

**Name:** David Klein  
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**Interviewer:** Karen Brewster

**Brief Summary of Interview:** In this interview, Mr. Klein is talking about the differences of the caribou herds in Alaska, the decline of the Western Arctic Herd, how caribou differ from the rest of the deer family, mosquito harassment, and when reindeer were brought in.

KAREN BREWSTER: Okay, today is August 21<sup>st</sup>, 2014, and this is Karen Brewster here with Dave Klein. And we're back talking about different aspects of Dave's life. And I think last time we were sort of talking about some of your work and research related to the caribou in the oil fields on the North Slope. And so I thought maybe today we'd start with the other big caribou herd, the Western Arctic Herd. The North Slope one was sort of that Central Arctic Herd.

DAVID KLEIN: No, I think that would be good because the Western Arctic has been our largest herd for many years. And at one point it was the largest one in North America. And it's been declining slightly but not rapidly, recently. And there's been a long history of the state Department of Fish and Game trying to monitor it, which was very difficult because when you have a herd that size and its components are fractured out into different areas, and to do a total population count requires a lot of airplanes. So you have to move all these airplanes, some of them are chartered, some of them might be existing flights from the Park Service airplanes or Fish and Wildlife or something and they work as a group. They have radio collars on some of the animals, so that -- satellite radio collars nowadays, earlier they were just radio collars. That way you can get an idea of where the animals are before you go out and search, but, of course, you have to have good flying weather. And the summertime in the Arctic, that's where they are up in the coastal plain and the foothills on the north side of the Brooks Range, and it's frequently foggy or overcast or sometimes snowing. And the problem is how -- if you're gonna -- it costs mega-bucks to get all the planes and people and observers up there to do the count and they do -- the aggregated animals are photographed so they have one Beaver (airplane) with a special photography in the bottom of the plane. And the pilot can tell when to take pictures as they go over. And they're up high enough so they're not disturbing the animals. And then they can -- if they're not disturbing them, they can differentiate with, usually calves versus adults. If they're too aggregated, they can't do that because -- if the insects are too bad.

KAREN BREWSTER: So I just want to step back a second, for people who don't know, what the general range in area of where the Western Arctic Herd goes.

DAVID KLEIN: Yeah, the Western Arctic Herd calving grounds are mostly in the headwaters of the Colville River and tributaries to the Colville. So they're in rolling hills

mostly with some lowland meadows, but they're not close to the coast when they're calving.

KAREN BREWSTER: But then the herd range goes all the way down to the Kotzebue area and even sometimes past to Nome, also?

DAVID KLEIN: Well, then they -- they -- As it's true of caribou herds, the calving grounds defines the herd. Females return to the same calving grounds. So they may -- In the winter, they can scatter out and they can even mix with other herds in the winter and then return. Now there's a little genetic exchange undoubtedly, because some of the males may decide to stay with another herd, but most studies show that they are genetically distinct. The herds are genetically distinct more or less and with some exchange occurring. And so when winter comes -- or in the fall, they start aggregating and to migrate. The bulls then join up with the cows and calves. The cows are going to come into estrus during migration usually, either just -- usually during migration or immediately after migration that they get into the wintering areas. And they're just sort of moving into these wintering areas and coming -- The Western Arctic Herd, they're coming down through the lower reaches of the -- after they come through the Brooks Range of the Kobuk and Noatak Rivers and then sometimes they go right close to Kotzebue. Sometimes they're inland ten or more miles. And sometimes they're following the coast and a large component is wintering right at the base of the Seward Peninsula. And some of them move out into the Seward Peninsula, and that's where they've had problems in the past with reindeer herders. The caribou make it difficult for reindeer herders to maintain their herds. And sometimes the female reindeer will go off with the caribou

KAREN BREWSTER: Well, that's what happened to the reindeer up on the North Slope. That happened.

DAVID KLEIN: More historically, yeah.

KAREN BREWSTER: Historically, yeah.

DAVID KLIEN: And so then they also will go down as far as the Yukon River, usually. They don't usually cross the river, but sometimes they might depending on how -- The extent of their winter range usually is related to the total population size, so they spread out more and some of them will move over into the headwaters and the drainages of the Koyukuk drainages. So, you know, in the -- in the -- they're down in the Noatak there in the Iñupiat people's area, and if they move through into the Koyukuk then there's the Athabascan people.

KAREN BREWSTER: Right. Well, and it would make sense they'd move into the Koyukuk 'cause that's an easy passage from the upper Kobuk over.

DAVID KLEIN: Right.

KAREN BREWSTER: I mean the Native people used to traverse back and forth through there.

DAVID KLEIN: And generally once they get into a wintering area and the snow is accumulating, they tend to stay in those generalized areas. And on rare occasions, if there's a very late -- if things are, say a late green-up -- late maturing of vegetation in the -- on the north of -- north of the Brooks Range in the summering area, they may stay up there a little too late. And so occasionally a large segment of the herd is sort of caught and they tend to winter up there in areas that are not the best wintering areas. And there have been, occasionally, die-offs. Very localized die-offs during the wintertime. It's mainly the young animals that die and the others might barely survive. And so they could get, say, 10,000 in one area with a very heavy mortality whereas other wintering areas they wouldn't see that.

KAREN BREWSTER: Now say that again, why they might get caught in a bad area is because --

DAVID KLEIN: Because they wait too late and then they get a lot of snow.

KAREN BREWSTER: So the coming of fall is late in that area so they stay?

DAVID KLEIN: That's right.

KAREN BREWSTER: Okay.

DAVID KLEIN: But then the condition of the animals going into the winter is important. And the condition can vary a lot. If a condition is poor, then it's going to be likely high mortality of the calves of the year.

KAREN BREWSTER: You mean their body condition, is that what you mean?

DAVID KLEIN: Yes, body condition. And this is usually related to the degree of insect harassment during the summertime. So the mosquitos are major harassing insects. If they can't get away from the mosquitos, the mosquitos take their blood around their face, mouth, and on the legs where the hair isn't very thick. On the rest of the body not so much, because earlier in the summer they still have their winter pelage and the mosquitos can't get through that. And even the other pelage is enough so that mosquitos are only going to be attacking on these areas. And the way the caribou deal with that is to move to the coast where they go into the breeze that may be coming off the Arctic Ocean. And if there's still sea ice there, it'll be cooler and too cold for the mosquitos when you get close to the coast. But in doing so, the plant growth is delayed there, too, so it's not best grazing area but it's at least a tradeoff where they can get away from the mosquitos. And then when the fog comes in and it cools again, or at night when the temperature goes down. Night is not darkness at that time of the year, but it's cooler when the sun is low on the horizon. And then the animals move back inland, feeding as they go, and the mosquitos go down into the vegetation and become dormant or quiescent until the

temperature gets up again. Warm enough into the sixties, usually. High fifties or sixties, and humidity is high. If it's sunny and seventy degrees, it's too much for the mosquitos. It's too dry. And if there's a breeze blowing, it's nirvana for the caribou. Cool weather is nirvana because they can feed well.

KAREN BREWSTER: This summer must have been good for caribou because it's been so cool up there.

DAVID KLEIN: Definitely. And then the caribou are growing like mad. The calves. The females in the early summer are producing a lot of milk. They have a huge demand for high quality food. Now they're no longer eating a significant amount of lichens. It's green vegetation. New growth, green vegetation, which is very easily digested. It doesn't have a lot of cellulose yet and it's not very fibrous. And it's loaded with digestible carbohydrates as well as proteinaceous materials. All of which they need for a balanced diet for growth and milk production, re-growing antlers, re-growing winter coats, going into the winter, winter pelage. And so the timing of the females physiologically and males are different. Males have started growing their antlers even before the snow has melted and have significant growth, but they don't have to produce young and provide milk for them. Whereas the females have wimpy, small antlers. Those are held to give them some advantage in feeding over other females that don't have antlers. And if a female doesn't have a calf from the previous year and hasn't been in good enough condition to get bred, she sheds her antlers early in January or early February. Whereas if she's pregnant, again she holds her antlers until right about the time of calving, which gives her an advantage in feeding in wintertime because they're in groups and feed in groups for predator avoidance. So that while some are feeding, others are looking. The wolves don't get close enough for an attack. They can move out if some animals are observant. And that works fine, because some of them will stop eating and start ruminating or sit down or lay down and ruminate, but they keep their alert. But the ones that are standing and feeding, some of them are looking around while they're chewing and digesting -- and swallowing what they're eating, and then they go back to feeding. And so some heads are up, some are down. So they keep an eye on things. And that's the advantage of being in a group. But if you're in a group then there's a social hierarchy, because you want to be top of that hierarchy because you have the best feeding locations. If you had to dig a hole through the snow to get to the winter food, which is mainly lichens, there's a certain amount of energy involved in doing that. Once you dig that hole you want to protect it from other caribou that might want to kick you out. If you don't have antlers, you're going to get kicked out more readily. And if you're a young male or a young female, you're going to get kicked out unless you happen to be related to that mom. So the mom will allow her own calf of the previous spring -- it's a pretty good size animal by that time. They'll allow that animal to feed in the crater along with them, so they'll put their heads right down together in the feeding crater. But any other animal gets kicked out if they come in. If they can. So being top of the social hierarchy gives you an advantage in feeding more selectively and high quality food in the group.

KAREN BREWSTER: Now it's interesting that both male and female caribou have antlers. But there are other animals where only the males have antlers.

DAVID KLEIN: All of the members of the deer family, the only one species that has antlers on both sexes are the moose. I mean, are the caribou, not the moose.

KAREN BREWSTER: 'Cause moose, only the males have the antlers, right?

DAVID KLEIN: Moose and deer and elk. That's true.

KAREN BREWSTER: So why is it that the caribou are different?

DAVID KLEIN: It's because of their social dynamics of the caribou. That they're very social. They live in open country where they can see one another and they can also see predators approaching. Whereas, if you're in forested or brushy habitat, or even mountain habitat, it's a different situation. So there's a proportion of females in most caribou herds that may not have antlers. The Western Arctic Herd, for example, there might be one in a hundred. But in woodland caribou there's a much higher percentage. It might be fifteen or twenty percent where there's less opportunity to be in large groups, because if you're in a wooded habitat you can't maintain contact with one another. And you're not competing with one another if you're in smaller groups. So there's less need for having antlers on females.

KAREN BREWSTER: Oh, okay, interesting. So I wanted to talk about the Western Arctic Herd in terms of its changes in population size and management issues. I don't know what year, but there were -- you can tell me what year, perhaps. There was big crash and there was quite a controversy over what was going on. Is that familiar to you?

DAVID KLEIN: Well, yeah, there was a -- The population of the Western Arctic Herd has fluctuated widely over several decades and so it -- And we know historically it fluctuated widely. And there were varying causes for the fluctuation. And sometimes it was overharvest and some of the earliest recorded overharvest was related to the increased dependence of the coastal Native people, the Iñupiat people, on the Seward Peninsula all the way up into the North Slope, because of the whaling. And the whalers had overharvested the walrus, as well as whales. But the Native people that lived on the coast were becoming more dependent upon caribou and so caribou were being overharvested. The whalers on the north coast they actually hired the Native people to hunt for them to provide meat when they over-wintered up there. And so the Natives, some of them moved from these areas where there was not enough marine mammals and not enough caribou. They moved with their dog teams and moved up onto the north coast and started living there where they could make money by hunting for the whalers. And also the whalers wanted the Native women to make winter clothing for them out of caribou skins and seal skins. But mainly the caribou skins, because they made good clothing that was warm. And they paid good money for having the women to do this work.

KAREN BREWSTER: So what you're saying is that because the people moved sort of into -- I was gonna say, prior to this the Iñupiat population was sort of more spread out

over the country side and now they moved into larger communities and therefore that consolidated where people were hunting instead of being spread out?

DAVID KLEIN: No, there was -- the initial contact with the Europeans caused real decline in the Native people because of disease.

KAREN BREWSTER: Right.

DAVID KLEIN: And smallpox was one of the worst, but other diseases as well. But in addition then, the westerners, some of them were explorers, some were miners. And then the whalers, of course, were trading along the coast and also harvesting marine mammals. So there was the competition from these other people, but the disease factor was a major factor. And it reduced populations so drastically that they could no longer hunt effectively with teams out in the sea. But there wasn't things to harvest, too. And so they started moving inland, and then you don't hunt in big groups, you hunt in smaller groups. And so there was massive starvation and it was hard --sometimes it was primarily disease -- disease and starvation, and over use of resources by Europeans coming into the country. But some of them found that they could make a living by moving. Those would be family groups. Two or three family groups moving together up into the -- and word spread, of course, and so then they came back and other families moved up if they were still there where they could make a living by selling meat to the whalers that over-wintered and making clothing for them. But it was a combination of factors, because the Native people living on the coast were also dependent on -- more dependent upon these things because the marine resources up there were being over-exploited.

KAREN BREWSTER: Right. So yeah, I mean, if you're used to -- you had walrus, you had whale, you had seal, you had fish, you had caribou, and now you only have fish and caribou, you're going to get more caribou than you used to?

DAVID KLEIN: Yeah, that's true. You're going to try to get it. But you're going to maybe change your lifestyle. Like the interior -- we know that interior Iñupiat people that were living at Anaktuvuk Pass seasonally and then wintertime they would maybe move to other areas or vice versa. But they had contacts and relatives on the coast, so if the caribou populations went down, which they were doing, a lot of them stopped hunting caribou or living solely off caribou. They moved to the coast where they had relatives, and they made a living up there one way or another. And then gradually they would still be hunting caribou if they were accessible. And they wouldn't move back until the caribou recovered.

KAREN BREWSTER: Well, I was just also thinking, too, that, you know, the Nunamiut are a good example. They used to be spread out all over the Brooks Range. And some would be in the Killik Valley, some might be in the Anaktuvuk Valley, some might be over on the Kobuk. And so they'd be hunting in different places. And then when they all sort of came together in Anaktuvuk, now all those people are hunting from the same pool of animals.

DAVID KLEIN: More or less, except that the -- in Anaktuvuk, as well as the Kobuk and other areas, the main hunting locations were along migration routes. They weren't wintering in large numbers right around these places. They came through during migrations in spring and fall. And then they could go out and opportunistically kill animals as they were -- during migration. And that worked out pretty well, because in those days in the wintertime you could stockpile meat. The summer you can't very well. You have to dry it if conditions are suitable, but it's not usually. They can't do as much storing of meat. So you've got to be more mobile. But, of course, you can't be mobile -- too mobile in the summer, because you don't have dog teams and you're traveling with a family.

KAREN BREWSTER: That's a lot of walking.

DAVID KLEIN: It's not possible. And so you're dependent more on other things like mountain sheep and fish in lakes. And so you settle down and live in tents. And you're very dependent upon fresh water fish in lakes.

KAREN BREWSTER: So this historic decline in the Western Arctic Herd because of this shift with the whalers and feeding the stranded whalers and all that, so that's one decline. And then the population rebounded? The population went back up after that at some point?

DAVID KLEIN: No, then that -- I should -- There's one more factor that -- complicating factor was the Native people themselves like to harvest calves, caribou, for the children's clothing because it was softer and easier on the children. Well, a little of that is okay, but if you're already harvesting heavily on those herds close to the -- components of the herd close to the coast where they could be hunted. They would -- Not only were they selling skins, or clothing, to the whalers, they were deliberately harvesting a lot more fawns, so that they could -- or calves, so that they could have the skins for their clothing for their people. And so they were productive in terms of their own families. They needed this clothing, but they put more pressure on by harvesting the calves because then recruitment was much lower. Now they may have been keeping wolves from killing caribou, but there weren't many wolves when the caribou started declining because they're dependent on the caribou. And if these people were deliberately hunting calves, it all worked against their interest. About this time, this was late 1800's, the people were starving down on the Seward Peninsula from caribou no longer migrating down there when the herds were declining markedly. And they were being overharvested on the North Slope. The numbers of caribou had dropped substantially. And so then reindeer were brought over from Siberia. And that was Sheldon Jackson.

KAREN BREWSTER: Yeah.

DAVID KLEIN: Who -- you've got the information on that. He was a commissioner for education under the territorial government, but he was also a missionary. And so he brought reindeer over to the Seward Peninsula and to Nunivak Island. And that began the period when all of the reindeer were belonging to the government. And the plan was to

train the Native people to herd them and they also brought reindeer herders from Scandinavia, the Sami people. Some of them were hired or contracted to come over and help to teach the local people how to herd properly and manage the herds. And in exchange the Sami people could get ownership of some animals and intermarry. They did intermarry with the Native people and they became owners of some of the reindeer. Well, then the numbers of reindeer -- it seemed like, at the time, people including the Europeans who were miners and prospectors and what on the land, they thought this is good. Let's just replace the caribou with reindeer. And so they -- gradually the reindeer were spread out and new herds were started along the coast all the way up to Barrow. And further east, in fact, than Barrow. Almost all the way over to the Canadian border, but not quite. And then they were brought into the Interior. They were down around Cantwell in the Reindeer Hills there. And the Alaska Peninsula and the Yukon-Kuskokwim Delta.

KAREN BREWSTER: I didn't realize that reindeer were in all those places.

DAVID KLEIN: Yeah. And about that time, the miners who had made a lot of money in mining, gold mining on the Seward Peninsula out of Nome, the Lomen brothers, they got the idea of buying up the reindeer and starting a commercial business selling reindeer meat. Buying -- They had actually purchased -- It got to the point where they had purchased some refrigeration ships to pick up the -- they'd do the slaughtering on the Seward Peninsula and Nunavik and places like that, and then bring the reindeer down to the west coast where they would be sold primarily to the railroads for use on the Pullman cars going across the country.

KAREN BREWSTER: Oh, I didn't know that.

DAVID KLEIN: And then the -- It looked like a good venture, except that the Lomen brothers' argument was that the Native people were -- they were hiring the Native people to take care of the herds, but they didn't have trained people to do this. And the herds were increasing rapidly, because they had enough people out in the areas, trappers at that time, fur prices were high, they were killing off wolves and other predators. And so they -- while the people were harvesting the animals, they were not controlling the populations. It was the food resources that would ultimately control the numbers of animals. And if you had so many animals out there, there was no way the caribou would recover because there was so much competition from the reindeer. And the reindeer herds were established up all the way up around Barrow and those areas. And for a while it looked like it was a good deal and people weren't starving any longer, and so there was a lot of reindeer. But at the same time, the Iñupiat people were not into living that lifestyle of herding reindeer. They were focused on the sea and marine mammals. And in the area of south of Bering Strait on salmon. And some a little bit beyond. But mostly, they were dependent on the sea for resources. And so seasonality of the hunting was important and they didn't want to spend their time with the reindeer. And they didn't have -- And it was all done in the summertime by walking, because they didn't have helicopters or 4-wheelers. And in the wintertime they hadn't developed reindeer as traction animals.

KAREN BREWSTER: They did it a little bit.

DAVID KLEIN: A little bit. But the Sami people taught them, but it never really caught on.

KAREN BREWSTER: Right. They did have dog teams.

DAVID KLEIN: Partly, because they had -- You had to tend these animals. And these people didn't want to have to give up hunting when the marine mammals -- they could go out on the sea ice and hunt marine mammals. And so it didn't work.

KAREN BREWSTER: Yeah. No, but, I mean, their cultural tradition is a history of being marine-based hunters and moving around and all of a sudden to become sedimentary agriculturalists with a herd is just not what they were about.

DAVID KLEIN: Well, this was just before the Great Depression that this all came to a head. And what happened is that Sheldon Jackson and a lot of the missionaries were saying -- arguing for the Natives, that, well, these reindeer were brought over for the Native people and now the whites, the Lomen brothers primarily that had bought up all these animals, they were -- it was like taking this resource away from the Native people. You know, some of them were hired but not -- they were no longer their animals. And so the Congress debated this question. And the beef industry in the Lower 48 got panicky, because they saw reindeer as being a big competitor for selling beef to the railroads. And so they were able to get legislation. And they bought out the Lomen brothers. Bought out their interests, at least a portion of it, but they made it illegal for non-Natives to actually own the reindeer. So the reindeer then became -- the government became ward for the -- they became ward for the government. So the government suddenly had all these reindeer and they had to hire herders, but most of the herders were the same problem. They didn't -- A lot of the reindeer were just abandoned. And then when this happened, wolves increased. And there was probably a lot of overgrazing and decline of the herds from overgrazing. So at the peak population it was estimated there were 600,000 reindeer in Alaska. And then after the massive decline, some herds in the Interior just totally disappeared. And then the populations dropped down to about 40,000. And they were mostly left on the Seward Peninsula and some on Nunivak Island and a few on the Alaska Peninsula. Some of them were allowed to go feral in some places like Nunivak where there had been no caribou before. They were allowed to go feral, but the Natives still owned them and they could round some up periodically and harvest. But it was an island and there were no wolves there so they could sort of have round-ups periodically and slaughter them, as needed. And even market the meat. So it was this major transition occurred. And once that did occur, then the caribou started increasing again, but there was a lag of decades of where there was recovery of the range and the lichens and then the caribou started --

KAREN BREWSTER: So because there had been so many reindeer, the caribou declined and then once the reindeer kind of were abandoned the caribou were able to come back? Is that what you just said?

DAVID KLEIN: Yeah, it was complicated, because during the reindeer decline the wolf populations built up. Coyotes spread widely, too, and became an important predator even though wolves might have been. Even on the Seward Peninsula. So there were government efforts to go out and poison predators, mainly the wolves and coyotes. And no one knows whether there may have been other factors like disease, like brucellosis, may have been a factor in the declines in some areas. So then --

KAREN BREWSTER: But I guess -- I'm a little confused. So we're talking about the reindeer and they were in herds and they were overgrazing and they were out-competing the caribou, so the caribou started to decline?

DAVID KLIEN: No, the caribou had been shot out. The last of the caribou had pretty much been shot out. Once you had reindeer herders out there, then they could shoot any caribou that came and eat them themselves and take the skins. And they didn't like caribou because they were bigger animals and the bulls would -- they would out-compete the reindeer bulls. And if they bred the reindeer cows -- The cows, when the caribou migrated back north, some of these cows would go with them and they would have their calves earlier because they normally do. At least two weeks earlier. And it was a disaster for the calves to be born during migration, because they had swelling streams and as melting was occurring. And the cows would be straggling along and vulnerable to predation by wolves.

KAREN BREWSTER: So the caribou population was going down because of all this impact from reindeer herding?

DAVID KLEIN: Reindeer herding and hunting with the --

KAREN BREWSTER: Well, the reindeer herders as the hunters.

DAVID KLEIN: Well, but even before that it was overhunting was a factor and that would continue with the --

KAREN BREWSTER: Right. Because the way it was -- Yes, there was overhunting, so the caribou were in decline, then reindeer came and that added to the decline?

DAVID KLEIN: Yeah.

KAREN BREWSTER: And now with the --

DAVID KLEIN: It added because of competition for forage by the reindeer, but also the herders. Once the population of caribou were low, they would get harvested because they didn't like the caribou because they made it hard to manage the reindeer.

KAREN BREWSTER: Right, right. So now we have reindeer herding kind of dissipating and dwindling out, and those reindeer herds mixing with the wild caribou now at this point?

DAVID KLEIN: No. There used to be back in the '60's, there was still a government herd near Kotzebue. And they were -- all over the Seward Peninsula there were areas leased to reindeer herders and they were usually families, Iñupiat families, that had adapted enough to be reindeer herders. This was very complex culturally because in a village -- one village would only usually have one reindeer herd and that belonged to one family. And so they hired -- during round ups, they would hire the locals, pay them with carcasses of the animals they killed. Whereas these people that didn't own them, they would have been much happier killing caribou. So when the caribou started moving down onto that area as the Western Arctic Herd increased, onto the base of the Seward Peninsula, the villagers, the majority were happy except for the reindeer herding family. And so they had to try to spend more time with their reindeer to keep them from mixing with the caribou. And it was very controversial, too, because they thought that they were there first, and, of course, they weren't there first, the caribou were there first. And then the caribou were shot out and died out. And then the reindeer were put in and then the caribou were coming back.

KAREN BREWSTER: So why was it right there that the caribou started coming back after the reindeer herding sort of was starting?

DAVID KLEIN: Because they had disappeared except -- the reindeer had been eliminated except on the Seward Peninsula.

KAREN BREWSTER: So the reindeer being eliminated gave the caribou the opportunity to start increasing and having better forage?

DAVID KLEIN: Well, yes and no. Except that the breeding grounds for the Western Arctic Herd was north of the Brooks Range. When it was small, it didn't migrate very far. And then as it got bigger it started migrating further and further and spreading out. And finally, it wasn't until the '70's that it started moving onto the -- some of them would start moving onto the Seward Peninsula. And then they were interacting with the reindeer to the disadvantage. And they would only stay there during the wintering period and then they'd move out and go back up to the common breeding grounds along with all the others that went -- some of them went over into the Koyukuk drainage for winter. And they would all eventually be back on the calving grounds again at calving time.

KAREN BREWSTER: But if the calving grounds are up on the Colville River drainage area, and you still said that they were in decline. The overall herd numbers, there was period where they were in decline even though their calving grounds -- ?

DAVID KLEIN: But they were. When they were in decline, they weren't migrating down around Kotzebue and those areas.

KAREN BREWSTER: But they were still -- Yeah, so the herd was more localized up on the North Slope?

DAVID KLEIN: Right.

KAREN BREWSTER: Okay. So then what led to it to be able to get bigger again?

DAVID KLEIN: The fact that the reindeer died out.

KAREN BREWSTER: Okay, so they were able to start migrating farther?

DAVID KLEIN: Yeah. And the people were -- In those days when they were using dog teams and trapping and what, they were controlling wolves more as predators. So that was a factor, to keep the wolves down as much as possible.

KAREN BREWSTER: So that was when there was a wolf bounty, you think was a factor?

DAVID KLEIN: Well, it could have been. But yeah, there's so many other factors that could be involved. And we don't have good data on how the numbers of bears changed, because bears were a major predator on calves. We don't have good information on eagles there in the foothills area close to the mountain. They're an important predator on newborn calves.

KAREN BREWSTER: So this time period that we're now talking, where now the caribou in the Western Arctic Herd were slowly starting to increase, is that the '40's we're talking about? '50's? Because you said the Depression is when the reindeer herds were around.

DAVID KLEIN: The '40's we don't know too much because most of the men were going into the military during the Second World War. And so they -- We don't have good data on what was going on and there weren't any biologists out there counting them. And it wasn't until the late '40's that federal government, it was still a territory, the federal government Fish and Wildlife Service, they started using aircraft to count animals and see what was going on. Well, before that time there were just -- those remote areas where Native people were involved were ignored. And the rules and regulations during territorial days were determined through a Board of Game. It was called a Board of Game; Alaska Board of Game. And it was made up of, I think, about five senior men who were hunters, and trappers, and fishermen, etc. That meant there was one from Seward Peninsula, who was a fur buyer. One from Fairbanks, who was a lawyer, I think. No, a doctor. And one from Kenai Peninsula, who was an outfitter, guide outfitter, had been a long-time guide outfitter. One from southeast Alaska, who had been a commercial fisherman and a hunter and fisherman. And these guys set the seasons and bag limits under rules and regulations that the state legislature had established, but that -- Not the state legislature, but territorial legislature had established. And that was all under the federal government then that managed it during the territorial days. So the Fish and

Wildlife Service started getting biologists, predator and rodent control people, who were out killing wolves, and coyotes, and bears or whatever they could do. And for whatever purpose, depending upon the part of the state. But there was a lot of that going on the Seward Peninsula and related to reindeer herds. They did a lot of wolf and coyote control out there, some bear control. The Alaska Peninsula, they did some fox control because of reindeer calves had -- are vulnerable right after they're born, even to foxes killing them because they can't move around for a day or so after they're born.

KAREN BREWSTER: So this increase in the Western Herd was in the '50's then?

DAVID KLEIN: Yeah, it was increasing in the '50's. And I was a student starting a master's degree in '51 to '53. I remember doing -- asked if I could be an observer on a flight by Clarence Rhode, who was a pilot and they had a twin-engine plane. And we flew -- I think it was a Grumman Goose. And we flew to find out -- get a general idea how many animals in the Western Arctic Herd and where they were located. That was before they were putting radio collars on. This was in late winter and we located a big aggregation that must have been -- well, they seemed big to me. In one area, there were like -- it was winter, so they weren't aggregated because of -- they were aggregated because they were starting to go up toward the calving grounds. And so there were about 10,000 in this one herd. I even had a black and white photo I took from the plane. It came out pretty well. It showed these caribou there. And then I went up again with a Cessna. And one of the pilots that was one of my mentors, Bob Scott. Again, he wanted me go along because he was asked to do another survey flight to find out where the caribou were. And that one was -- We flew up to Bettles, and then -- I think we flew to Bettles. And then flew up and went west. And we didn't locate such large numbers. And then we came back. On the way back, we stopped at Anaktuvuk, which was just tents.

KAREN BREWSTER: Right.

DAVID KLEIN: And we were on skis and so we landed in -- it was mainly curiosity on his part. And we thought we'd stop and take a pee break. Well, it turned out that the people saw this plane landing and they came. Started coming. And there was no bushes around, so we just had to hold it for a while. And they came up and they wanted -- planes were so unusual that -- I think Wien (Airlines) was flying up there with a Cessna and he had worked out an arrangement and so they could order things through Sears Roebuck and stuff, and have them delivered there. And so they had localized there at Anaktuvuk Pass, because most of the time in the late winter, they moved over to a lake where they'd fish, or fish in the summer, too.

KAREN BREWSTER: Well, they also started coming there because of the need to go to a school and there was a trading post.

DAVID KLEIN: Well, there were no schools for quite a while at that place.

KAREN BREWSTER: No, but eventually that's what --

DAVID KLEIN: Eventually that was the case.

KAREN BREWSTER: So that was in the early '50's then that you were up there?

DAVID KLEIN: That's right. Yeah.

KAREN BREWSTER: And so now the Arctic Herd is increasing from the '50's on?

DAVID KLEIN: No, it increased to a peak, and I'm not sure of these dates, but I think it was around the mid-60's that it got up. By that time one of the students that did a master's here with the caribou, he continued to work for the Fish and Wildlife Service and he was working on a -- that was his master's thesis. He was focusing on the total populations of caribou in northern Alaska, mainly. And his studies showed that the herd was -- it was up around -- and was working with the Fish and Wildlife Service. And they were doing some aggregating planes and doing surveys. And so it was still very rough, but it was getting closer because up there in that country it's wide open and you can see the animals better than down in herds that are in the Alaska Range, for example. So at any rate, I think they came up with about 250 to 280,000. And that was considered the peak population. And then at that time he went up there and he made observations showing that there was a moderate proportion of animals infected with brucellosis and had swollen joints. Or females were aborting calves as a result of brucellosis. So there was a big debate as to where that brucellosis came from. Was it the reindeer?

KAREN BREWSTER: Because it is not endemic to the population?

DAVID KLEIN: Well, that was the question. A lot of people said no, it had to be the reindeer, because we never noticed this before. But, of course, no one ever looked closely before. And there's never been close enough interaction with Native people to ask whether they had seen these kinds of things. Because they see things, but do they keep a record of how many and what time it was? No. So at any rate, the herd started to decline. And then in the '60's, we had students working up there doing some studies on energetics. And one of the students was also trying to estimate Native use of the caribou. And we were in a position to see that there was a lot of wasteful killing, because when the herd peaked the -- this was after statehood. So the new Department of Fish and Game, they had biologists that were starting to work on those areas occasionally, but there wasn't a lot of focus there. But their attitude was to the Natives, well, they're not going to have a significant effect. The herd is so big and there aren't that many people that were dependent upon them, and the marine resources were in pretty good shape, etc., etc. And they didn't have snow machines. They had dog teams. And so if you weren't close to your village, it still was costly to go a long distance with dog teams, you waited until they got close and then you went out with your dog teams and harvested. So we were actually able to observe some of the overkilling. And that was after -- that was at the early '70's, late '60's, early '70's. After oil was discovered at Prudhoe Bay. And some of these Native young guys were making money by going and working up there in the oil field. And coming back and then some of them were buying snow machines for the first time, and snow machines were being developed that were reliable. And so they come back into

the village and they hadn't been trained in the traditional way of hunting with dog teams. And so they were still though living in the culture that people hunted for the whole village, not just for one family. So these young Natives could buy good rifles and snow machines. Not everybody. But in the village just two or three had snow machines and toboggans. They could go out there, two or three guys at a time, and kill a lot of caribou if there were a lot of them were wintering there. And that's what was happening. The herd had already declined markedly and probably declined because the herd was overgrazing the winter range. Partly because there had been a lot of forest fires that had burned in that northern boreal forest, which was where a lot of lichens were that was primarily wintering habitat. So the total amount of wintering habitat declined and that was probably what caused the decline of the caribou. And put pressure on them, and that accounted for the increased brucellosis, as one factor. But there are other factors, too. And that includes [57:47] [indirect harassment?] and the parasitic flies. Which when the herd gets big, they become more of a problem. And if body condition goes down, the calves become more vulnerable. And the adults being parasitized by the parasitic flies. The botflies. Both nose bots and warble flies.

KAREN BREWSTER: I just assumed those flies were always there and were standard. I didn't realize that they were more or less a problem based on other things going on with the population.

DAVID KLEIN: Well, one of them is the more dense the animals are, the more flies are going to survive. The flies are only free-living for a short period of time. And when the larvae that are carried through the winter and they make holes in the skin of the back, they drop out and pupate. And they become little black pupa, which look very much like caribou droppings. So that that's probably an adaptation of the flies so that birds don't pick them up and eat them because they look so much like caribou droppings. They have to lay out there where the sun can reach them, because they're dependent upon heat. So the back is good because they're absorbing the heat. And it takes them about eight to ten days, I think, to pupate into the adult flies. And then the males and females have to locate one another. And there's been a little work on that. And the males usually hang out around -- if they're out in a coastal plain area where there's any small rock outcropping or something where this creates an area out of the wind. And these things doing this mainly by smell. The males will hang out there and then when the females fly by they smell them and go after them. And they mate in the air. And then the males have done their thing. But then the females have to then find the caribou to reinsert the eggs in their hair. And in order to do that, they have to have suitable weather conditions. If it's too cold, flies can't fly. Although, they can fly in cooler weather than mosquitos. But they can't fly in high winds, and they can't fly if it snows or if it's really cold. They go down and hunker in the grass like mosquitos and then come up again. And then they have to find the caribou because they're -- the caribou aren't where they dropped the larvae. They're out in the calving grounds and post-calving areas. So they have to find them. And they can probably track them by smell on where caribou have been. And their droppings, they can follow them because they find them. And then they harass the caribou in a different way, in that they present them -- it's later in the summer because they don't -- the mosquitos come out around late -- the end of June in the Arctic. And

then they last through -- usually by late July they're declining and that's when the warble flies are just starting to fly and look for the caribou. And so they -- the caribou sometimes don't aggregate to get rid of the flies, they scatter out. And the flies are going to be affecting usually the bulls and the young yearling animals more than they will the cows. Now there's two reasons for that. One is the cows may take action to move out of areas and they're together in groups so the number of caribou per fly is less when they're in big groups. Whereas, if the flies find a small group, they can usually stick with them and parasitize them. But also it appears from some studies with these flies and other parasitic flies in other parts of the world that once the eggs hatch, the larvae are just almost microscopic. They migrate down around the base of the hair where the eggs are laid. They migrate and burrow into the skin and they go into the circulatory system for a period of time, which is only fairly short like ten days or so. And eventually they're working their way out into the tissues. And then they migrate out when they get to be rice size in under the back of the skin. And then they punch a hole, because they have to breathe then from then on. So they punch a hole and stick their hind end out where they breathe. And then they feed off the fluids from the caribou and they grow there. So they may be bitten up in the legs, but they migrate up and they usually come out at the central part of the back. And that's probably because that can't be reached by the caribou with their hooves to brush them off or something. At any rate, then the -- Oh yeah, during that migrating period in the tissues of the body, these larvae when they're microscopic, that's when, apparently if an animal is in good physical condition, it can reject some of those, so that they don't actually develop. And they've developed now techniques that they use with the reindeer. It's called *Ivermectin*, which they can inject with the animals in the early winter, about the time that they might be potentially affected. And it prevents the larvae from developing. And so it's for reindeer herding in Scandinavia and Russia now, too. And in Canada and the U.S. With this reindeer, they do the roundup usually and give them this *Ivermectin*. They put a lot better body weight when they don't have these parasites. It takes care of other internal parasites, too.

KAREN BREWSTER: Can I interrupt for a second?

DAVID KLEIN: Sure.

KAREN BREWSTER: Which is do you have handy a pen accessible from where you're sitting?

DAVID KLEIN: Let me check and see whether it works.

KAREN BREWSTER: Because mine has run out.

DAVID KLEIN: This one seems to work.

KAREN BREWSTER: Thank you.

So all this talk about all the flies and the parasites gets back to that that affects the animal's body condition. And if the herd gets too big, there's lots more flies but then negatively impacts the body condition and starts leading to a decline again?

DAVID KLEIN: But you got to -- these things all have to be factored in to other variables. So there might be a bad summer when it's hot and humid and there's no relief from insects. So the body condition of all animals coming out of that, because -- especially the mosquitos early on, all of the animals can't feed when they're being harassed. So if they got to go to the coast or go up onto a ridgetop where there's a little breeze, and there often isn't any up there, and they aggregate and this reduces the number of mosquitos per caribou. But they stand together touching one another almost, they can't feed. So the animals on the outside are trying to work their way in. And then in the evening it usually cools off enough and then they'll start moving down into the valleys and grazing. But it can be -- some summers can be a disaster and they don't get to do the feeding and they lose blood, and if they lose a lot of blood in addition to not feeding, I mean, they're going to go down in body condition. Going into the winter, they're going to be in very poor shape.

KAREN BREWSTER: Right. And if they start in poor shape, then their chances of surviving the winter are lessened? Or surviving predator impact?

DAVID KLEIN: Yeah. And then the ones that are going to be worse infected are the calves of the year. So there may be no calves surviving under those conditions. And then the reverse can happen. You can have a summer like we've had this summer. It probably was very hard on the insects and good for the caribou. If it stays cool, the mosquitos are down in the vegetation and the warble flies are -- it's going to take them so long to develop they're not going to be as much of a problem. And so the animals can be in top condition versus the reverse on account of weather. So these variables are not necessarily related to the numbers of animals, whereas other times it can be. And, of course, some of the island populations of reindeer and caribou, there are no warble flies because they weren't -- There's two factors. One is they may have been brought out when they were free because they are free of parasites after the warbles drop out before they're re-infected. So if they moved, like out St. Matthew Island, they were apparently moved out then. But on an island where the winds are so strong, if you only put a handful of animals, the chances are they're not going to be any warbles. And this is true in the high Arctic. The warbles are not there and there's very few mosquitos.

KAREN BREWSTER: So you said that in the '60's there was this peak of about 10,000 animals or so in the Western Herd?

DAVID KLEIN: No. No, the peak? You mean at the low level?

KAREN BREWSTER: No, you say that your student --

DAVID KLEIN: 10,000 that died in one winter because they didn't -- they stayed up in the north.

KAREN BREWSTER: Oh no, 250 to 280,000. My mistake. So that was sort of in the '60's, there was that peak and -- ?

DAVID KLEIN: Well, then it went down.

KAREN BREWSTER: So then, why --When and why, did it go down?

DAVID KLEIN: Well, it went down because of a combination of factors. One might -- And we didn't have as good numbers to work with, and we didn't have as good numbers on predators to work with. But there was a book published and it's here in the bookcase. It's called -- I don't remember titles, I just remember content.

KAREN BREWSTER: And you can't get up because I have you connected to the microphone.

DAVID KLIEN: I know. I'm not going to.

KAREN BREWSTER: You're a prisoner (chuckling).

DAVID KLEIN: I had it over here but it's probably migrated. And it's probably right behind me or something.

KAREN BREWSTER: But what was it about?

DAVID KLEIN: It was written by two people, one was -- the Fish and Wildlife Service, this was in the 1950's when there was a decline of the -- Yeah, that's when I was a student. There was a decline in the Western Arctic Herd. There were varying hypotheses. One was it's wolf populations that built up. And it was the same across Canada. The populations were down in the big herds, and, of course, the Native people got a lot of blame. No one was out there seeing how many they were killing or whether this was a factor or not. There were a lot of fires during that period in the wintering areas, both in Canada and in Alaska. There were a lot of studies done. Some of the Canadian studies showed that, yeah, there had been massive areas of winter habitat were destroyed and lichens -- Then some of the early work on lichens started showing that it takes them 40 to 50 years at least to recover following a fire. But some of the studies were trying to be positive and saying that, no, no, there's caribou are still in these -- using these burned areas. Well, those studies were showing that they were migrating through them. And when they were migrating, especially in the springtime, or even a year or two afterwards, they could eat some green vegetation that would be regrowth of sedges and stuff. And so they were migrating through because there was migration, traditional migration. And a lot of people, other people, are taking more of a negative attitude and say, well, they wouldn't even migrate through those areas. There were a lot of studies done and they weren't very conclusive and so they -- The Fish and Wildlife Service here in Alaska hired these two so-called world experts on large herbivores, wild herbivores. One was the son of Aldo Leopold called Starker.

KAREN BREWSTER: Starker, yeah.

DAVID KLEIN: He was based at the University of California at Berkeley at the time. And the other one was -- this was the Fish and Wildlife Service in the U.S. that did this, but they were connected to the Fish and Wildlife Service here in Alaska because we were a territory. And the other one was a fellow from Scotland who was the world's expert on red deer, and had done a lot of studies on how their habitat in those island situations where you have a given number of animals and you can monitor the vegetation and showing how they're habitat-related. So Fish and Wildlife Service was figuring the habitat -- No one was paying much attention to habitat and maybe they should be good to -- but these were guys that came and they were going around Alaska. And then they wrote this book, *Alaska Wildlife* or something like that. And it -- I don't pre-think these things out.

KAREN BREWSTER: That's okay.

DAVID KLIEN: But at any rate, I'll show it to you later. So they published this book, and I was -- Fortunately, I was -- I met them both. This was in the summertime. And I didn't have any direct funding for my studies of mountain goats that I did for my masters, so I went to work for the Fish and Wildlife Service as a field technician and they assigned me to work with the Nelchina herd. And so they flew me down and I had one -- there was a team of us, another grad student was hired, but I was hired to be responsible for the counts. And we were flown down to a lake in alpine area, Clarence Lake. And then we had to hike to where the caribou were and they were. And they were aggregated during the insect season. And we'd go down there and they had got up on top of a flattop hill usually, or mountain, and we would get as close as we could get without disturbing them and then we'd wait for the weather to cool in the evening and then they'd start migrating down to greener vegetation. And so with a spotting scope and binoculars we could do a count. And we were mainly getting cow/calf ratios. And the third person that went with us was a volunteer and that was George Schaller. He was an undergraduate student. He volunteered to join us because he wanted to see the country and they asked us if we could use an extra person. Well, yeah, okay. So he came and got to know George fairly well then.

KAREN BREWSTER: So who was the other grad student with you?

DAVID KLEIN: I have to look in my field notes.

KAREN BREWSTER: You don't remember?

DAVID KLEIN: He wasn't as notable as George, but he was a good guy and we worked well together. But at Clarence Lake, while we were there, had just been dropped off and were getting -- And the plane was going to come and going to move us to this other lake closer to where the caribou were. And they brought these two, Starker Leopold and -- And I just read this not a few days ago, looked at it and I know the name, but he was a more senior guy, a really nice guy. And he had British kind of characteristics.

KAREN BREWSTER: He was from Scotland, you said.

DAVID KLEIN: From Scotland, yeah.

But I'll give you his name. But any rate, so I got to talk to them briefly and they were nice treating us as young students. We had a lot of questions, but we were busy, too. We didn't have too much time. We had a meal together with them, and then I think then the plane had to move us out to the other place and they had to move someplace else. But they were there, and I remember this other fellow -- We had a spotting scope and we had binoculars, but we had a reasonable, modern spotting scope at that time. It was like a Bushnell scope. And it was okay. Spotting scopes were not good when it was hot because you had too much heat waves. Binoculars were much better. And when the sun got lower and went down then it was ideal, because you didn't have all that shimmering and heat wave. But this fellow -- Frank Fraser Darling was his name.

KAREN BREWSTER: That was the guy from --

DAVID KLEIN: Frank Fraser Darling.

KAREN BREWSTER: I've heard of him.

DAVID KLEIN: So he would lay on his back and he was in his probably late '60's, early '70's, and prop his knees up on the beach and he had this long telescope, so he'd balance that between his knees.

KAREN BREWSTER: And he through it with --

DAVID KLEIN: He claimed it was better than the spotting scope.

KAREN BREWSTER: One of those long telescopes?

DAVID KLEIN: Yeah, whereas we could use a tripod and you could stand up or sit down to see it with a tripod. At any rate, that was a momentous experience for me. And I didn't fully appreciate it until I realized that they were going to publish a book and the book was good. Their conclusions were that there was -- in terms of the caribou, it was a combination of factors that was -- including mainly the fires on the winter range. There had been a lot of fires and that they had exceeded the recovery rate of the lichens. The frequency of the fires. And so the area available for animals, the caribou to winter, had been insignificant for the large herd because they lost -- So it was, you could say it really wasn't an overgrazing problem as much as a loss of habitat through fires. Loss of winter habitat and the slow recovery rate of lichens. But also they pointed out that in talking to Native people and others that the fluctuations were normal over time. And so this could have happened in the past, but then they said there could be these variable factors, too. And that is heavy harvest by that time or maybe decline in the wolves forced the populations that got lower than they would normally because it takes a while for the wolves to decline after the caribou started declining.

KAREN BREWSTER: So then in the '70's there was a big decline in the Western Herd?

DAVID KLEIN: Again.

KAREN BREWSTER: Again.

DAVID KLEIN: Yeah, it came back up again. So at one point, and more recently, it got up to almost 500,000, 400 and some. 400 and some thousand. So at that time I think it was considered the largest herd in North America for a couple of years. But then the one in Quebec, the George River herd, reached 500,000 and this one had just started to go down, too. It was held, surprisingly, after the previous experience, with a peak of 200 and some and there wasn't enough habitat suitable for them, it seemed like. There you had 400,000 for several years and it stayed fairly stable. With liberal harvest and not massive buildup of predators, etc., etc., and reasonable body condition, no brucellosis, etc. So it seemed like there was a recovery period for range, but also that's when it got bigger, then it started moving out into the Seward Peninsula and other areas and venturing into newer areas where it hadn't ventured previously. And so maybe it was able to move out because it was still expanding and in good body condition, but we don't know about that. There's a lot of unknowns, and that's important to acknowledge. I wrote this short article on the conundrum of caribou complexity, which that one had to do with the Arctic Refuge. And other contributors were President Carter and a whole bunch of other people and environmentalists and what. And these had to be really short articles and so I tried to do it, summarized things as best as possible for the Porcupine Herd. But point out that they were the most -- caribou are the most complex of all the members of the deer family. And some of this complexity is the high sociability of them, the adaptations of the females with antlers, and it's a social related situation. They're capability of wintering primarily on lichens, which is not utilized by most other herbivores, most other plant-eating animals. They don't get -- they're out there and if there's no caribou around they just keep growing. And sometimes moose will eat arboreal lichens, if they're real hungry, but they don't chow down on it. And you can feed cattle lichens but you have to adapt -- the Scandinavians did that during the First and Second World War. Farmers, they couldn't grow grains, it was all being taken by the Nazis and/or for the war effort. So they even learned to make mixed lichens with oats and other things to make bread out of it for human use. And a little of it apparently can be digested but under those conditions, but we're not adapted to do that. 'Cause lichens have a lot of special kind of acids that are usually hard on animals that aren't used to it.

KAREN BREWSTER: I would think lichen would not be so easy to digest.

DAVID KLEIN: They're not. So what happens is the special microorganisms in the gut that develop in relationship to lichens, when they start feeding on lichens. If animals are able to -- and caribou generally will eat some lichens if they're there in the summer, through the summer. If they're eating some lichens, they can make a transition to full diet of lichens without any problem. A lot of work with reindeer in Scandinavia shows that some farmers in Finland had small numbers of reindeer and they would keep them in paddocks with the cows in the wintertime. And they would feed them on other things and then maybe they'd gather lichens and feed them to them. And if they had a lot of lichens

gathered and they just fed them to them right away, they couldn't digest the lichens very well. They had to have a period of adaption. But it was mainly a period after they start eating a few lichens, the microorganisms that are there and largely not very many of them, they start reproducing and pretty soon there's a lot of them, then they can handle lichens. So they did studies showing if you -- Also they can't do as well on straight lichens as if the lichens and a little bit of mixture of green vegetation. So if you have captive animals, you use high quality alfalfa hay and give them a little of that along with the lichens they can do -- they can put on weight and put on more fat in the winter. If you just do straight lichens, they can survive but they lose body fat. They can't do as well as if you mix. And they found they could even use, say urea, and supplement that. Mix it with a little bit of chopped grain or something. And another thing they used was sugar beets, which have a lot of readily available sugar beet pulp.

KAREN BREWSTER: This was in Scandinavia?

DAVID KLEIN: Yeah. Where they grow -- produce a lot of sugar by growing beets, sugar beets. And then they'd squeeze the beets. And then the pulp, they can feed the cattle and it's pretty good because still the sugar residue's there. But that seemed to make it easier for them to adapt to increasing the lichens in their diet.

KAREN BREWSTER: So I don't know the year, but at some point wasn't there a big caribou die-off of the Western Arctic Herd, or a big --

DAVID KLEIN: Yeah.

KAREN BREWSTER: Or there was a lot of dead ones found or something and you perhaps made some controversial comments about the cause of this?

DAVID KLEIN: Yeah, probably. It's not difficult to make controversial [comments], because there's a lot of different explanations and none of them could be -- are too reliable. There were a big die-off when there was a segment of the Western Arctic Herd that didn't migrate down to the wintering area. And I forget the years of that. It was in the '70's, I think, or maybe even it was even the '80's. It might have been the '80's. And the general assumption was -- and I think it was Jim Dau who looked into this and went up and they autopsied animals, etc., etc. And I think -- and I've pretty much accepted his observation and conclusions was that they were late. That segment of the population was late in migrating because they were still in good habitat and the frost at the end of the summer was late in coming. So it was still pretty good and then suddenly they got a big dump of snow. And they still had to go through the Brooks Range; they were still on the north side of the Brooks Range. So they just stayed there. And they could crater through the snow, but it wasn't the greatest place for them to spend the remainder of the winter because they were -- it was one thing to be doing okay for a while, but then if they're going to stay in that one place -- One of the advantages in the wintering range is that they move around a lot and they don't -- They pack down the snow when they're digging craters and so some of this packed down snow they can't crater in it again so it protects what's underneath. It's patchy after the snow melts where there's been a big -- It's

patchy. You can see where they've overgrazed lichens in one area of the patches and it can recover rapidly that way.

KAREN BREWSTER: It protects from overgrazing, I suppose.

DAVID KLEIN: Yeah, yeah, it does. And some of the lichens are fractured there, too, and the living tissue is there when the snow melts, it's in the snow column and it falls down. And if there's mineral soil or someplace where it can start growing again and doesn't get blown away, it becomes attached again and it can start growing. Those fragments of lichens can start growing again. Whereas if it has to start from scratch, if it's been overgrazed, it has to start from scratch, there's no living tissue of those high-quality lichens left. And you have to wait for this whole cycle of pioneering species coming in that aren't very good for caribou to eat and gradually you finally get the other ones coming. So it takes -- It's very controversial how long it takes to recover from heavy grazing depending upon what's there, what's left. It used to be people made a lot of, especially the reindeer people, made a lot of generalizations. "Well, it's going to take 30 years." Or "In the past it's taken 30 years or so." It depends on how heavily it was grazed. And then in the islands where there's high winds, how much snow there was and how much of the lichens got blown away that didn't get eaten but was disturbed through the eating process.

KAREN BREWSTER: So this segment in the '70's or '80's, whatever it was, that didn't migrate and they kind of got caught, they were then on the north side of the Brooks Range in heavy snow and so couldn't -- ?

DAVID KLEIN: I don't know the details on that, whether -- I think a large number of them died but I don't think they all died. And I don't remember whether they knew whether some of them did continue and migrate out of there. I think there just wasn't enough evidence available to Jim when he was doing surveys on that. So I'm not really sure. There was a big die-off for the other big herd in Quebec that was -- it was about 10,000, too, that was actually counted. And that was caused so where they had impounded for hydroelectric development, this river, and the hydroelectric company wanted to check something on the dam and so they quickly released a lot of water and it was just when the caribou were migrating. And to get across this river there were a lot of rapids, but the worst place -- it was a wide river and they tended to cross where these rapids were because they didn't have to go from spot to spot very far to get across. And they're pretty good swimmers, and they could rest in between. Well, it was such a torrent that about 10,000 drowned out of probably 100,000 that were crossing. And so here are all these carcasses along this river, and down river on Hudson Bay, a village, a Native village, and they said, "We don't want to all these decomposing carcasses. This is our water supply." And so they had to spend big bucks. And these weren't salvageable by the time they got there. They went with helicopters and picked these carcasses up and flew them away from the river, inland from the river, so they could decompose more slowly and get back into the river. Not overwhelm the river, let's put it that way, with decomposing dead caribou. But that got a lot of publicity. And, of course, at first the hydro people claimed, "Oh well, this is just a normal thing." It wasn't a normal thing at

all. They shouldn't have done this. And it turned out that it wasn't a crisis situation, that there were no big leaks or anything they were checking.

KAREN BREWSTER: So was there any incident in Alaska where they discovered a big die-off and it could be traced to some Native over harvesting?

DAVID KLEIN: No, we documented over harvest when there were 10,000, about 10,000 wintering in this big coastal plain area adjacent to the Waring Hills [Waring Mountains] and we were doing the study in the edge of the Waring Hills. Had one student doing a study on the energetic cost of grazing through the snow, digging through the snow. That was a master's student project. And then I had this Danish, sort of like a post doc, who was working with me. And he was doing a study on the -- it was related to this energetic study but on how they use their feet, left versus right, for cratering. And how the leg length was related to the -- he was doing a study of energy cost of cratering but from a mechanistic standpoint. So the leg length and how deep the snow was, whether the wind was blowing the snow back into the hole or not. And he published a small monograph in the biological papers of the University of Alaska on all of this. And then he did a lot of measurements on skeletal material and compared say reindeer to caribou in this regard, and how reindeer are more efficient at feeding in the absence of snow than are caribou because caribou are more long legged, have to reach down their head further down to -- and then pick their head up when their chewing and swallowing. And it's sort of like what's the transit time between the gut and the stomach. And I remember we had an African studying giraffes and doing this stuff in South Africa. I think it was South Africa or Namibia. And I remember asking him what's the transit time. Did you measure the transit time of food from the time the giraffe does it, because -- ? And when they're ruminating. They're also ruminates and they re-chew this stuff. They have to bring all this stuff up this long neck and you can see that -- He said you could actually see this thing coming up. And then they chew on it for a while and they swallow it gradually as they chew on it. And he thought that was really clever of me asking that question. And he came up with a reasonable answer under the circumstance because they hadn't measured that. Factored that in.

KAREN BREWSTER: But you said, you were studying or you documented overharvesting in the wintering areas of this one segment?

DAVID KLEIN: Yes. And we were able to observe the hunting activities because the -- Noorvik was on the other side on the river and they had only a short distance to go to get there. Like four or five miles at the most from the village to get to this big open plain area with -- mostly it was open, with a few little drainages with some tall willows. Well, willows that were this high. And we were able to observe -- On several days of separate hunting that -- and these were the same people. There was this one elder with a dog team and he had a teenage boy with him. And we could tell that with a spotting scope where we were and how they behaved and everything. And we could see how they hunted. They would come out with a dog team and they would follow one of these drainages with willows and a riverbank with sort of willows were about this high.

KAREN BREWSTER: What, like four feet high?

DAVID KLEIN: About or less. But the riverbank was up there. Well, it was a small stream. The bank would have been built up over many years. And so they would say keep that between them and the open country so that they'd go with the dog teams and then they would stop, tie up the dogs in the willows, and then they'd grab their rifles and binoculars and they would sneak up through and get to the high part of that riverbank and look over. Get down on their hands and knees and look around and see whether there were any caribou within range. And then they'd go back and there weren't --

KAREN BREWSTER: So they could kind of hide down in the low spot of the creek bed?

DAVID KLEIN: Yeah, the caribou wouldn't see them with the dog teams coming out either. So then they'd go on further and then they'd be within range and we'd see the two of them, there would be -- We could hear the rifle shot and you could see the animals fall. Because we were far enough away, we wouldn't hear the shot until after the animal fell. And they would kill usually three animals. And then they would go back and get the sled and the dogs and they'd come up and tie the dogs up closer. And they got out and put these three animals on their sled and that was the load. And then they'd go back to the village. And then we saw the guys, two guys on a snow machine with a toboggan. And they would come blasting out in the open and they would go at pretty high speeds until they saw caribou in the distance and they'd open it up. And they would try to not go directly -- they'd go directly to the caribou for a while until the caribou got alarmed and started running and then they would veer off to one side and so the caribou would kind of turn. And so then they'd catch up and get a little bit in front to slow them down and then they would stop the snowmachines, jump off with their two rifles, kneel down and shoot. The caribou would be often running at this time. They would shoot into a group of running animals. And they would wound several. There were many shots and they really didn't know how many they had killed until we saw some falling, but we saw some limping and what. So they would have some -- they could carry about three on their toboggan, average adult caribou. And they might have five or six down. And they did follow up. If the herd kept running and we could see one of them was limping, they'd follow up and kill wounded animals. So they'd have all of these animals scattered out and they might have seven animals. And they'd drag them -- they would usually drag them together but we were able to go down and look at these and see the tracks and everything afterwards, and verify what we were observing from above. What they would do is, they would -- the well shot ones, in other words the ones that weren't gut shot, that were shot in the lungs or forward part of the body, they would gut those out and put them on the sled. So they would get a load of those that were well shot. And then the others that weren't so well shot, they would usually gut those out too unless they were so badly shot that there was rumen fluid all over everything, and it was hard to do a clean job, they would just leave those lay there. And, of course, it was cold weather so they'd freeze solid. By the time they had taken care of all of those and loaded the sled, the others would be -- the legs would be frozen stiff. They'd even turn them on their back and let the legs stick up. In some cases they would take some colorful, yellow nylon rope or something, put it around them to identify them that they were theirs and they're going to come back

after them. In other cases, they didn't even salvage them. They just left them if they were very badly shot. And so we collected all this information and then the student that did a follow-up study to find out how many of these were actually salvaged. So he went in right after the snow had melted and found many of these. There were so many caribou that stayed there, and even though the herd was low there was this big aggregation there of over 10,000 in that area, went into Noorvik and there were carcasses were stacked like cordwood. So they brought these in for the whole village and these young hunters wanted to be proud of being good hunters so they didn't like to bring in these badly shot animals. And he talked with the people. They were kind of reserved about it because they knew they had been criticized for wasting some animals. It was some of the elders who had acknowledged that well it was young guys who made money in the oil and got the snow machines and they wanted to help out but they never had hunted properly because they'd been off making money. And they felt they were -- and they were in a sense, helping to feed the village. And part of the problem was the caribou stayed there. If they had moved out because of the disturbance, but they didn't. And so it was a tough one because Fish and Game sponsored this student that went there and the student did a good job of collecting and they presented that information to the Native elders in Kotzebue saying that this excessive waste is unacceptable when the herd is going down and the Native community should be more responsible. They at first denied it, but gradually they had to accept it. And then once they accepted it, the policy of the state was, well, let's not rub it in too much because it was a unique situation where the animals were there. And they also said, "Well, we were told that there was plenty of animals. Therefore people didn't come and tell us early that there was a shortage." Well, they did, but they didn't spread the word. The Native leaders in Kotzebue were negligent in going around to the villages and convincing them that they shouldn't be so wasteful. Because Fish and Game had said the opposite only a year earlier that, "You can take as many as you want." And they were using good hind legs of animals, hanging them in a tree to bait for trapping for wolverine and wolves. And hang it so they can't quite get it and they can catch wolves that way. And you weren't supposed to use caribou for bait and trapping. And so, you know, there was this kind of attitude. And before Fish and Game wouldn't enforce that because there were so many animals anyway. And the trapping was important, they made money that way and there was plenty of animals. Well, did it make that much difference? No, probably didn't. But then when the herd declined, it did. So it's -- Of course, it's a combination of, you know, some sport hunters were starting to hunt trophies, caribou out of Kotzebue and, of course, they didn't -- They wanted to put all the blame on the Natives and vice versa. So that's when -- shortly after that, when -- Let's see, Jim Dau finished his -- I think it was in the '80's when he did his master's degree on the North Slope. Before he went to work down there [Kotzebue]. And well, it changed the whole situation there to have someone like him there.

KAREN BREWSTER: So this was before Jim Dau started as the biologist out of Kotzebue?

DAVID KLEIN: Yeah, yeah.

KAREN BREWSTER: So you're thinking this was in the '80's then?

DAVID KLEIN: I think it was. I can check on this.

KAREN BREWSTER: And so what was your role in all of this? You were with the Cooperative Unit at the time?

DAVID KLEIN: Yeah, I was Unit Leader and so these two, the post-doc and the master's student were working on this. And the student that did the follow-up was one of our unit students who wrote up a study on -- It was probably on population dynamics of the Western Arctic Herd. Yeah, Joe Doerr was his name.

KAREN BREWSTER: What was it again?

DAVID KLEIN: Joe Doerr. D-O-E-R [Doerr] I think, ER, I think.

KAREN BREWSTER: And so did you get involved somehow in this whole controversy and the debate about waste?

DAVID KLEIN: I was supportive of the data that was available and made it available to them and encouraged Native people, Native elders, when I had the opportunity. It might have been when I was on the Growth Policy Council, too, and got to meet up with some of the people in Kotzebue. But I think they -- by that time, the thing had cooled and the elders acknowledged that, yeah, they could have done a better job but they didn't. Mostly, they blamed it on Fish and Game didn't inform anyone about the population status until -- other than to say, "Well, no, there's plenty of animals out there." And then suddenly bingo. And that's often the way it is with caribou. Like you don't do a -- an aerial survey is only done say once every three to four years on a big herd. Or five years. Because you may figure you're going to do it at four years and you don't have good weather so it lags on and you have to have money in the budget. And it requires collaboration with a bunch of other people and lining up planes and everything. And then you may -- you have to count those aerial photos that make a pin prick for every animal to be sure. And you might have over a thousand animals in one photograph, and sometimes the calf is so close to the mom you can't see for sure. And then you do actual counts in the areas where they're scattered out more. And in the standardized procedure and people have to be trained, one observer on each side and you do transects through the area. And you have marked ribbons on the struts so that any animals beyond that you don't count. You count on this end. And you've got to be practiced and trained so you know how to do it so that it will be consistent on different flights and different people. And still the reliability of these counts is not all that great. And when you try to put it together for the whole herd, and did you get photographs of all the aggregations or you thought you did. And if you have a lot of radio collared animals, well, you can have better confidence in what you do but you still have to have a lot of animals collared.

KAREN BREWSTER: Right. So in that case, did you think that Fish and Game was doing the right thing with their management of that herd or that the Natives were correct in saying Fish and Game hadn't given them enough information?

DAVID KLEIN: That's a good argument from both sides. It's not that simple. In other words, yeah, Fish and Game could have done a much a better job than they did of keeping in touch with the people, but in their defense, the administration in Juneau and the Board of Game was focusing more on sport hunting. And the Nelchina herd was getting more attention because there were more urban hunters hunting there than Kotzebue. A few outfitters up there were not a big deal for them, providing Fish and Game didn't spend much time up there. Plus it was complicated and they tend to avoid complicated things. You have to interact more with the federal government because there's a lot of parks and refuges involved up in that northwestern Alaska where it's part of the caribou range. So you have to work between agencies, and Fish and Game much rather just have state land in the Nelchina, for example, working with -- Even though it's Nelchina, you've got to factor in the moose as alternative prey for the wolves and bears. And they screwed up royally there, too, because they didn't have good data. They blamed it all on -- first on the wolves, and then they showed, by putting mortality collars on the calves and going out there right afterwards, that it was bears were much more important there.

KAREN BREWSTER: That was the Nelchina?

DAVID KLEIN: The Nelchina. So the problem is we tend to generalize and say, "Well, all these herds are sort of the same. They're all caribou." They're all caribou, but the habitat is different for each herd, the number of potential predators are usually different. And it's particularly apparent in the Porcupine Herd where you've got two countries -- that the major wintering range is in two countries. A major calving ground in some years is mostly in Alaska but in some years it's -- in recent years, it's mostly in Canada in the coastal plain. And the Porcupine Herd is a good example where since it was -- much of the range of the Porcupine Herd is in the Arctic National Wildlife Refuge, there was a better collaboration between the Canadians and Alaskans or Americans because we were dealing with the same herd, and it was the Canadian Wildlife Service was playing a major role, while Fish and Game had a role but not a very important one because the federal government was doing it. And on the same side, the Yukon Wildlife sort of left it for the Canadian Wildlife Service. It's changed now. Then there was supposed to be an international agreement. And there wasn't a better data collection on that part of it in Canada than in Alaska. And we were supposed to do everything, because of the treaty, through the state department.

KAREN BREWSTER: Oh, yeah.

DAVID KLEIN: And so we just ignored them at times. And the Fish and Wildlife Service and the Canadian Wildlife Service, they worked so well together and sometimes they would say, "We can't do this unless we have your help when we're up there flying these." So they were able to -- usually when they're flying they had to go through channels but they frequently just went through the RCMP and no big deal if they want to fly in. And the same in Alaska. So the -- what is it, the Internal -- ? What is it, deals with foreigners coming to Alaska?

KAREN BREWSTER: Oh, Customs or Immigration.

DAVID KLEIN: Immigration, I think, was the main one, and Customs, too. Usually, we could work out some kind of deal. And then there were some cases where we even transferred money to Canada or vice versa for specific projects where we had to have the data on the other side and they didn't have it in the budget or we didn't have it in the budget. And the university was a key player in all of this, too, at the time. So we could frequently launder this money through the university where they couldn't pass it on directly to the Fish and Wildlife Service and vice versa.

KAREN BREWSTER: Now with Department of Homeland Security and all that, that stuff may be much more difficult to do. I don't know.

DAVID KLEIN: I don't know. There's not a lot of pressure, I know, to do that now. But then there was a co-management committee set up in Yukon Territory by the Canadian government and the Yukon government and the Native -- mainly the Gwich'in people. And that turned out to be very comparable to the Western Arctic Herd situation and it worked out quite well. According to the treaty, there was supposed to be an international committee and so there was officially, but for those committees to meet was so screwed up because you had to go through all these channels in the state department. And we had some good people in Alaska, mostly Fort Yukon and Arctic Village, and there were occasional meetings, but it was so formalized. That where should it be? It seemed like the state department didn't trust having it in, say, Arctic Village or even Fort Yukon. It should be in Fairbanks or Whitehorse rather than where the Native people are that were dependent. "Oh, well, we can fly them down there for the meeting" and that kind of thing.

KAREN BREWSTER: Yeah. And so now there's co-management of the Western Arctic Herd?

DAVID KLEIN: Yeah. They put out a paper. I have a copy around here. And it's about a quarterly or maybe a bi-annually.

KAREN BREWSTER: Yeah, isn't it called the Western Arctic Co-Management Committee or something?

DAVID KLEIN: Something like that.

KAREN BREWSTER: Yeah. Okay, I've heard of it.

DAVID KLEIN: And they -- it's amazing that they -- I forget who pays for that? Fish and Game pays for part of it but I think the --

KAREN BREWSTER: Fish and Wildlife?

DAVID KLEIN: Other agencies do, too. Fish and Wildlife, Park Service, and there may be the [Native] Regional Cooperation, or the --

KAREN BREWSTER: Or the Northwest Arctic Borough, maybe.

DAVID KLEIN: No it's -- what's the name, Maniilaq or something?

KAREN BREWSTER: Maniilaq, yeah.

DAVID KLEIN: Yeah, they probably have some money to pay for that. So it's -- and I know Geoff Carroll has been associated with that, but then there's this other guy who's retired now who was at Barrow for a number of years with Fish and Game. And maybe he was working --

KAREN BREWSTER: John Trent.

DAVID KLEIN: John?

KAREN BREWSTER: John Trent.

DAVID KLEIN: Yeah, he played a major role. And he was down at the moose conference in Alyeska [Resort]. I was glad to see him. I hadn't seen him for quite a while.

KAREN BREWSTER: So can you talk a little bit how this co-management works and how it's different than what was happening before when it was just Fish and Game management?

DAVID KLEIN: Yeah. The actual management decisions, and that includes the survey work, as well, and radio collaring and all that, has to be cleared through a committee that is dominated by users. That means the Natives have a major voice even though the biologists that are on the committee, they have a strong voice relative to the research but in interpretation of data -- But the users can disagree and have a strong voice in how the bag limits and harvests are designed, and where emphasis should be placed even on research. And one of the first things that happened with the Beverly and Qamanirjuaq Herd situation was where these villages were isolated and biologists didn't get into them very well. They didn't -- the solution for the biologists, the Canadians, was put more radio collars on and then we can get all this data and stuff. And the users, they didn't like the idea of manhandling the caribou so much. And is there an impact on the caribou that are -- ? And the biologists could only say no, there shouldn't be any significant -- we don't see any significant. Well, it's after the fact. They should have done some preliminary studies to see what -- so there were obviously on the north -- up in the coastal plain of the Arctic Refuge they first put on these satellite collars and they were -- the batteries were so big and cumbersome. They put this one on the cow caribou and they, you know, they're just so thrilled to have a satellite collar on it, but it hung -- it was too loose and when they were doing a -- went up to check on it again a week or so later, it was in a group and they started running and this thing was lagging really behind because

this thing was flopping around. And they realized it was just bait for predators. And so they were able to dart it again and tighten up the collar so it didn't flop around. But it was still -- you know, I raised these questions, it's still going to make that animal carrying that big thing around its neck, it's going to make it more of a target for -- attractive for predators. Bears and wolves particularly.

KAREN BREWSTER: Yeah.

DAVID KLEIN: I also have concerns about once they got radio collars, you know, you put them on everything. And yet you don't have any control. You have no control. In order to say that this is not having an effect on how they move, how they survive, how they feed, how they avoid predators. And, you know, if you put radio collars on little birds now that are so light that they don't seem to -- they get migrations all the way across the Pacific to Australia nonstop. Well, how many did you have to put on before you got -- What happened to the rest of them? Did they fall into the sea or did they just go -- The battery go dead or something? There's no control on that. And there's a lot of studies that are being so dependent upon doing things remotely like studies of predation that Gordon Haber did in Denali National Park on predation by wolves on caribou and moose and mountain sheep. It was based on having radio collars on the wolves and then flying over the wolves. And the wolves eventually get used to the plane. And so the assumption he makes, he made, was it's the real thing, it's natural. Once they get used to the plane, they don't pay any attention to the plane. Well, what about the prey? You're not following the prey, you're not following the caribou or moose, especially moose. Does the moose react at all to the plane flying over them that's tied to the same time that the wolves are attacking? And this wolf guru, Dave Mech, who was the -- he was senior scientist with the Fish and Wildlife Service same time I was as the Unit Leader here. And he came and gave a talk and he did this study in the northern Ellesmere Island with these white wolves. And he wasn't very -- I challenged him on this and he tried to say, well, it wasn't a significant effect. But what he did was he found this pack of wolves up in Ellesmere Island and where it was mainly muskoxen that were available to them. And he got a 4-wheeler up there and he followed the wolves when they were denning. And the wolves got used to this 4-wheeler because he always stopped and didn't go up to the den. He could observe the den from a distance. It was a nice den. It was a rocky deal with a sort of a cave like thing, and here are all these pups and he's got these fabulous photographs. And then he would do the same thing with the muskoxen, he would follow along. And the muskoxen would run and then they would group up and he got pictures of the wolves killing or attempting to kill. Well, in the summertime, the way wolves catch -- kill the young muskoxen is to surprise them and then they run to aggregate and group up. And they just pick off the calves that don't get there quickly. And so Mech was saying, "The 4-wheeler doesn't make any difference. They're so used to it." Of course, it doesn't make --but it does to the muskoxen because the muskoxen aren't used to a 4-wheeler being in the landscape at the same time that the wolves are out making a kill as a group. And then Mech finally acknowledged, yeah there was -- It's a national park and the park headquarters with only two people there in the summer and they have food waste, and the wolves come and feed there and they take pictures of them and it's no big deal. They say they help the wolves a little bit. Well, helping the wolves? The wolves are getting used to

people feeding them, why don't they get used to -- it's easy for them to get used to people on the 4-wheeler that are not feeding them but they're not hunting them. But the muskoxen aren't doing this. So the muskoxen are being clobbered by the wolf because the population of wolves is being maintained because they're coming and feeding. There's people there all winter at this station.

KAREN BREWSTER: Right.

DAVID KLEIN: And so -- And then when that gets written up in places like National Geographic, it's like "Oh, this is Nirvana, you know, it's such a natural situation."

KAREN BREWSTER: Well, I wonder, why use a 4-wheeler, why not walk?

DAVID KLEIN: Because you can't keep up with them. And you got cameras and a spotting scope.

KAREN BREWSTER: But people like Ade Murie in Denali National Park with all his -- and Olaus Murie with all their wolf studies.

DAVID KLEIN: Well, you could walk and hang out around the den to get pictures around the den, but to making kills then you've got to move around the landscape.

KAREN BREWSTER: Oh, okay.

DAVID KLEIN: Yeah.

KAREN BREWSTER: What was the guy's name you said?

DAVID KLEIN: Dave Mech.

KAREN BREWSTER: How do you spell that?

DAVID KLEIN: M-E-E-C-H [Mech], I think.

KAREN BREWSTER: And what was his first name?

DAVID KLEIN: Dave.

KAREN BREWSTER: Dave, okay. I wasn't sure if you were saying Mech [Mech] with an M, or Nech with an N. That's why I needed to ask. You had said, too, there was this one place I didn't catch what you said.

DAVID KLEIN: He had done a lot of work on Isle Royale with wolves.

KAREN BREWSTER: Okay. You had mentioned some place earlier on some studies of the Western Arctic Herd and caribou in the something Hills.

DAVID KLEIN: Waring.

KAREN BREWSTER: Waring.

DAVID KLEIN: Waring Hills.

KAREN BREWSTER: How do you spell that?

DAVID KLEIN: W-A-R-R-I-N-G. [Waring]

KAREN BREWSTER: W-A-R-R-I-N-G. I don't know where those are.

DAVID KLEIN: They're north of Kotzebue. North of the outlet of Noorvik.

KAREN BREWSTER: Okay.

DAVID KLEIN: Only about 15, 20 miles.

KAREN BREWSTER: Okay that's close enough. I needed a general, cause I wanted to make sure we got it spelled right.

DAVID KLEIN: That was fun working out there in late winter. It was cold, but we had down trousers and down parkas and we could ski. And we had a wall tent, a white wall tent with a wood stove. And we're in the little narrow valley right at the edge of the hills where there was a wood supply and so we had a little wood stove. And it was out of the major wind. And once you got out -- came out on -- And it was tricky skiing, because sometimes the wind was so strong. I remember coming back, and we had to go uphill and we had the wind behind us, and man, it was just blowing us up the hill. But going out, you had to be careful in some places where the snow was really hard pack. We had backcountry skis with steel edges, which you really needed. But it could be, say, ten below and the wind blowing and you'd wear facemasks and goggles and you would just lay down on the ground and the wind wouldn't be quite so fast. The caribou -- there was frequently ground snow being blown along, so it sometimes would obscure what we were looking at, but other times made it easier for us and they were busy digging and we didn't bother them.

KAREN BREWSTER: Well, I'm wondering if we should call it a night?

DAVID KLEIN: Probably, is a good idea.

KAREN BREWSTER: Tonight. Does that sound good? And we will continue on next week perhaps with more about management philosophy and how things can change.

DAVID KLEIN: Yeah, that's going to take a lot of sessions, but we'll do that and that's good.

KAREN BREWSTER: Yes, you were starting on it a little bit.

DAVID KLEIN: And I'm going to start writing up an article that could be eventually going in here on how Fish and Game has transitioned from territorial times when there was so much emphasis on habitat and even in the early stages of Fish and Game. And gradually habitat -- and that applies to both in the marine environment as -- although I wasn't as close to that, but in the marine environment as well as the terrestrial environment.

KAREN BREWSTER: And then I'm assuming that leads to that there's an impact from -- in terms of understanding the environment and the animals and the management decisions if you're leaving out that component?

DAVID KLEIN: I'm going to also have to get to the dirty part of it where initially the commissioners were all -- of Fish and Game were all technically trained scientists. The first head was Clarence Anderson, who was a PhD, also semi-retired from the University of Washington in fisheries. But he was a good scientist and he started up the Alaska Department of Fisheries just a couple of years before statehood, in anticipation of statehood. And the focus was on fisheries. But he hired some of our students to work on marine mammals, for example, and on predation of belugas in Bristol Bay and Nushagak and Chevak. They got good data on the number of salmon being taken by belugas and stuff like that. But it was -- then subsequently, the people who became commissioners were graduates of the university program here, the Co-op Unit Program before I was leader and then afterwards, as well. So Jim Brooks, he was employed by the first Department of Fisheries, worked under Clarence Anderson. And then when statehood came, he put Jim as head of the new Game Division, which later became the Department of Wildlife Conservation. And so he was the guy I worked for when I was transferred from Fish and Wildlife as a deer biologist in Southeast. I worked for him. And then another commissioner was Ron Skoog, who had been -- became a commissioner and he had been with Fish and Game for a number of years and then he did some research in Africa. And then he took a job down -- there wasn't a job available for him in Alaska, he took a job in California and then he was invited to come back and be commissioner.

KAREN BREWSTER: And that's S-K-O-O-G?

DAVID KLEIN: Yeah.

KAREN BREWSTER: Yeah, okay.

DAVID KLEIN: But he was a graduate here. And then we had other graduates of our program who were heads of the Game Division, and then Division of Wildlife Conservation. But technically, initially it was -- I think it was in the Constitution that the governor appointed the -- For their administration, appointed the commissioner. And he probably could appoint the heads of Commercial Fisheries and the heads of Game, and maybe the heads of Sport Fisheries. But the pattern had been set that they also have

technical trained people for these other positions. They're not within the state -- Below that, they're all within the state merit system and the governor can't replace them or move them out. But then it broke down. I think when it broke down the first one was under Wally Hickel's administration. And then they got a commissioner who ran a shoe store in Anchorage, who was an ardent hunter or something like that. Well, that really -- we protested -- the faculty protested here over that. And all we got was the Republican dominated legislature threatening to cut the budget for the university. And then it went from bad to worse. And then the worst occurred just before and during -- I think it went worse under the Murkowski governorship, and then it continued under Sarah Palin. So he appointed this guy as a Deputy Commissioner who was a -- he had an undergraduate degree only in wildlife that he got through correspondence from down in the Lower 48. A guy from Wasilla who was already known to be a game violator. And then, maybe, he was accused of being a game violator not necessarily -- Then the Commissioner of Fish and Game was another political appointee who -- he got busted. He was violating the law himself. He didn't get busted on that, but he got busted for drunken driving in Anchorage, or in Juneau.

KAREN BREWSTER: Oh yeah, right, I remember when that happened.

DAVID KLEIN: But he appointed this other guy, Rossi, to be a deputy [Corey Rossi appointed as head of Division of Wildlife Conservation of ADFG in March 2010. Had been in position of assistant commissioner for abundance management for about a year before]. And Sarah Palin -- he was like a Tea Party kind of guy. And all for no longer hunting. Shooting is the important thing and it's moose. That's the only thing of importance to spend money on.

KAREN BREWSTER: Right. Right. Well, we can get into more of that next week. Okay, thank you.