eat. And the net is in this big box. And essentially when you shoot it off, it has four pins that are at each corner of the net and they weigh it down and it shoots. The idea is that it shoots over the raven and then falls down on it.

Kristin Oxford, Host:

That just sounds like straight out of Inspector Gadget or something. That's amazing. I hope I get a witness that someday.

Lauren Walker:

It works about a tenth of the time.

Kristin Oxford, Host:

Okay. So perhaps a little more.

Lauren Walker:

Yeah, I would say Inspector Gadget could probably do it better than we did.

Kristin Oxford, Host:

Okay, fair enough.

Lauren Walker:

They're just tricky birds to catch, and then the nets are finicky as well.

Kristin Oxford, Host:

Yeah. Well, when you talked about them being suspicious or skeptical of new things, I would imagine that would actually make them pretty difficult, though who can resist a frozen Costco pizza? So there is that.

Lauren Walker:

Well, yeah, we spent many, many days in the freezing colds, not catching birds, watching piles of food being eaten by magpies or some other bird, but not the birds we're trying to catch.

Kristin Oxford, Host:

Amazing. Smart. Through the course of your time at Yellowstone, or actually just through your whole career, is there anything that you have learned about ravens that has surprised you?

Lauren Walker:

I don't know surprised. I had always read about the neo phobia and actually seeing how suspicious and cautious they really are, when at the same time, if you're a tourist in Yellowstone, you're a visitor and you're at a parking lot with picnic tables, they'll walk right up to you and almost it's like grab it out of your hands sometimes. Yeah, they just seem to know if you're up to no good. So that was one thing that was surprising to me, how difficult it was to catch them. And then some of the things that we learned from that project, like I said, it's ongoing, but the early takeaways were we saw birds that were just moving tremendous distances. We had birds flying from Gardener to Canyon back and forth almost every day to go see if there was food at Canyon in the winter. And then coming back to the Gardener area to roost. We had birds that left Yellowstone and went all the way up to Saskatchewan, like over 400 miles like an adult bird. What was it doing?

Kristin Oxford, Host:

Amazing.

Lauren Walker:

So yeah, really interesting movements and just behaviors that we would never know about without the transmitters, so that was really cool.

Kristin Oxford, Host:

So they're just full of surprises, it sounds like.

Lauren Walker:

Yeah, yeah.

Kristin Oxford, Host:

One other thing that ravens are known for are their mimicry skills. So you mentioned earlier that there's some maybe theories about ravens like mimicking wolf. Is there anything else interesting that you've either heard yourself or colleague has witnessed when it comes to a raven mimicking something?

Lauren Walker:

I have not heard them mimicking speech, or you hear lots of things on the internet about captive bred ravens have mimicked speech and things like that, but I have not witnessed that in the wild. I have heard other corvids, so lots of corvids do this or have the capacity to do this, right? Crows can do this. I've heard both Stellar's jays and blue jays mimic red-tailed hawks. So what I have heard from ravens, or what I've experienced, is that even what sounds like normal bird noises or whatever, they're not mimicking something specifically. They just have an incredible range of vocal abilities. They can make these really deep croaking sounds and then also some really high pitched noises. So yeah, it's just amazing what the range is that they can do, and that is because they're songbirds.

Kristin Oxford, Host:

Very cool. Amazing. My next question, I suspect, is something maybe slightly self-serving that got dropped in here by lovely producer, Emmy, but we're going to go ahead and ask it, which is, it possible to become friendly with a raven by enticing it with shiny objects? Not that you would ever do this in Yellowstone, just theoretically, could you make offerings?

Lauren Walker:

Oh, of course not. I would say if you wanted to become friendly with a raven, the best offering would probably be some sort of food object. So there's lots of stories, and maybe you guys have heard there was a girl in Seattle that would get gifts from a crow. She would feed the crows and the crows would bring her little trinkets or pieces of trash, whatever they thought was cool and shiny they would bring to her. So there are stories like that and ravens have done the same. I've never received a gift from a raven or a crow, but I think your best strategy, if you're going for it, is to be consistent and to provide a food source. They like peanuts a lot, and give them peanuts in the shell. My advisor used to say this a lot, John, peanuts in the shell, they make a noise so there's that connection and it's like a signal. If you throw them on the ground, they'll hear it and they'll know. And then they get a little puzzle trying to open them up and play with them, so it's rewarding on multiple levels.

Kristin Oxford, Host:

I like it. That resonates because I think if somebody was trying to befriend me if they gave me a consistent food treat. That would be a pretty good way to do it, so it checks out. So we are, as I

mentioned earlier, celebrating Halloween with this raven episode. So do you happen to have any interesting, maybe more spooky raven facts that you could share with us? Maybe anything that they do that's a little unsettling?

Lauren Walker:

So there's so much cultural association with ravens and crows with death, Edgar Allan Poe, and all this darkness surrounding them, and that's probably because they eat carrion, they eat dead things when they can. I don't know something specifically spooky about ravens. I did have a colleague in graduate school that studied crows and she looked at what she called crow funerals essentially, when they would see a sibling or a parent or a dead crow that they recognize, they congregate or they've been known to congregate around that bird. I've not heard of that specifically with ravens, but there's a lot of lure about these big black birds that eat dead things that could be interpreted as spooky and Halloweeny.

Kristin Oxford, Host:

Yeah, certainly. Well, thanks for humoring us with that one.

Lauren Walker:

Yeah.

Kristin Oxford, Host:

Awesome. So we did get quite a few listener questions about ravens and other corvids, so we're going to transition now into asking a few of those. Okay. Kicking us off, Ryan from New Jersey is wondering what the best way to tell ravens and crows apart is if you aren't looking at them side by side. So I think you did touch on some of this earlier, but just to reiterate, if you're just looking at a raven, there's not a little crow round to compare it to, what kinds of things are you looking for?

Lauren Walker:

Yeah. So again, I would look at the bill and I would look at the tail. So the tail shape is a pretty good one. On crows, all their tail feathers are basically the same length, so when it's spread out, it makes that C-shaped curve and a raven, their middle tail feathers are longer, and so it makes that V-shape. And then the ravens just have this really chunky big bill.

Kristin Oxford, Host:

Okay. I heard something about this once. I want you to check this for me. Check me against this, that if they are perched and calling, that a crow... No, sorry, Ryan from New Jersey, we're comparing with crows again, a crow will duck up and down when it calls. It'll be like a little bob like, "Kaw kaw," but a raven will more shrug its shoulders like, "Rah." Listeners can't see that I'm doing this right now. But is that something that you've noticed or heard, that there's like a bobbing of the crow versus a sort of shrugging of the raven?

Lauren Walker:

I have not noticed that. That's interesting. But you did touch on the other big clue, which is the sound that they make. So crows are definitely more of a "kaw kaw" sort of sound. And while I did say earlier that ravens make a wide range of calls and sounds and they have a big vocal repertoire, they typically they'll make these more deeper, almost like honking sounds sometimes or they don't do the "kaw."

Kristin Oxford, Host:

Okay. Okay. Yeah. Awesome. All right. Moving on. Next question, Leah from California is wondering, if you can tell us what is known about ravens' ability to remember human faces?

Lauren Walker:

So they can, I don't know specifically off the top of my head. I'm more familiar with studies that looked at crow's facial recognition. That was through my same graduate lab. They looked at crows in the Seattle area and they wore these crazy masks. They captured some crows wearing the masks and then would walk around to see after the fact if the crows gave alarm calls and things like that in recognition of this person that did this horrible thing to them, this traumatic event that they had. They absolutely found that the crows remember those scary faces. And not only that, but they passed on that knowledge to their offspring and the next generation. I mean that study was done the late 2000s and there are still birds in Seattle that recognize those masks, so it's pretty amazing.

Kristin Oxford, Host:

Even though those birds didn't have that negative interaction, they've been taught.

Lauren Walker:

Yeah. So they witnessed other birds reacting to that scary mask and said, "Oh yeah, that's a social cue that that's a scary person." That was enough for them to then also recognize and remember that face.

Kristin Oxford, Host:

Amazing. Though again with the food treats, I got to say, I guess if I was abducted by somebody wearing a mask, I would probably remember it for the rest of my life and tell everybody I knew as well.

Lauren Walker:

I think a lot about what birds, what they're processing, like when we capture them and banded them, and it must be like some alien abduction, right? There's got to be some PTSD in there.

Kristin Oxford, Host:

Absolutely. I can only imagine. Okay. Onward, Sam from Wyoming is wondering why ravens are totally black?

Lauren Walker:

That's a great question. I don't know off the top of my head the lineage or whatever the genetic lineage that would lead up to ravens that, I mean I don't know that we could know what color they were. Ravens do live often in cold environments, or at least environments that are cold or have harsher winters or relatively cold at least a good chunk of the year, so I imagine that it's probably due to some heat retention or absorption or at least that gives them some benefit in that environment.

Kristin Oxford, Host:

That makes a lot of sense actually.

Lauren Walker:

But I'm shooting off the cuff there, so don't pull [inaudible 00:45:42].

Kristin Oxford, Host:

Educated guess. All right, Sam, you got it here,, educated guess that it could be a heat absorption thing. That does make sense though. All right. Onward, Nile from Montana is wondering how the intelligence of ravens compares to that of cats or dogs?

Lauren Walker:

I would say that ravens are probably a bit more, I don't know, more intelligent maybe than cats. Dogs can do similar things in terms of puzzle solving and at least sub breeds. So it all depends on how you measure intelligence, right? Cats probably could, they just don't want to.

Kristin Oxford, Host:

Don't I know it. No, that's fair. Yeah, of course we're always measuring intelligence by our own human standards, but earlier you had mentioned that ravens might be somewhat equivalent to chimpanzees, so I feel like that's a really interesting benchmark.

Lauren Walker:

They do fall above the average mammal brain to body size ratio line, so yeah.

Kristin Oxford, Host:

All right. Moving on. Jamie from Montana is wondering what we know about how ravens communicate. So we have spent some time talking about their vocal range and the different abilities they have there. Do we know anything about how they communicate with each other?

Lauren Walker:

Yeah, I mean those vocal signals are really important. They're talking to their mate if they're breeding pair. Even if they're not, if they're a younger bird or just a bird that hasn't found a territory yet, hasn't found a mate, they still rely on that community of birds that they roost with every night or that just live in the same area, talked before about how they were very neophobic. So a young bird might get clues that an area is safe or a piece of food is safe if there's another raven already there. And so oftentimes when you see a kill site or something, adult birds are usually the first ones on there. The territorial breeding pair that's in the area that knows the area really well, they feel safe, they're going to be the first ones there.

And then gradually these non-territorial younger birds sometimes filter in. And it grows almost exponentially, like you get a couple in and all of a sudden they're all like, "Oh, okay, it's fine. We can all come in." And you hear lots of vocalizations and they're calling. And part of that is because the younger non-territorial birds can't really compete with the breeding pair that lives there year round until they get enough of them. Once they have a crowd, then they can actually get in and get a bite. So there's a lot of communication that goes on. There's a lot of vocalizations and there's a lot of nuance to it as well.

Kristin Oxford, Host:

Fascinating. Okay, thank you for that. Last listener question. Rowan from Ireland observes that many human cultures and traditions have stories and mythologies that are centered on ravens. So ravens seem to have long played an important role in how humans make sense of the world. From your

perspective as a biologist, why do you think that is? Is there something special about ravens and their relationship with humans that makes them particularly compelling to people?

Lauren Walker:

It's an interesting question because he's right. Ravens are so widespread across the globe and really there are stories that about them in human cultures from around the globe as well. To me, obviously I can't say, but I think it's because they are so adaptable and so opportunistic, they find a way to live and survive and be successful in all of these really harsh places and they make it work. Their ingenuity in doing that is really impressive and inspiring, I think, sometimes.

Kristin Oxford, Host:

Yeah. That really resonates. I guess if you're a human trying to do something similar, which is to say survive in a harsh environment and you're looking to the world around you for cues on how to do that, you would be noticing how other creatures and animals like ravens are pulling it off. So I think that checks out.

Lauren Walker:

Yeah. You got to be adaptable. You got to eat the seeds in the fruit in the summer and the frozen meat in the winter.

Kristin Oxford, Host:

Yum. Okay. Just a few final questions for you. First, if people want to learn more about ravens in Yellowstone, ravens and wolves, or just maybe corvids in general, do you have any recommendations of where they can go, what they can read, what they can watch, any sources come up for you?

Lauren Walker:

Yeah. I mean there's a couple books that I have read that I really enjoyed. One is called *Mind of the Raven* by Bernd Heinrich. John Marzluff has a book called *In the Company of Crows and Ravens*, and he talks a lot actually about the cultural mythological stories behind both of those birds. So that would be a great read for your listener that was interested in that. If you're interested specifically in ravens in Yellowstone, we did just put a book out about Yellowstone birds and there is a whole chapter on ravens that talks about the recent research, their relationship with wolves in the park and all these things.

Kristin Oxford, Host:

Great. What's the title of that piece?

Lauren Walker:

So that book is called *Yellowstone's Birds*. Pretty straightforward.

Kristin Oxford, Host:

Classic. Love it.

Lauren Walker:

Yeah. So you should be able to find it in bookstores and online, in bookstores in the park. It's out as of a couple weeks ago.

Kristin Oxford, Host:

Oh, wonderful. Brand new. All right. So we will go ahead and put some links to more information about those books in the show notes. Classic podcast question for you. We ask all of our guests this. Do you have a conservation hero?

Lauren Walker:

That's a great question. So I always say that I don't know if I would call her a conservation hero, but as a inspiration for studying wildlife and birds in particular, I always think of Margaret Morse Nice, who was a early female ornithologist in the early 1900s. She took it upon herself to do these really detailed behavioral observations of song sparrows. She was an early bird bander and color banded birds and really paid really nuanced attention and took a lot of notes that were really instrumental to understanding behavioral patterns. Not only is she an important early ornithologist, but she was a little bit groundbreaking in the fact that she was a woman, and breaking into that world as a woman wasn't always so easy.

Kristin Oxford, Host:

Absolutely. That's a wonderful answer. Thanks for sharing that with us. Okay, final question. Probably the most important question of the whole podcast. What are you going to be for Halloween?

Lauren Walker:

Oh gosh. Okay. So I have two kids and my older one is a first grader and he's going as a skeleton. So I was convinced I was roped into being a family of skeletons with him.

Kristin Oxford, Host:

Love it. Okay. Appropriately spooky. Classic. Right to it. Wonderful. Okay. Lauren Walker, thank you so much for joining us on the Voices of Greater Yellowstone. It was really lovely to talk to you today.

Lauren Walker:

Oh, thank you for having me.

Kristin Oxford, Host:

A huge thank you to Lauren for joining us on the podcast and indulging all our questions about ravens, both scientific and maybe not so scientific. It's also pretty cool that she initially wanted to study the OG birds, the dinosaurs, but eventually made the pivot to the feathered foul we know today. We hope you, dear listener, learned a lot about these clever corvids. We'll also place Lauren's book recommendations in the show notes so you can stock up on all your fall and winter reading. Also, little disclaimer, we definitely don't condone trying to make friends with ravens in the park, but just wanted to learn a little more about the shiny object theory. Please don't feed ravens because they'll probably just rob you anyway and that would really hurt your feelings, so let them use their smarts instead. Okay, just kidding. Just don't feed the wildlife.

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