



Janet Sumner: 0:00

Welcome to *The Clear Cut*. Hi, I'm Janet Sumner, Executive Director at Wildlands League.

Kaya Adleman: 0:08

And I'm Kaya Adelman, Carbon Manager at Wildlands League.

Janet Sumner: 0:14

Wildlands League is a Canadian conservation organization working on protecting the natural world.

Kaya Adleman: 0:21

The Clear Cut is bringing to you the much needed conversation on Canadian forest management and how we can better protect one of Canada's most important ecosystems, as our forests are reaching a tipping point. Okay, good morning. Well, it's morning now, but welcome back to another episode of the Clear Cut. Really excited that we're bringing this episode on caribou science with Dr Justina Ray, who is the President and Senior Scientist of Wildlife Conservation Society Canada and, as Janet will tell you, Justina is probably one of the best people that we could be talking to about caribou science.

Janet Sumner: 1:09

Yeah, Justina has been working on caribou for many, many years and is often appointed to federal and provincial committees because of her work and because she's so good at it.

Kaya Adleman: 1:22

Well, in this conversation I had actually a really great deal to learn from both of you guys as someone who is coming into this conversation not really having a huge background on caribou. I don't have a biology background, I don't really haven't taken that many animal



science courses in my educational journey, but it really was interesting to be able to kind of sit and listen to this conversation between you, Janet and Justina, and really kind of take in this wealth of information. And this conversation really left me I would say just to kind of tease it out a little bit with an understanding of why caribou conservation is really important in the context of forestry, why it's important in the context of environment and sustainability issues that we all know and love so much. I'm really excited to be kind of bringing this conversation to the podcast so that other people can kind of share in the experience you know.

Janet Sumner: 2:24

Yeah, it was a really great chance. You'll hear in the podcast. I've known Justina a long time and been an avid fan of all of the work that she does, and so it was a great opportunity to sit down and really dig into some of these issues directly with her. Yeah, and thanks Kaya for setting this all up.

Kaya Adleman: 2:45

Yeah and all right. So without further ado, let's get into the conversation.

Janet Sumner: 2:54

Good afternoon, Welcome everybody. Really happy to have Justina Ray with us on the podcast today. Aren't we Kaya?

Kaya Adleman: 3:01

Yes, we are Very excited to learn all about caribou.

Janet Sumner: 3:05

Yeah, it's going to be a good conversation. So, Justina, we've known each other 20 years or more because you were on my hiring committee. You were on the committee. You were the people who chose to give me the reins to Wildlands League, which, yeah, you



know you might still be second guessing, but anyway you were on that committee that helped me land the job of my lifetime. So I know a lot about you. But I just I wonder if you, for our listeners, could maybe tell us a little bit about you, and maybe why the heck you do what you do, or what motivates you, or something fun about you. Do you like ice skating, for example, or something you know, whatever it is?

Justina Ray: 3:47

Well, I'm thrilled to be here, Janet, and thanks so much for inviting me. Like who am I? So I'm a trained wildlife biologist, and I've wanted to be one since I was six years old, and I don't think I ever deviated from that path, although there was a while there where I wasn't sure you could make any money doing being a wildlife biologist, and it wasn't until I read books about researchers in wild places who studied this animal or that animal that I realized that, yes, you can do this for a living. And so, you know, I was steadfastly in that direction, pretty much from the get-go. I don't remember wanting to do anything else, and so I've done wildlife biology forever, and I'm now the president and senior scientist of [Wildlife Conservation Society Canada](#). I founded this organization together with WCS, the global organization, back in 2004. So this is the 20th anniversary.

Janet Sumner: 4:51

So you were six and you decided you want to look Absolutely.

Justina Ray: 4:56

So I remember it very well because somebody came into our classroom to talk about whales and I was kind of in the back row, but I remember this so vividly and yet I don't remember much of what they said, except I remember being there and what I decided afterwards, and so I was completely concerned about the plight of whales and I just was also obsessed with whales from that point on, but also other critters as well, and that's partly why, if I ever get asked to and this is probably dangerous to say on a podcast but whenever I ever get asked to talk to a classroom, I do everything I can to do that,



because I remember how incredibly motivating that was for me at such a young age. That's amazing, justina.

Janet Sumner: 5:51

So how's your whale research going? Well, interestingly I did my first field project was on whales, really, that's something I didn't know, because Justina's usually got the four-footed creatures that she's looking at. So you did whales Indeed.

Justina Ray: 6:08

And it was back when I was sort of one summer I think I was third year university and I snapped up this opportunity at the Center for Coastal Studies off Cape Cod, Massachusetts, and my headquarters was Provincetown, right at the tip of Cape Cod, and I worked for the Center for Coastal Studies, who was doing lots of field studies on all the great whales in the Stellwagen Bank, which is just an enormous feeding ground for cetaceans in the summer, and they knew each individual of each humpback whale from the pigments on their tails and my job was to go out every day in whale watching boats to determine who we would encounter, take all the notes and then also develop the photographs and do some other things. It was a mostly volunteer project, so I also worked at the local grocery store the whole summer, but it was an extraordinary experience. But I determined afterwards that, even though it was amazing, that I didn't necessarily want to stay with whales because I felt like I might not be able to do anything else, like the most of the whale biologists that I saw were doing only whale biology I mean that was my impression at the time and I felt that I needed more of a kind of a general education and focus, and I was also obsessed with Africa and mammals and carnivores at the same time. So I pursued that route and ended up doing my PhD research in Central Africa, where I lived for three years in the middle of the rainforest there. So those experiences were very formative for me, but I was always focused on one critter or another in terms of my research.

Janet Sumner: 8:01



Wow, that's inspiring.

Kaya Adleman: 8:02

That's so cool. I love whales. Like whales are actually like orca whales, specifically, are my favorite animal.

Janet Sumner: 8:10

Me. I'm a big narwhal fan. That's my mind.

Kaya Adleman: 8:18

Yeah, it's really amazing to hear from Justina and kind of hear more about her background, just because from my perspective, you know, I don't get to meet very many people who, like me, have had a very determined career path from when they were a very young age. I remember wanting to make a career working in environmental issues from as young as 12 years old so I wasn't quite six, but 12 and I've never really deviated from that path either, and I tend to meet people who have more deviated life paths before they end up where they want to be. So it's cool to get a chance to talk to someone who has kind of that similar life experience. But that's all to say. We're now going to hear more about boreal woodland, caribou and about the four footed creatures that Justina studies.

Janet Sumner: 9:13

Okay, so I'm going to switch from the ocean to where I met you, which is talking about caribou, and I'm wondering, because many of our listeners may not be familiar with boreal woodland, caribou, and I'm wondering if you could just take a few minutes to tell us a bit about the creatures and what they look like, what they eat, the habitat needs you know and maybe their importance to Canada.

Justina Ray: 9:41



I'll do that and I'll just say that my pathway to caribou was through studying wolverines, which are very, you know, critters, creatures that are really confined to our north and often quite remote areas. And because I had done my PhD research on carnivores, kind of the weasel raccoon equivalents of Central Africa, I found out when I got here that, particularly Ontario, there were big knowledge gaps with wolverines, and so, in collaboration with the Ontario Ministry of Natural Resources and also the Wolverine Foundation, a number of us got together to devise and get funding for a Wolverine effort, and at that time there was no knowledge, even confirmation necessarily, that wolverines were breeding. There was no understanding among the scientific community and that one of the first things I did was go travel up to northern communities to find out what the elders and trappers knew in about six communities about wolverines, what their relationship was, and that was helpful for kind of devising a study, and so I ended up talking to about 120 people in six communities, and then that led to aerial surveys across northern Ontario, and it was there that I was encountering caribou all the time. These were animals that shared the same geography with wolverines, and just being able to see these animals live naturally in areas where there was not much human influence, at least not industrial. Human influence was a privilege, and that's where I studying these animals at such a broad scale at the same time was where I got into caribou.

Janet Sumner: 11:42

I was just going to remark on something we heard just recently. You mentioned about trappers. We have a colleague that works in forestry but also does some trapping and has remarked to us recently that they've actually been seeing more wolverines in the Northwest. So just I don't know if there's something successful happening there or no.

Justina Ray: 12:03

Well, they're pretty resilient and they did. Their whole distribution really retreated back in the 50s and 60s, but they are probably an expanding population now, certainly indigenous trappers who I've talked to over the years. They didn't used to be in communities like Winnisk, but they are now, and even in close around to Moosonee



Moose Factory, which is 10, 15, 20 years ago that was really almost not happening at all. So they are up there.

Janet Sumner: 12:47

Yeah, okay, so then off to.

Justina Ray: 12:50

Off to caribou.

Janet Sumner: 12:52

Yeah, Santa's little reindeer.

Justina Ray: 12:55

So caribou are a conservation challenge for us in Canada and [they're very emblematic of healthy and intact boreal forests](#). They are also a Northern species, although over 100 years ago their range was further south and into the Northern states, for example, but now they're really confined to the Northern half or one third of boreal forest across Canada. But then also there are other caribou types that live in barren ground and in mountains up in the Arctic and so on. Even though they're the same species, we recognize about 11 kind of ecotypes of caribou that have evolved with different conditions across the expanse that is Canada. Boreal caribou in particular is where I've spent most of my time, and these animals require big, vast expanse of boreal forest. Certainly, fire is the natural disturbance agent that's most dominant, but they do require these large areas in which to move around and also to keep distance from predators. They are vulnerable because, unlike other ungulates like moose and deer, they almost always give birth to only one individual. When they do, it's a tough survival time for them. So if their populations get knocked back, it's more difficult for a caribou than it is for something like a moose or a deer or wolf to rebound in terms of populations, because they're just not that many births.



Kaya Adleman: 14:54

Do caribou only give birth once in their lifetime, or once?

Justina Ray: 14:59

a season. They get pregnant very regularly, but whether or not they give birth and whether or not they survive it's definitely variable. The first six weeks of life is when they're the most vulnerable.

Kaya Adleman: 15:26

Yeah, so just to backtrack when I first started working at Wildlands League, I really didn't understand anything about caribou or why caribou conservation was an important piece to the whole environmental forestry NGO campaign system. So when I came in and started working on carbon and how they overlapped with forestry issues and then everyone was talking about, oh, caribou, caribou are super important. I started to piece together why we see caribou in campaigns so much and I also. I didn't really link them to reindeer before. I always my familiar with ungulates, for the most part, is deer. I've actually also never seen a moose in real life. Yes, I traveled to Newfoundland last summer and everyone was talking about how moose are such a big problem on the highways and I didn't see one the entire time I was there. So in my opinion, this is a joke. By the way, I don't even know if they're real because I've never seen one. I think it's maybe a giant prank that people are playing on me that moose are real and that there's a lot of them in Canada.

Janet Sumner: 17:01

I think you can be grateful you didn't see one on the road because they can be big bees and that would be a sometimes you're on the losing end of that. Yeah, that's a good thing you didn't see.



Kaya Adleman: 17:12

You're doing a lot of problems from what I understand, but anyway, that's all to say. I think this conversation, I think really showcases just how important caribou conservation is in the context of the greater picture of nature conservation, and I think that's kind of where we're headed in the next part of this discussion that we have with Justina.

Janet Sumner: 17:35

Yeah, I just want to say one thing Kaya was hired to help us work on carbon, which is the Borough Forest, is really carbon rich ecosystem and contains and holds a lot of stored carbon. But what is fascinating is that the caribou landscape is the Boreal Forest and it overlaps almost entirely with that deep, rich richness of carbon. So, yeah, so it's good that you're working on carbon and you get to learn more about caribou.

Kaya Adleman: 18:07

Yeah, and I'll also just add that we did. If you're listening to this and you remember, we did touch a little bit on caribou in our conversation about forestry in Ontario with Dave and a little bit of the background of that. So hopefully this conversation will kind of further expand on the importance of caribou conservation.

Janet Sumner: 18:31

So we often, from like from a Wildlands League perspective, have focused on caribou not because of the individual species but more because we're concerned about I mean, we're concerned about both. But really for us, talking and working on caribou has been because we want to ensure we have a healthy, thriving boreal forest. Can you maybe just talk about that, on whether or not it's a? Some have called it an umbrella or a keystone or you know different names I've heard bounced around and maybe you could just give us your sense on that or how you would. I think you said just said it was emblematic of a healthy forest.



Justina Ray: 19:15

Yeah, I'll start with saying that you know caribou. I mean, [canada has a significant responsibility for the world's caribou](#). Even though they're so cold, circumpolar, circumpolar species, they occur in many and all the kind of Arctic and boreal countries. Canada, being the second largest country in the world, has a huge responsibility and it does surprise some people that you know the caribou is on our quarter. Either people haven't noticed or people think it's a moose or something else, but that's a caribou and and and for across Canada. You know they're a huge cultural significance for many indigenous communities, particularly up in barren ground, up in the Arctic and and in other places, and and so they're terrific because their needs are so significant in the sense for having large tracts of boreal forests that is, of older age, they can be a good indicator of old, a older age, healthy boreal forests. So from that standpoint they can be used a bit as a management tool at the same time, because because, if the idea behind that is if, if they are a good indicator, then that means that if we manage them for them, then we'll be able to manage for all other manner of bio-boreal biodiversity. And you can only take that so far. On the one hand, it is very true at the macro level and is useful because we, you know, caribou is a very well-studied animal compared to so much and so many other elements of biodiversity and that haven't received any research attention and that we don't really understand their needs and also because they are so vulnerable. But some folks who have studied the extent to which boreal habitat, caribou habitat, overlaps with you, know other critters like birds and at risk, and you know other smaller plants and so forth that are at risk. It isn't necessarily a perfect overlap at all and, in other words, you know, if you just look at at particular habitat needs of caribou and you, oh and you, it doesn't mean that they're going to take care of every place that and every kind of unique habitat that's occupied by by a particular bird or plant or so on. But that isn't to say that if you manage for caribou habitat, so if you bring, if you leave aside large tracks free from roads and industrial disturbance and whatnot, that that wouldn't be beneficial to these animals that don't have as much attention. And so those, those are two different ways of getting at that notion of them being a good umbrella species, but they are a fantastic ambassador for good and for not so great. You know they've had, they've, they've definitely have contributed to polarization, because they're very challenging to conserve and do industrial development at the same time and in many of the areas where that they occupy.



Janet Sumner: 22:48

I'm gonna ask just a very maybe blunt question on that. Has there ever been any science that suggests caribou and industrial disturbance can like? Can we do forestry, for example, and have caribou coexist with forestry?

Justina Ray: 23:09

What is pretty clear from the science, from science that has been undertaken and where caribou populations have been studied, is that [the more clearing of habitat, the more overall disturbance there is in a range of a population](#), a range occupied by a population, the more at risk those animals are, and when I say risk, I mean they are giving birth to fewer calves that are surviving, or even the females themselves are not surviving to give birth, and that overall that can and does lead to population declines and so. But it doesn't mean that you have to leave areas untouched by any stretch. Caribou are used to living with disturbance. They have lived with fire for the entire time of since, since time immemorial, and, and that's always been, you know, a disturbance that you know they've dodged, weaved around, lived with at a population scale. But when that is introduced on top of industrial disturbance, then it becomes too much at some point and it's very difficult to figure out when. What point is too much. But but certainly, the more disturbance there is, the more risk there is to the population, and, and I think that's not really how we manage caribou for the most part, we don't think about limits. We think about either, you know, mitigating around the the, the disturbance that we've caused, so making it less bad than it would otherwise would be, or in some cases trying to restore habitat, but of course that can take 40, 50 years to restore. So so if you take all that together, the cumulative effect of all of that becomes more and more difficult for caribou to survive in a landscape like that. That's subject to more and more disturbance, and indeed that's what's happening in areas across Canada, across the boreal forest, where, where there's been a significant history of all of that disturbance at once.

Kaya Adleman: 25:38

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Yeah. So my takeaways from this section of the conversation is that one caribou are kind of a cornerstone of conservation initiatives amongst environmental groups because they require these large intact areas of forest to be successful or at the population level. But that doesn't necessarily mean that conserving caribou, while there is some overlap between their habitat requirements and other species, that all species will be successful if just specifically caribou are successful. So it's important to make that distinction. But caribou are kind of a cornerstone in that they do require large areas of untouched land to be successful. The second is that they are sensitive to disturbance, although they they are able to kind of bob and weave, as Justina says, around fire and co-exist with fire at the landscape level. Extra disturbance or cumulative disturbance, which is something that we've talked about on this podcast in our previous episodes, is that continued industrial disturbances to the landscape compounds the impact of, I guess, natural disturbances like fire. So that's all to say Janet does. Does that make caribou as a species high maintenance because they have so many requirements?

Janet Sumner: 27:06

Well, I'd almost reverse it. I think that caribou will survive if they give, if we give them space, if you just leave them alone. Industry needs to stop disturbing their habitat.¹ But we haven't done that. We haven't protected critical habitat for boreal caribou and the disturbance numbers are climbing as industry continues in caribou habitat. It's been more than a decade and we need to address this now. It's not about you know maintenance practices or trying to get in and manage things. It's about actually staying out and giving caribou a chance to thrive and the forest a chance to thrive, because we bring the disturbance numbers down and stop the pressure on caribou.

Kaya Adleman: 27:52

¹ Read more on this in the amended [Boreal Caribou Recovery Strategy \(2020\)](#): *the recovery strategy identifies 65% undisturbed habitat in a range as the disturbance management threshold, which provides a measurable probability (60%) for a local population to be self-sustaining. This threshold is considered a minimum threshold because at 65% undisturbed habitat there remains a significant risk (40%) that local populations will not be self-sustaining.*



That word, maintenance also, I guess is putting in a human focused lens on it. So I think, yeah, you're right to point out that the word is associating with humans interfering with things that maybe they shouldn't be interfering with.

Janet Sumner: 28:09

Yeah, it's as Justina talks about. It's a complex species and the more we allow it to exist and be without disturbance, the better it is.

Kaya Adleman: 28:18

Okay, so I guess, moving on, we actually get to hear some cool information about how caribou monitoring and surveying is actually done on the landscape.

Justina Ray: 28:32

So [surveying and monitoring caribou is incredibly difficult](#) because these animals are dispersed, especially boreal caribou. They're dispersed over enormous areas under trees and the best time to do so is in winter because you can have the benefit of their tracks. But the surveys and monitoring that I've taken part in also requires animals to have been collared first so you can find them. And what the kind of work that I've done across Northern Ontario and it was now you know, ten years ago was after the Ontario government had captured and collared 100 caribou in a number of different populations across the province. I went with a pilot to visit each one of those collared caribou over two years to check out what groups they were in and what was the composition of those groups, like how many calves were standing, and it was in late winter, which is a good sign of kind of what you would call recruitment into the next generation, that if you've got calves which are still small enough to be obvious in a group that we can range in size from anywhere from like five, six to ten individuals to, you know, maybe 25 to 50. But you can, if you can, circle around these groups, you can count the calves and check out what the ratio is of that to females or adults, depending on how well you can see the females, and that gives you some sense of you know collectively, if you visit a number of those groups, it gives you some sense about how recruitment is going like how many

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calves are really making it until the next population, and that gives you a little bit of indication of health. That in itself doesn't give you numbers and you have to do more than that in the province with big airplanes and helicopters and so forth. You know, take surveys, going across transects, counting them, going back, counting them with helicopters. It's an enormously expensive enterprise and operation and it depends on you having some collared calves, because you can't just go out to the landscape and find them willy-nilly, because it's so difficult to do that to make sure that you have enough of a sample size that you'll be able to count and give population estimates for how many caribou there are. This is why not many jurisdictions, including Ontario, do much of this and it's a definite handicap because if you don't know how the populations are faring, then it's difficult to understand whether your management prescriptions are effective or not.

Kaya Adleman: 31:40

So getting and obtaining data about caribou is super easy. Clearly, you know all you have to do is to take a plane, or you have to capture and call 100 caribou, and then you have to go out in a plane and monitor. It's a very easy and simple task to undertake.

Janet Sumner: 31:59

It sounds like a really cool task to undertake, but easy I don't know. It's obvious that Justina has been in some pretty incredible places, like she said, in Africa working on whales and then now and for the last 20 years working on caribou and going out and counting them in the north. Yeah, it's pretty incredible.

Kaya Adleman: 32:28

So my next question in uncovering the caribou story is you know we talked about disturbance a little bit earlier, but what's the relationship between caribou and disturbance and what does that look like? How does it impact the welfare or how caribou are faring on the landscape?



Janet Sumner: 32:48

So, justina, it's over 10 years ago that the federal government asked a group of scientists and people to look at the question of caribou and try to figure out critical habitat, the relationship, how much disturbance, et cetera, and there was some terrific work that was done. I think it was under the Harper government. It certainly was under the Harper government that it got released, but you were part of that group that was looking at that. Can you tell us a little bit about that?

Justina Ray: 33:21

Yeah, it's an interesting [history](#). So the [Species at Risk Act](#) has this thing called critical habitat and it's other acts like the [Endangered Species Act](#), have that as well, and it's legally defined under the Species at Risk Act as habitat required for the survival and recovery of a species that's either threatened or endangered. And what it was like really traditionally made for are rare species that are threatened, that live in discrete patches of habitat, and the idea is that if you know where those places are that are really important for that particular species, then you can just sort of protect that somehow and that will bring certainty to operators like industry and so on, and it's much more. It's really straightforward with rare species, but the more that we have modified habitat, the more habitat destruction there is. Then a lot of the species that are kind of wide ranging, still vulnerable but wide ranging are not served by that notion that if you protect discrete patches then they will be fine. And that's kind of underlying what turned out to be critical habitat science for boreal caribou, and what happened was that the federal government was preparing to release a strategy, a recovery strategy, with no critical habitat identified in it, because it wasn't straightforward. It was like, how are we going to do this? Put a big protected area across the boreal forest? I don't think so. And they were prepared to release that. But then certain organizations caught wind of that and said that's probably not a good idea because there will be consequences to that, namely legal challenges. And so what happened is that they then decided the feds decided not to release it, instead convene a group of scientists that was a mix of government and non-government biologists to put their heads together to determine, to give an recommendation for how critical habitat should be identified for boreal caribou and this was a very long process and to skip over all the details. What really, where we came and

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I was one of these individuals, but where we really landed was that this discrete patch notion would not work, that really you have to identify caribou critical habitat or boreal caribou critical habitat at the range scale, so at the scale at which it matters to the population. So we're talking about 30,000 square kilometer scale or something like that, and instead and I'm sort of describing it at a really high level, instead of trying to figure out how much habitat is enough, to really get at from the other direction as to how much disturbance is too much, because it was kind of clear to people who had studied caribou for quite some time about this vulnerability to disturbance, but it had never been quantified or looked at. So what we did was assemble the data from 25 or so studies that had been done across boreal forest, where caribou had been radio collared but where also sufficient data had been collected on survival and recruitment, so we could tie the habitat needs to the condition of the population, which doesn't happen very often. That's a difficult thing to do, but we were able to do that from these studies, or at least get some idea about that, and build this sort of relationship between habitat condition so how much disturbance is in the area and a population condition, specifically how well calves were being recruited into the next generation, and it was a fairly linear relationship with enormous amount of variability around it, but still a pretty good relationship, describing and confirming what I started out by saying, which is really that the higher the disturbance levels in a range, the more risk to the population, and so that got brought in that notion as critical habitat into the recovery strategy in 2012. And yes, that was during the Harper government.

Janet Sumner: 37:58

And there was a decision made in terms of that percentage.

Justina Ray: 38:01

Right Like I'm, gonna say so because it's a Sorry, yeah, I'm gonna say it's a political decision.

Janet Sumner: 38:07



but what I mean by that sort of a policy decision it wasn't like a big heavy-handed we're gonna run a campaign on this, but rather it was basically we're not gonna choose this because it's absolute science, but because we have to make a choice and we have to have a policy. Is that correct?

Justina Ray: 38:24

Yeah, so what, what? There was already pretty groundbreaking to have a critical habitat identification that talked about it at the range scale that wasn't spatially explicit, right. It didn't say, you know, at latitude, longitude X and Y, this is critical habitat. It talked about population ranges which were identified and then talked about levels of disturbance within those ranges, this sort of notion about how much disturbance is too much, but it but. The problem with a linear relationship is that there is no threshold. Like this, we as scientists could say, yeah, the risk gets worse and worse, but we can't give you a magic number as to you know, things don't just like fall off the cliff at at this point. You know, and in fact we were quite resistant to that notion but in in a kind of a legal situation, you kind of have to be on one side of the line or another. It's sort of like people chose a threshold for amount of alcohol in your blood when you get stopped by by a cop. And yeah, there's a lot of variability around that relationship. And you know, maybe somebody could claim that you know, actually I'm a big person and I could, I could probably, it could probably be more, I could push it more for me, but, but, but in fact that's the except. You know, that is the legal limit and in this case a decision was made, it was a management decision. Really, that's how we'd like to talk about it or a policy decision, and it was based on their notion of. I mean based on the science, in the sense that there is a probability surface and there is a certain probability of caribou being safe at the level of [65% undisturbed](#) sorry, you know undisturbed habitat, but, but, but but. But not a very easy decision to make because of all the variability around it.

Janet Sumner: 40:22

Right. So and correct me if I'm wrong, but my recollection is it's about a 60% probability of persistence, at that 65-35, right.

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Justina Ray: 40:33

Yeah, based based about, about, based on, you know yeah about based on on, on the science that was underlying that, and and and in fact that has been corroborated by other addition of new populations and and studying that, that relationship, and and there's a lot of noise around it, right? I mean, you know, and nobody involved in the science has ever claimed that that that at 65% is is is absolutely where you know it's going to be guaranteed that if disturbance above that is going to cause all the all the caribou to to go extinct in that area, nobody is saying that, but it's just about the risk and getting more and more, getting higher and higher as as you go down that line.

Kaya Adleman: 41:26

Okay, so let me get this straight. The typical approach that you think of around habitat protection is, for example, you have an endangered frog and you would protect their habitat like a pond or something, or you would protect a specific, discrete patch of land for an endangered plant. These approaches don't work for caribou right, because they require these large swaths of intact land.

Janet Sumner: 42:27

That's right and this is my interpretation. What we've done as a society is we didn't start by thinking, okay, what do various species need? What does the boreal ecosystem need to thrive and exist? Instead, we basically built mills and gave forestry companies tenure. We said here you've got these large tracts of land, sometimes as large as 2 or 3 million hectares, up to I think it's the largest, one might be 8 or 9 million hectares and we said go and do your logging on this landscape. And then came back and said okay, well, and we need you to mitigate for this species and we need you to maybe try and minimize this damage. And that's how we thought about it. It's like you have the ability to go out and have various industrial practices, whether it's mineral exploration, mining, forestry, road building, seismic lines, etc. The land is there for you to go and work on it, and then we'll put some rules on how we try to mitigate the damage, maybe even minimize it in some way. But that doesn't work for caribou, and that's what Justina said. She said that. So I just decided they needed to really think about the relationship instead of discrete parcels



of land. Is that there was evidence of a relationship? This 65% undisturbed, giving caribou a probability of persistence, and this is very different than that discrete parcels of land. And this threatens really how we think about industries and their use of the land, because they're using or they've been given license over the same forest as caribou and what caribou need are large landscapes and it's not enough to set aside a little calving lake or maybe some habitat there. Scientists said we need to think at that range level and put some limits on how much you can disturb it. So we're now saying you have to operate on a much smaller lamp base and we'll get into more of this on caribou policy. But the challenge is that once critical habitat is identified under the federal species at risk act, it needs to be protected. Caribou and what they need forces us as a society to think about the landscape on a much bigger scale. Now we can't just think about these little parcels of land. If we want a thriving forest, we must think about the whole landscape and the challenges. Industry has been handed the whole landscape and our society hasn't figured out yet how to do that landscape level conservation. But the good news is scientists have given us that advice on that threshold and now we need to hold fast to it and keep that disturbance below that. In my understanding of that group of scientists, as you said, were government and non-government scientists, but in that non-government some of them were industry, some of them were, like I know one of the industry scientists who was on that committee.

Justina Ray: 45:41

Yeah, and overall there's lots of good scientists in industry and that was a good group because it was mostly government and non-government and mostly academic and provincial government and federal government biologists. But it was a group that worked very well together and had the same goals in mind. So the whole business about which hat you wore, that was off as soon as you walked in the room and it was very clear that way. I mean, I didn't even remember some of those details in that sense.

Janet Sumner: 46:19

Yeah, and so then the disturbance threshold, or where you're trying to get to in terms of disturbance, and that it links to a greater risk, is there any way to sort of test, as you're



going, whether or not what you're doing is working? I.e, can this particular population withstand more disturbance or?

Justina Ray: 46:44

Yeah, and the recovery strategy is designed like that. It's sort of in the fine print it says we're going to say 65%, but if you have other information that suggests that that line, that threshold, so to speak, should be different, and that would have to be from population information. It would have to be from you know, proving that the population is not declining, and of course it's complicated by time lags, but I won't even go into that. But it does suggest that you know, it acknowledges the variability around that relationship and suggest that you know, with more information it can be adjusted. That rarely gets brought up in conversations. Really, it's meant that 65% is meant to be sort of a guidepost, particularly where you don't have good monitoring information. I told you about how expensive it is to monitor and there are several jurisdictions many that do not regularly monitor their caribou. They don't put the resources into that and so in the absence of that information, the prudent thing is to stick to that 65%, because that's our best. So that's where our best information points to.

Janet Sumner: 48:05

Right. So having done some conservation work in Alberta, I know they. I think they do some pretty good monitoring. That would be one of the jurisdictions I would, which for some people might be an odd thing, but they spend quite a bit of money on monitoring and figuring out some of these challenges. Is that correct to say about Alberta?

Justina Ray: 48:26

Yeah, Alberta and Northeastern BC, where there's quite a bit of oil and gas activity industry has definitely provided significant funds over the years for that. Those are also the caribou populations that are in a lot of trouble, where there's a lot of disturbance, and so they're kind of monitoring the decline. But that information is coming out and it's useful for the rest of the country to be aware of. But it's not the only places where at



least caribou populations are monitored or have been surveyed sufficiently where we can understand and maybe calibrate this disturbance recruitment relationship.

Kaya Adleman: 49:19

What I think is interesting is that Justina says that the 65% and the variability around that 65% is not often brought up in conversations, because that seems like a pretty important key thing to consider when talking about, I guess, disturbances to the boreal landscape.

Janet Sumner: 49:38

Yeah, but she also says that it has to be. If you're going to veer from that, you've got to use population data.

Kaya Adleman: 49:46

Yeah, and that's what you were saying earlier, right, that? You always have to refer back to the data when thinking about that number.

Janet Sumner: 49:53

Yeah, and she talks about the time lag too. So you can do a population survey today and not know where the population is trending, because that's the other thing, right. It's like, oh, the population is good in 2017 and our disturbance is at, you know, 33%. I think they could actually take a little bit more. What happens if you're just capturing that snapshot in time and the population is actually trending down and you don't know that because you have to do it multiple years to know what the trend is? And that's, I think, one of the big kickers, because there is that, as she discussed, is that time lag. So do you have to measure it over one year, five years, 10 years before you can make an adjustment? And I think that's you know, with it being so expensive, I haven't seen provincial governments actually testing that. And then, when they do, as she's suggesting in Northeast BC, in Alberta, it's more to watch the decline than it is to actually take the action.



Kaya Adleman: 50:56

Yeah, and what I found also interesting is that there's a lot of funding for monitoring received from the oil and gas industry. So it seems like an I don't know, it's just like oh unlikely source, while the government doesn't seem to be putting that much effort in.

Janet Sumner: 51:14

It's a challenge, for sure. When did we last do the monitoring in Ontario?

Justina Ray: 51:22

The last time was the last. Surveys were in 2012 and 2013. However, there have been some recently. They're starting to ramp up again. There's been two years ago about a conservation agreement signed between the Ontario and the Canada and that has provided and stimulated new surveys, which is very welcome. A couple of them have been done, but the information has not come out. There's more surveys probably being conducted as we speak, because this is the month in February, March, which is the best time to do these surveys. Are they publicly available when they come out? They should be eventually, but it's just a question of when. It does require analysis, but to date, they have not come out.

Janet Sumner: 52:18

So when you get your population data that tells you whether or not your recruitment, that the next population is surviving and you're getting a steady increase or a stabilized population or decreases, and from that then you could argue or discuss what you might want to change in terms of the percentage, or maybe in terms of what your plans are in terms of how you adjust strategies.

Justina Ray: 52:52



Yeah, I think the latter is really the key and if we stick to Ontario, effectiveness monitoring is a key piece of the Crown Forest Sustainability Act, if we're talking about just forestry, and so caribou are a key indicator in the CFSA, and so the results from those caribou surveys should inform the effectiveness. The challenges that there are time lags all the time. Right, these are animals that live long enough that when you actually survey them you're seeing things that happened 10 years ago rather than just right now, sometimes even longer than that. So that's a challenge. The other challenge is that it's not just forestry happening on the landscape, it's other things are going on and there isn't right now much of a process, at least in this province, of kind of thinking about all those agents of disturbance together, and that is what's meant to happen through the critical habitat protection framework that's been devised. That it's really about monitoring and managing cumulative disturbance of all sorts. That and that includes fire, for example, because fire is part of the equation and when you have fire on top of industrial disturbance, then that creates conditions that are difficult for animals like caribou. It doesn't mean that fire by itself and it levels historical levels is bad. No, as I told you before you know you can. You know caribou are used to. They've evolved with that kind of a of a landscape. But it's just about, like so many things, you can have too much of a good thing At some point. That can create risk rather than opportunity. But but collectively, like if you think about it all together, that's where you start to get concerned about the situation, especially when fire is combined with industrial disturbance in the same geography.

Kaya Adleman: 55:08

Janet, can I ask you what that looks like when you're doing, I don't know, maybe like a forestry plan or any other sort of industrial activity plan in the, on the landscape and where? How do caribou come into that equation? In Ontario, like, do you do? People look at the data and then they say, okay, we're not going to go here, here, here, or like, how does that work?

Janet Sumner: 55:38

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Just roughly speaking. Again, if you were to do a caribou plan and try to do it in the right way, you would say, okay, well, the disturbance in my area. And this gets very complicated because a forest management unit may only cover a portion of that range. There may be three forest management units and then you might have mining or you might have a new road for hydro development going through, and so all of that is cumulative disturbance. And yet your forest management plan is the only thing that you're responsible for. Like, you're designing that. And if you were to do it the right way and there's this is where it gets tricky, because the what we should have is that cumulative disturbance package should be there on the table so that you can say, okay, well, the cumulative disturbance in my area today and my forest management plan, by the way, is for the next 20 years. So what does the cumulative disturbance look like over the next 20 years? Does the background cumulative disturbance and what they do is? They look at things like okay, that we're scheduled to keep harvesting, all these three units are going to keep harvesting. That will increase disturbance by X, but maybe some of the places that we've done regeneration are going to come back online. Maybe that regeneration that happened 35 years ago or I think it's 40 years. After 40 years it's considered viable or potentially viable as caribou habitat. That's another question that we can argue about whether it actually becomes caribou habitat or not. But that disturbance then maybe gets added back in as undisturbed because it's now regrown trees. And so you could then say okay, well, where we're trending over the next 20 years is our disturbance in this region is going to be 43%, or maybe it's going to be 28%. Whatever it is, you factor that into your calculations or you should into your calculations and say well, this is how I'm going to manage, how much fiber I can take off the landscape or how much land I'm going to disturb. You can benefit if you stay on your existing footprint, because it's already disturbed, so you're not adding disturbance. But you also have to manage for other species, so you may be restricted in terms of what you could take off from that landscape. And then you look at well, if I open up these new intact areas, I'm actually increasing disturbance, and that's where it increases the risk for caribou. But that's not what we have in Ontario. It's not what we officially do. Forestry is exempted from the Endangered Species Act, as is mineral exploration and unfortunately, caribou don't get factored in right now, and certainly not the cumulative disturbance, because it's not required anywhere. Because all of these massive exemptions, it's all a mitigation model and we've discussed how mitigation, we've gone past the point of



mitigation, we're now into several of these ranges being past that disturbance threshold and under the Species at Risk Act you must protect critical habitat and we're not doing that. So whether you're getting environmental assessment right now, approval for your hydroline, or maybe you're doing early exploration or logging, all of that's exempt and it just all you're required to do is mitigation and it doesn't factor in protection of critical habitat and species can still go extinct under a mitigation model and the environmental assessments aren't working either. We have permitting under the Endangered Species Act. That isn't working. Forestry is obviously not working because they're exempted, and what we have is this mitigation model while we watch extinction happen and maybe study caribou a little bit more, with more money for studies on caribou, but not taking action, not protecting critical habitat, which is what's required under the Species at Risk Act.

Kaya Adleman: 59:56

Not applying a precautionary approach.

Janet Sumner: 59:59

Not at all. So what Justine is saying which is really important is this 65% has some variability about it, but it also relates back to the population condition and the trend of the population. So if you don't know what your population numbers are and we certainly don't in Ontario we haven't looked at them for 10 years and even if we get the new reports out, that'll give us one data point in time, it won't give us the trend. We need to get the trend of how that population is faring Before you can even move or veer from that 65%. So the precautionary approach was to be to do at least 65% of the habitat to be protected. In fact, you might want to go higher. In the absence of population data, you might want like 70 or 73% to be protected because you don't have any certainty over your population trend and that those two things work in combination. They help you understand if what you're doing is actually working that population trend data, and so in the absence of that, we should be taking this precautionary approach and protecting more critical habitat, not continuing to just study and not take action, and



certainly not just govern industrial activities with a mitigation approach. We need to be protecting critical habitat Full stop.

Kaya Adleman: 1:01:26

All right, I'm just going to cut Janet off there real quick from yammering on, and I don't know if you caught that earlier, but Janet refers to the CFSA the Crown Forest Sustainability Act, as a regulation, but it's actually an act. Just so we're clear on that. But don't worry, we're going to end the episode here and we'll be back next week with Justina Ray, president and Senior Scientist at WCS Canada, to go over some of these strategies and other approaches to caribou management in a lot more detail, and there's going to be a lot to learn in that episode, and it's one you're not going to want to miss. So thanks for listening and we'll be back next week.

Janet Sumner: 1:02:13

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Kaya Adleman: 1:02:24

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Janet Sumner: 1:02:45

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Kaya Adleman: 1:02:51

See you next time.

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