Field Trip: Birds of Prey and Raptor Facts
Ologies Podcast
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Alie: This is an interesting, weird episode so we're just, kind of like...

Chris: Just roll, just wing it.

Alie: We're winging it! Hee-hee!

Yup, it's a fun, weird, hybrid episode we made you, for fun, it's a Field Trip. Oh hey, it's your friends who rented a house for your wedding weekend who want you to have a vow renewal party annually, Alie Ward. So, my friend Miles – you met him, Miles Thompson, he's the chef from the Pectinidology episode about scallops – he married his very cool bride, Aubrey, a few months back in Boise, Idaho. And since every single person I met told me that I had to go to something called The World Center for Birds of Prey I said, "Hell yes," and I sent a few desperate emails, and then I grabbed my old purse, full of microphones, and I arrived with a van full of friends to learn all about owls, and eagles, and vultures, and condors, and peregrines, and kestrels, and more.

So, here's how this episode is going to work. You ready? We're going to do a tour, we're going to gawk at some birds, we're going to see a bunch of California condors up close and personal, we're going to hear the stories of the birds and their sanctuary, and then we're going to peel off and duck into a library for a traditional *Ologies* episode in the last half. And I will freak out many times during this episode because of cool birds and you will love it.

But first, thank you to the folks at Patreon.com/Ologies who submitted questions for this episode and support for a dollar or more a month. Thank you to folks who rate and subscribe and just make my day with sweet reviews like, here's a fresh one from Pattrick11, who this week wrote:

> *Hey, it's the relationship you rekindled. Ologies re-sparked the embers of my relationship with my partner.*

Which is so lovely to hear. I hope this podcast gets you and everyone naked in the best ways. Also, Katie [ph.] with the slugs, good luck with those slimers lickin' on your shower curtain. Gross, I loved it.

You can find other ologites in the wild with merch from OlogiesMerch.com; we sell beanies and bathing suits. No matter what hemisphere, you can't lose. Okay, let's get into this episode. You ready? Audio in the first half, it's on-site, it's immersive like you're right there with us before we settle in for the chat in the library.

So, get in you hot losers, we're going field-tripping to learn about raptors, industrial-sized Easter eggs, old-timey contaminants, breeding in captivity, lunchtime for carrion connoisseurs, apartment vultures, my favorite book, adopted owls, the cause of India's mysterious vulture apocalypse and if they fixed it, commuting with flesh-eating dinosaurs, and the sexiest hat you've ever seen. So, get in the pass-van to meet up with the folks who run the center, including a person who has acted as The Peregrine Fund's Director of Global Conservation Science, he spearheaded the Global Raptor Impact Network, published roughly 90 peer-reviewed articles on the subject, and is the Associate Editor for the Journal of Raptor Research, ornithologist and certified raptor enthusiast, Dr. Chris McClure at The Peregrine Fund's World Center for Birds of Prey in Boise, Idaho. Let's go.

Alie: You must be Chris.

Chris: I'm Chris.

Alie: Hi, I'm Alie Ward, nice to meet you! Hi! We're in town for a wedding so we figured, yeah, we're in Boise, this is The World Center for Raptors, let's see some frickin' raptors!

Carolina: We got birds.

Alie: Sweet, yeah.

Chris: The idea was, we'll just show you all the center and then go over, we'll show you the library and the specimen collection.

Alie: Let's go check it out.

Chris: All right.

Aside: So, your PodMom, myself, and some of our best pals arrived at The World Center for Birds of Prey on a mild, cloudy, Idaho afternoon via an 11-person passenger van that we rented for the weekend, which we figured we might as well drive people around on this wedding weekend to be helpful. This van prompted at least one cashier at Stinker, a Boise local gas station/convenience store that has a wonderful skunk mascot, to ask if we were all in a band. And that made me feel good. So, we got out of this van, the six of us, and we tumbled out into the welcoming arms of a bunch of raptor conservationists.

Alie: Can you tell me your first and last name, your title here, and the pronouns you use?

Carolina: Carolina Granthon, Research Coordinator, and she/her.

Chris: Chris McClure, Executive Vice President of Science and Conservation, he/him. Carolina is a fan, I'm going to...

Alie: Are you serious?!

Carolina: Yeah. And the entire condor crew is a fan.

Alie: Really?!

Carolina: Yeah, because we go to the dairies in Twin Falls and it's, like, a three-hour drive and so we go every week.

Aside: So, that's Carolina Granthon and she's the center's Research Coordinator. She's a petite brunette woman wearing sensible outdoor fleece. Chris is tall with sandy brown hair and also wearing sensible outdoor fleece. But wait, did Carolina just say that they listen on the way to a dairy? Weekly? Why are there van-fulls of bird nerds taking regular road trips to a milk farm? Do birds of prey secretly love sour cream? Do they live off strawberry milk? Oh, my little ologites, what delights are in store for you. We're going to get there, but first, why is The World Center for Birds of Prey located 15 minutes outside of Boise, Idaho?

Alie: Now, is this area, this valley, is it really hospitable to birds of prey in general? Are there a lot naturally occurring in the wild? Why this spot?

Chris: So, the Snake River Birds of Prey National Conservation Area has one of the highest densities of raptors in the world actually.

Alie: Oh!

Chris: Yeah, so there's a canyon that runs through it so there's lots of nest sites there, lots of cliff ledges, so that's one thing they need. They need a bedroom and a pantry, basically. [*Alie laughs*] The

pantry is the, sort of, plains outside there, so they hunt jackrabbits and ground squirrels and stuff out there. It's these two things coming together to make it a really great place.

So, we were actually founded by falconers.

Alie: Tell us everything.

Chris: Okay, so we were founded by Tom Cade who was a professor at Cornell University at the time at the Lab of Ornithology and he was a falconer. He was worried about his favorite bird, the peregrine falcon, almost going extinct from DDT. And so, from his falconry knowledge, he had a way of captively breeding these birds, so he founded The Peregrine Fund in 1970, basically to bring back the peregrine falcon through captive breeding.

Alie: How are they doing now?

Chris: They're doing great. Populations are on the increase, and they are no longer on the Endangered Species List. It is said that there are two reasons that the peregrine falcon was delisted. One is the banning of DDT, and another was Tom Cade and his partners that helped captively breed these birds.

Alie: Wow. What an inspiration! Does he have his own day in Boise? Does he have a Tom Cade Day? He should.

Chris: He should. Every day is Tom Day.

Alie: Every day, yes.

Aside: Chris pointed a few yards away to this life-sized human figure saying, "That's Tom, right over there," and it was a statue of ornithology professor and Peregrine Fund founder Tom Cade. It's one of those bronze castings that you see sometimes in the middle of a town square, maybe by a gazebo and some nice flower beds. But this statue has Tom dressed kind of like Indiana Jones but with a dad cap instead of a fedora and wearing a tucked-in button-up shirt under a leather jacket, binoculars around his neck, and a satchel draped across his body, I imagine probably full of dead mice. And in the statue, he's standing with his arm outstretched with a big, thick glove on his hand so that a beautiful bronze peregrine falcon can perch on the end and stretch his wings for Tom to gaze upon with paternal admiration and affection. It's a really good statue!

Alie: For one second, I thought that was a real bird and I was like, "Oh, you got me." But that's so cool. Sweet. Let's go look around.

Chris: All right.

Alie: Thanks, Tom!

Aside: So, we spent time kind of bopping between the outdoor sanctuary that has un-releasable birds and also birds in the captive breeding programs, and then we also wandered inside this tiled, high-ceilinged visitor center and through a carpeted library that kind of has excellent college campus vibes.

And Chris mentioned that in the 53 years since The Peregrine Fund has been established by Tom Cade, they've helped repopulate, like, 100 different raptor species in 65 countries around the world, including some critically endangered species including the California condor, who we're going to get to meet in a minute, plus the peregrine falcon, and the Mauritius kestrel, which was down to just four individuals known to remain on Earth. So, they've done this by working with ornithologists to figure out the best shot for chick survival that they could.

Alie: Is it difficult if one is really, really endangered in the wild to bring it in and try to get it in a captive breeding program? Are they ever just like, "This is so different that I don't know what to do"?

Chris: Yeah. Often, animals won't breed in captivity but luckily, raptors tend to do so pretty well.

Alie: Oh, that is lucky.

Chris: The hard part with condors was actually the politics of the people. There were organizations, very prominent organizations saying, "Let them die with dignity," and basically go extinct.

Aside: So, sitting here now at a time where The World Center for Birds of Prey exists and quite a few species of raptor have been successfully rescued from the brink of extinction, it's kind of hard to imagine a time when conservationists argued *against* captive breeding programs. But in 1981 when condors were down to just 22 birds in the wild, and with this failed attempt at captively breeding them that happened in the 1950s, many a lover of the big birds really opposed trying to rescue them again. They were like, "We tried it in the '50s, it didn't work. There are only 22 birds left, let's give up."

And the National Audubon Society, and the US Fish and Wildlife Service, and the Los Angeles and San Diego Zoos supported plans for capturing and breeding the last wild condors. The largest chapter of this National Audubon Society, the Golden Gate Audubon, stood in really strong and vocal opposition. The Bay Area Audubon Society was like, "Don't do it, let's not breed any more condors." Why? Why? Why would you ever stop a giant, caped goth bird from lovemaking itself out of extinction?

Well, one argument made by Point Reyes Bird Observatory board member and an ornithologist out of UC Berkeley, this guy named Frank Pitelka, argued that "The millions of dollars needed for a risky condor recovery program would be better invested in less expensive efforts to save many other endangered species." This sentiment echoed many haters' viewpoint that condors were just too fragile, they were too high maintenance to be saved by the clumsy hands of the humans that endangered them, and that their every other year breeding cycle would just not produce enough offspring to make a difference. Don't bother.

Now, the award for the most sentimental opposition, however, must be given to Rich Stallcup. He was a longtime leader of Bay Area Birding and the ornithology community who helped found the Point Reyes Bird Observatory and he was given the nickname Mr. Magic by fellow Bay Area birders because he had this knack for finding rare birds; he had a gift. And Rich wrote a brief, more bitter-than-sweet public letter in 1991 which began, "Farewell, Skymaster." And he argued that condors were:

> *Ecologically extinct, and we owe them the 'freedom of the sky'... A grounded condor couldn't be much happier than a grounded whale... Must we burden and demean the doomed skymasters with electronic trinkets, then imprison them in boxes and demand that they reproduce?*

So, we're going to link to the whole letter; it's really quite worth a read, it's pretty dramatic, but from an emo standpoint, ahead of its time. He wrote a passage like, "Allow them to die with a dignity that has always been theirs." So, obviously, Rich Stallcup did not stop the condor captive breeding program. And now he has flown himself to the great beyond; he passed away in late 2012 from leukemia at the age of 67.

But by the time of his death, the number of living condors had swelled to 405 with only 179 of them in captivity. So, I hope that he was comforted by that success and that maybe he felt that taking the skymaster under our wing for a while was worth it in the end. And the point of all of this is to say that a lot of people thought it would not work but condors are making the comeback.

For more on these fascinating birds and the people who protect them, we have a whole episode linked in the show notes called Condorology with Dr. Jonathan C. Hall.

Chris: We have the largest flock of California condors here on site. We still do captive breeding here, we release those birds in California, New Mexico, and Arizona.

Alie: I don't think I've ever seen one in real life but yeah, okay.

Chris: You're about to!

Aside: As I strolled to the next very prominent enclosure with the tall Chris and the diminutive Carolina, I saw that the concrete walkway was decorated with imprints of some enormous bird feet.

Alie: Whose big feet are these?!

Carolina: Condors.

Alie: Those are condor– Are those actual condor imprints? Thems big feets though. They're as big as your feet.

Carolina: Yeah.

Alie: What size shoe do you wear?

Carolina: 5.

Alie: 5! [*gasps*] You're a size 5! You must find the best shoes on sale. Wow, we happen to have someone with tiny feet next to giant bird prints. How fortuitous is that? That's rad.

Carolina: I used to work with the condors. So, when you hold them, they're so big that they're, like, as big as me, pretty much and they're, like, 20% of my body weight.

Alie: [*croaky voice*] Oh my gosh! What is it like to hold a condor?

Carolina: It's crazy, they're strong. They're like 20 pounds of, "I want to get out of your arms right now."

Alie: Oh my gosh, wow! Holy smokes... [*awestruck*] They're giant.

Chris: So, I was an intern on the project once upon a time, and I was coming over a hill at the same a condor was coming over a hill and it banked, and one tip of the wing was on the ground and the other tip was just up 9-and-a-half feet in the air and we were both terrified of each other.

Aside: On this particular day, the condors were really active, more active than usual we were told, and they were kind of flapping around and swooping onto each other's perching spots, displacing each other. They were generally engaging in what I would describe as horseplay but for giant, almost-once-extinct birds, maybe it was birdplay. I don't know. Is that a thing? Let's ask an ornithologist.

Alie: Now, are they just playing tag?

Chris: So, they will displace each other. And this is the most active I've ever seen these particular birds actually, so you're seeing a show right now.

Carolina: Yeah, same. But also, they're, like, trying to get to the best perch and so they all want the best perch.

Aside: Okay, so these very big, very goth birds were playing a tug of war over something pretty big, like the size of a big dog or maybe a medium-sized bench but none of us could quite understand what we were seeing right away. Well, remember those road trips to the dairy that we mentioned earlier? Well, they don't drive out there for soft serve, kiddos.

Chris: So, we get free cows from dairies around here.

Alie: Oh, I see hooves now. Oh wow, that's straight up a dead cow. It's so wild just to see a dead cow in there just, like, snacky snacks, you know? But, I mean, they must be so excited when you bring it.

Chris: Oh, they love it.

Carolina: It's the most natural thing we can give them.

Alie: Yeah, I'm sure it's just like a pizza delivery. They've just got to be stoked.

Aside: So, later in the visitor center I couldn't stop thinking about that weird, elliptical, circle-of-life relationship that we have with raptors.

Alie: That's really wonderful of the dairy farmers to be like, "I've got a calf for you if you need it."

Chris: Yeah, it's not the most glamorous part of the job.

Alie: Do you have to go pick up a dead calf sometimes?

Carolina: Yeah, when I was in propagation, we would go every week.

Alie: [*goofy voice*] "What ya got for me?"

Carolina: Yeah. And sometimes, you know, we have a huge chest freezer that we set up for them and they put the calves in there. They are mostly stillborn organic calves, organic dairies.

Alie: Ooh, only the finest.

Carolina: Yeah. But sometimes, you know, five calves, other times it's like 15 calves, and you're like, "Oh my god."

Alie: Do you get to use the company car for that, or your personal...?

Carolina: We take the company truck.

Alie: That's smart. Can you imagine putting that in the back seat of your Sentra?

Aside: Speaking of vans, again, when I first saw the California condors, as a Californian, I kind of wondered how they got up here to Boise.

Alie: How did they make their way up to Boise, Idaho?

Chris: Mostly by van. So, it's actually a neat story. We breed the California condors here, and then they travel by van to wherever they're going to go and it's actually quite the process because we keep it very quiet in the vans.

Aside: Chris says that in an effort to keep the birds from getting too comfortable around human beings, when the ornithologists drive the birds to their new home in the wild, no one's allowed to talk or listen to the radio, and they have to keep the AC *cranked* up, ice 'em out so that the birds don't overheat. Because heading west for them, to California, is a 13-hour drive. So just imagine, a big, cold, silent cargo van full of razor-beaked flying dinosaurs with 9-foot wingspans, fairly recently basically brought back from the dead. It's just deeply spooky in the best way. Oh! It warms my little science dark heart. Maybe we should have told the Stinker guy that that was our band, Condor Caravan Cult, just touring with hit singles like, "Cow Baby Tug-of-War," or "Cold and Quiet as the Grave" and the instant classic, "Eating Lead."

Alie: And they came back from near extinction in the wild, right?

Chris: That's right. There were 22 individuals and they trapped them all up in the '80s and started breeding them and now there are over 500 in existence and about half of those exist in the wild.

Alie: Wow! And I know off the coast of California they're like, "Oops we found barrels of DDT," right?

Chris: That's right. There was lots of DDT spilled off the coast in LA and stuff and it's been getting to the marine mammals and then the mammals die eventually and wash up on shore and the condors eat them so that is a problem.

Aside: So, you may remember that we talked about this both in the Carnivore Ecology episode with Dr. Rae Wynn-Grant and in the aforementioned Condorology episode with Dr. Jonathan C. Hall. Here's a quick aside from that episode.

[clip from Condorology]

Alie: But things that contributed to their extinction in the wild, around 1987, this was before the captive breeding programs, were things like the use of DDT, which has been known to cause really fragile shells that break in the nesting process. These effects of DDT were still happening decades after it was banned in 1972 because it was stored in the blubber of sea mammals that the condors ate years later.

And while DDT is certainly very bad for birds...

Chris: The main problem for California condors though is lead poisoning from spent ammunition. So, The Peregrine Fund is actually the only entity that breeds California condors, releases them in the wild, *and* tackles lead poisoning. So, we hit on all three aspects of condor biology and restoration.

Alie: And is that, like, using copper bullets and things for hunting?

Chris: So, we want people to start using copper bullets. Actually, we do workshops, we give out copper ammunition. So, you can either use copper ammunition or you can bring in your gut pile. [*"I'm sorry, come again?"*] So, often, folks will shoot an animal, they skin it, and leave the guts there. Those guts then have lead in them if they were shot with a lead bullet.

Aside: So yes, lead ammo. Don't leave, say, a deer's viscera for the scavengers if it's contaminated with lead ammunition. And we talked about this in the two-part Cervidology episode about deer, kind of touching on conservationists who choose to hunt mammals and birds over factory-farmed meat. So, it's haul in your guts or copper ammunition within the bounds of their namesake, California, which for the record, was the first state to ban all lead ammunition for hunting in 2019. [*"I'm doing my part!" "I'm doing my part."*]

And for more on how condors become lead poisoned by tainted buckshot, again, go back and check out the Condorology episode, which of course, linked in the show notes. But if you were to visit The World Center for Birds of Prey, you might get the chance to see different big birds, each time you go.

Chris: They will rotate which birds are on display based on the genetics and whose genetics are needed out in the wild. So, these birds are too young to be breeding right now, but sometimes there will be an adult in here.

Carolina: But these are three juveniles that are waiting to be bred later. They don't reach maturity until 6 or 8 years old.

Alie: Oh, wow!

Carolina: Yeah, so it takes a while. These are going to stay in captivity to breed, so we want them to get a little bit used to people and to be a little bit more manageable.

Alie: Are they boys or girls? Do you know?

Carolina: So, I believe that one on the left, that's 988, that's a girl, she's almost 4 years old. She's the oldest one in here.

Aside: Carolina pointed to a few more towering creatures whose leading wing edges bore these black and white numbered tags.

Carolina: And then the other one, 1032, that's a boy. And 1086 here is a girl.

Chris: It's interesting, so they were down to 22 individuals and it's really hard for a species like this to bounce back because it takes them 6 years to breed and even then, they only breed every other year.

Alie: Oh wow.

Aside: 22 individuals, before the breeding program, and now there are over 500. And at this moment, a very friendly and knowledgeable volunteer approached us and asked what we were up to because we were carrying microphones and we looked like we were in a very cool band. I'm someone who worked as a volunteer docent at the Natural History Museum, so sweetie weirdos who stand around in science places to chat, they're my people, I am them. Naturally, me and this retired man had a lot in common and we hit it off.

Chris: This is a podcast.

Alie: Yeah, a science podcast.

Spk 1: Are we on right now?

Alie: It's not live so don't worry. How long have you been volunteering?

Spk 1: 15 years.

Alie: Wow! What's the most common question people ask you?

Spk 1: How long do they live? Is it a boy or a girl?

Alie: [*laughs*] I've asked both of those questions already!

Chris: These are good questions. [*Alie laughs*]

Aside: Our friend Jason asked a question and this docent *delivered* like an unlimited vending machine of bird facts.

Jason: Do you guys know exactly what the population is?

Spk 1: Little over 500 on the planet Earth. We have 50 here on the premises. So, you know what, we have a tenth of the world's population, roughly, right here. We have 14 eggs right at the moment, 57 days of incubation for the egg. The first egg was laid on February 2nd. So, guess 57 days from February 2nd, guess what day that is?

Jason: Today?

Spk 1: Today!

Alie: Is it really?

Spk 1: It is today.

Alie: Whaaat?

Spk 1: It is today. [*DJ airhorn*]

Alie: Are people standing around watching it with balloons?

Spk 1: Well, you know, the nest boxes have cameras.

Alie: Yeah, yeah. Will white smoke come out like at the Vatican? [*Spk 1 laughs*] [*"Oh, we got white smoke, we have white smoke!"*]

Aside: We didn't that day but there was some bird hatchling gossip afoot.

Carolina: These are the parents, but I don't know if they actually have that egg because sometimes, we switch eggs around.

Spk 1: Let me read it. This is in regard to that first egg, "Pull to incubation at Day 7, parents left to recycle."

Carolina: Yeah so, they don't have their egg.

Spk 1: Yeah, they don't have it. They're hoping for a double clutch, huh?

Carolina: And they did.

Alie: Oh, so if they put the egg in the incubator, they might have another egg?

Carolina: Yeah.

Alie: Oh, double clutch. Ahh! Doubling down.

Aside: Wait, hold on, what is it again? What is a double clutch? Okay, a double clutch, it sounds like a gamble that you would make at a craps table in Reno, but double clutching is a way to get more condors in less time. So, the wild condor will usually only lay one egg any time they nest and that only happens once every year and sometimes, every other year. Also, condor couples only raise one bird at a time. So, you can see they're not exactly rabbits when it comes to the ease of progenesis.

So first, you need to understand that condors are not necessarily the most careful birds. And the bird nerds at the visitor center told us that sometimes, they'll break their own egg in a nest. Eugh! It hurts me to think about. So, to avoid this, when the mama condor isn't looking, they swap out the real egg for a replica, which it sits on until the real egg pips (which means it starts to crack), and then they switch it out for the mom to sit on until it is fully hatched. Such capers! And this year, this new double clutching technique yielded 14 baby birds, which is huge for them, especially considering the wild population of California condors lost 21 from a flock in Arizona to this highly pathogenic bird flu. They were even able to rescue a mama bird's egg after she died, and they carefully hatched it in Boise.

In this interpretive visitor center, you can watch all the various potential parents, kind of like it's an episode of *Love Island* but filmed on a security camera. And when they're double clutching, they'll just sneakily remove that real egg, and they'll not replace it. So, you know, you might think that this would be a great trauma for the condor parents, and who knows, maybe it is, I don't know. But the San Diego Zoo says it isn't too unusual for a wild condor to lose that first egg, so they'll often lay a second egg about 30 days later, netting two new baby birds, hence the double clutch.

Well, what happens to the first bird baby that they took away? Okay, don't worry. Another currently childless condo pair adopts the would-be feathered orphan. And if those aren't available, sometimes they're parented by a human with a puppet and a puppet that has been described as slightly terrifying by the Irish newspaper, *The Independent*. Now, will the baby condor be unpacking this puppet parent decades later in therapy? Who is to say? What we do know is it makes more condors and gosh, golly, we do need more condors.

Alie: Oh, my gooosh.

Chris: This is our interpretive center.

Alie: Holy smokes! Oh, there are the cameras!

Chris: You can see the cameras, yeah.

Alie: And are these paired birds? Do you ever put them together and they're like, "I don't like this one."?

Carolina: Usually the first year they're, like, trying to test the waters, see what's up, "Who are you?" But yeah, usually they pair totally fine. We have a pair that has been together for, like, four years and they tolerate each other, they live together, they're roommates but yeah, breeding... Nope.

Alie: Nope? [*"We're just friends."*] Do you think you're going to have to remix and match?

Carolina: Yup. We do that every few years. This bird over here, that's a single male and so he's not paired and so nobody's laid an egg for him, he's just by himself. But he's surrounded by everybody else so they kind of get into the breeding mood and we give them a dummy egg, so an egg just like this one.

Aside: So, at the visitor center they have this heavy, white object, it's about the size of an oblong softball and it's been scuffed up from thousands of visitors having this hands-on learning of what these dummy eggs look like that they sneak into the nest.

Carolina: And yeah, he just went in, and he was like, "I don't know where you came from, but I love you and you're mine now." And we use these guys as extra parents and so for example, we were talking about double clutching, so they'll have two eggs, two chicks but they're only going to raise one. But the other young can be raised by this guy.

Alie: Oh! Like a doting uncle. Oh, that's so sweet.

Carolina: And they're really good at it.

Alie: Uncles are the best! They're like, "Eat whatever you want. Let's go race cars and stuff."

Carolina: He used to be our mentor for the pre-release birds. He was doing that last year, we just moved him into breeding again and he's by himself and he's like, "I miss breeding, let's do this."

Aside: Okay, so condors, we're going to give you some privacy, onto some other species.

Alie: Oh great. Anyone else we should see while we're here?

Chris: Oh yeah.

Alie: Great! Yeah, let's go have a look...

Holy smokes there's a bald eagle right there. Why do I have the inclination to whisper around them?

Chris: It's just respect, I guess. [*Alie laughs*] They command respect.

Spk 2: She looks like a chicken.

Alie: I know! Isn't she cute?

Aside: So, this female bald eagle is in a large enclosure sitting on a perch as regal as you would expect a bald eagle to be in three dimensions.

Spk 3: Do you know about their calls and stuff? I remember I learned, like, last year about bald eagles not making the sound that everybody thinks that they make.

Chris: Yeah, that's a funny... Yeah, so if you're ever watching a movie or a TV show and you hear that, "Cawww," [*"Bald eagle" cry*] and they show a bald eagle, that's actually a red-tailed hawk. It sounds cooler than a bald eagle does so they play it over and it's a running joke with bird people.

Spk 3: Yeah, a bald eagle sounds something like a seagull or something, right? It's kind of goofy. [*series of little chirps*]

Alie: How old do you think bald eagles can live for?

Chris: In captivity up to 40 years, probably.

Alie: Wow.

Chris: In the wild about half that.

Aside: I've seen a few in the wild when I visited Alaska for a TV shoot. You know who else has seen bald eagles in the wild? Dr. James Maley from our Ornithology episode in 2017. Allow me to share an excerpt.

[*clip from Ornithology episode*]

James: I lived in Alaska for long enough to see what bald eagles really are.

Alie: Yeah? Oh no. [laughs]

James: Which, if you ever go to Homer, Alaska.

Alie: I've been there!

James: You've been there? Did you look at the dumpster behind the McDonald's? Because it was probably full of eagles. [both laugh]

Alie: No. But now I have to go back.

James: Yeah, they're really scavengers. There are some birds that only steal from other birds and other things, they're called kleptoparasites. But bald eagles are not kleptoparasites, they can catch their own food. But more often than not, I've seen them steal food. Like, I saw one steal a flounder from a river otter and it's like, "Come on, the river otter has just finally caught his dinner and you steal it. That's just rude."

Alie: That is a pretty American tradition though. [laughs]

James: I suppose so, yeah.

Alie: How big are their nests? Giant, right?

Chris: They can get huge, yeah. They can weigh about as much as a car.

Alie: Oh my gosh.

Chris: It's because generation after generation just keeps adding to it and they can get pretty big.

Alie: So, the nests, you can grow up in one nest and then end up using that later? Like inheritance?

Chris: You could. Yeah, totally.

Alie: [*softly*] I had no idea. I love that they're just like, "We'll keep doing additions, adding on a sunroom."

Chris: Mother-in-law suite.

Aside: Now, aside from the condors, who will be chauffeured silently by the van to their new homes to live out lives in the open sky, many raptors at The World Center for Birds of Prey will be lifelong residents of Boise.

Chris: All of these birds are not releasable out in the wild, either because they're imprints or because they're injured.

Alie: What's an imprint? Oh, they've imprinted onto humans? Like, were they raised by humans, and then they...

Chris: Exactly.

Alie: Got it.

Aside: We also rounded the corner in the visitor center to see a bird that looks kind of like Dorothy from *Golden Girls* if she were wearing a hat made out of a feather duster. I mean the vibe, the presence is immaculate.

Alie: Oh, I love a harpy eagle, they look so cartoonishly beautiful with the plumage, the crest. It's gorgeous.

Chris: So, this particular bird lived in the wild for a while. This bird lived off of monkeys and sloths and it was getting a little too familiar with people, so they trapped it back into captivity.

Alie: This particular...?

Chris: This is Grayson.

Alie: Grayson! Where was he born?

Chris: Panama.

Alie: And so, getting a little bit too familiar with the public, does that also mean, like, the bird is in danger and maybe the public might be as well?

Chris: Exactly. It's usually not good for people or raptors when the two get too close to each other.

Alie: What a beautiful bird, what a vibe.

Oh my gosh, do we have owls as well? Oh, let's check them out. Look at how tiny this owl is! That's a frickin' owl?

Chris: Oh yeah.

Alie: It's the size of a parrot! And a saw-whet owl is that tiny? [*gasps*] The great gray owl is pretty giant, that's as big as my dog.

Aside: So, this great gray owl has the volume and majesty of my 13-pound poodle but weighs just 2.5 pounds! The fluff on this bird, the volume-to-mass ratio is astounding.

Alie: Ohhh! Do you want to see an owl eating something? It's dingle dangling a little bit of meat, might be a whole rodent. So, we're looking at a barred owl. Where's a barred owl typically from?

Chris: So, they're really common out east but then they have expanded their range into the west, and actually now it's a big problem, they're competing with northern spotted owls.

Aside: Barred owls, not to be confused with barn owls, are described by the Fish and Wildlife Service as, "Larger, more aggressive, and more adaptable than the threatened northern spotted owls." So, barred owls have become an invasive species in parts of the Pacific Northwest where they're currently barred from existing, sort of.

So, since they displace spotted owls, and they mess up their nests, and they compete with them for food, the US Fish and Wildlife Service did an experiment removing barred owls from an area where they'd been encroaching, and they found that it indeed had a very positive effect on the northern spotted owl's survival. So, it looks like they're going to continue controlling their presence, not just to keep helping northern spotted owls survive and thrive, but to prevent declines in California spotted owls who apparently are also common targets of barred owl bullying. [*"How many of you have ever felt personally victimized by Regina George?"*]

Alie: And then who do we have in here? Oh, this is a peregrine falcon?

Aside: Yes, *the* peregrine falcon. White neck, striated breast and back, big glossy eyes, and feet and a beak that match your favorite number 2 Dixon Ticonderoga pencil.

Alie: How beautiful! I didn't expect such fluffy plumage, is that because it's chilly out or is it recently molted?

Chris: That's right. If you ever see a fluffy bird, it's not a fat bird, it's just fluffed up.

Alie: [*laughs*] It's not fat, it's fluff!

Aside: For the record, people do this to my daughter, who is a dog, Gremmie, all the time. She gets into her little ragged muppet Ewok teddy bear mode and people start saying, "Mm, she's getting a little thicker than a snicker, huh?" And then she gets a haircut and she's tiny because she's always just a teeny, tiny baby.

Speaking of tiny babies, the bird who is simply fluffy that I thought was a juvenile was, in fact, a Cassini peregrine falcon which is a non-migratory bird found throughout South America from Ecuador to Bolivia, northern Argentina, and Chile, down to Tierra del Fuego and the Falkland Islands. It's just a little guy, this Cassini peregrine.

Alie: I don't know if I've seen falcons in the wild ever. I know we've got a lot of great hawks in LA but...

Chris: You should have peregrine falcons, downtown I bet. They say New York City has one of the highest densities of peregrine falcons.

Alie: So cool! [*laughs*]

Chris: Peregrines again, falcons need a bedroom and a pantry, right? They need a cliff; New York is full of artificial cliffs, right? And then they need prey; full of pigeons. So, that's all they need.

Alie: So, they're not going after the rats as much as they are the pigeons?

Chris: It's mostly pigeons.

Alie: Okay good, because I was going to say, rodenticides must be wild in New York.

Chris: Yeah. Peregrines eat mostly other birds.

Alie: Oh! Okay, well, plenty of pigeons. No wonder. Yeah, if I needed a cliff and a pigeon I would go straight to New York.

Aside: If you feel like having your tender heart weep sweetly about sewer rats, I'm going to link the Urban Rodentology episode we did in the show notes. Augh, it's a certified banger.

Alie: Anyone in that one? Oh, that's a falcon too!

Chris: That's an aplomado falcon.

Alie: Oh wow! Oh, they're beautiful.

Chris: So, this is the only falcon on the US Endangered Species List.

Alie: Really?

Chris: They live in South Texas. Actually, we had a project where we captively bred thousands of aplomado falcons and released them into South Texas, and there are now about 23 pairs down around Corpus Christi and Brownsville.

Alie: So, if you breed say, 1,000 and there's 23, do you know what happened to the ones that maybe didn't make it? How do you figure out what proportion might survive?

Chris: It's called mark-recapture analysis. So, each bird that we release gets an anklet basically, and if you go and you see how many of those birds you can resight every year, you can get a proportion of the ones that are still hanging around and that can help you get your survival probability.

Aside: These aplomado falcons have dark brown heads and backs, they've got striped black and white tail feathers, and kind of a rusty-colored face, and then these deep red ochre head stripes that look kind of like blunt graphic eyeliner wings.

Alie: Oh, they're such beautiful birds. What do they tend to eat in the wild?

Chris: Mostly other birds. These do a really cool cooperative hunting strategy where the male and the female will help each other catch the prey.

Alie: Does one chase it into some area and then the other dive bombs it?

Chris: Basically, yeah.

Alie: Cool... Oh my gosh, who is this?

Chris: Come over here and look, you'll be able to tell.

Alie: Oh, it's a turkey vulture! Hello!

Spk4: It's Lucy.

Alie: Oh my gosh, hi Lucy! Any idea why Lucy is here?

Aside: So, we called in a friend because...

Chris: The volunteers know everything. [*Alie laughs*] Hi Jeff.

Jeff: How you doing?

Chris: Good, good to see you.

Jeff: You too.

Chris: Do you have any idea why Lucy's here, what her backstory is, or anything?

Jeff: Lucy has the craziest backstory of any bird that we have.

Alie: Really?

Jeff: She was found by Fish and Game being kept as a personal pet inside somebody's house.

Alie: [*softly*] What?

Jeff: No crate, no mews. Just in the house.

Alie: What were they feeding her? Leftovers?

Jeff: I have no idea. Just the poop factor alone would be... yeah.

Alie: Wow, vulture poop on a couch seems like a real pickle.

Jeff: Yeah, not quite as cuddly as Bowser, or your cat, or whatever.

Alie: So, any idea how old she might be?

Jeff: She's 21.

Alie: She's 21! How long was she living in a house?

Jeff: About 5 years and then she's been with us ever since.

Alie: But she definitely imprinted on humans?

Aside: So, because of this imprinting, Lucy is not able to be released into the wild or rehomed. I mean, definitely not a "Free to a good home" via Craigslist situation.

Chris: So, Lucy has a defense mechanism where if she gets excited or scared, she will vomit at an attacker.

Alie: Oh no!

Chris: So, I can't imagine having that in your house too.

Alie: Yeah, every time the mailman comes, or someone is at the door...

Chris: Yeah, you think your dog barking is bad? [*"I'll pass."*]

Aside: What about in, say, South Asia? Well, in the 1980s, there was a little thing called, very ominously, "The Indian vulture crisis" where regions lost nearly all, statistically, of their vulture populations.

Chris: So, in the '90s, vulture populations in India just plummeted and no one knew why. We're talking about, like, the birds went from being the most abundant large raptors on the *planet* to nearly extinct; they plummeted by like 99% and nobody knew why. There were all these hypotheses about, was it a disease? Was it something else? And it was actually scientists with The Peregrine Fund at the time who figured out that it was diclofenac.

Diclofenac is an anti-inflammatory drug, and you can get it prescribed for you if you have something like arthritis or whatever. But there are a lot of cows in India and those cows live to old age and they get old age problems, so people were giving their cows diclofenac to help with inflammation. Those cows would then die, the vultures would eat the cows, and it would cause kidney failure for the vultures; they would die within, like, 72 hours. So, it was this problem, this very acute problem that scientists with The Peregrine Fund and of course other collaborators helped figure out.

Alie: Did they find something else to give the cows?

Chris: Yes. Yeah, they found less toxic alternatives.

Alie: Man, it's like an episode of *House* or something. Just, like, a medical mystery.

Chris: It was a mystery.

Alie: Oh look, a theater named after Tom.

Carolina: There is a bird show, there should be a presentation in two minutes.

Alie: Oh yeah? Should we go check it out?

Kelsey: Welcome folks! My name is Kelsey, I'm one of the raptor specialists here and we're going to be free-flying a bird here for the next few minutes. I know it's really exciting but if everyone stays calm, quiet for me, remain seated the entire time… And most importantly, this here is Penny. She is our 7-year-old female American kestrel. And American kestrels are the smallest falcon here in the United States.

Aside: Kelsey explained that these tiny kestrels inhabit all kinds of places from deserts to shrublands and grasslands and forested areas, riparian areas, and that their diversity in habitat also reflects in the diversity of their diet. Kelsey said that Penny will eat anything she can get her talons on from small mammals to lizards, snakes, and bugs. But they need to eat about a quarter of their body weight each day, usually in mice. So, imagine if a 200-pound person had to fight a rat the size of a Doberman Pinscher every single day; it's kind of a rough way to make a living. And the US has lost over 50% of its kestrel population in the last 50 years.

Kelsey: Are there any questions?... Yes.

Alie: What's Miss Penny's story?

Kelsey: Yeah! So, way back in the day, she was a little wild hatchling, and someone thought she'd make a really good pet. I love these birds, love them so much. Anyone you ask who works with these birds will tell you how high-maintenance they are. Oh, buddy. So, she was taken in a young stage. So, Penny is kind of considered an imprint. What exactly does that mean? Well, when it was raised, it was a baby bird, the first thing it sees, hears; that's imprinting done. We're kind of learning it's a little more complicated than that, species-specific. But basically, the general new information is that it is a series of learning windows that can extend their entire life.

Aside: So, raptors are an altricial species, which if you remember from the Chickenology episode, means they're born with their eyes closed, barely any down, no fuzz on 'em, so they rely completely on their parents to survive. Now, precocial birds, like chickens or duckies for example, those are born with their eyes open, and they imprint on their parents immediately upon seeing them. But since they don't have vision right away, raptors and other altricial birds like parrots and pelicans, they have to use other sensory inputs like sound to recognize their parents. Also, altricial birds, like raptors, take a longer time learning and they do much of that by watching their parents and their environment.

One paper about another altricial species of animal, called humans, entitled, "Origins of social knowledge in altricial species," suggests that altriciality actually serves as an adaptive trait in that in the extended period of care required for altricial species to grow self-sufficient, they end up learning many more important and really intricate mechanisms for complex social interaction and survival strategies from their parents.

And right now, in our backyard, we have a red-tailed hawk and its baby and we're watching the mama bird teach a baby how to hunt! We've never seen this before and it happens right outside our window! But anyway, what do they learn first?

Kelsey: So basically, those learning windows, crucial when they're younger, are: Where is food? What am I? And what should I be afraid of? A lot of fear-based learning. And Penny learned the exact opposite, unfortunately, in her learning window from what she should have been for a wild bird. Meaning: humans are fun and friendly, they mean food. She hung out with other birds of prey close by that would naturally be her predators and eat her out in the wild. She'd be like, "Oh hey, red-tailed hawk, best buddy!" So, she didn't learn where her food properly comes from, who her mate properly is, how to hunt, and what to be afraid of.

So, she was deemed non-releasable by Fish and Game and wound up in our education program when she was almost two years old. So even though, Penny, super cute when they're young, super cute now, she is not my pet. I have the same respect I have for her as any other wild creature, but I tell you a lot, she can throw quite the attitude. [*audience laughs*]

And I'll let you guys in on a little behind-the-scenes secret with her. So, a lot of people think Penny, her full name is Penelope, right? That's the shorthand. Ahhh. Actually, her full name is a play on

Pandemonium, so she's Pandemonium because of how spicy she was when she was younger. She's not really spicy now, she's matured. That was a long answer to your question.

Alie: Yay, thank you!

I'm going to do an interview and then we'll come back out and head on back, is that cool?

Aside: I broke away from the band to ask Chris, Executive Vice President of Science and Conservation and resident bird nerd some of your questions.

But first, every week we donate to a different cause, and this is going to shock you but this week we're donating to The Peregrine Fund, and they're also, obviously, behind The World Center for Birds of Prey. Founded in 1973, The Peregrine Fund's mission is to restore rare species through captive breeding and release to improve capacity for local conservation to conduct scientific research and environmental education and to conserve habitat. We've linked them in the show notes and thank you to sponsors of *Ologies* who make that donation possible.

[*Ad Break*]

Okay, onward, upward, and to the library.

Alie: Okay, birds. Have you always been a birder? What's your deal?

Chris: I started in high school actually.

Alie: Did you?

Chris: Yeah, I went to a really great high school, they had an ornithology class.

Alie: That's rare, I feel like. Yeah? So, was there a bird that got you hooked, looking for it?

Chris: Yeah. Well, I wasn't looking for it, but I remember seeing it and it had a yellow rump, [*Alie laughs*] and I was like, "Oh, it's a yellow-rumped warbler, I can do this." So, it's not the coolest spark bird or whatever, but that's my spark bird, the yellow-rumped warbler.

Alie: You mentioned to me earlier when we were coming in, you're from Georgia. Is it common for the area that you lived in to have an ornithology class?

Chris: No, no, it wasn't. It was a private school; I was very fortunate to be able to go to this high school.

Alie: What a pipeline to be like, "I took an ornithology class annnd I'm an ornithologist."

Chris: His name was Mr. Sam Pate [ph.] and many of his students actually ended up being ornithologists and when I went to college at the University of Georgia, Go Dawgs, we would meet people and they were like, "You're from Columbus? I bet you like birds, don't you?" [*Alie laughs*] And it was all because of this great high school ornithology teacher.

Alie: Did he know that you became an ornithologist? Did you ever let him know?

Chris: He did, yeah. It was great, I was very fortunate to grow up the way I did, I guess.

Alie: And what about raptors?

Chris: So, I really wasn't a raptor guy until I started working for The Peregrine Fund. I actually circled back around The Peregrine Fund. My undergraduate degree is in environmental economics.

Alie: Mm! Okay.

Chris: Right, exactly.

Alie: That's a thing?

Aside: "What in the heck is environmental economics?" you'd like to know. Well, I wanted to know too. So, it is the application of economic principles to study how natural resources are developed and managed, like, in determining the costs and the benefits of environmental policies. And it comes into play when looking for solutions to things like environmental toxins and global warming and the development of biofuels and so forth. The EPA puts out all kinds of environmental economics reports such as "The Benefits and Costs of the Clean Air Act, 1990-2022," and the "Handbook on Valuing Children's Health." So yes, environmental economics, I mean one day, maybe we're going to do a show that's just -ics, like economics, although we do have an upcoming Disgustology episode that discusses "The ick." But back to environmental economics.

Chris: It's hard to get a job in environmental economics, turns out, so I took a seasonal position releasing aplomado falcons in west Texas for The Peregrine Fund and it was there that I was like, "*This* is what I've got to do." But I didn't have the degree for it, so I had to go back to school, I did a few more jobs, and I ended up here in Boise doing a postdoctoral research study on noise pollution and songbirds, basically. But it was in Boise, and they heard that I was good at statistics, bird math, basically, [*Alie laughs*] and I ended up doing some work for them and they hired me, so I got to circle back around to The Peregrine Fund, and it's been a dream.

Alie: And what do you do? I mean, you're the lead of research here? What does that encompass exactly?

Chris: It's a lot. It's a lot of pressure, actually. I oversee all the research, monitoring, and conservation that The Peregrine Fund does around the globe. It's a big job. I feel like the dog that caught the car sometimes. [*"Can't believe I did it."*] It's a fun job too. All grad students in ecology and conservation want to make a difference, they want to make sure that their work is important and I say, be careful what you wish for because at some point, someone is going to come to you and ask you to make a conservation decision and your decision will 1) cost money and 2) have an effect and you need to be prepared for that. That's kind of the position I've landed in, so I'm, again, really fortunate to be here.

Alie: And especially with peregrine falcons and with falcons in general, I feel like peregrine falcons are such a mascot of things going *really* bad, but we turned it around. So, there's a legacy there, I imagine. For me, I think I always heard "on is and there's, like, a respect and a dignity, a mystery to it. But if you had to ask me "on is, in terms of raptors, I'd be like, "[*stutters*] I have no idea. I don't know actually." What makes one raptor a falcon as opposed to an eagle or an owl?

Chris: It's evolution basically. All falcons are in the genus *Falco*, so that makes it easy. You can move it up to the family that they're in, *Falconidae*. Now, they share that with the caracaras. So, caracaras are pretty cool, they're like falcons, they're related to falcons, but they do more scavenging than most falcons would.

Aside: So, the caracara usually has a bright red beak and a whitish, speckled head but with a black streak on top that sometimes looks like a spikey crest and sometimes kind of resembles a little comb-over. They mostly have these long yellow legs and blueish silver hooked beaks. They look a little bit like an eagle crossed with a parrot, but if it were a falcon, which actually makes a lot of sense when you consider that they are indeed members of the family *Falconidae.* And something interesting, I think you'll think, about all falcons is that their closest relatives are not other raptors like eagles and owls, but in fact, closest genetic relatives are songbirds and parrots! Which, they are estimated to have diverged from somewhere around 60 million years ago. I think that's neat.

Alie: Do falcons eat anything dead or do they have to hunt what they eat?

Chris: They prefer live prey but pretty much any predator will scavenge if the opportunity arises, or they have to.

Alie: How do most falcons hunt? Do they have amazing eyesight? Do they tend to be daytime hunters? Nighttime hunters?

Chris: Most of them are daytime hunters. Some of them have amazing eyesight. It turns out– Everyone thinks raptors have this great eyesight and many do, in fact, the wedge-tailed eagle has the best visual acuity of any vertebrate that's ever been measured. So, some raptors have amazing eyesight. But even, like, the American kestrel has lower visual acuity, at least the ones that we've measured so far have lower visual acuity than your average human.

Alie: How do you do an eye test on a bird?

Chris: Well, there's the clean way and the dirty way. You can cut open the eye and count the number of rods and cones. [*"No thanks."*] Or you can do some behavioral tests, when they see a certain thing, they act a certain way, so that's basically how you run the eye test. It's not like the big E and the little... yeah. [*Alie laughs*]

Aside: So, one way researchers evaluate visual acuity in animals is with this measurement called Cycles Per Degree. Okay, basically how this works is, imagine you're in the middle of a big, spinning barrel, or one of those old zoetrope early movie things where it spins around and it looks like a horse is running. You know what I'm talking about? Yes. Okay, so imagine the inside of the barrel you're facing is white with black stripes running vertically from top to bottom in front of you. So, they begin spinning the barrel, so you see white-black-white-black-white-black-white-black, and you can tell that there are distinct lines spinning in front of you. But then they make the lines smaller and closer together, making the pattern denser and harder to distinguish, and eventually, you're just seeing a gray blur instead of distinct lines rushing past. So, the highest number of cycles per degree able to be distinguished is how they can get an idea of how sharp an animal's vision is.

Humans' threshold is right at 60 cycles per degree whereas falcons' threshold is 160. However, that great eyesight, don't be too jealous, because it's really dependent on luminance and when the light goes out, they lose visual acuity very quickly. So, hawks and falcons and eagles are diurnal, but owls are… well, they're night owls.

Alie: And how many kinds of falcons are there?

Chris: 64.

Alie: Oh, that's it?

Chris: Yeah, that's it.

Alie: I had no idea. Are they all over the world?

Chris: They are all over the world, they're mostly in South America and Africa.

Alie: Oh! Is there something about the southern hemisphere that lends itself to falcology?

Chris: It's the tropics basically, and there are just more species in the tropics than there are out elsewhere. I'm pretty sure that the radiation of falcons happened mostly in Africa, they are said to have evolved right alongside humans.

Aside: So, according to a 2015 study, "Rapid diversification of falcons due to expansion of open habitats in the Late Miocene," falcons diverged and diversified on a timescale similar to that of early hominids due to similar ecological and geological pressures. Also, there's evidence that falconry has been practiced in the Middle East for at least 5,000 years and the relationship between falcons and humans may have had long-term effects on the genomes of falcons through things like interbreeding between escaped falconry birds and native falcons. [*gasps*]

So, why is a falcon party closer to the equator? Well, since the temperatures at the Earth's waistband don't fluctuate nearly as much, prey is more readily available throughout the whole year. And as a result, the predators in those regions usually are not keen to migrate because why would they? [*"We've got everything we need right here."*]

Alie: What about where they nest? Are they all rock-dwelling or tree-dwelling?

Chris: It's mostly cliffs. They don't really build nests. So, often, like the aplomado falcons in South Texas, have to have a nest already built for them so they'll just take over old nests of other species.

Alie: Really? So, they can maybe find an old osprey nest and be like, "It's a little too big but it'll work for us."?

Chris: Yeah, that's basically how it works. And so, our biologists down there have put up artificial nest sites for aplomado falcons. They're barred, so it looks like a little jail cell, [*"Come on jailbird."*] but the bars are just wide enough so that the falcons can get in and out, but their predators can't. We've basically doubled the productivity of the population through those boxes.

Alie: When did they figure out that that's something they had to do in order to help them out? Did they realize, "Okay, these nests are working but they're getting picked off?"

Chris: Yeah, it was Tom Cade, our founder, and Grainger Hunt, who is still around, he's still a great friend and mentor to all of us here at The Peregrine Fund. They figured it out, they actually drew it on a napkin.

Alie: Augh! Oh, I love those stories.

Chris: Yeah, it's one of those.

Alie: Is the napkin somewhere in a museum?

Chris: It should be.

Alie: It should be! [*laughs*] I hope they have the napkin still.

Aside: One day maybe I'm going to open a museum of important napkinry or an Institute for Napkins of Impact.

Alie: And what about the peregrine falcon's story? When you're talking about The Peregrine Fund, I mean, The Peregrine Fund has now, from what I've learned, gone on to help in the conservation of many other species. But the peregrine's story as this iconic comeback, can you tell us that in a bit of a nutshell?

Chris: I can sure try. So, DDT was in high use after World War II and biologists realized that it was causing eggshell thinning in predatory species, so raptors mostly. It was causing peregrine falcons to plummet, the populations, because they weren't reproducing as much. So, Dr. Tom Cade was out of Cornell University at the time, and he founded The Peregrine Fund in 1970 to reverse the decline of the peregrine falcon. There were basically no peregrine falcons east of the Mississippi in North America. There were a few pairs scattered here and there out west but none in the east.

He was a falconer, and he took that falconry knowledge and put it on an industrial scale of how to captively breed these birds. So, we – I say we, I wasn't there – The Peregrine Fund released about 4,000 captively bred peregrine falcons into the United States, and of course, we did this with a slew of partners that I can't name, but they all deserve credit, and a lot of them were falconers. There is a good chance that if you are in New York or in LA or even in the Grand Canyon and you see a peregrine falcon, that it's one of the progeny that was created here in Boise, Idaho.

Alie: And how many pairs were they down to? How many in the wild were they down to?

Chris: Very few. They're one of the first species listed on the Endangered Species list.

Aside: So, this was via the Endangered Species Conservation Act of 1969.

Alie: And when it comes to breeding in captivity, what did falconers know from having raised from young chicks to imprint on them? Did they have any secret hacks and tips?

Chris: Yeah. So, actually, you said hack, there was a technique called hacking.

Alie: What?! Okay.

Chris: Yeah. This technique is basically a soft release into the wild, so they put the young fledglings into a box that has a barred front so they can't get out, but it helps acclimate them to the environment that they're in. They feed them in the box and then they release the birds from the box but keep feeding them there, so they learn to hunt but aren't reliant on hunting their own food immediately. And that was one of the falconry techniques called hacking, that helped save the peregrine falcon. And there were other breeding, like, direct breeding techniques, like artificial insemination with falcons and stuff like that, that were directly from falconry.

Alie: Do a lot of falconers, do they rear their own chicks or adopt? I imagine with falconry, you want the bird to imprint on you and it's also a sport but it's also husbandry, it must be kind of like horseback riding where you have a relationship with an animal.

Chris: Many raise their own; some buy, you can buy falcons or raptors to use; and many of them will take them from the wild and it's perfectly legal to do so, you can get a permit.

Alie: How is it?

Chris: Actually, the US Fish and Wildlife Service does a great job with setting falconry take, so it's the number of birds that can be taken from the wild, and actually, my good friend Brian Millsap runs the models and it's his team that does it. And he's a falconer too so he's one of the big proponents of sustainable falconry. It's just like, so many ducks get shot a year and so many falcons get taken a year for falconry.

Aside: And as I say often, we cannot exist on planet Earth, as humans, using roads and living in houses, and eating farmed foods without negatively impacting other species and that's tough ethically, and I think about it often. And as we were touring the facility, I wondered how these bird researchers felt about falconry in general. Chris told me that there are a few bad apples to watch out for in terms of poaching eggs, and not in a brunch way, but that ornithologists and falconers tend to have a good relationship because they're both in it for the love of the birds and falconers tend to have such deep respect for the birds and have assisted in conservation when few other people cared.

Alie: Are the populations of those species stable enough, I imagine, to do it? What species tend to be used in falconry?

Chris: American kestrels get used a lot; red tails get used a lot. And then there is a sustainable level of peregrine take now. Peregrine falcons are doing so well that people are allowed to take them and use them in falconry.

Alie: Wow. That's really shocking. I would have thought that they're like, "Hands off peregrines, literally forever," but they've really rebounded that well.

Chris: Yeah, they're doing great.

Alie: Wow. Is there any species of falcon right now that you are looking at that you're worried about, like, "We better get ahead of this before it gets critical?"

Chris: Yeah, saker falcons.

Alie: What are those?

Chris: They're an old-world species, so they live over in Asia, and there are several power lines in Mongolia where they are getting electrocuted. There's a great team of folks that are actually retrofitting the power lines, putting plastic covers on them basically, to keep the birds from getting electrocuted.

Alie: Wow. Do falcons and other birds of prey learn from previous generations anything to avoid?

Chris: They don't seem to. Especially given the sheer number of birds that were getting electrocuted in Mongolia, they didn't seem to be avoiding the poles that had dead birds under them or anything like that.

Alie: Yeah, I mean it's one of those things where it's, like, you have millions of years to evolve and then you've got about a decade of power lines that you're like, "What?"

I would love to ask– I forgot that I have Patreon questions for you. Can I ask you a couple of questions?

Chris: Yeah.

Alie: Normally, I would lightning round you with a bunch, but this is an interesting, weird episode so we're just, kind of like...

Chris: Just roll, just wing it.

Alie: We're winging it! Hee-hee. On a wing and a prayer. [*ba-dum-TSH!*] Taylor wants to know: Do they mate for life? And do any falcons stray from their partners?

Chris: Yes, and yes actually. So, they will hang out together for life, but they will also cheat on each other. They're called extra-pair copulations, in the bird world.

Alie: And do most of them do that?

Chris: It's a pretty common practice.

Alie: It's just mixing those genes up, that's what it's all about.

Chris: Yeah, it's evolution.

Alie: Kali Holder has a very serious question: Ask about falconer hats for collecting semen! Who makes them? What makes a sexy hat?

Chris: So, I actually met the guy that invented that hat. [*Alie laughs*] He's a falconer, again this is– I wasn't going to bring it up when you asked about falconry techniques, but that's one of them. You heard earlier that the falcons will imprint on their falconers, basically, and see them as a mate. So, this hat was invented to be mated with and collect the semen so that the females could be artificially inseminated.

Aside: Oh, how delighted I am to be able to share with you tales of the very horny bird hat. Okay, so, this copulation hat was invented by Lester Boyd, a man who loved birds but I'm sure not nearly as much as they loved him. So, in the early 1970s, he made a falcon sex hat, and it looks kind of like a rubber bowler hat, or a still rolled-up condom, but the whole surface of it is dimpled with a honeycomb pattern on top.

Male falcons raised in captivity imprint on their human handlers. So, during the nesting season, their handlers court the bird by bowing and mimicking the female falcons' chirp. [*high-pitched,*

quick, regular chirps followed by longer, honking sounds] And the male falcon is *down*, he's down to do it. He's going to flap over, he mounts the hat – which is, again, on top of a human person's head – and then once the bird is done, [*splat*] the lucky falconer collects a couple of drops of semen and takes it to the female falcon for artificial insemination. There's a really great video from a local Sacramento news station KXTV ABC10 where you can watch reporter John Bartell get fucked in the hat by a very excited and flappy peregrine falcon. Oh, I love it. Enjoy. [*"He's ready to do his thing."*]

Alie: So many good questions. Michael Heiker: Best movie with falcons? And hopes that you say, *Ladyhawke*. I've never seen *Ladyhawke*, but any movies with falcons that you like?

Chris: I've never seen *Ladyhawke*, that's going to be on my list now.

Alie: I've never seen it either.

Aside: I'll tell you who has seen it, your old PodMom Jarrett. So, Jarrett loved this movie, he told me, as a kid. It stars Matthew Broderick, as a thief, who escapes this dungeon only to join up with a traveling warrior and his beloved hawk companion, played by Rutger Hauer. And spoiler, but not really because it's on the cover of the movie, the hawk companion is also his lover, played by Michelle Pfeifer, who has been placed under a satanic curse by an evil jealous bishop, which makes her a hawk in the daytime and then makes Rutger Hauer a wolf at night. So, they can never really be together as humans. But anyway, it's very '80s. It's apparently a mess but a delight and I wish they still made movies like that, and so does Jarrett.

Alie: Have you seen the old, old *My Side of the Mountain* movie from the '60s?

Chris: No!

Alie: Oh, I gotta send you a copy of that. If you like the book, there's a lot of falconry in that, a lot of just wild falcons too.

Aside: Here's the deal, I love *My Side of the Mountain* so much that I had brought it up earlier on the tour.

[*clip of Chris and Alie talking*]

Alie: There was this book I read as a kid called My Side of the Mountain.

Chris: Oh yeah!

Alie: Do you know that book? It involves falconry and he, like, gets a falcon and uses it to hunt with. Was that a peregrine falcon?

Chris: I think so.

Alie: Yeah, I think so too.

Chris: So, that book, I think, was written by Jean Craighead George.

Alie: It was, it was.

Chris: And the Craigheads were big falconers and ornithologists and raptor biologists. We should do some research and see if there's some crossover there.

Alie: Oh my god, I will.

Guess what? Turns out there is. Remember Tom Cade? The bronze man who founded The Peregrine Fund. Turns out, he first got interested in falconry at 9 years old after reading a *National Geographic* article titled "Adventures with Birds of Prey." It was written by twin brothers, John and Frank Craighead. Now, while Frank and John did begin training falcons at age 15, these twins are

most known for their research on grizzly bears in the 1960s that saved the bears from extinction in Yellowstone Park. But the writings on falconry that they did also had a significant impact on the popularization of the sport.

Their sister, however, is Jean Craighead George and she holds a *very* special place in my heart because she wrote and illustrated more than 100 books on nature, including *The Summer of the Falcon*, she also wrote *My Side of the Mountain*, in which a fed up nature-loving adolescent just fucks off and lives in the woods and his parents are like, "Well, that's what he likes." I loved that book so much that my dear friend, who you heard from in the Field Trip: WGA episode about the writers' strike, Dr. Teagan Wall, once found a signed copy and gave it to me, and I cried so hard.

So, that author's brother wrote the article that inspired Tom Cade to start The Peregrine Fund, and then the author's nephew, Derek Craighead went on to serve on The Peregrine Fund's Board of Directors for over a decade. So yes, I'd say there's some cross-over here.

Alie: Sara Rocero wants to know: I've heard that American kestrels can see UV light which reflects off rodent urine. Is this specific to falcons or all raptors?

Chris: Thank you so much for asking this. This is actually one of the hills I'm willing to die on.

Alie: [*laughs*] Okay. [*"Let's do this!"*]

Chris: Because actually that study that everyone cites about American kestrels using UV was conducted on Eurasian kestrels, so we don't know about American kestrels. *And* that study was refuted afterward. So, the study that purported to show kestrels using UV was published in *Nature*, which is, like, the biggest journal in the world.

Alie: Yeah, legit!

Chris: So, it got all this press and everything but then the one that refuted it was published in the *Journal of Experimental Biology*, and so it is not as big a journal and it didn't get as much press. So, this idea has really stuck around and it's migrated over to American kestrels, so everyone still thinks that American kestrels hunt using the UV reflectance of vole urine, and really, the evidence is mixed, at best.

Alie: Do you think anyone's going to end up doing a PhD on it just to be like, "I have to figure out if this is flimflam."?

Chris: I hope so. I would love to be involved in that.

Alie: Holler. Dantooine, good name, wants to know: Is the *Millennium Falcon* named after the bird? If so, why?

Chris: Good question. So, I love *Star Wars*. You know who would know this, is my kid? [*Alie laughs*] This feels more like *Star Wars* trivia than falcon trivia.

Alie: [*laughs*] I'm going to have to look into that for us.

Aside: Why was the *Millennium Falcon* named after the bird? Okay. There's no definitive answer out there. But besides the obvious stuff, just like, falcons being the fastest creatures in our galaxy that we know of – I mean, they dive up to 200 miles an hour or over 300 kilometers an hour, which is triple the land speed of a cheetah – but aside from that, there were some other *Star Wars* theories.

Here are my two favorites. One is that the character of Hans Solo was inspired by Humphrey Bogart's noir anti-hero character in the 1941 film, *The Maltese Falcon* and so the name was a nod to that film, that's a pretty good possibility. But I really like the idea that the *Millennium Falcon* may

have drawn some design inspiration from another ship, featured in a mid-70s sci-fi serial called *Space: 1999*. That ship is called *The Eagle*. So, if you ask me, which nobody did, it seems very possible that George Lucas was inspired to name Hans Solo's ship after another bird of prey, like *The Eagle*, plus a reference to the 1999 of *Space: 1999* which is also the closing year of a millennium. Pretty neat, birds and space together at last. [*"It's the ship that made the Kessel Run in less than 12 Parsecs."*]

Alie: Okay, David Clark, first-time question-asker wants to know: Are hawks actually strong enough to carry away an adult chicken? I'm guessing they have chickens. Hawks are not falcons though?

Chris: Correct.

Alie: Okay, can any falcons carry away a chicken?

Chris: Maybe a gyrfalcon. Gyrfalcons are the largest falcons in the world. There is probably a lot of variation among chickens, right? You've got your broilers, you've got your layers, so I would imagine that different ones are heavier but, you know, your average chicken, most falcons probably wouldn't fly very far with.

Alie: Okay.

Aside: So, the gyrfalcon is the largest falcon in the world and about the size of a buzzard. Males can reach up to 61 cm long, females up to 65 cm, which is, like, 2 feet long. They live in the high Arctic and they nest in the far reaches of Canada and Alaska. They prey on other bird species including sage-grouse, ptarmigan, and jaegers, and gulls, and terns, and fulmars, ox, and pheasants, and hawks, and owls, and ravens, and songbirds. But they can also hunt mammals as big as hares. So yes, one could probably carry a chicken.

If you want to hear all about busty broilers and teeny heritage breeds of chicken, get yourself to that recent two-part Chickenology episode next.

Alie: Okay, one more question, Karlie V wants to know: They look pointier than most birds. Are their beaks pointier? What's with their beak shape?

Chris: They're hooked so they do have pointier ends of the beaks, which makes sense because they need to be able to tear apart their prey. And actually, falcons have something called a tomial tooth that helps them break the neck of their prey.

Alie: Where is that tooth?

Chris: It's right on the beak.

Alie: So, it just crunches down on a vertebra?

Chris: It breaks the spine basically and severs the spinal cord.

Alie: Is that how they're doing most of their killing? Neck breaking? It's just quick and easy?

Chris: Yeah, for that genus of bird, yeah.

Aside: So, falcons have what's called a tomial tooth on the front part of their beak and it's a sharp, triangle-shaped ridge on the outer edges of the upper mandible. It kind of reminds me of having a little bottle opener but instead of opening bottles, they use it to break necks with... Casual.

Alie: Biggest flimflam about falcons that you wish you could debunk, if you could get on a soap box and be like, "This is a perception about falcons that is incorrect."

Chris: Well, we already spoke about the UV. Raptors, in particular, this is more pedantic...

Alie: Love it.

Chris: Don't have chicks.

Alie: What?! What? Mic drop. What?

Chris: For the listeners, I just mimed a mic drop. [*Alie laughs*] So, they have fledglings, they have nestlings, but 'chick' refers to a precocial young, so birds out, walking around – I'm doing a hand walking motion now. So, the raptor nestlings are altricial, meaning they're stuck in the nest so they're nestlings. An Earthling is stuck on Earth, you know? Nestling, stuck in the nest.

Alie: When they're altricial they come out, kind of, eyes closed....

Chris: Alien-looking.

Alie: Alien-looking with [*desperate chirps*]. So, how long is it before they can go off on their own?

Chris: Well, let's use the American kestrel, for example. That's easy because it's about a month in the egg, and the mother is incubating, and then they hatch, and then there's about a month of brooding in the nest. And when the birds actually fledge, they are *fully* grown; they are the size of their parents and they're out in the world. They're not as smart, they aren't as good at hunting, but they are about the same weight as their parents.

Alie: Oh my gosh. So, they get them all the way up to that size?

Chris: Yeah. They grow– Think about how long it takes a human to grow from a baby to a grown-up. These American kestrels do it in 30 days.

Alie: Oh my gosh. What's the hardest thing about studying falcons? What's either the most annoying, the most tedious, the hardest, the most challenging?

Chris: Well, there's a lot to it. So, they tend to nest in remote areas and on cliffs, so that makes it hard. Raptor biology in general is just kind of hard because they're predators and they're big so they need lots of space, so they don't cram themselves in very often. So, to get a big sample size or to get enough data for it to actually matter, you have to cover a very large area. So, raptor biology in itself is pretty difficult.

Alie: And is that why there are spatial ecologists working on it too, really understanding the geography of things?

Chris: That's right, yeah, we definitely need spatial ecologists, and geography itself is incredibly important for ecology.

Alie: What about the best thing about your job? Because you've got a tight job. I would have to say you have a pretty cool job. What's the best thing about it?

Chris: Well, it's that it matters. And that's one of the benefits of working at The Peregrine Fund instead of, like, being a professor somewhere. Oftentimes an academic will publish a paper, hope the right person reads it, and that that person can do something about it. I can run an analysis, call Thomas, ask him to release a certain amount of Ridgway's hawks in the Dominican Republic and he can just do it.

Aside: Just real quick context, who is this baller? Who is Thomas he's talking about? Does he have a briefcase full of cash and a burner phone to call bird lords? Not really. He's just a guy named Thomas Hayes, he's the Ridgway's hawks project coordinator for The Peregrine Fund down in the Dominican Republic, which is a small area which is the only place in the world where the Ridgway's hawk exists and is now endangered due to a number of factors including some particularly vicious botfly larvae that sometimes eat the nestlings.

But since 2011, however, Thomas and Christine Hayes, who are a conservationist couple and very adorable, have assisted in not only raising the number of Ridgway's hawks significantly but also getting them spread across more diverse areas, making them less susceptible to going extinct if there were a single catastrophe like a forest fire. Anyway, that's Thomas. And that's just one of the more than 100 species of birds around the world The Peregrine Fund is working to protect and the opportunity to do direct work is something that the ologists here really seem to love.

Chris: So, I have a direct pipeline to on-the-ground management, that's probably the best thing.

Alie: Augh, what a great place. If anyone is ever in Boise, they've got to come here. This was a joy.

Chris: Thanks for coming. This was fun!

Alie: Loved it.

So go out, see what you can see, ask fabulous folks some falcony questions, and big thanks to The Peregrine Fund for having us and to Koda, Monica, Aaron and Jason [ph.] for coming along for the ride. Jarrett bought a lot of bird merch and honestly, his falcon sweatshirt has become a wardrobe staple, I love it. We have merch at OlogiesMerch.com; thank you, Susan Hale, for managing that and running so much at *Ologies* headquarters. Chris and The World Center for Birds of Prey have social media handles linked in the show notes.

We are @Ologies on Twitter and Instagram, I'm @AlieWard on both. The *Ologies* Podcast Facebook Group is adminned by the lovely Erin Talbert. Emily White of The Wordary makes professional transcripts which are up at AlieWard.com/Ologies-Extras, those are linked in the show notes. We have so many other episodes up at Ologies.com. *Smologies* are shorter, kid-friendly episodes up at AlieWard.com/Smologies, those are linked in the show notes and edited by Zeke Rodrigues Thomas. Jarrett Sleeper and Mercedes Maitland also work on those. Kelly R. Dwyer works on the website, Noel Dilworth does our scheduling, Laurel McCall helped research this episode. And this week additional research and producing and some writing was done by the man, the myth, the guy in a raptor sweatshirt, Jarrett Sleeper of Mindjam Media. And lead editor is Mercedes Maitland of Maitland Audio. So, falcon sex hats off to them for making this episode so possible. Nick Thorburn wrote the theme music.

If you stick around until the end of the episode, I tell you a secret. Let me tell you... This week has been bonkers. I needed to call in *so* much help on this episode and it's still coming out a day late because for the last, like, eight days, I've been on the road, I was in Philly. I think I did nine interviews total, and I also visited with your squidly friend, Teuthologist Dr. Sarah McAnulty, and I recorded some Field Trip episodes, I recorded a bunch of sit-down interviews. I also had to go out there for a keynote for this education conference, hello ISTE, you were lovely. So, yesterday morning, I did this speech for 5,000 people, went straight to the airport, landed in LA, and this morning got on a boat to go to Catalina Island, where I'm recording this, I'm an instructor for the USC Science Communication program here at the Wrigley Institute. People, I'm bushed.

But after I get back to LA, I'm going to put a cushy quilt under a tree in a park, I'm going to draw some pictures of bugs in a nature journal, maybe I'll have an ice-blended or a Thai iced tea, and then I'm going to take a nap on the blanket. I'm going to smooch my dog, maybe I'll make Jarrett go to an antique mall or something, and then we're going to work on the next episode. We've got some really, really good ones coming up.

Also, if you have Google Podcasts and you're listening on that, you might not be listening because Google Podcasts has been having an issue with the RSS feed in the last couple weeks and it has not

been updating. So, listen on another app, Google is saying that they should hopefully get it fixed in a week. Anyway, enjoy, go out and have fun. Okay, berbye.

Transcribed by Aveline Malek at TheWordary.com

Links to things we discussed:

The World Center For Birds of Prey in Boise, Idaho

Follow the center on Instagram and Twitter, Chris McLure's Twitter

A donation went to The Peregrine Fund

Rich Stallcup's "Farewell, Skymaster" Open Letter

John Bartell's Falcon Sex Hat Video for ABC 10 Sacramento

Chris McClure's research

Environmental Econ via the EPA

Enviro Econ 101

Crested caracaras

Falcon genomics in the context of conservation, speciation, and human culture

Peregrine falcon

Visual Acuity and the Evolution of Signals

Falcon Visual Acuity

Details That Look Sharp To People May Be Blurry To Their Pets

Rapid diversification of falcons (Aves: Falconidae) due to expansion of open habitats in the Late Miocene

Peregrine Falcon

Peregrine Falcon Migration: A Complete Guide

Restoring Aplomado Falcons to the United States

DDT dumped off Catalina Island

"Beyond the Brink" documentary via the Peregrine Fund

What is "hacking?"

Peregrine Falcon Delisted

Falconry Permitting Guidelines

UAE conservation fund saves thousands of falcons, raptors from electrocution

Infidelity Common Among Birds and Mammals, Experts Say

Copulation hats

The Purpose of Falconry Hoods

Most Female Raptors Are Bigger and Stronger Than Males, but Why?

Remembering Tom Cade, the Father of Peregrine Falcon Conservation

Craighead House

Star Wars' Original Millennium Falcon Design (& Why Lucas Changed It)

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Condor debate

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General Bald Eagle nesting information

The Harpy Eagle

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Golden Eagles, Peregrines, and Harris's Hawks

Visual Imprinting in Birds: Behavior, Models, and Neural Mechanisms

The Mysterious Thomas Hayes (and Christine!)

Other episodes you may enjoy:

Chickenology (HENS & ROOSTERS)

Wildlife Ecology (FIELDWORK)

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FIELD TRIP: How to Change Your Life via the Natural History Museum of Los Angeles

FIELD TRIP: An Airport Full of Neuroscientists

FIELD TRIP: My Butt, a Colonoscopy Ride Along & How-To

FIELD TRIP: A Hollywood Visit to the Writers Guild Strike Line

P-22: The Life & Death of an L.A. Cougar

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