



- 1 When did freeze-up occur? How does this compare with past years? How about the first snowfall? How about break-up?

**Kotzebue**

- 2011 • In 2011, breakup was 7-10 days early. Freeze-up was later than usual.
- 2012 • In 2012, freeze-up was later than usual. Not sudden, but more gradual.  
• Kivalina had a late freeze-up.
- 2013 • Breakup – early in 2013. Dangerous ice conditions. Difficult spring hunting.  
• More flooding and lots of erosion. River courses straightening due to erosion.  
• Freeze up – Fall started normal, but then more southeast winds caused thaw (high temperatures, high water) until a couple of weeks ago. November storms.  
• Cyrus noted that when he was a kid, by end of October there was solid ice from Kotzebue to Sisoalik.
- 2014 • Freeze-up – Started in time in 2014, but then warmed up. Kotzebue Sound is still open – lots of open water.  
• Noatak River freeze-up about October 6, not as late as in 2013.  
• River ice thin on upper Kobuk River.  
• Warm temperatures = no ice at Kivalina. Also tundra thawing.  
• Very little snow, even at this date (December 17, 2014). Has warmed to rain – a few rain events.
- 2015 • Noorvik – Freeze up late. Just 2-3 weeks ago (late November 2015). Very difficult for hunters to go on ice. Would go on ice and it was thin. Different with climate change. Lost two guys this fall under the ice. Winters shorter, warmer than usual.  
• Kotzebue - Along the coast it is freezing up later than normal, seems to start freezing at a normal time but then the weather changes to SE and warms up. This seems to be a trend these past few years at least. It seems to start cooling off on time and then it warms back up.  
• Noatak - September 28th we pull our boats up. The river is pretty shallow. Freeze up was pretty early compared to the last three or four years in Noatak. This year it was early. But, conditions change quickly. Weather shifted quickly from hot to cold. Trout and white fish were present right before freeze up. Freeze up for two days and then warmed up again for a week.  
• Kotzebue Sound – Warm, cold, warm, cold fall. Past five years it's been like that. It is effecting the way people hunt and the way animals come in.  
• Kobuk - Fall was normal. I was up at camp and living there, we come back at freeze up.
- 2016 • Freeze up late—break up early and no snow December 2016.  
• Late freeze up, no snow as of 12-14-16. Early spring thaw.
- 2017 • Freeze-up was very late. Getting later and later freeze up. Got a lot of snow before freeze up. Break up was early and early break up.  
• Mid-November, later. Snowfall was late but a lot of it. Break-up was about normal.

- 2018
- Freeze in early November
  - Very late freeze-up—December
  - Later freeze-up than before
  - Earlier break-up than before
  - In general, snow and freeze-up were delayed by 2-3 weeks.
- 2019
- First snowfall [2019] was a fake. Then it didn't snow for a long time. Was later and not steady.
  - Got lots of snow [upper Kobuk].
  - No snow at all [Noorvik].
  - Got lots of snow [Deering], then it turned to rain.
  - Early September, mountains would get snow, and then it would melt. September 3, it started raining, lots of flooding. That stops caribou cold from migrating. Kelly River, Kugururuk River had flooding. Third worst flooding in 50 years.
  - Two weeks ago [early December], no planes for five days due to wind, snow, fog. After all the snow came in, we started getting rain. Melted all that snow, gone. So we don't get our snow until March-April.

When did break-up occur [in 2019] and how did that compare with past years?

- Lots of snow but warm winter. River went out slowly, water stayed high for a long time but spring breakup wasn't much.
- Our spring breakup was different. We didn't have any floods. The earlier years' floods washed out road to airport.
- Breakup is earlier and earlier every year. Try to teach our young folks how to go out at breakup. Changing drastically. We've lost 5-6 people last year. Compared to last year, we have less snow. We have no snow. Storm warning last week but storm never came.

### **Koyukuk Middle Yukon Region**

- 2011
- Freeze-up late this fall; about a week later than usual on Koyukuk and Yukon Rivers. Combined with heavy snowfall around first part of November, made traveling really difficult.
  - Last summer was very rainy. Breakup was unusual. Thinner ice than usual and ice rotted, so was quick breakup with less snow.
  - Ice pattern during 2011 freeze-up has not been normal.
  - A lot more broken ice on riverbanks, rather than smooth ice going right out from the bank.
  - Yukon breakup has been unusual for several years; less ice, especially last spring.
- 2012 Koyukuk –
- Freeze up was two weeks late.
  - There was unusual rain in September.
  - Actually rained from July 1 – September 20 when freeze-up occurred.
  - Lakes and creeks were high when freeze-up occurred
  - Ground was saturated at freeze-up.
  - Standing water ponds on forest floor at freeze-up.
  - The above conditions were the opposite of last years' freeze-up
  - Last year the permafrost appeared to have melted substantially at end of summer season
- Allakaket –
- Rained right up to freeze up
  - Temperatures dropped quickly and stayed cold in fall
  - -20 deg. F or lower all November

- 2013 • First year that had rain until November.
  - Still running boats in November.
  - Freeze-up November 24th on Yukon, Koyukuk. Late freeze-up but ice is smoother in 2013 than in 2012.
  - Couldn't go out trapping until October 15 in Fairbanks/Livengood areas.
  - Breakup in spring 2013 was late. (In Fairbanks, significant snowfall on May 15.)
  - Late spring affected waterfowl.
  - Mentioned Galena flood. After the flood, the river was good during breakup. They had anticipated more flooding downstream of Bishop Rock, but it wasn't as bad as they thought.
- 2014 • Fairbanks – First snow late October, but couldn't use trails until after Thanksgiving.
  - Koyukuk – First snow November 10, but got rain about two weeks ago (early Dec.).
  - Allakaket – Only 4-5" of snow so far this year; can't run snowmachines yet.
  - Breakup is changing. It used to be that the Koyukuk River went out before the Yukon River. In 2014, ice moved out fast but hung up.
- 2015 • Fall 2015 - Freeze up was late this year. Ice froze smooth (like it used to be), not jumbled ice.
  - Winter 2014-2015 was mild.
  - Spring 2015 – Breakup was early. Very dry early on.
- 2016 • Warm climate = late freeze up and early break up. No snow also, makes it tough for sno-go.
  - Freeze up late October 2016, break up mid May 2016.
- 2017 • Freeze-up was a month late, break-up is two weeks early.
- 2018 • The weather has changed; we see later freeze-up and early break-up.
  - Freeze late, snowfall late.
- 2019 • Rain occurs in winter every year now. Little amount of snow must have an impact on vegetation and other things because not as much run-off or ground infiltration. In Nulato, one of our traditional hunting areas for moose (Kaiyuh Slough), we can't get to in last 15 years because of low water levels.
  - Much warmer now. Getting wetter and bad for fish drying.
  - Much warmer now than when we were kids. We definitely needed snow shoes then, might not need them now. Used to be roaring ice break-up, but now much quieter because ice rots in place – not as thick. In 1993, Hughes and Allakaket, had a fall/September flood – whole store in Allakaket floated eight miles downriver. When construction crews came in, hired local people all winter, but tough job because had to work even when 60 below.

## North Slope

- 2011 • Freeze up didn't occur at Wainwright until late October. Because freeze-up was slower than usual extra caution was need on the ice.
  - At Anaktuvuk Pass, there wasn't much snow and freeze-up late October; had to be cautious on ice. Anaktuvuk Pass, not much snow, freeze-up began in mid- October.
  - In Howard Pass area (Northeast GMU 23), freeze-up later than usual. So warm that caribou weren't moving south.
  - Barrow – late freeze-up also.

- 2012 • Wainwright – Rivers usually freeze in late September, but about 10 days late this year (2012) and water was high when they froze. The water levels dropped carrying the ice out, and then the rivers refroze later.
- Barrow – Break-up last spring (2012) was in late May, rather than early June as is usual. It was very warm in early July and people were catching caribou just outside of town. It was warmer and wetter in August and the caribou left the coastal plain for the foothills. It was really wet this autumn with winds out of the west from mid-summer to October. Rivers froze late, in mid-October; under-ice fishing has been poor as a result. There was no sea ice until November.
- 2013 • Wainwright – Still on-going (especially the ocean); takes awhile in Wainwright. Safe on rivers just last month (November 2013). Rivers and lakes were still open in mid-September 2013. Several cycles of freeze/thaw this fall. Freeze up is later than in past years. Dustings of snow fell in early September, but couldn't use snow machine until Halloween. Ice went out in late June this year. Later than usual.
- Brooks Range Aviation (North Slope) – Lakes were still open on the 12th-15th of September 2013 (usually freeze on the 7th or so). Freezeup was late in 2013. However, spring 2013 breakup was also late.
- 2014 • Point Hope – Lots of changes. Rain in mid-winter. All snow recently blew away.
- Wainwright – Rain after the first snows.
- 2015 • Point Hope – Celebrate the first slush ice connecting to land, getting later into October-November. Froze up in mid-November 2015, whales tale celebration. Up river, should freeze in October, but it is occurring in November now.
- 2016 • Really late freeze-up.
- 2017 • Freeze-up started late in middle of October. Past years have been about the same. Snowfall in September but a wet September, the snow kept melting. I think break-up was late or mid June.
- 2018 • Freeze-up occurred very late mid- to late-October and slowly froze. Did not even freeze enough to ice fish.
- It has been about the same for about 3-5 years, with slow freeze-up.
  - In September and first part of October it snowed, but did not stick.
  - Break-up in 2018 was about the same as the year before.
- 2019 • Utqiagvik – Depends on ice or ocean. Still boating in November. Whaling and ice fishing. Ice on lakes 8-10 inches thick by November 5.
- Later freeze up, after it melts can warm up again.
  - So much warmer – remember Halloween with 20 below. Not anymore.
  - Break-up was earlier. Began boating earlier, by June 2019.
  - Colville River broke up a week or two early.

## **Seward Peninsula**

- 2011 • Fall came late in 2011; snow was late
- Rivers froze about a week or two late.
  - Water froze in Norton Bay before the big storm, which was good
  - Used to be freeze-up around September 7, but three times in last ten years it has been much later. It froze in December.

- 2012
- Very late spring breakup (2012) in Nome; bad for salmon and herring fishing
  - Hunting seals from ice in June (2012), very unusual (“first time in his life”)
  - Late September/early October (2012) freeze-up in Elim
  - Mid-October (2012) freeze-up in Nome, Imuruk
  - Mid-November (2012) freeze-up in Pt. Clarence Bay
  - In December (2012), still open water west of Brevig Mission
- 2013
- Full freeze-up hasn’t really happened yet (as of December 4, 2013)
  - Nome – Freeze-up very late this year (2013), maybe 1 to 1.5 months late; freeze-up now in late November; used to be around October 10.
  - Koyuk – First freeze-up in October 2013, but high water and wind opened up river again. River is sort of frozen right now, still had Lesser Canadian geese hanging around on October 28th; maybe 4 inches of snow right now (Dec. 4, 2013).
- 2014
- Chukchi Sea is just now freezing up and isn’t complete (as of December 17, 2014). This late freeze-up is similar to last year.
  - Nome – River freeze-up about October 10. Ocean freeze-up seems about a month late. Changes in freeze-up interferes with juvenile salmon.
  - Spring breakup 2014 was early – water everywhere by the last week of April.
  - Koyuk- In 2014 there wasn't a typical "breakup" on the rivers. Spring runoff was low and gradual, and didn't life the river ice and cause it to move out; rivers held their ice and it just melted in place.
- 2015
- Winter 2014-2015 / Spring 2015
- No snow through most of winter 2014-2015. Finally got snow in the first week of March 2015. (ADF&G didn’t get snow to do musk ox survey until first week of March.)
  - Then, break-up began in April 2015.
  - This makes three years in a row of short window of snow.
- Winter 2015-2016
- Nome – Windier, stormier fall. Ocean ice hasn’t set up yet this winter (as of December 2015). Seen a few recent pictures, but might not stick. Ice went out, them came back.
  - Koyuk – Freeze up occurred the month of November 2015. Prior years, from what I can recall, it usually occurred late September to October.
- 2016
- Freeze up occurred last week in November 2016 for Port Clarence Bay. Brevig Mission had their first major snow fall Dec. 11, 2016. Last spring, Port Clarence Bay was open by the last week in May 2016.
  - November, a little later—no snow. Break up was I think in June.
  - Late Oct. Couple weeks late
  - Rivers late Oct. 2016 a month late compared to 10 years ago.
- 2017
- Month late October-November.
  - End of October, around June. First snowfall was in Nov. followed by rain and snow, finally the snow stayed.
- 2018
- Deep snow early this year may keep caribou away. Maybe wind will create some clear zones.
  - Break up - lots of water and snow. On schedule.
  - Freeze up - month late—late October; in December 2018, the ocean is still water.
  - The freeze up has not been as fast as it used to be; it is still progressing in my area (Koyuk).
  - First snowfall was normal as last year (Elim)
  - Port Clarence Bay frozen January 5th and went out May 24th, first time [freeze-up and break-up on the bay was] in the same calendar year (2018). Prevailing winds from the Northeast or East have kept Pt. Clarence Bay open up to December in the past.

- 2019 • Lots of overflow, fog. So we stayed home because of those types of conditions. That was in January and February 2019. A lot of streams didn't even freeze.
- People can't really travel until January.
  - Pretty much the same [as above comments]. Cooler summers after the big warm spell, not much snow until late (February-March), but by that time caribou are out in the Kuzitrin Flats. We have to go up to the northwest side of the lava beds to see anything. Pretty much same across the board. Later freeze-ups. Early melting, prevented us from going over to the Bendeleben Mountains. My last trip over to the Bendeleben Mountains was May 9 many years ago. Now I would have to walk there.
  - [Re: spring breakup and hunting access] - Bear hunting is over by April 22 or 23. I used to do hunts well into the second week of May. Last spring, I went to WMO to haul wood. It was so warm and there was water under the snow, I didn't do it. My client was hunting - it was warm for a week and a half. You could ride anywhere over the snow. The whole countryside had frozen over with snow. We hauled trees for two days. Which I do every year, but didn't last year since the conditions. It was a random freeze.

## 2 What did you notice with snow depth and icing?

### Kotzebue

- 2011 • Relatively little snowfall.
- Most snow flew away with the storm and the breakup of 2011.
  - Bad icing after November 2010, throughout all of Unit 23. People found dead moose and some dead caribou.
- 2012 • Everyone is hurting for snow so far this winter (2012). This is affecting travel.
- No discussion on icing events.
  - Rivers are freezing while water is high, which causes access safety problems.
  - In Kivalina in particular, there has been no snow and the caribou came back very fast.
  - Thought lack of snow may be preventing caribou migration. Usually caribou don't like to walk on ice. They like to walk on snow or snow-covered ice.
- 2013 • Little snow this fall (2-3").
- Caused ice to thicken rapidly. Could only net fish for two weeks.
- 2014 • Very little snow so far this winter; none in many areas.
- Glare ice on ground in some areas.
  - Thick ice on snow in Noorvik.
  - River ice thick when beaver trapping; maybe kill the muskrats.

- 2015
- Noorvik - Finally got a little bit of snow a couple of weeks ago (late November 2015) with the storm that came in. Not much snow, after snow it rained, snow was hard in our area in Noorvik.
  - Kotzebue- Too much snow up there so far this winter. Past five years we haven't had any snow. This is the first year. We have more SW wind, not quite a storm, blowing snow, constant southwest wind.
  - Kotzebue - Still a bit of punchy snow, can't go to fast on snowmachine or you'll hit tussocks underneath.
  - Kotzebue - Took video of the caribou and seals on November 10, 2015. It had frozen up and we thought we were done seal hunting and then the ice picked up and took it out and all the seals were out there and they caribou were wondering where's the ice? Got snow on top of ice and it insulated the ice so the ice isn't very thick right now, can't do night riders race, not safe for trucks. I'm trapping too, and the snow is blowing and drifting into willow valleys. Can't take trucks up the Noatak for the first time up the river because of the snow depth and drifts, first time in about five years.
  - Noatak - It is snowing more; we had a couple of snowstorms. We usually have a big snowstorm right before Christmas. Last three four years we didn't have too much snow we couldn't use snowmachines, we used ATVs. Now everyone is using snowmachines. Ice is not that thick.
  - Noorvik - Thought freeze up is going to be normal then you have extended periods of warm, and it causes ice to be really unsafe. One day you are driving on the ice and the next you have to stop because it's too warm.
  - Kobuk - It snowed again, been a good year for snow.
- 2016
- Ice is thicker due to no snow.
  - Snow depth late winter March-April 2016.
- 2017
- Lot of snow this year, and rain.
  - Lots of snow. Thin ice with the snow cover.
- 2018
- No snow (as of December 2018)
  - Ice very thin in some areas
  - Normal
- 2019
- No specific responses to this question

### **Koyukuk Middle Yukon Region**

- 2011
- More snow than normal around Huslia area last year.
  - Less snow than normal on Koyukuk, around Alatna and Allakaket regions.
  - Not much snow south of Koyukuk in Ray Mountains last year. That led to fat caribou in February because it was easy for them to get food.
  - Taller grass in September indicates deeper snow to come in the winter. The grass wasn't tall this September, so there might not be deep snow this year.

- 2012 Koyukuk –
- No snow till two weeks ago (mid-November 2012)
  - Usually snow by October 20
  - Last two or three weeks very cold (prior to the early December WACH meeting); below -20 F
  - 5 inches of snow in Galena which is low compared to other years but highest in area (compared to other villages)
  - The ice is already too thick to trap under. This is similar to around 1953 when they had a lot of ice and flood.
  - Concern expressed about no snow and fast freeze-up for salmon streams
  - Water freeze to bottom of streams
  - No place for salmon fry
  - This thick ice situation happened before in 1937 and 5 years later the king salmon run was poor
- Allakaket –
- Only a dusting of snow (2 inches)
  - No clouds
  - The river was high when it turned cold which lead to rough ice (especially along the river shore)
  - Six inches of ice on the shore, which pushed up on other ice and lead to jumbled rough ice. It makes it very difficult to get around by either sled or snow machine.
  - Used to be smooth ice on the shore (they could ice skate)
  - Now winter is unpredictable.
  - Only real difference from last year in winter weather is lack of fall snow
  - Lack of snow is hard on people who don't have 4 wheelers or car but only have snow machines (snow machines get torn up).
  - Longer winter season than usual. It is cold when hunting.
- 2013 Currently 8" of snow in Middle Yukon (early December 2013).
- 2014 • Koyukuk – last year just 2-3 feet of snow; used to be 4-5 feet.
- 2015 • Interior –Allakaket had snow early (September dump)... it didn't melt in Allakaket, as it did in Fairbanks. Got about a foot and half in Upper Koyukuk last week (December 2015).
- 2016 • Not much snow for a few years now.  
• Normal.
- 2017 • This year is more snow.
- 2018 • There is more snow falling. It's warm, which causes icing.
- 2019 • No specific response to this question

### **North Slope**

- 2011 • Not much snow at Wainwright. Late rain in September 2011 created an ice layer in snow in 2011-12. No ice layer at AIN in 2010-2011.  
• Barrow has different perspective on the winter weather – now using four-wheelers more and less snow machine and boat; it might be causing a problem deflecting caribou away from Barrow.
- 2012 • Pt. Hope - very little snow in autumn 2012; had about 4" and then it blew away.  
• Pt. Hope - Ice after freeze-up thicker this year due to colder weather.  
• Pt. Hope – The high, standing water on the tundra this year will freeze and may make foraging hard for the caribou.  
• Wainwright - He's seen a lot of change in weather in his 15 years at Wainwright. Last winter (2011-2012) was relatively calm without too much wind or snow.

- 2013 • Wainwright – Not much snow so far in 2013. Mostly dry snow. No rain on snow / icing events this fall. Last spring, snow was average.
  - Brooks Range Aviation (North Slope) – Now has average depth of snow. Snow stayed longer last spring (2013).
- 2014 • Point Hope – Sea ice is connecting to land later and later. Ice cellars are no longer cold enough for storage. Snow depth is thinner (worse than last year); ice is thinner. For river ice, strong currents are eroding the ice from underneath and making it thinner.
  - Wainwright – could travel on ice on lakes in late October 2014. Used to be earlier.
  - Barrow/Nuiqsut – Snow consistency is different than in past, not moving with winds the way that it used to. Creating ice sheets. A lot of frost events. Up to 6” of hoar frost. Problems with people breaking through ice during fall fishing.
- 2015 • Point Hope – A lot of deep snow lately (drifting). Snow started October 31, 2015 this winter.
- 2016 • Not much snow this year.
- 2017 • Hardly any snow in October and November. It was rough riding with snow machine. Just a few inches but snowdrift on the ridges, lakes and hills, snow about 6-18 inches in December and end of November. Ice froze up late October, had about an inch to 2 inches end of October and by 2nd week of November, 4-6 inches.
- 2018 • Snow depth was too deep to go to camp by mid October, with an ATV with a depth about 12”-18”.
  - Icing was on ground and ditches, and small ponds were frozen in the mornings and by late afternoon melted and re-froze at night.
- 2019 • Right now it blows, but have lots of snow now. Had rain after first snowfall this winter. Rain has given caribou a hard time.
  - The first snow was thin, not very much. Only now getting more snow. Snow was patchy in early this winter.
  - Lots of powder snow, gets blown by wind. Get a foot but then a day later gets moved by wind.

### **Seward Peninsula**

- 2011 • Traveling conditions are difficult due to wind scouring related to big storm.
  - Last spring, didn’t notice much icing or rain on snow events.
- 2012 • Great snow conditions in all directions, spring 2012; easy travel
  - Not severe icing, but light crust on snow made travel easy
  - No snow anywhere yet in winter 2012 (December 2012)
- 2013 • Nome – Very little snow. Last year (2012) they were able to drive to Pilgrim River area on Christmas Eve; normally the Kougarok Road is closed by snow in November. Not the case this year. Just north of Nome it is still brown tundra right now.
  - Koyuk – About 4 inches of snow right now (Dec. 4, 2013)
- 2014 • Nome – Snow is inconsistent. Not much snow last spring.
  - Elim – Not much snow. Don’t get any caribou because cannot travel to hunt.
  - Lack of snow makes it difficult to travel.
  - No mention of icing events or ice on snow.

- 2015 • Southern Seward Peninsula – 62” average of snow per year. Late 2000’s, average 80” of snow per year. But since then, it has been dismal. Remarkably little snow.
  - Koyuk - Break up was in May for most of the years I can remember. This year (2015) for this time snow is deeper and icing or ice thickness may be not too thick - a foot and a couple inches.
- 2016 • Winter snow did not drift until January-February 2016, late April 2016 snow.
  - Less snow—plenty ice.
  - No snow yet. No icing.
  - Not much last winter. Very mild.
- 2017 • Somewhat early snow this year.
  - The snow depth in the preceding years have been accumulating to March and that has been when it is deeper whereas in the 60’s deep snow came in Nov. The icing has usually started in Oct. and Nov.
- 2018 • Lots of snow in 2017; more than past 20+ years
  - Low ice and slow snow.
  - Our bay is ice free [in December 2018] (Elim)
  - Snowfall happens when they temps get colder, but with lots of low pressure from west to east snow will melt when temps go up. January or February are when we get the most snowfall in the winter (Brevig Mission)
- 2019 • A lot of water on the tundra.
  - All the sea ice trails were worthless. Big surges in the fall that cracked the ice at the lagoons so all river crossings along the coast were a hazard. You have to go fast to avoid overflow. Early in the season with all the tundra collapsing there’s a lot of snowmachine traps. Probably caribou traps too.

### 3 What were winds like in winter? In summer?

#### **Kotzebue**

- 2011 • Summer of 2011 windy; mostly north winds that were pretty cold.
  - As a result, fewer bugs.
  - Winter of 2010-2011, windy early in winter, then pretty calm.
  - Fall 2011, big wind storm in November.
- 2012 • Lots of wind and rain.
- 2013 • Strong winds this fall, from S, SW, SE.
  - Summer was windy too.
- 2014 • Winds generally more from the east or southeast.
  - Wind direction is less variable.
  - Southeast wind isn’t bringing moisture / snow like in the past; snow blows away.
  - Not as windy as 2013.
- 2015 • Kotzebue - Frequent SE and SW winds, but SE wind is bringing the storms.
- 2016 • Fair, no storms.
  - Prevailing E, SE winds.
- 2017 • Somewhat windy in the winter, no real storms. Summer windy all summer.
  - Normal for the winds.

- 2018 • Not much winds in the winter
  - Summer 2018 was windy as usual
  - Prevailing ESE winds
- 2019 • Lots of east and south wind in summer and fall.
  - Lots of east wind in summer.
  - We had a windy fall. Low after low, windy fall.
  - Currently north and northeast winds. Where I'm from [Deering], the north winds are cold.

### **Koyukuk Middle Yukon Region**

- 2011 No response
- 2012 • Koyukuk – in Galena, summer was windy
  - Allakaket – summer was not windy like Galena
- 2013 • Fairbanks – winds were bad; storm with ice and freezing rain.
  - Galena has strong winds at the same time as Fairbanks.
  - Not bad winds at Allakaket.
- 2014 • No comments about wind conditions.
- 2015 No comments about wind conditions.
- 2016 • No wind around Allakaket in winter.
  - Lots of rain July & August 2016.
- 2017 • In summer there is more winds.
- 2018 • Not much wind around Allakaket.
- 2019 • Allakaket is not very windy. Snow just keeps piling up.
  - In Nulato winds are now so strong, knocking over trees – never saw that as a kid.

### **North Slope**

- 2011 • Wainwright noted that winds normal last winter, but unusual this fall (2011), now getting prevailing NE wind.
  - Anaktuvuk Pass winds normal last winter; switching between N and S; no storm in a long time.
- 2012 • Wainwright - Summer 2012 had relatively calm winds, but still not too much insect harassment of caribou because the insects began about a week late (end of June) and ended early (end of July).
  - Wainwright & Barrow – Winds were prevalent from the SW and W in summer and fall 2012, while they are typically out of the NE.
- 2013 • Wainwright – Storms not as bad as previous winters. Summer was windy.
  - Brooks Range Aviation (North Slope) – Pilots didn't complain about winds. No smoke / fires.
- 2014 • Point Hope – Very strong winds; winds coming more from east and southeast, used to come more from the west.
- 2015 • Point Hope – High winds (generally) in 2015.
- 2016 • Calm winter so far, mild
- 2017 • Winds were windy around ranging about 5-20 mph and blizzards high as 25-60 mph if I remembered correctly. Summer were some breeze about 3-12 mph winds, to hot sunny days with hardly and winds. A lot of heat waves across the tundra.

- 2018 • Winds in the winter were about 3 miles per hour (mph) to an average of about 35 mph during a storm. During a storm would be about 20-50 mph, maybe to 60 mph.
  - Summer – ranged from 2 mph to 30 mph. Just a few times maybe 35+ mph.
- 2019 • There's more wind now. More westerly wind compared to other winds, which were north/northeast. In summer, wind was also mostly west wind, less east wind. Weather was circling over the area.
  - Felt colder and windier this summer. "Weather felt different. Everything felt different – the winds and the rains."

### **Seward Peninsula**

- 2011 • Noteworthy storm in early November. Frozen bay protected the shore from flooding. Winds paralleled the shore and by the time they switched, the winds had died down significantly.
  - Spring hunting conditions were excellent.
- 2012 • Southwest winds made it hard to fish
- 2013 • Strong winds in early winter 2013.
- 2014 • Nome – Strong winds. However, not as strong as the "hurricane force" winds 2013 and not as much property damage.
  - Elim – Severe winds this fall (2014), mostly in Norton Bay.
  - Koyuk – North winds at Koyuk during beluga hunting time in the bay.
- 2015 • Stronger winds.
  - October 2015 on was pretty windy.
  - Koyuk - The winds were from the east and south for the most part. We had rainy weather and some strong east and southwest winds last summer.
- 2016 • Wind was not a big factor around Port Clarence Bay area; much of severe wind warnings happened St. Lawrence/Bering Strait area.
  - Relaxed—late summer a little strong.
  - Late fall lots of wind Oct.
  - Normal.
- 2017 • Some days the winter winds were strong. The summer had some days with little breeze.
- 2018 • Lots of wind in winter
  - Wind stayed longer and blew longer period in the mid-summer to early fall
  - Mild winter; warm & mild
  - Most of the extreme wind conditions have occurred on the southern portion of the Bering Sea; high winds were mostly from the east or northeast.
- 2019 • No specific responses.

4 Has there been any unusual weather this year? If so, what kind? (For example, strong winds, storms, much/little rain or snow, etc.)

### **Kotzebue**

- 2011 • Rain in November 2010.
  - Frost even in end of May 2011.
  - High wind storm in fall 2011.
- 2012 • Lots of wind and rain.

- 2013 • Strong S and SE winds on coast.
  - Lots of rain late in season, even yesterday (Dec. 3) in Kotzebue.
  - Unusually warm this fall.
  - Almost no snow this year.
  - Ice too thin to travel at Halloween.
- 2014 • No big storms this year, which would usually arrive and bring snow.
  - Dry around Noatak.
  - Very warm.
- 2015 • Noatak - Hot to cold and too hot, and the berries aren't good.
- 2016 • No snow, little rain. Hardly any storms
  - Prevailing E, SE winds.
- 2017 • We had flash flood high water and lots of rain.
  - A lot of snow. Warm.
- 2018 • Not much snow
  - Raining in August 2018
  - Not as much fall storms as last year (2017)
- 2019 • Like I said, rain. River came up then tried to re-freeze. Almost went trick or treating to Shungnak by boat, but couldn't quite make it.
  - Really bad, lot of rain.
  - When it starts blowing out of south, raining, caribou turn around and head north. They're coming, coming, coming, then you get a low-pressure system and they turn around and head north. Position hunters, set up camp, then low comes and caribou go north.

### **Koyukuk Middle Yukon Region**

- 2011 • Less tundra storms.
  - More dry lightning.
  - Fewer hail storms.
- 2012 • Koyukuk – water too high for fish wheels; drift netting (seining) instead across Koyukuk
- 2013 • Lots of rain. Only two weeks of good weather in July.
  - High water in lakes due to late rains. Past two years, lakes were quite dry, but this year they filled back up. Moisture in Pacific is warmer because of climate change.
  - This seems to be affecting the fish. No salmon; not enough nutrition, so came back smaller. Good run for summer and fall chum.
  - Leaves stayed on the trees until late October. Moose stayed up in the hills because there was food available. Very different.
- 2014 • Rain last January. In middle Yukon, one freezing rain event in mid-winter.
  - Weather changing – wet summer, cold spring, not as much snow in winter. Hard to travel now with snowmachine.
- 2015 • Rain in late January 2015, rained on snow, created sheet of ice, made travel difficult.
  - Rained July, August, September 2015. Lots of rain, rivers high going into freeze-up.
- 2016 • No snow this winter (2016-17).
- 2017

- 2018 • It's warm and more snow.
- Lot of rain this summer.
- 2019 • In 1993 had 80 below [zero] for 10 days straight. Colder was better because people could travel safely, but now not as safe to travel on the Yukon River. Used to go to Fairbanks all the time by snowmobile, but now have to wait until after Iron Dog race because afraid [it's not safe.] Sometimes no snow on entire section of river because blown off by wind – just glare ice. Wind will blow sand on snow and makes it melt faster. And makes harder to travel because riding on sand and glare ice (no lubrication for the slides, so look for open water to lubricate machines).
- Last few years in Allakaket, weather has been mild and warmer; cold snaps are shorter.

### **North Slope**

- 2011 • “Everything is unusual.” General trend over last 20 years is warmer.
- 2012 • Barrow - We had good snow at first this fall (2012) but then it quit. The southern coastal plain and foothills are brown. This may be good for foraging caribou but is harder on predators and lemmings. It's so warm that gulls are still in Barrow. Wainwright - Lots of rain in August. Villagers were able to boat further upriver than ever before.
- 2013 • Wainwright – Nothing unusual.
- Brooks Range Aviation (North Slope) – Late breakup in spring 2013 was very notable. Two freeze-ups this fall – early and late.
- 2014 • Point Hope – Rain in mid-winter, after first snows. Still no sea ice on south side of Point Hope and even on the north side it is five miles offshore. A lot of erosion due to this, threatening airstrip.
- Wainwright – Rain after first snows.
- Some of the old ways to predict weather may not work anymore. Changing weather patterns are interrupting the hunting cycles. It is hard to adjust to changes in weather cycles and behavior of animals.
- 2015 • Point Hope – Rains in January and February 2015. Temperatures were 30-40 deg. F, with rain. Rain made everything icy, up in mountains also. Maybe more rain during the summer and fall 2015 than previous.
- Barrow – A lot of rain in summer 2015. A lot of overflow in rivers inland.
- 2016 • Late freeze, and early break-up.
- 2017 • Wet weather rain, light showers, and some heavy rain in October, very wet this time in October.
- 2018 • Snowing in July.
- Mix of little rain and snow in September and part of October.
- High winds in late July, about 35-45 mph winds.
- 2019 • Creeks were high; made traveling difficult.

### **Seward Peninsula**

- 2011 • Summer conditions were late coming on. Cool and wet weather affected fish drying; took place about three weeks later than usual. Dry August.
- Stormy early in the year.
- Not much snow when you get 40 miles out (on ice).
- Seems easier on animals because they weren't dealing with deep snow. Skimpy near lava beds.
- 2012 • Late spring in 2012 – breakup very late; fish late
- Rainy/cool summer conditions in 2012; lots of summer rain; “never seen so much rain”

- 2013 • Weather generally – storms are not unusual anymore. Last year it was cold all fall but little snow. This year (2013) it is warmer, but there is storm after storm and no snow.
- 2014 • Weather is less predictable. Elders used to be able to predict. Lately found out that magnetic north is off; tilting in some fashion. This may have something to do with what we are seeing in our area.
  - Think that with north wind there isn't as much precipitation (less rain in 2014 than in 2013).
  - Think north wind coming across the open water leads to warmer air temperatures (above zero degrees Fahrenheit).
  - Some lightning around Unalakleet.
- 2015 • There was rain in January 2015.
  - Koyuk – Rainy fall in 2015, coming in from the east.
  - Nome - Last 20 years has had rain mid-winter. Easterly side of mountains gets more snow than west, rain on snow with snow on top of it harder.
- 2016 • It rained constantly the 2nd half of May; August-September 2016 also saw a lot of rain.
  - Lots of strong wind in March.
  - Winter mild and short the last 3 years.
- 2017 • Lots of open streams even now (mid-December).
  - The fall winds were more consistent in the month of August and going strong in October. The rain has been occurring Nov. and Dec. in small precipitation.
- 2018 • Fall to freeze-up, too much east wind. Warm and windy.
  - Yes, warmer
  - No unusual weather this year
  - Rain occurred during late July to early September; cooler summer days.
- 2019 • Last couple of years hunting has been hampered by storms. There were 18 storms last year [2019]. So you have to hit the window just right to even go out and get anything. Springtime (March – late) is a good time to go do something.

5 Has there been anything else noteworthy this year regarding the air, rivers, and lakes, or land? (For example, occurrences of fire that may have impacted caribou range, good/poor vegetation growth, late/early freeze, erosion, etc.)

### **Kotzebue**

- 2011 • Thaws along river banks are still happening (noted that these have happened long ago too).
  - Faster riverbank erosion along the Kobuk River.
  - River bars changing more rapidly; Kugururok, Selby, Lower Noatak.
  - Brief intense fire season in June 2011; ended with summer rains
- 2012 • High water. Didn't seem to be a big deal for animals, but was an issue for hunter access. Transporters had to switch planes to floats.
  - Water so high on Kiana River didn't hit prop on river bottom until back near Kotzebue.
- 2013 Very late freeze-up.
- 2014 • No berries.
  - Seems like Kobuk River water is warmer than usual. Kids (in Noorvik) are swimming earlier in the summer and still swimming in August, which is unusual.

- 2015 • Noatak – Berries weren't good.
- Sisualik – It was a really dry summer in Sisualik, no water in the wells. Blueberries were in the trenches where there was wells, but outside of that the vegetation was really crunchy. But, blackberries at Sisualik were good.
- Kotzebue – Blueberries, but no salmonberries
- Upper Kobuk – Lots of lingon berries (low bush cranberries), but not other berries. It is because we had a warm May and then snow in June. And the June snow killed the berries.
- Kobuk - We didn't have wildfires in 2015. It was smoky, not from a close fire, they were way off.
- 2016 • No salmon berries. Lack of snow. Erosion on riverbanks.
- 2017 • Lots of erosion due to floods.
- Late freeze-up with lots of snow.
- 2018 • Lots of algae in the rivers
- Late freeze up
- Early break up
- Lots of erosion on riverbanks
- 2019 • Every time you get high water in fall, you get lot of erosion. In spring, high water is cold and ground is frozen, so erosion doesn't take place easily.
- Rode upriver (upper Kobuk) with Billy Bernhardt last summer, that river has really changed. Lots of sandbars where there weren't sandbars, bends cut off, river is changing, different bars, river is getting straighter.

### **Koyukuk Middle Yukon Region**

- 2011 No response
- 2012 • Ray Mountain winter habitat needs to be protected from fire.
- This was the first year in many with no fire activity in around Allakaket
- 2013 Nothing additional to responses above.
- 2014 • Permafrost isn't freezing as deep as in past.
- Because of rainy summer, there were not many berries.
- Ground water was really high; froze as ice among the tussocks.
- Icy rain in winter.
- Rain kept mosquitoes down last year.
- Mudslides between Nulato and Koyukuk; a rockslide between Hughes and Allakaket broke the river ice and that open water disrupted safe travel on the river.
- Rainy summer made willows grow; this will help moose habitat.
- Fires burn up caribou feed / habitat.
- 2015 • Temperatures not that high this summer at all. General observation that water temperature in Koyukuk River has risen over time.
- Lots of fires. 2015 significant fire year; 80,000 acre right by sand dunes, foothills of Nulato Hills; big fires around Hughes as well – possible long lasting impact to caribou habitat (food). Some talk about fire and the desire for protection of caribou habitat (food) through more fire suppression. Noted the need to know where the important lichen / food source areas are (e.g., studies to map lichen). (BLM staff noted that the agency is working on mapping.)
- 2016 • Large fires around our area, burning up caribou feeds.
- Normal.

- 2017 • Fires impacted caribou range, late freeze-up/early break-up.
- 2018 • Fire burns up caribou range, leaves poor vegetation growth.
  - It's warm so it's late freeze-up.
- 2019 • No specific response to this question

### **North Slope**

- 2011 • Noted that weather has been cooler in 2011
- 2012 • Barrow – extreme beach erosion in September 2012
- 2013 • Wainwright – More grass & sedges growth (taller than usual). Good berry year.
  - Brooks Range Aviation (North Slope) – Lack of fire. Lots of berries.
- 2014 • Icing on vegetation is getting heavier; impacts to shrubs (which caribou eat).
- 2015 • Point Hope – A good salmon berry year. Used to get them in August, but this year (2015) came in July. Spring came early, whales harvested in early April 2015. Ice lead, half mile out rather than 10-15 miles like normal. Ice very thin by late April and early May. Not safe for pulling up whale.
- 2016 No response given
- 2017 • I have not noticed any changes in the air, lakes or land. Oh except after freeze-up November 3rd, 2017 on the river a silver salmon was caught ice fishing.
- 2018 • River stayed raised [high water] during July and August could not cross.
  - We had a poor vegetation growth. No blueberries, cranberries, salmon berries and black berries, and other vegetation.
  - Freeze-up way too late.
  - I have noticed erosion – Have been seeing this as long as I can remember; as far back as 2007??
- 2019 • Summer was hot. Used to snow sometimes in July, near freezing. This summer around 40. Hot. This year had the record of not snowing in July.
  - Vegetation upriver is growing much faster. Plants come out earlier and die out early, but some stay green another month or so. Scrub is growing taller.
  - Grass and vegetation was growing taller as well. Growing faster and greener. This year (2019), grew as fast, but didn't seem as much vegetation growth as last year (2018). But since it was so warm, in late September a salmon berry bloomed (this was unusually late).
  - The bluffs are eroding faster and changing the river. Ride tide is starting to show up in mouth of river in fall. Zooplankton showing up and feeding from the fish that are caught from nets.
  - Less blueberries this summer.

### **Seward Peninsula**

- 2011 Nothing on this topic
- 2012 • More coastal erosion – trees that are 500-600 years old are washing away
- 2013 Nothing to report.

- 2014
- There is bare ground from Golovin to Darby Mountains.
  - On south side of Seward Peninsula, already have only spotty permafrost. North side of peninsula, it is thinning and disappearing. Pingos disappearing on north side of Seward Peninsula.
  - Koyuk, Unalakleet – Seeing sinkholes from melting permafrost.
  - Koyuk had 3-4 fires; Unalakleet had 2-3 fires (lightning started). Not significant. No fires in Nome area.
  - Erosion events in spring have much less impact than in fall, when the ground is soft and erodes more easily.
  - Very little aufeis along rivers (not big piles of ice).
- 2015
- Koyuk - Fires came early and seemed to me a little more spots here and there in the Norton Sound area.
  - Koyuk - Willows seemed to bud earlier this year. Salmon berries and black berries hard to find in 2015. Used to be many salmon berries, but think they have moved south. Saw a bunch of cranberries. Saw blueberries, but not much.
  - Nome – Last several years had good blueberry crop, but 2015 wasn't as good in Nome.
- 2016
- Early break up and freeze up was the last part of November 2016; majority of September 2016 was above freezing temperature.
  - The absence of snow so far.
  - Late freeze up. No snow.
  - As permafrost melts thicker active layer, the surface is dryer in the fall. Seem to be good for lichen.
- 2017
- Caribou working west into new range the last several winters.
  - The burn area/s has shown good growth and even August the vegetation is bright green.
- 2018
- Permafrost is melting very fast, will change vegetation.
  - Have had hillsides move, road was pushed and had to be rebuilt, permafrost thawing all over.
  - Really not sure. Climate change seems to be noteworthy.
  - Our lakes and rivers were late in freeze-up
  - Frost did not show up until the middle of October 2018. There was a mid-May spring thaw, with little or no snow within our area (Brevig Mission).

- 2019
- Algae bloom on the rivers – Niukluk and Fish rivers. The river never got shallow. This climate change stuff is a reality.
  - Ugruk hunting is different, ice goes earlier. If you don't go out in March you're fighting water earlier. Our whole lifestyle is different – I set nets out for beluga in the fall. But pulled them a month earlier. One or two days isn't good enough. Mid- November it finally calmed down to put nets out. The one good thing about the native community is we'll adapt – we will figure it out.
  - See evidence of melting permafrost and erosion of the tundra soil. More than one person has commented asking what "that dusty stuff" was at the bottom of the river? Peat washing downriver. On the Nome River we didn't even get to the bridge before I could show them the permafrost goo. It was really noteworthy towards the Sinuk River bridge this year. When you glass the tundra there are big crevasses.
  - During July there were a ton of dead fish before they spawned.
  - The water gets too hot (15-17 degrees Celsius) and that kills them. The fish gets hot, uses up all its fat reserves, and then dies from half strangulation / half starvation. That heat coming down absorbs oxygen.
  - There were fires too. We had several fires not too far from our village [Koyuk]. They put out the closer one. The fires are good for re-growth.
  - Some of the biggest fires in western Alaska were the ones at the North River fire. It smoldered for months. There was a smaller one at the Ungalik drainage, east of the Koyuk. Those were former reindeer ranges and now caribou winter range. I don't know if it will stop caribou from coming down. (Noted that Christmas Mountain, Ingalalik, Ungalik. Unalakleet folks call that caribou country.)
- Caribou

6 When were caribou present in your area? When did they first arrive? When were they last seen? How does this compare to past years?

### Kotzebue

- 2011
- Migration started slow in some areas, like along coast and bulls were stinky by the time big numbers of caribou showed up.
  - Big numbers didn't really show until November, but up in Kobuk it was more normal – more like it was 15-20 years ago.
  - Kivalina had caribou; unusual.
  - Generally, along the coast (Point Hope, Kivalina), caribou aren't coming as far south now as they did 20 years ago. They generally head east up the Kukpuk River earlier and through the mountains toward Howard Pass and eastward to the Upper Noatak.
  - Lower and Middle Kobuk, caribou arrived about normal time. Seems like in past 20 years caribou have shifted down from the Upper Kobuk to the Lower Kobuk.
- 2012
- Caribou slow coming into Sisoalik area, but kind of normal. Not enough initially to stock up on.
  - Vern said there were lots of caribou in Noorvik area, but because of criminal incident there were safety concerns among local hunters, so less people out hunting.
- 2013
- Late migration, but very healthy when they did show up. Both bulls and cows were fat.
  - Kobuk - Bulls arrived in late September, just in time before rut.
  - Kivalina – Cows harvested; bulls too stink.
  - Sisoalik – Arrived October; healthy cows.

- 2014
- Caribou migration late, but not as late as 2013.
  - The migration is unpredictable now.
  - First caribou came through when temperatures cooled off in late August; but then it warmed up again and they quit crossing for a long time.
  - The fall migration path was farther east than in the past. No caribou in northwest Unit 23 (Kivalina River).
  - Noatak hasn't gotten any caribou in their area for the past 5-6 years; not enough for their food needs. Many families (90%) have few or no caribou. Have to go way upriver to get them.
  - In July, there were caribou near Kivalina.
- 2015
- Kotzebue – Coastal route, indigenous knowledge states that caribou camp out above Cape Krustenstern area until it really cools off. In fall 2015, they started moving when it cooled off, but they made a right hand turn to where they dead-ended by the NANA building in Kotzebue and they had to run around to go back to around Lockhart.
  - Kotzebue - First time in a long time they were by Francis Ballot slough and area by Sivu.
  - Kotzebue – USFWS took kids out hunting during the 4th week of September when we had snow and it was the first time in years when there were caribou around for the kids to hunt.
  - Noorvik got a lot of caribou. They were late. The ones that crossed on the road system, some of them went through the upper part of the village and the recent ones went up through the mountains.
  - Upper Kobuk - Caribou didn't make it up to Kobuk this Fall 2015 until after it snowed. At first, they couldn't cross the river and then – when it did freeze – we got caribou. Caribou were above Kobuk; crossing between Shungnak and Ambler. There are few caribou around right now (mid-December 2015) near the hot springs. All in all, the migration is later.
  - Upper Kobuk - There were not many caribou in Spring 2015.
  - Noatak - Caribou were pretty scattered this year. Got one up by the Aggie River on August 8, 2015. Got one up by camp September 1, 2015. Looked for one week for the main migration, but couldn't find it, had already passed by. When they closed Red Dog Road (in mid-September 2015), watched the caribou cross for hours. But, they didn't reach Noatak. There's few that come down to the river. Don't get a five a day like we used to, getting two or three a day. It's getting worse. They used to cross closer to Noatak.
  - Red Dog Road – They were a bit late by the Red Dog Road. This year the migration has been spread out. They are still coming; recently saw 3,000 down by Aqaluk.
- 2016
- September, October—Very healthy caribou.
  - Mid September—Lower Kobuk.
- 2017
- Late November-December arrived.
  - Very few caribou this year.
- 2018
- Seen a few in September near Kiana
  - October can cross
  - Were very late
  - Along the coast - northwest of Kotzebue, one lone caribou harvested in mid-September, another lone caribou harvested in mid-October.
  - Mid-November caribou movement occurred after the bay in front of Kotzebue froze—good harvest in Sisaulik.

- 2019
- They arrived in September.
  - Middle of August up the Noatak River they showed up. Getting earlier than other years.
  - Didn't get any caribou up there (upper Kobuk). No fall migration. They started filtering through behind Bornite more recently.
  - A few crossed in August, then they were not seen again until Oct 13. Then they really crossed Kobuk River. People spent thousands on gas looking for those darned caribou. Went to Onion Portage and back and nothing. Everything came to a standstill. Until Oct 11. Then someone said they're downriver below Noorvik. My freezer was empty. Sure enough, they were on the tundra behind Camp Sivu, going north. I know if there's ice along the edge of the river they won't cross. They'll keep following the river until they can see clear all the way across. Sure enough, they start crossing below Kiana. The day before freeze-up they crossed. I told them the river was going to freeze. When you see ice crystals, it's going to freeze. Caribou hung out and they're still migrating.

### **Koyukuk Middle Yukon Region**

- 2011
- Around Huslia, woodland caribou tend to be fat and the ones off the flats are in poor condition.
  - The last big herd around Huslia was in 1994; so seeing a lot more caribou there this year than for many years.
  - In Middle Koyukuk, caribou came from an unusual direction; came from Kobuk Flats. But this is first time in 10 years that caribou came through. Came about a month late.
  - Huslia area, caribou came about a month earlier than usual.
- 2012 Koyukuk –
- Galena had caribou in the spring but none in the fall
  - Allakaket – good caribou harvest; were there this spring (2012) after having been absent for 10 years
  - There were lots – thousands around Koyukuk, past Allakaket, from Ray Mountains (caribou were around unburned areas)
  - Caribou came in having made a westerly loop; used to come in from east. The presence of the Haul Road changed the migration path.
  - Influx of caribou started with just 4 and everyone knew right away (announced on CB)
  - Village elders encouraged hunters to only take what they needed and leave nothing to rot out in the field in hopes that the caribou would continue to come back to the area in future years.
- 2013 Koyukuk –
- No caribou in Koyukuk. This fall (2013) there were WAH caribou on the north river bank at the Yukon River Bridge. First time they' have been there in 40 years.
- Allakaket –
- No caribou yet in 2013.
  - Before they put in the haul road they always had caribou all winter. When they put in the road, they didn't come around anymore. However, now they are starting to come back. Two years ago, caribou came from the west to Allakaket. Mentioned “good caribou harvest in the Ray Mountains.
- Fairbanks –
- Fairbanks hunters generally hunt 40-mile or haul road. Pretty normal year for hunting.
- 2014
- No caribou yet in any of these communities in fall/winter 2014.
  - Allakaket – Prior to 1974, there were caribou a few miles out of Allakaket every year. Now there are none.

- 2015 • Haven't had caribou present in Upper Koyukuk or Alatna/Allakaket area for a decade, except for one year.
- There have been caribou within 50 miles, but difficult to get to. Cost of gas is very high.
  - Prior to 1974, caribou were just a few miles out of Allakaket, but they don't come back anymore. (In 1974 the haul road was pushed north for the Trans-Alaska Pipeline; after completed, don't see anymore due to traffic on road; almost parallel to caribou migration route.)
- 2016 • No caribou for ten years [around Allakaket]. Before the [Trans Alaska] oil pipeline was put in, we used to have [caribou within] a few miles around Allakaket. The oil pipeline impacts the caribou routes. Roads will impact caribou movement. Winter of 1994.
- 2017 • In year 1974 the oil pipeline road was built going to the Slope. Before that year there was caribou in Koyukuk River. Present Time there is no caribou in the area. The north to south road impacted the caribou route.
- 2018 • Last year, 2017 we got caribou in Allakaket that travel west from Kobuk River—no caribou yet this year.
- No caribou present in Koyukuk area in 2018.
- 2019 • [Caribou were last in Allakaket in] 1974; impacted by haul road [Dalton Highway], which created a lot more access for people to harvest caribou. Caribou loop around community. Caribou used to winter in Ray Mountains – good caribou habitat. [Now] people travel about 40 miles to harvest caribou; travel to Bettles to hunt; also travel North to Gates of the Arctic National Park and Preserve (GAAR). [Hunters] don't shoot the lead caribou because then they will detour/change direction. There are problems with sport (non-local) hunters shooting lead caribou and diverting the herd. If follow river from Allakaket downriver to Hughes – couple of young guys that go halfway to Allakaket when caribou are around, get 10-20 caribou and bring back to Hughes; 80 miles for nomadic people is “nothing”.
- Bunch of caribou went through Nulato in 1993 for the last time. Before 1993, it was at least 50 or 60 years since caribou were in Nulato. Woke up one day in 1993 and were surrounded by caribou; used to have caribou in Nulato area because before European contact, had clans and Michael is part of the caribou clan. 1993 was a wake-up call because always knew we were the caribou clan. In spring-time if really want to get caribou, can get because ground is hard/crusty and easy to travel – travel from Nulato to Point Hope and Kotzebue to hunt; right now go to Kaltag to Unalakeet, about 80 miles one way from Nulato to access caribou.

## North Slope

- 2011 • Can be caribou on North Slope at any time of the year.
- In Wainwright, saw caribou in July coming from the south. They'd also see them from other directions and sometimes they stay through winter.
  - In Upper Noatak (Douglas and Cutler Creeks), a lot of caribou there in mid-August in very large groups. In September, only in small groups.
  - Bettles haven't seen very many caribou coming through for several years.

- 2012 • Wainwright - Lots of caribou stayed around Wainwright all winter, so we had wolves around, too. By April 2012, caribou groups had grown to about 1000 individuals.
- Wainwright - Caribou normally begin migratory behavior in late August, but this year (2012) they were just feeding, not moving at that time. As a result, when hunting he couldn't find them near the river so had to make long carrying trips to get carcasses back to the boat. Bulls were healthy and fat and entered rut early (mid-September 2012). The tundra was very wet this September (2012). The calving seemed like it could have been late and calves were less healthy/seemed weak and some had evidence of disease around their ankles, although there was no sign of any kind of hoof rot or anything in the adults.
  - Barrow - There were a lot of caribou in Barrow area in July 2012 and hunters were successful. Caribou arrived near Barrow in late November 2012 and were really fat and healthy. Some appeared to have gold on their teeth; what is that?
  - General - Caribou were not at the rivers/river crossings at their usual time and hunting required a lot of hiking across the tundra to reach the herd.
  - Barrow – Caribou on the Chipp River (S of Barrow) had shown up on the river late this year (2012).
- 2013 • Wainwright – Caribou seen any time of the year, as always.
- Brooks Range Aviation (North Slope) – Can only relate this question to times when they are guiding. But, caribou were in normal areas this fall and stayed later (12th-15th) before moving south through the Brooks Range. Numbers of caribou were good / normal. More large caribou.
- 2014 • Point Hope – Used to get caribou in July, but now coming later. It has been 10 years since caribou have come near town. Have to go nearly to Kivalina to get caribou.
- Wainwright – Herd from south was late this year (late October, early November). Getting caribou now (December).
  - Barrow/Nuiqsut – Last year Barrow had caribou, but this year they have to go more than 40 miles to hunt. Since people are having to travel further, community sharing gas, etc.
- 2015 • Point Hope – In 2015, caribou came to Point Hope later than early July (as was usual). In fall 2015, caribou were five miles out from town in late October and early November, so that was great. Good fall season for Point Hope. First time hunters giving away their first catch. Been a long time (10 years or more) since caribou wintered around Point Hope. Caribou still hanging around right now (December 2015). Folks are up river right now ice fishing and able to get caribou right now.
- 2016 • The caribou didn't come as close to our community (Wainwright) as years past.
- 2017 • April thru August, then they came back again October thru December. Last seen in December. It was unusual because they were usually around in September. But heard there was a bear around our area and I finally seen some caribou signs of tracks further south about 10-15 miles.
- 2018 • [Caribou have been present near Atqasuk] as long as I can remember
- In 2018, caribou near Atqasuk in August-December, May-July.
  - April arrived? Last seen December?
  - None to compare, been same for a few years.
- 2019 • First showed up in April, May. They're still there in Barrow (the ones that came from the west are still there). Teshekpuk Herd (TSH) is still there too. Wainwright did pretty well, caribou farther upriver.

- 2011 • Northwest of Nome, about 80-90 miles, there's a group of caribou; people talk about them being resident to the Seward Peninsula. Reindeer industry would like to test to see if they are caribou.  
 • This year, caribou are near villages. Last couple of years hasn't been like this. Caribou returned to calving grounds at about normal time.
- 2012 • Harvested caribou in late April 2012 by Chicken Hill  
 • There are resident caribou on the Seward Peninsula  
 • Lots of harvest in April; males make up a big percentage of harvest at this time  
 • Robust fall (August, September) hunting, both caribou and moose  
 • Granite Mountain consistently has caribou  
 • Serpentine Hotsprings area has consistently had caribou for past 5-6 years; 120 miles each way from Nome • White Mountain and Nome hunters didn't have to travel too far last winter  
 • Shishmaref hunters only had to go 20 miles to get caribou  
 • East side of Fish River flats had caribou  
 • Bulls near Darby Mountains; year-round herd in this area  
 • In December 2012, Nome hunters already getting caribou  
 • Caribou were further south than in past years  
 • (Noted that in the 1950's had to go almost to Yukon River to get caribou)
- 2013 • Nome – Caribou were late arriving to Seward Peninsula. Moved farther west on peninsula than usual. Moved in rapidly.  
 • Koyuk – Seemed like caribou arrived with first snow.
- 2014 • Nome – At Serpentine, 100,000 caribou on Seward Peninsula since late October 2014. Nome hunters driving to end of road to hunt them there. They are arriving a bit later than average, in mid-to late-October.  
 • Koyuk – Started getting caribou in November.  
 • Elim – Caribou are 20-25 miles NE of Elim, but can't use snowmachine to get to them due to lack of snow. No caribou hunted yet in 2014.  
 • Golovin – Not able to hunt because no snow.  
 • White Mountain – Got about 13 caribou from hot springs area.  
 • Herd up in Darby Mountains that stay there year round.
- 2015 • Nome – Spring 2015 – Thousands of caribou above Bunker Hill in April 2015. Fall 2015 – Caribou in the flats now (December 2015). Usually when there's a big snow, that's where they stay the rest of the winter. As long as wolves don't harass them, they'll be there.  
 • Koyuk – Spring 2015 – Some caribou seen up Koyuk River in April 2015. Fall 2015 - First caribou seen in early November 2015. This has been pretty consistent for the last six years.  
 • Elim – Spring, 2015 – March 2015, 20 miles northwest of Elim, people catching caribou. Those weren't caribou, they were reindeer. Caribou were gone by then. They had Merlin and ear tags. Caribou leave in January, maybe it's the reindeer that are around. Fall, 2015 - First caribou in October 2015.
- 2016 • Local reindeer herder saw caribou in his herd's range in mid October 2016 (caribou are probably from the year round caribou/reindeer herd around Serpentine River). Fall/winter 2015, bull caribou were observed around the Agiapuk River; females toward Kuzitrin River.  
 • The caribou have not been sighted yet. Last year they arrived around early November. The last sighting was late March or early April. Some years they were farther away from the populated area.  
 • We had a few animals hit the road area north of Nome, very few animals though.  
 • Kougarok Road Oct. to April 10th. Similar to the last 10 years but more animal came far west on the Peninsula.

- 2017 • Winter 2016-17 Northside Seward Peninsula on border of GMU 22.23. Now mid Seward Peninsula – Nulato Hills for a change.
- Yes. Around end of November. April is my best guess. Very similar.
- 2018 • They have not arrived [near Nome] this year [as of December 2018]. Just feral reindeer in small numbers.
- We were able to hunt into April [2018].
  - High snow year and it was good traveling. We have a lot of snow early this year, so caribou may go south from Granite Mountain.
  - Have yet to arrive in 2018. In the past they have gotten to us [in Nome by] mid October.
  - Yes, November-April last seen [in Koyuk area]. Think it was consistent in comparing earlier times.
  - [First arrived near Elim] 12-10-18
  - Caribou have been present throughout the year (north of Brevig Mission) as they have access from Serpentine River area through the mountain ridges to the west.

- 2019
- About 10 miles north of Brevig Mission. They go through Taylor. Weiouyanna used to say the caribou are always on the north side. They were there in October 2019. Maybe a resident herd.
  - The caribou either go through the northside by Kotzebue or come to the Goodhope area. Or they come through the Bendleben Mountains. Those are the two areas we see them. Most caribou are in the eastern portion of the Seward Peninsula.
  - They come through Darby Mountains. Where there were a lot there would be caribou stretched for 3-4 miles. It was like the whole mountain moved there were so many caribou. I said to my friend, there are caribou and a lot of them! All moving south. Some of the reindeer had purple/pink tags on their ears. There was a lot that come down by Darby Mountains. Almost every year.
  - People were going past Koyuk over to the Buckland area to get caribou last year. Or they were going north of the lava beds.
  - In March 2019, there were some about 60 miles east [of Koyuk] that passed through. Folks from other villages would go hunt them. We had to go further because they went somewhere... over 150 miles one-way in February-March. But the caribou we saw were in dispersed groups of about 40-50. Biggest [group] was over 100. My brother used to say that when it's south wind the caribou will travel into the wind to migrate. They'll go southwest in the fall. I don't know if it [wind] has anything to do with how fast and far they move.
  - A couple of resident rein-bous by Mt. Bendeleben. Hard to catch. More by Black Mountain by Serpentine. They walk over towards Nuluk and back. There are so few and so much pressure on them that they're hard to get from Nome. They were way, way east. Reminded me of the 1990's when you had to go to Granite Mountain to get caribou.
  - Too far [from Nome] for me. I didn't go after them. From my cabin it was 26 miles one way. Last 2 years were further than that. They never made it in to McCarthy's Marsh. Guys were going over the mountains into the Kiwalik. Past the lava beds looking for caribou.
  - In April they were out in the northern portion [of Seward Peninsula].
  - My sister used to see them in the fall time – they come from the north. All the women and children used to get on that hard snow and dig out the snow. The caribou would come down and women and children would chase them down. At the bottom men would be there with knives.
  - Once you start seeing nubs on the bulls, that's when you harvest them. In the Kuzitrin and Fish River Flats, the caribou were real spooky.
  - You want to get the migrating ones in March. Once they migrate down they travel and are real skinny, but if you wait until March they're plump again. If you wait for nubs, those are the real prime. That happens in March when they're getting ready to go north again.
  - There's a National Park Service (NPS) cabin at Cottonwoods, at the Goodhope River. It's right at the divide. It's a place to go overnight. And in the morning go to the ridges to look for caribou, but last year there was no luck.
  - Shishmaref was harvesting caribou year round at the Serpentine Hot Springs area. Right around Ear Mountain.
  - Kuzitrin Lake was a bust too.

7 How many caribou were in your area? What was the composition of the herd like (calves, males/females)? How does this compare with past years?

### **Kotzebue**

- 2011 • LOTS.
- Early on, there were relatively few bulls, mostly in the Lower Aggie and the Sisoalik are in November. In August, there were very few caribou along the entire Kobuk, Noorvik to Selby Lake, but there were wolves and bears seen up there. Also may have been too warm this fall.
- 2012 No specific response.

- 2013 • Once they arrived, there were LOTS along coast and Noorvik.
  - Lots of bulls. Few boats got more than five per day.
  - Caribou fat.
- 2014 • First caribou in the fall were mostly females and calves (early September); mostly bulls and cows in later September.
- 2015 No response to this question.
- 2016 • Lots, but migration moving further south.
  - Lower Kobuk—Kiana area, fair amount, lot of female and calves.
- 2017 • None.
  - Very few caribou.
- 2018 • Very few in Noorvik area
  - Seeing males, females, calves
  - Migrating later and later
  - The late fall, early winter, saw equal number of bulls, cows, and calves
  - Harvested only cows, good body fat
- 2019 • Very few came at a time. 1, 2, or 3 at a time.
  - Really good migration overall compared to a lot of years. Steady. When I started guiding at end of August, caribou were around in early August in the flats between upper Kivalina and Wulik. Pulled last camp on 28 Sept, 8,000-10,000 up the Kivalina. Caribou were coming down from Noatak, but caribou stayed up in the mountains, they didn't head west towards Noatak. Just stayed in the mountains. When I flew on a direct line to Kugururuk, caribou all over on the right wing.

### **Koyukuk Middle Yukon Region**

- 2011 No response
- 2012 • Snow was deep last winter near Kaltag so fewer than usual caribou
- 2013 Nothing additional to responses above.
- 2014 No responses.
- 2015 • Some discussion of the Ray Mountain herd, which numbers less than 2,000 animals.
- 2016 • No caribou for ten years [around Allakaket]. 1994. 50,000
- 2017 • No caribou in this area.
- 2018 • Not too many caribou.
- 2019 • Little herd near Galena – called Galena mountain herd.
  - And traveling between Nulato and Huslia – caribou are on the trail (90 miles by trail); majority of trail is on land, so easy to travel between these villages; these trails are old mail trails from when using dog teams and walking; because of climate change, can't travel on river as much, so using these old trails more, called "portage".
  - Can get from to Allakaket from Hughes or from Tanana/Fairbanks if know where old mail trails are. Started marking these trails better. Traveled from Nulato 585 miles to Nome on trails.

### **North Slope**

- 2011 • Hunters out of Bettles saw fewer bulls.  
 • In Barrow, depends on time of year. Last July, lots of bulls near town, but most all caribou were gone from vicinity of Barrow in August. However, there were many along the Chipp River area where lots of Barrow people have cabins, but there were few older bulls at that time, mostly young bulls. Just last week (late November 2011), caribou came closer to Barrow, coming from the west.  
 • In Wainwright, sometimes caribou are around and sometimes they are around Atqasuk in winter.  
 • In Anaktuvuk Pass, there have been fewer caribou moving through in both the spring and fall since the large fire in 2007.
- 2012 • Wainwright – Once there was about 6” of ice, caribou came by the thousands and the females were obese with 2” of rump fat. In September, the ratio of mature bulls to other caribou was about 1:20 or 1:30, but by mid-October it was more like 1:10. There are still plenty of caribou around Wainwright now. The average household harvest this fall was about 20 caribou and a lot were sent to Barrow.
- 2013 • Wainwright – Lots of caribou, year round. Hunting success very high. Lots of calves. Fewer barren cows. A decent number of bulls.  
 • Brooks Range Aviation (North Slope) – Lots of caribou in fall (normal). Movement began as a trickle, then full migration. Seemed like plenty of bulls.
- 2014 • Point Hope – Not many near town anymore, especially in fall.  
 • Wainwright – Quite a few caribou, both TCH and WAH, but not as close to town as before. Saw a lot of calves this fall, similar to previous years. Hardly any bulls; proportion of bulls to cows is lower than usual. Bulls were large antlered.  
 • Barrow/Nuiqsut – Decrease in number of bulls to cows this year. There were lots of caribou around town last winter, but this year they are more than 40 miles away and not numerous.
- 2015 • Point Hope – Lots of calves with the cows.
- 2016 • We had a good mix of caribou we did see.
- 2017 • In August we had big herds coming through our area by the hundreds. Majority of the herd was female, calves, and young bucks, 25 male per 100 caribou. Last year was about the same except herds of smaller by groups of 150 or less.
- 2018 • April-July about 3-27 in a group. August hundreds, September 3-25+ caribou in wide area. October there were 1- 23 in groups. In November-December, 1-9 in a group. Depends on migration changes, bears, wolves, wolverines in the area changing the direction of the caribou/reindeer.
- 2019 • A lot within area, especially in summer. Didn’t have to go far to get caribou. Creek was high, so no one could travel much, and lots of caribou. Grandson was walking with a caribou. During summer felt like there was more caribou than normal. When creeks and rivers are low, they go farther out/away.  
 • About 2,000 of TSH herd upriver, didn’t leave area. Western Arctic Herd already away.  
 • Seemed like more cows and calves, and young bulls.

## **Seward Peninsula**

- 2011 • Caribou seem to be dropping antlers earlier.  
 • Reports of caribou mixing with reindeer in Teller area.
- 2012 No specific response.

- 2013 • Nome – Probably 100,000-150,000 caribou on Seward Peninsula now (Dec. 2013).  
 • Koyuk – mixed age and sex ratios.  
 • Caribou use areas with less feed than what reindeer would tolerate.
- 2014 • Nome – ADF&G says there is approximately 100,000 caribou on Seward Peninsula now, near Serpentine (Dec. 2014). As he has hunted, the most he has seen is about 500 animals. Least seen on a hunt is about 25 animals.  
 • Emphasizing that caribou matter to people that live in the winter range, just as they do to people living farther north.  
 • In early October, there were many north of the Darby Mountains, heading west.  
 • Koyuk – mixed age and sex ratios (cows, bulls, calves). One report of about 300 in a bunch north of Koyuk.
- 2015 • Nome – Overwhelmed with Caribou this year. A few weeks ago (December 2015) still a lot. More so than in the recent past. Thousands and thousands. Fall 2015 had more caribou on the Nome road system than 2014. This year was the first year in memory of having so many caribou show up.  
 • Koyuk – Biggest group Morris saw was a couple of hundred. Hunters said there were more dispersed small groups. The number of caribou in our area for me is hard to estimate. From what I seen and heard there seems to be about almost an equal or close to equal number of bulls and females and calves were around some females, not sure about percentage.  
 • ADF&G survey observations (Tony Gorn) – Dec. 4-5, 2015, flew Game Management Unit (GMU) 22C. Saw caribou on doorstep of Casa, American Creek flows into GMU 22B, caribou there. Did not see thousands, but saw dozens at mouth of Casa. Group of six headed southwest and turned around at snow. Headed back and near Council runway. Didn't see thousands of thousands. Flew GMU 22C all day, didn't see many more. This seems like the time of year when they're not pushing further, they're pushing back.
- 2016 • The main herd in Seward Peninsula were toward the Kuzitrin River lava beds area; following high ridges from Mt. Bendeleben area toward Davidson landing.  
 • It has been difficult to put a number only rough estimates can be made. The fragmented info in regards to the sex and calves were the females and calves were close to half as many as the bulls.  
 • The main heard was north of the road system so not sure.  
 • Very dense groups about 90% of herd. Good survival and relatively young animals.
- 2017 • Lots in the west. Cows, calves, yearlings, not many bulls.  
 • Hard to make an estimate, a fair amount of all. Pretty average.
- 2018 • Late winter 2018 and spring was good hunting [near Nome]. Strong [caribou] numbers then. But not this fall [2018].  
 • Have hunters getting caribou year around. These [include] animals through main migration and others that spent the summers on the Seward Peninsula.  
 • +500 estimate [Koyuk area]. And that's below half way decent estimate. The area that the caribou migrated through it was difficult to give a clear answer. The caribou basically went through the same area used before.  
 • Normal as last year (Elim area)  
 • Caribou bull concentration was in the northern portion of the Seward Peninsula moving from east to west in and around Ear Mountain.  
 • Female concentration was in the eastern part of Seward Peninsula, in and around Serpentine River.
- 2019 no additional comments.

8 If you harvested caribou, how did the meat and skins compare with past years? What did you notice about fat? Parasites?

**Kotzebue**

- 2011
- Very fat; fat from back of ears all the way up to tip of the tail from early fall caribou.
  - The caribou that didn't show up until later, meat was still good but less fat. (Mostly having to shoot cows.)
  - Caribou seemed healthy.
  - Parasite numbers seem lower than in the late 90's and caribou in good condition.
  - Some think that caribou are fatter now than 6-8 years ago when population numbers higher.
- 2012
- In general, caribou are fat and in good shape.
  - Early caribou were better than the later caribou.
- 2013
- In general, caribou are fat and in good shape.
  - No evidence of parasites (much less than compared to ten years ago).
- 2014
- Caribou are very fat and healthy. (Same as last year.)
  - Big bulls – big body and fat.
  - Meat very good.
  - Kivalina – noticing caribou are smaller; perhaps hybrids with reindeer.
- 2015
- Noorvik - Caribou were fat. Never seen it except for this Fall (2015); they were very healthy caribou. Caribou are very healthy. Even in the Spring, when they were migrating back, they were very healthy.
  - Kotzebue - Caribou conditions were really great this fall, hair was shiny, really good shape caribou.
  - Bulls and cows were both fat and healthy.
  - Upper Kobuk - Different in upper Kobuk, we don't get those good Spring caribou. In the Fall, by the time they get to the upper Kobuk they are damn skinny because they've been traveling a long ways.
- 2016
- Lot of fat. Skin was good.
  - Healthy and fat.
- 2017
- Very slow – no fat.
  - No caribou.
- 2018
- Good health
  - Fat
  - Harvested only cows, good body fat
  - In 2018, saw the least amount of rump and gut fat on caribou bulls that he recalls seeing in the past 52 years.
- 2019
- Quite a few parasites. More than other years. In the ribs, like bugs, couldn't deal with it because of bugs. Smelled bad.
  - Bot flies in the throat. In the fall time you don't see bots. You see them in the springtime.
  - Caribou are very healthy. Very healthy caribou. The ones that came in this fall. I noticed I opened one up and I couldn't stand the smell. I just left it. It was so bad. Their elbows had big pustules and they were sick like. You can't tell that when they're in the water. You can't see their legs in the water.

**Koyukuk Middle Yukon Region**

- 2011 • Too cold to hunt this fall, not much harvest yet around Huslia.  
 • What has been harvested has been poor condition.  
 • Not much harvest yet in Middle Koyukuk as caribou have just arrived. Happy caribou have returned to the Koyukuk River.
- 2012 Koyukuk –  
 • Caribou appeared to be in good shape  
 • No parasites reported in Galena or in Huslia  
 • Caribou from the woodlands were fatter than in prior years, but those from flats were in poor condition  
 Allakaket –  
 • No parasites  
 • Bulls from Ray Mountains in good shape
- 2013 • Caribou appeared to be in good shape.
- 2014 No responses.
- 2015 • Noted that Hughes and Huslia are only communities that harvest.  
 • Noted that caribou from tundra not as good, but ones from woodlands better.  
 • Fairbanks (non-local) hunters (hunting not in the Middle Yukon area, but near Ambler, Dahl Creek, Kobuk River) came back with very good, very large caribou with good antlers and a lot of fat on hides.
- 2016 • No caribou [around Allakaket]. 1994, low fat.
- 2017 • Caribou were in good shape.
- 2018 • The caribou were in good shape.
- 2019 • Caribou on Unalakleet trail were in really good shape. And got some caribou from friend in Shungnak that were in really good shape. Even though no caribou in Nulato, still the caribou clan, so sing the caribou song every year for the caribou to come back and then next village over also sings the same caribou song. Mostly go over to Unalakleet to harvest caribou.  
 • Depends on the weather and snow depth because if deep snow have to dig more to eat. Last April [2019], got a whole box of caribou meat from friends (in Kobuk/Shungnak?). Caribou travel down valleys from GAAR; caribou cross by Hughes.

### North Slope

- 2011 • Wainwright – caribou that come from the north are fatter than from the south. Caribou are healthy.  
 • Barrow – Caribou have been fat in 2011; fat in July and still fat just last week.  
 • Anaktuvuk Pass – healthy fat caribou in August.  
 • Noted that weather has been cooler in 2011, so maybe less insect harassment and caribou had chance to build up fat.  
 • Noted that some caribou have external boils. Sometimes see caribou with lungs stuck to their ribs.

- 2012 • Pt. Hope - Caribou fatter and their meat softer; the previous year it was tougher.  
 • Wainwright – Females were obese with 2” of rump fat.  
 • Barrow - Caribou arrived near Barrow in late November 2012 and were really fat and healthy. Some appeared to have gold on their teeth; what is that?  
 • Wainwright - The calving was late in 2012 and calves were less healthy/seemed weak and some had evidence of disease around their ankles, although there was no sign of any kind of hoof rot or anything in the adults. Noted that calves appeared very small and weak and there appeared to be a lot of calf mortality, specifically many calves that were “too small in September” (2012) and were abandoned by the river.  
 • Pt. Hope - mentioned they (with Jim Dau, ADF&G) had wanted to examine some caribou that had died near Cape Lisburne (possibly starved?) but were unable to reach them due to bad weather.
- 2013 • Wainwright – Same as previous years. Females pretty fat. Healthy overall.  
 • Brooks Range Aviation (North Slope) – Nothing unusual. No excessive parasites.
- 2014 • Point Hope – Not as fat as they used to be; maybe a function of how people harvest, since they are traveling so far they may be willing to take the skinny ones.  
 • Wainwright – Expecting to see more blood on caribou hooves caused by bleeding from rain/ice storms.  
 • Barrow/Nuiqsut – Mostly fat caribou brought in. Some caribou still have lots of fat in November. Think this may be due to less sea ice and more moisture in the air in the fall.
- 2015 • Point Hope – Caribou came by in November; were nice and fat. Very happy there was meat to eat. All kinds were harvested. No mention of parasites from community. Healthy animals!
- 2016 • Nothing out of ordinary.
- 2017 • Majority of the caribou harvested the meat was good, the skins were good, the fat was a lot less from last year but some had more fat than others like the bulls. Did not see any parasites at this time.
- 2018 • I have seen less fat this year, but enough fat in between the meat. Bones less fat.  
 • No parasites known for me that I have experienced.  
 • Meat and skin are fine no changes that I have noticed.
- 2019 • Caribou looked very healthy.  
 • All looked healthy; calves too.  
 • Heard that in Wainwright, caribou were fat with few parasites. Heard about one this year and one last year with the worm.  
 • One person harvested about 26 caribou near Nuiqsut, about half were sick. Other reports of them being sick upriver – had parasites, clear puss in joints. Some had clear green (metallic tinged) fluid.  
 • Some had swollen lymph nodes. Some had small black (like rice grain) throughout meat.  
 • One caribou harvested had big scar on back leg, maybe an old attack of a bear/wolverine. Another had fresh wound.

### **Seward Peninsula**

- 2011 • Elim – animals seem lean but meat is good.  
 • Koyuk – the most fat they’ve seen is about ¾ inch layer on cows.
- 2012 • Bulls with knobby antlers in spring are ready to harvest and are good eating.  
 • Lots of healthy caribou. No concerns.

- 2013 • A lot of the caribou were fairly lean. Cows fatter than bulls.  
 • August was best time to get caribou.  
 • First group of hunters that encounter them, they are not wary. For later groups they are “seen a half mile away and they’re running”.
- 2014 • Nome – Of the five harvested in late October/November, there were a lot of warble flies. All were skinny (no fat), but that is typical for this areas.  
 • They improve in condition over the winter. If you get them in October, they are skinny. However, if you get them before they go north in the spring (e.g., March), they are better.  
 • Koyuk – Some with fat but mostly lean. Few warble flies. Lesion on liver of one animal (harvested in August).  
 • Elim – In good condition.
- 2015 • Nome – Helped someone skin recently, most like jackrabbits. Only one had fat.  
 • Nome - Caribou harvested this fall 2015 had a couple inches of fat, they were eating good before snow. No snow until late October, got to feed a lot.  
 • Koyuk - Hunters said they had little fat, mostly lean. Just a little fat. Some hunters say some were lean and some said they got some with some fat. Not too much seen or heard of parasites to my knowledge.  
 • No diseases or parasites mentioned.
- 2016 • Majority large bull caribou harvested for our area is when the bull grow show nubs (antler growth) early and indicates that the meat is good for the freezer or drying the meat.  
 • The fat content have in most harvested caribou has been in the meat and the warble fly have still been seen after skinning. I have not heard about any hunters getting any with parasites.  
 • Myself—no harvest yet.  
 • Good healthy animals. Lots of warbles as usual. Got one w/ previously shot and broken front leg. It had been at least a year and had healed. The bone and muscle fused to make it be of limited use.
- 2017 • Meat normal. Bugs bad in over summering animals from Kuzitrin River Drainage.  
 • There are no noticeable changes by the time they reach they are lean. Haven’t heard of any yet.
- 2018 • [Caribou were] OK  
 • Had an animal with nasal bot larva [parasite] in the neck  
 • The skin seems to be about the same. The fat content seems to be the same, along with few that said they got fat ones with at least an inch of fat. Nothing that I heard about parasites.  
 • Normal  
 • Meat was lean but had fat between the muscle meat. Hides were not suitable for sleeping or sled mats as hair was falling out due to harvest in April.
- 2019 • I got maybe two. They were pretty good and lean.  
 • The one thing about those resident ones, they seem to be more parasitized with warble and bot flies. Their calving area isn’t far from their summer range so the bugs get them bad. Late spring – the bugs are so bad in them that they’re hard to eat. I’ve seen calves of some that never left.

9 Were there any other notable changes regarding caribou compared with past years?

**Kotzebue**

- 2011 Nothing re: this topic
- 2012 Nothing additional re: this topic
- 2013 • Late fall migration, but probably following the weather.  
 • Kivalina caribou coming from Noatak; different migration path.

- 2014 • Trail systems and summer snow on mountains direct the migration.
- Caribou go higher up into the mountains when the ground is frozen, without snow.
- Earthquakes scare caribou away?
- 2015 No response to this question.
- 2016 • Larger males
- 2017 • Very late due to warm weather!
- Very few caribou.
- 2018 • Different migration routes
- Second year in a row caribou have traveled later than before due to climate change
- 2019 • Lots of younger bulls. Didn't see lots of big antlered bulls.
- Got some that were as big as a moose, ones later in October. But they had no fat, none, zip. They must have been moving for a while. Nonstop. Because when you butcher it, on the radio people say don't get any more bulls, they're skinny. Started getting younger bulls, they had more fat.

### **Koyukuk Middle Yukon Region**

- 2011 No response
- 2012 Nothing specific regarding this topic.
- 2013 • Friends from Anaktuvuk Pass said caribou were two weeks late coming into the area.
- Has heard the same from Shungnak.
- 2014 No responses.
- 2015 • Historic perspective on WAH - Late 1800's, guys working on steamboat, about 12 miles above Galena relayed story that the WAH was migrating in the thousands and crossing river. Steamboat had to tie up for one week, couldn't go. The steamboat then had to go back downriver and pick up more wood. By the time it came back 10 days later, the WAH had cleared out. They said that where the herd had been crossing the river, the trail was about 300 feet wide and 10 feet down.
- 2016 • No caribou.
- None.
- 2017 • No.
- 2018 • The caribou were a little lean, not as fat as the past.
- 2019 • Depends – want to go before the rain comes because they are nice and fat, but once rain comes, they start getting skinnier.
- Other Animals

### **North Slope**

- 2011 Nothing on this topic
- 2012 • Wainwright – noted that bulls dropped their antlers early this year (2012), in early November.
- Barrow – Noted that “thought that caribou communicate with each other over long distances, maybe like elephants”.
- 2013 • Wainwright – Nothing notable.
- Brooks Range Aviation (North Slope) – Nothing notable.

- 2014 • Point Hope – No trails developed during the migration.
- 2015 No response.
- 2016 • They did not reach as close to our village as in the past and we had to go further out to hunt them.
- 2017 • Yes. Last year seen 1-2 caribou with green pus around the hindquarter, and one with just a growth cyst looking circular with rough looking deformed skin. And this year one caribou had green stuff all around the belly and side of the hindquarter. With another caribou with green pus everywhere around the neck, shoulder, side of belly and on the opposite side of body too.
- 2018 • Yes! Changes of migration direction of the herds, as per being farther to hunt..
- 2019 • This fall, seeing them doing different migration. Caribou not going to Anaktuvuk Pass.
  - Fairly similar to past years, but more caribou to south of town (Atqasuk). Due to more predators.

### **Seward Peninsula**

- 2011 Nothing on this topic
- 2012 No specific response.
- 2013 • Nulato Hills – Not really using the Nulato Hills area like they did in the 1980s through mid-1990s. Shifted away from wintering in the Nulato Hills in the late 1990s. Used to come down the Kiwalik and then hug the north side of the Bendeleben Mountains; did not do that this year, are hanging farther north and west.
  - Noticed the migration didn't cross the Kougarok Road (though there isn't a lot of road traffic).
- 2014 None reported
- 2015 Nothing mentioned.
- 2016 • Spring 2015 hunt toward Davidson's Landing (Imuruk Basin), bulls w/ 2 to 4 inches of fat were harvested in mid April; very little snow was present at or around the first part of winter and one of the first areas observed for caribou breeding, which is predominantly reindeer grazing region (Kuzitrin River area).
  - They spook more easily when they heard motorized vehicles.
  - Movement late and not south far enough to benefit southern areas.
  - Very few animal to the Nulato Hills. 15 years ago at least ½ the animals went there.
- 2017 • None that I know of yet.
- 2018 • The caribou seem to graze in areas that hunters had difficulty in accessing.
  - No notable changes
  - Caribou have been present the last couple years in the northern portion of Seward Peninsula and mingled with the reindeer herds on the western portion of Seward Peninsula.

- 2019 • The little experience I have with them passing the Buckland River and going up north to Granite Mountain. Those were good areas. There was good hunting there. Someone from Nome wants to go to that Candle area.
- In my past hunting caribou, I would go over to the Kuzitrin Lake. That's prehistoric. There are big caribou drive camps on the shores of the lake. It's white there with crushed bone from historic marrow extractions. There are big rocks from caribou drive-lines where caribou would drive through the mountains. You can see tent rings right along the Bering Land Bridge National Preserve boundary. Right between Fish River and Kuzitrin.
  - Boston Creek – don't drive that.
  - Haven't had much luck that last couple years.
  - They may have been pushed out of that area by wolves. I don't see any by the lower portion of the Kuzitrin River.
  - That's where the Darby range runs into the Bendeleben Mountains. Very alpine. Kuzitrin Lake is 800ft in elevation. The highlands are 1000ft. Good alpine habitat for caribou.

10 What did you notice about bears and wolves in your area?

**Kotzebue**

- 2011 • LOTS of black and brown bears and wolves throughout Kotzebue Sound.
- Wolf packs big now. Wolves coming closer to villages; not as afraid of people. Pack now denning on Seward Peninsula (didn't see that very much 20 years ago).
  - Lots of bear cubs; sows with three cubs.
- 2012 • Lots of wolves and bears; getting caribou the last few weeks (December 2012).
- Lots of wolves. Mentioned that if you see caribou, you will see wolves.
  - High water displaced salmon, which in turn displaced bears. Bears coming into town.
  - Discussion about what makes wolf populations fluctuate. Suggested that since cost of gas is high, there is less hunting. There are three wolf families with pups, are getting baby caribou.
  - Not as many travelers and trappers out in the field, to deal with bears and wolves.
  - If reindeer herders were "out in the field" they would deal with bears and wolves, but since there are fewer herders, the predators are coming into town now.
- 2013 • Bears –
- Sisoalik - More bears along coast, very different than in the past. At Sisoalik, never saw tracks before, but now have to carry a gun while berry picking.
  - Noorvik - Lots of brown and black bears, even near towns. Twenty years ago there were no bears; now numerous. Need to liberalize regulations to get more bears.
  - Shungnak – Lots of bears (brown and black).
  - Kivalina / Deering – Elders say there are a lot more bears.
  - Wolves – Lots of wolves; more than in the past. A lot of wolves around villages. Eat the best part of the caribou. At Shungnak, found two moose side by side completely eaten.

- 2014
- Lots of brown bears and wolves. High cost of fuel is reducing hunting for bears and wolves.
  - More brown bears than black bears.
  - Bears breaking into cabins along the coast (Sisualik). This used to be rare, but this year 12 of 13 cabins were broken into by bears.
  - Noatak – Lots of bears and wolves. Bears in the village.
  - Kobuk, Ambler, Shungnak – Wolves in villages. Also lots of bears in Upper Kobuk. People want to hunt black bear more than brown bear.
  - Kivalina – Few bears, no marine mammals. Lots of wolves.
  - Selawik – Bear and wolf tracks on every bar.
  - Deering – Three wolf packs with pups near village; population expanding fast. About 40 bears near Deering.
  - Kotzebue – Four wolves near Kotzebue all year.
  - Traveling Kotzebue to Wulik River – saw 19 bears; lots of sows with three cubs. No moose. Heard wolves howling every night and tracks on every bar.
  - Bear tracks a few weeks ago on lower Noatak River; maybe a polar bear.
- 2015
- Noorvik - We have a lot of predators, a lot of wolves.
  - Bears, wolves. Bears are predators for fish and caribou. Wolves are predators for caribou.
  - Wolves, took a trip to Kotzebue on snowmachine was going to cross a creek on the river trail and stopped on the ridge and smelled wolves. Saw fresh wolf tracks where they veered into the woods.
  - Our people used to hunt bears. They used to like to fall hunt bears. My uncles would go every fall during the night.
- 2016
- Lots of bears & wolves.
  - Both bear and wolves kept the caribou from crossing river.
- 2017
- Reports of lots of bears and wolves.
  - Wolves coming into town at night ? hungry. Seems to be more bear taken close to village.
- 2018
- Lots of bears and wolves
  - In 2018, saw heavy lice infestation on grizzly bears, but the hides looked normal.
- 2019
- Lots of bears and wolves.
  - Lots of people stopped hunting bears in our area. Wolves moved into our area and started digging up fox dens. Three packs of wolves in our area and they start having pups every year.
  - Bear tracks behind Kobuk.
  - There are four kinds of berries. Bears prefer soapberries. I also saw an abundance of new type of lichen. No berries this year at all. Rootless transient lichens are in abundance now.
  - Wolves, waiting down there with their pups. Lots of bears haven't hibernated. Not cold, no snow. For five years, hunters have taken record-sized bears.
  - Bears getting bigger.
  - Really smart wolves now. They come close to the village. They're smart ones. Not like long ago.
  - Way back in ... I went with Walter Douglas and Larry Custer, we'd get the back hairs of wolves.
  - Wolves are getting bigger. You can't lift them up any more.

### **Koyukuk Middle Yukon Region**

- 2011
- Fewer black bears; grizzlies are cleaning them out.
  - Wolf populations normal but packs are smaller and they're broken up more.
  - Wolves are migrating west.
  - Trapper harvests of wolves are down; used to harvest about 200 wolves/year in the Koyukon Region but harvest is declining because wolves are harder to find.

- 2012 Koyukuk –
- Villagers reduce predators by trapping.
  - One year they took 200 wolves in the region, but now they stay away.
  - Black bear population appears to be down since they are being eaten by brown bears
  - Den harvest of bears is way down from previous. Have to travel over 100 miles to find.
  - Not many trappers active in Alatna and Galena
  - Most of the young guys in Kaltag trap martins, but not many people trapping wolves any more
  - ADF&G's Jim Dau may bring Benedict Jones to Kotzebue to teach people how to snare wolves.
- Allakaket –
- Black bear population down, brown bear population up
  - Pollock described this chain of events:
    - Brown bear first ate caribou
    - Then no caribou so ate moose
    - Now no moose so eating black bear
  - Allakaket has requested ADFG predator control around the village
  - Not many trappers active in Allakaket now
- 2013 Koyukuk –
- Wolves normal.
  - Bears (grizzlies) increasing every year. They are killing black bears. Lot's of grizzly tracks. (Old timers used to eat grizzlies, but not anymore.)
- Allakaket –
- Lots of grizzlies, increasing.
  - Hardly any moose.
  - Wolf predator control effort – ADF&G shot 42 last winter.
- Fairbanks –
- Good numbers of both bears and wolves.
- 2014 • Seeing lots of grizzlies. Grizzlies and black bears were out late in fall due to warm weather. Saw grizzly tracks on track-line at Livengood on December 3, 2014. Late.
- Flats (wetlands) full of water pushed bears and moose to higher ground; moose hunters did better in higher ground (and low amount of snow hasn't pushed them back to lower ground).
  - Grizzlies are eating black bears.
  - No coyotes now. Coyotes used to be in the region, but moose came in, followed by wolves. Wolves killed off the coyotes in the 1930.
- 2015 • Seeing lots of grizzlies. Noted that grizzlies migrated from Canada within last 30 years; 50 years ago there were no grizzlies around. Brown bears didn't come to river area, stayed mostly in mountains. People used to hunt brown bear in late November, December, before they migrated (in Nulato Hills). This spring (2015) had a low harvest of bears, but when fall came, lot of grizzly bears. Bears that came in were in good shape, long hair, fat... even older bears were really good skins, large bears got killed this year.
- Black bear that were hunted had no fat on them (Huslia area) and wouldn't have survived the winter
- 2016 • Lots of big bear around [Game Management Unit] 24B. Need to do something about this. People don't eat big bears anymore, so they don't kill them so there is lots [of] big bears now.
- Lots of wolves, low black bear.
- 2017 • There is more bears and wolves.

- 2018 • There are more grizzly bears in Koyukuk River. They kill moose and caribou.
  - The bears, there are more of them, because we don't kill them. We don't eat them.
  - No black bears near Koyukuk.
  - Lots of wolves.
- 2019 • In Allakaket – had state predator control for wolves; grizzly bear population increasing – not too many black bears.
  - Same in Nulato – lots of grizzlies, but not as many black bears; grizzly bears will eat black bears and get them in their dens; know they're super healthy when see a sow with 3 cubs; know not as healthy when only see a sow with one cub. Right now, see most grizzlies with 3 cubs.
  - Do predator control on our own. Have super-hunters in Nulato area – a few guys in 4 days will get 90 wolves and kill most of wolves around Nulato. Moose population seems to be benefiting from this predator control, population is growing around Nulato.

## North Slope

- 2011 • Barrow – Bad bear behavior last several years; cabin damage. Lots of grizzlies last summer; wolf short near Barrow last week
  - Anaktuvuk Pass – lots of grizzlies and wolves
  - Bettles – hunters saw lots of wolves
- 2012 • Wainwright – Lots of bears everywhere this fall, bears were blocking caribou migration until we killed 9 of them in a 10-mile stretch of river.
  - Barrow - More grizzly bears were caught this fall and wolves are coming back to the Barrow area also. Grizzly bear numbers seem higher than in the past. Three wolves were caught in Atqasuk just 2 days ago (Dec. 3).
- 2013 • Wainwright – A lot of people catching more wolves and wolverines, but few bears. Wolves closer to villages. No problem with bears at cabins.
  - Brooks Range Aviation (North Slope) – Lots of wolf and bear sightings by clients. Also a few wolves staying near Bettles.
- 2014 • Point Hope – Good wolf and wolverine hunting, as well as lynx. May be due to high population of lemmings. Lots of bears.
  - Wainwright – Good wolf and wolverine hunting this year.
  - Barrow/Nuiqsut – Not as many predators as usual (bears, wolverines, wolves), but still plenty.
- 2015 • Point Hope – Catching a lot of wolves past several years, with 4-5 wolves taken maybe in a single trip. Seeing a lot of wolf sign. Few wolverines around as well.
- 2016 • There was an increase in wolves & bears. I caught my first bear this fall.
- 2017 • We had more bears coming through last year and maybe a couple wolves around our area. This year had seen only one bear and tracks spotted in the area and wolf tracks right outside my cabin area, and heard a wolverine was in our area at the time also.
- 2018 • Bears are seen in the area from April-October and have scared just about everything around the area they are at.
  - The same with the wolves and wolverines. Scared caribou away from the area they are at.
- 2019 • Bears broke into camps this year – twice in a week at one place (2 different bears). Bit up the pots and pans.
  - Younger people getting lots of brown bears in summer. Teaching younger people to take more bears. Getting them in the spring when they first come out.

## Seward Peninsula

- 2011
- Wolves are moving among groups of caribou/reindeer (herds that aren't tended)
  - Numbers of wolves around Brevig Mission, Teller and Nome higher than in other parts of Seward Peninsula. Hunters are trying to get wolves.
  - Seeing wolves close to White Mountain.
  - In Elim, wolf dened in a beaver lodge.
  - People complain about bears, I say "shut up and go hunting!"
  - Bears are more numerous.
- 2012
- Wolves are impacting moose and reindeer
  - Lots of wolves
  - Lots of trouble with bears in Koyuk area
- 2013
- Seeing wolves, wolverines, lynx
  - Koyuk - wolves seem to be showing up when caribou arrive. Some smaller resident packs up the Koyuk River; on the Inglutalik there is a pack of 20 or more.
  - Seward Peninsula - lynx have moved very far west on to the Peninsula.
  - At Shaktoolik, someone got a wolf hanging around the dump.
- 2014
- Wolves weren't all that common 50 years ago, but came to the area with the caribou and now wolves are staying there year-round. Wolves are impacting moose, muskox and reindeer.
  - Bears and wolves are increasing in numbers. There are now fewer people who hunt and trap these predators.
  - Reindeer herders are having more trouble/concern with wolves.
  - Noticed bear predation on muskox having more impact than on caribou. Bears have learned to take muskox.
  - Noted, however, that when guiding for bear in Nome area, it has been harder and harder to find one to take.

## 2015 Wolves

- Wolves are hard on the caribou. When snow is high, they get a bunch.
- ADF&G observation – Dec. 4-5, 2015 flight, saw wolves around Casa. People in Southern Penn (GMU 22) villages say they are seeing more wolves.
- Nome - Growing up didn't have resident wolves. As a kid, wolves were rare, dad didn't know what a wolf was when they saw it. Now they have wolves set up on the Seward Penn, resident wolves. Officially ok'd to kill young wolves. Someone near Council saw 18 wolves in one day.
- Shishmaref is similar – they are killing wolves.
- Southern villages have similar stories.
- Koyuk - More sign of smaller wolves, hunters reporting seeing more wolves. Recently coyote harvested. I saw wolf kills not too far from home and the wolf sign indicates that young wolves are in the pack of the predators here but not like the previous years where larger packs signs were seen. In my opinion the wolves keep the caribou on their hooves and ready to run with any noise.
- Elim - Someone got 5 wolves a day. Got a secret way to do it, but get 5 a day.

## Bears

- Koyuk - There's a good number of bears. They're a part of caribou harvest too. In spring they saw two bears fight over a caribou carcass. In his opinion, the bears are at a good number for harvest, maybe 20-30 a year. Can't compare them historically.
- Koyuk - November 2015 was latest they saw bear tracks. Not sure on denning timing changes. March or May they come out. Saw a bear in 1980's come out at end of March.
- Elim – Saw bears out near Elim in November 2015 (as guide).
- Elim – Lots of bears at home. Eat salmon all summer long. Bears on the south side of the mountains eating berries as far as you could see. Counted 40 bears one time. Quit counting. Told story of helping a teacher shoot a huge bear up in the headwaters of a river. Bear was 7 ft tall, so old didn't have teeth, tons of scars.
- Seward peninsula generally – Seeing fewer and fewer bears now; 15-20 years ago would see 15-20 bears. Now only see one on a river float. In past, could get two bears in seven days; now, harder to make successful bear hunt. Don't think they have the bear numbers now that they did 20 years ago. Big skulls are less common. Now the bears are smaller. Thinks the road system has hurt the bears.
- ADF&G observation – Saw a brown bear during Dec. 4-5, 2015 over flight. Discussion of ADF&G brown bear surveys (with Tony Gorn): There is a difference between counting the bears that you see and surveying the bear population. What's a repeatable, reliable method to use to get an accurate population count? We have some areas where bears congregate, but we don't have enough data that we can base bear management decisions on. NPS biologists tried aerial surveys in Unit 22 and out of Kotzebue. This effort worked to teach them things, but it didn't produce an estimate for bear populations. Last year, ADF&G flew the middle third of the Seward Peninsula, north shore to south shore, and the technique worked. Biometrician said that from the first time it was surveyed for bears in the 1990's to last year's survey, the results show only a little increase in bear population. It may have maybe it fluctuated in the time between these two survey counts, but we can't know.

- 2016
- Bear harvest is pretty much non-existent by residents of both communities (Teller & Brevig Mission) but wolf harvest is pretty high for the past 5 years compared to other communities in western Seward Peninsula.
  - Bears and wolves abundant.
  - Bears in dens when caribou come. Too many resident wolves in our area.
  - Many wolves. Every band of 50+ [caribou] seemed to have a wolf following. Bear hibernate when caribou are present.

- 2017 • They seem to have peaked may be declining.  
• The bear sign are healthy also as are the wolves.
- 2018 • Bear population younger and down in numbers  
• Wolves—too many in our region  
• They are still being seen in our areas with bear numbers increasing.  
• We have plenty of bears & wolves  
• Wolves have replaced other wolf territories that have been harvested around the Kuzitrin River area (lava beds and Bendeleben Mountains) to access the local reindeer herd in the Southern part of Seward Peninsula.
- 2019 • I think there are more bears in our area and the wolves are still in good numbers. There is a group [of wolves] hanging around Koyuk waiting for caribou, I think. In 1982 they did research on wolves in the Koyuk watershed. In June and July, they went to Granite Mountain to catalog moose, bears, fish. That was the year that caribou were observed there. [The researcher] didn't go to the village and get traditional knowledge. That part of the report is someone's handbook with Bureau of Land Management (BLM). He figured how many moose per square miles. Not too many bears. But now you see lots of bears – lots where you didn't see many.  
• There were packs of wolves going towards the Kakaruk reindeer herd. Reindeer won't really run away like caribou. There are four different wolf packs in the last five years.

## 10.2 How did predators affect caribou in your area? (New question in 2013)

### Kotzebue

- 2013 • Wolves probably kill more caribou than do bears.  
• Along coast, heard of wolves killing caribou and leaving behind uneaten.  
• Wolverines take caribou too.
- 2014 • Bears and wolves affecting moose more than caribou.  
• Wolves following caribou.  
• Upper Selawik River – caribou present; then heard wolves.
- 2015 No response to this question.
- 2016 • Affect caribou big time.  
• Same.
- 2017 • No caribou this year.
- 2018 • Bears and wolves keep pushing them from river crossing
- 2019 • I have six assistant guides out there. Each of them saw 7 sows with 4 cubs each. Every one of my guides saw a bear kill a caribou this year. One of the biggest thing with our adult caribou decline is the bear predation. Amazing how many bears are out there killing caribou.

### Koyukuk Middle Yukon Region

- 2013 • Usually, if there are caribou, wolf packs will follow them. However, there weren't caribou in the area this year.
- 2014 No response to this question.
- 2015 • Predator control in the area has seemed to help with regard to moose population.
- 2016 • They kill lots moose and caribou.  
• None.

- 2017 • They kill the young caribou.
- 2018 • The wolves chase and kill caribou.
- 2019 • No specific response to this question

### **North Slope**

- 2013 • Wainwright – Predators brought caribou closer to town. Some wolf mortality. Some sign of wolverines eating caribou, but not sure if they killed them.
  - Brooks Range Aviation (North Slope) – Pilots report wolves attacking caribou, but nothing unusual.
- 2014 • Affect caribou movement and causes caribou to not use parts of range, as caribou avoid areas with more wolves.
- 2015 • Point Hope – Possible that wolf harvest is allowing caribou to stay close to town or wolves are keeping caribou pinned down close to town. Still a lot of wolf sign around even though harvest is high.
- 2016 • Wolves kept them some distance away this year.
- 2017 • This year was hard on us from September and most of October. The predators kept the herds farther south. I heard Utqiagvik on the VHF at my camp, campers telling or announcing a lot of bear activity to the east of our area.
- 2018 • They kept caribou away from area they were at, which made it hard to harvest caribou when they are in the area of hunting usually takes place.
- 2019 • They made the caribou move to different areas near town (Atqasuk).

### **Seward Peninsula**

- 2013 • Seward Peninsula – Wolves kill caribou and also impact the reindeer industry.
  - TEK reports that lynx kill caribou.
- 2014 • In last 4-5 years, predators have increased; impact may be greater on moose than caribou.
  - Seeing more wolves but personally have not that evidence of wolf kill of caribou.
  - Concern that while caribou are declining, the predator populations are still relatively high and will have a disproportionate impact on the herd size.
- 2015 • No specific responses on effects of predation.
- 2016 • Caribou harvested were lean due to being chased by wolves constantly, but harvest was appreciated by hunters.
  - They will reroute the caribou from traditional and existing routes.
  - Not too sure, heard of lots of wolves at the end of the Kougarok Road, which may be the cause of few caribou there all fall (end of Oct. on).
- 2017 • May trigger migration – bears.
  - They keep the caribou in good health to my knowledge.

- 2018 • Bears didn't [affect caribou]  
 • Wolves harassing caribou making them skinny and jumpy  
 • It is really difficult to say for the area that caribou migrate through [near Koyuk]  
 • Not too much effect  
 • Eastern shoreline of the Imuruk Basin was used by four different wolf packs in the past years. Wolves killed within the Kuzitrin River area are replaced by wolves from the lava beds area or the northern portion of Seward Peninsula.
- 2019 • Bears didn't [affect caribou]  
 • Wolves harassing caribou making them skinny and jumpy  
 • It is really difficult to say for the area that caribou migrate through [near Koyuk]  
 • Not too much effect  
 • Eastern shoreline of the Imuruk Basin was used by four different wolf packs in the past years. Wolves killed within the Kuzitrin River area are replaced by wolves from the lava beds area or the northern portion of Seward Peninsula.

11 Have there been any notable changes regarding other animals in your area, compared with past years? (For example, new animals arriving in your area, or animals that you do not see much of anymore, or changes in behavior or body condition)

### **Kotzebue**

- 2011 • Wolverine numbers seem pretty high on Seward Peninsula.  
 • Any place along the Kobuk in winter where people shoot a lot of caribou, that's a good place to find wolverines.
- 2012 No specific response
- 2013 • Beavers are moving downriver, even to Kotzebue and Kivalina. Forty years ago there were no beavers in the Wulik and Kivalina Rivers.  
 • Fewer muskrats now (used to be thousands, now lucky to see one).  
 • More grasses in Kobuk Delta, as well as pond lily (Nymphaea).  
 • More frogs in Kotzebue and Noorvik area, just this year (2013).
- 2014 • Wolves are now in villages. Can't hunt or trap wolves without snow; hard to chase on tundra.  
 • More bears breaking into cabins and camps.  
 • Fish - Record chum salmon run in 2014.  
 • Fish die-off – would this affect bear numbers?
- 2015 • Bumblebees in May when the ice was moving.  
 • Bad year for mosquitoes in Sisualik, never felt it in town.  
 • People aren't hunting beavers anymore.
- 2016 • Not really.
- 2017 • More bears and wolves, fewer moose and caribou.
- 2018 • No
- 2019 • Coyotes. Coyotes are starting to come into our area.  
 • Polar bears. I think we tracked one. Maybe March, it couldn't be a bear, it had to be a polar bear. We tracked one between Noorvik and Selawik.

### **Koyukuk Middle Yukon Region**

- 2011
- Moose moving closer to villages to avoid wolves.
  - Haven't seen any wolverines between Galena and Koyukuk since 1960.
  - Mink, muskrats and blackfish are depleted.
  - Beavers are moving out of lakes into streams and rivers.
  - Fewer geese and no sand hill cranes this year.
  - Moose antlers are smaller.
  - Fish are smaller.
- 2012
- Koyukuk –
- Concerned about fish in general; usually harvest about 150 king salmon from but this year only 30 king salmon
  - Fish are smaller (used to be 40 lbs and in last 10 years only 15-20 lbs)
  - White fish harvest good though
  - Concern about salmon by-catch in the Pollock fishery
  - No fish net in river this year. Ice got too thick, too early. There's 6 feet of ice.
  - Moose population in good shape
  - Glad for 5 day extended hunting season from Sept 20 to Sept 25
  - Appears that moose habitat is changing. Willows are getting old and too tall for moose to reach. Not enough gravel bars.
- Allakaket –
- Low moose population
  - Wishes for days when there was a cow season since cow meat tends to be more tender
  - Winter bulls are tough. The winter season is bull only. Used to eat cows.
  - Some muskox sightings around Allakaket, but there's no season so you can't hunt them. If more come around maybe they could eat them.
- 2013
- Climate change affecting habitat.
  - "Due to climate change, there is less fur."
  - Moose had velvet ten days longer than normal.
  - King salmon are smaller and younger. Good chum runs.
  - Fewer waterfowl in the area in the past ten years. Migrate back south earlier. Not as many young this year.
  - Muskrat and mink decline over past 20 years due to high water. Pike get caught in the lakes and kill the muskrat and ducks.
  - Pike live to be over 100 years old. Pollock caught a 42" pike in net this year.
- 2014
- Fewer furbearers; low cycle (even squirrels). No mink or muskrats.
  - Koyukuk - More moose, but still low numbers.
  - Koyukuk – Saw one muskox about 4-5 years ago.
  - Birds - Weather in Lower 48 is affecting waterfowl; no geese this year. Not many owls.
  - Fish - Higher river water temperature affecting fish (affecting survival in spawning beds and affecting chum migration); king salmon are now smaller. No whitefish after August. Lots of pike, which are eating blackfish. No kings this year. Whitefish numbers are low; some sheefish; lots of chum salmon.
- 2015
- Low insect year.
  - Rarely see coyotes, usually one or two a year on the haul road.
- 2016
- Big bears also kill black bears; our people eat black bears.
  - Grizzly bear high.
- 2017
- None.

2018 • Moose are leaving the interior and going to the west and coast.

2019 • No specific response to this question

## **North Slope**

2011 Nothing on this topic

2012 • Barrow - It was so hot last summer that we saw dragonflies in Barrow for the first time. (Ted commented that they were normal in Pt. Hope.)

• Barrow – A Wainwright hunter caught a lynx.

• Barrow – people are seeing new fish that they haven't seen before.

2013 • Wainwright – Lynx killed near Barrow. Not as many ptarmigan. Saw muskox on Kuk River in July (say two, unusual as they are usually few and far between).

• Brooks Range Aviation (North Slope) – Problem with wolves killing sheep in central Brooks Range, especially east of the haul road on the north side of the range. Larger wolf packs. More muskox along the Noatak. Fewer hares lately.

2014 • Point Hope - Seeing some lynx, muskrat and river otters. When they go eggng, they are seeing murre and other birds that are not usual in the area; more and larger crabs and different fish species.

• Wainwright – Grasshoppers and beavers in Wainwright area. Lots of snowy owls (may be related to lemming population). Porcupine as far north as Wainwright.

• Barrow/Nuiqsut – Bowhead whales coming by earlier (February), using the open water, even before the belugas.

2015 • Point Hope – More and more moose showing up. Possible that fires from inland means more moose. There were some smoke issues this summer. Smelly and hazy. Often pushes animals towards the coast.

2016 • More bears; brown and polar

2017 • Yes last year we had a lot of owls and lemmings, this year no owls and lemmings. Seen more hawks/falcons this year, and a musk ox near town by the end of the airstrip near the Imagruaq Lake on August 26th, 2017.

2018 • I have seen different types of birds in our area and seeing different insects.

• We are seeing more salmon and pike in our river and another fish I cannot recall what type it was.

• One grayling had a lump on the lower belly near the lower section of the fish.

2019 • Too many muskox; they are diverting caribou. Muskox come right to the village and change the caribou migration. Wants something done about them. Splits up the caribou groups when the muskox come around.

• We also have one muskox that comes to town during hunting season, and scares away the caribou. Saw a pike in the area for the first time.

• Broad white fish had mold on their slime layer in the spring when they go back up river, but didn't have it when they were coming down.

Other Comments

## **Seward Peninsula**

2011 • More ptarmigan, rabbits and lynx near Koyuk.

• Good ptarmigan numbers despite wet summer.

• Increased beaver activity makes people need to treat water.

- 2012 No specific response.
- 2013 • In recent years there have been a lot of rabbits, but they are cycling down.
- 2014 • Elim - Last summer (2014) was the best fishing the community had ever had.  
 • Several muskoxen herds near Nome (think they are coming to town to avoid predators), but virtually no young of the year survived (conflicts with people and dogs).  
 • Noted that moose arrived on Seward Peninsula in about 1950. Bears were not super common then.
- 2015 • Elim - Pigeons. Come from Nome.  
 • Elim – Bowhead whale in front of Elim in first week of January 2015.  
 • Koyuk – Coyotes moving into their area. Unusual. Hunters have gotten several coyotes so far. (They use the meat for drying, frying, baking, stew, and uqaq.
- 2016 • Did not see any notable change among other species other than beaver colonizing the western portion of the Seward Peninsula.  
 • Haven't seen anything unusual.  
 • Wolves, wolves, too many wolves.  
 • Unit 22B moose have poor calf survival in part due to wolves.
- 2017 • Wolves target moose more bears too, ravens working calves, newborns.  
 • None that I know of.
- 2018 • Wolves were the “new animal” [to arrive] as the caribou expanded its range into the Seward Peninsula years ago. Too many resident wolves now killing all other resources (moose, muskox, reindeer, etc.)  
 • Not too much changes regarding other animals  
 • Bear population might be on the increase in and around the communities of Teller and Brevig Mission as they are not actually hunted.
- 2019 • Wolves were the “new animal” [to arrive] as the caribou expanded its range into the Seward Peninsula years ago. Too many resident wolves now killing all other resources (moose, muskox, reindeer, etc.)  
 • Not too much changes regarding other animals  
 • Bear population might be on the increase in and around the communities of Teller and Brevig Mission as they are not actually hunted.

12 How do people in the communities use caribou, other than for meat (e.g., clothing)?

**Kotzebue**

- 2011 Nothing additional on this topic
- 2012 No specific response
- 2013 • Still saving hides for blankets, seats, sleds. But nobody sewing. Most skin sewers are gone.
- 2014 No response to this question.
- 2015 No response to this question.
- 2016 • Mukluks, sinew.  
 • Sleeping mats, sled mats, mukluks.
- 2017 • Mukluks, dolls.  
 • Mattress, rug, mukluks, mittens.

- 2018 • Mukluks, mitten, boot socks  
• Thermos bottle bags
- 2019 • People use hooves, horns, lower jaws, start making handicrafts out of them. Eskimo sleds, antlers for handles, Eskimo dolls. It's a tough world living out there now, especially the cost of fuel. People do what they can to make money. Price of fuel is going up.  
• Use skin/fur for weather stripping for my door to keep out the cold. That's true.  
• Use skins for door stripping to keep out cold. Sinew too is used.

### **Koyukuk Middle Yukon Region**

- 2011 • Lake vegetation is changing; muskrat food is gone.  
• Don't see moose feeding in lakes like you used to.  
• Water temperatures recorded by fish finders has been about two degrees warmer in the last couple of years on both Koyukuk and Yukon Rivers.  
• Kings and chums are swimming deeper; about five feet deeper by fish finders.  
• Grass is starting to close in on lakes.
- 2012 Koyukuk –  
• Used to use moose pelts, but not being used as much now.  
Allakaket –  
• Villagers use all of animal (e.g. bones, dried heart membrane for bags, boil hooves, hide for rawhide rope)  
• Special note that villagers make moose head stew (sport hunters usually waste head meat).
- 2013 Koyukuk –  
• Leggings, shoes, parka, nets from hides, great winter mattress (last long if you take care of them).  
Allakaket –  
• Winter mattress, bones for scrapers, skin for sewing, horns as handles for knives.  
Fairbanks –  
• Home décor, taxidermy.
- 2014 No response to this question.
- 2015 No response to this question.
- 2016 • Caribou skins are good mattress. The leggings are used for mukluks.  
• Clothing—dry meat and fat.
- 2017 • Caribou skins make good mattress, the legs is used for winter boots.
- 2018 • The caribou skins make good mattress when camping in winter.  
• Make dry meat.
- 2019 • No specific response to this question

### **North Slope**

- 2011 No response
- 2012 • Use of caribou for other than meat for food: make drums or boots from skins; mostly use hides for blankets and mattresses or pads for sleds; use sinew (from legs of caribou taken during summer) for sewing umiaq skins; make handicraft sleds from jawbones; use parts as bait for traps; use bone and antler for knife and tool handles; eat tips of velvet antlers, tastes good; use stomachs for drums; can eat the bone marrow or sometimes use it for insect repellent.

- 2013 • Wainwright – Hides for tents. Antlers for carving. Clothing (“I got a new jacket from nephew”). Hides from late August. Tendons for sewing whaling boats.
  - Brooks Range Aviation (North Slope) – Not many elders left in Evansville, so mostly use of meat there and in Allakaket. Some use of hides for crafts.
- 2014 • Need to educate younger hunters about how to use caribou.
  - Still use tendons to sew seal skins together to make boats; need to butcher properly to preserve tendons. It takes tendons from 15-20 bulls to sew skins for one boat.
  - Skin for mukluks.
  - Still using skins for blankets and sleeping pads.
  - Important to be efficient with the parts from the caribou and share; more competition for caribou.
- 2015 • Point Hope – Mainly an ocean people, but rely on tutu for clothing and other uses. Fall time and winter time clothing.
- 2016 • We use the sinew for sewing, skins for clothes and sleeping mats. Antlers for ulu handles.
- 2017 • Caribou heads are boiled and eaten also the bones are boiled and the marrow in the bone is eaten either boiled or right out of the bone. Tendons are used for thread to sew skins. Whole caribou skins used as padding in tents to keep warm and used for sitting on while ice fishing. The belly part of the stomach is cleaned, cut into strips to dry for dried caribou meat. Heart, tongue and liver are eaten. Antlers used for ulu handles or knife handles.
- 2018 • Antlers for knife handles and ulu handles.
  - Caribou skin for layering in tents on the floor, on sleds when tying down for cushion or warmth, and use when fishing on the ice to keep warm.
- 2019 • No specific response to this question.

### **Seward Peninsula**

- 2011 • Last fall, lots of berries; bears with three cubs.
  - This fall, fewer berries. Could affect animals.
  - Seals with lesions.
- 2012 No specific response.
- 2013 • Use of caribou pretty much the same, although skins are not used as much anymore.
- 2014 • Blankets/bedding.
  - By the time the caribou get to this region the hair is too long for parkas.
  - No one uses caribou leggings anymore.
  - Skins with warble flies don’t keep.
- 2015 No comments.
- 2016 • Hides are used for sleeping or hunting mats; warble infested hides are used for cushions between boat & sled.
  - We use the hide for mattress and seat in the sled.
  - Hides—ground mats, clothing
  - Skins for sleeping pads and sled liners to cushion sled loads.
- 2017 • Hides for sleds/camping. Sell antlers.
  - The skins are used for cushion from what I’ve seen.

- 2018 • Predominantly used for food, all users that I'm aware of.
- Early winter harvest for good bed mats.

- 2019 • No specific response to this question.

13 What types of exploration and development or other activity have you noticed in the region that may be impacting caribou?

**Kotzebue**

2011 Not asked in 2011

- 2012 • Discussion that road from Red Dog mine to port area may affect caribou movements.
- The pattern has shifted because of the road? Locals want to meet with Red Dog Mine workers. RDM does halt traffic when migration happens, but perhaps not soon enough. Should halt their activity (like) 10 miles up the road, instead of 1 mile.
- Concern expressed about mining activity noise. That may contribute to displacement of caribou.
- Dau asked Phil Driver about Kivalina road 'affect'; he thought it would actually be worse than it is.
- Proposed road to Ambler mining district. Local opinion shifted for the preferred road access.

- 2013 • Bornite
- Roads to Resources
- Red Dog road might be changing migration. Should have no blasting during migration (August, September). Sound travels a long ways.
- Kivalina – seeing lots more non-local hunters.

2014 • In the Upper Kobuk area, Nova Copper wasn't working this summer. More caribou were seen around Kobuk and Shungnak.

- 2015 • Shared information about closure of Red Dog Road from September 15-21. Early in this period, there was local disagreement whether road needed to be closed. A lot of elders and other hunters wanted it closed; group of young hunters were fighting it. Caribou were coming from the east side of Jarvis Mountain. Young hunters were shooting them on the north side of the road. Concerned that this made them avoid crossing and turn back to Jarvis Mountain.
- A lot more marine shipping traffic, more vessels in Kotzebue.

2016 • Red Dog road.

2017 • Bornite mine noise.

- 2018 • Red Dog road
- Climate change

- 2019 • Red Dog mine. Guys said they could hear loader at Red Dog while they were at Cutler. Noatak complained about not getting caribou, but now they got caribou this year.
- Lots of people out mining for gold right now in our back yard in Deering. You should see what they're doing to our river. They've pushed the river to the side.
- We got that mine going behind Kobuk but we have no caribou anyways so what does it matter.

**Koyukuk Middle Yukon Region**

2011 Not asked in 2011

- 2012 • None near Galena
  - Haul Road traffic has disturbed caribou migration from east. Caribou are afraid of Haul Road traffic and are avoiding the road and pipelines. Crossing routes for wildlife on pipeline don't work.
  - Sport hunters are affecting (deterring/detouring?) caribou migration
  - Group is stationed on Alatna making measurements (for road crossing?)
  - No issues with helicopter traffic noted
- 2013 • Haul road has affected the migration. Road construction particularly affected caribou – they don't like the lights and stay away.
  - Concern that Red Dog Road affects migration.
  - Concerns about road to Ambler.
- 2014 • Concerned that the proposed road to the Ambler mining district will also impact caribou movement. Vehicle traffic will be a problem.
  - Road realignment around Livengood disturbed a trap-line, as road trappers came to the area.
- 2015 • Some Working Group members expressed concern that the proposed road to the Ambler mining district will also impact caribou movement, as well as other subsistence and community lifestyle. Vehicle traffic will be a problem.
  - Ambler Road would go east and west; concern with caribou crossing. Concern that historically roads have affected the big herds in Alaska.
  - Some concerned that Ambler road would bring non-local people into the country; cause conflicts. tell us that we would get cheaper groceries and gas; but feel would have to sacrifice way of life for that, give up for cheaper groceries, gas.
  - Others in group have a different view about the road – doesn't think that development has impacted caribou (even the Red Dog Road).
- 2016 • The [Trans Alaska] oil pipeline impacts the caribou travel routes.
  - Normal.
- 2017 • The pipeline road impacted caribou.
- 2018 • In 1974 the oil pipeline started going up north to the oil fields. The haul road put in place and later was opened to the public [as the Dalton Highway]. Lots of people went up the road to hunt caribou. This greatly impacted the caribou movement and now there is no caribou in the interior.
- 2019 • No specific response to this question

## North Slope

- 2011 Not asked in 2011
- 2012 • Wainwright – Hunting was difficult in September due to a lot of helicopter traffic. Reported that Gordon Brower mentioned that there were over 3,700 helicopter landings recorded in the NPR-A. Couldn't be sure if the helicopter traffic was the cause of the more difficult hunting or if it was just a coincidence in time; nevertheless, there are many projects going on in their area.
  - Pt. Hope – also had a lot of helicopters for about three weeks.
  - Barrow – the same around Barrow. They had lots of public service messages on KBRW, so more people were reporting aircraft tail numbers and their color. They have also received several calls with frustrated people threatening to shoot at aircraft.

- 2013 • Wainwright – Not noticing yet, but may be a lot in the future. Some air traffic, but haven't heard of effects on caribou or hunters.
  - Brooks Range Aviation (North Slope) – A lot of helicopters along the John and Alatna Rivers, related to potential road development. Noisy for guided hunts.
- 2014 • Planes and helicopters associated with development and research activities disturb caribou, but do not disturb wolves and bears.
  - Concern about disturbance from seismic activity on caribou. Not enough enforcement on effects of development and research activities on caribou and the herds' reproductive cycles.
  - Expecting more roads around western North Slope that would impact caribou.
- 2015 • Point Hope – Concern that research activities on the North Slope are diverting some resources away from some communities.
- 2016 • Caribou still cross the road.
- 2017 • Aircrafts doing flights for census on birds, fish and plant vegetation, etc. Once in a while, at least once or twice, would see an aircraft just scaring caribou for no reason.
- 2018 • When organization like the ones that do surveys on birds [are in the area], ... I have watched with my own eyes [and] see [caribou] run, which impacts the caribou from using excess energy that should be reserved to keep them stress free from running for a long distance.
- 2019 • Development is heavy in area now. National Petroleum Reserve – Alaska (NPR-A) is opening up and more lease sales are going to happen. Activity from air, lots of helicopters and planes. Nuiqsut is the most heavily studied area. Nuiqsut is a subsistence community that depends on migratory animals. This development changed everything.
  - We live off the land, development won't bring us food. A group went to the area near my camping grounds to look for gravel and thankfully didn't mine gravel right there. I went to a meeting and stopped it. I'm against Alaska Strategic Transportation and Resources (ASTAR) roads – they would change everything. They would divert animals and fish, with bridges and stuff.

## Seward Peninsula

- 2011 Not asked in 2011
- 2012 • Wondering about radio tower planned for Granite Mountain; any impacts to caribou?
  - Concern in White Mountain, Koyuk, Elim about potential Uranium development in Death Valley; concern about Koyuk River water quality.
  - No impacts of immediate concern on Seward Peninsula; but note that industry does have impacts on caribou migration on a regional scale, especially roads.
- 2013 • Mining development – seems to be “junior companies” wanting to find minerals and then sell out to a larger interest. Revisiting areas mined in the past.
  - Bluff – mineral exploration
  - Graphite Mountains in the Sawtooths
  - GCI repeater sites on at Koyuk and Shaktoolik areas which have generators and other noise associated with them.
- 2014 • Cell phone tower went in near Koyuk, but don't know if it affected caribou. Construct in summer, which is not when we hunt caribou.
  - Proposal for Graphite mine near Teller; road built, but is in an area that doesn't have caribou.

- 2015 • Nome – Always a new mine.
- Koyuk – Cell towers put up last year. Don't seem to impact anything. To date I don't think that any exploration or development impacted the caribou around our area yet.
- Elim – Worried about proposed road to the Ambler Mining District. Worried about effects on caribou migration if that road is constructed.
- 2016 • None that I am aware of.
- The general traditional area that I have thoughts on are the GCI towers placed several points in the area. We have no received an impact statement from anyone, State/Feds or any other environmental agency/group.
- No big impacts.
- 2017 • I am unaware of any impacts from the GCI stations in our area which are 3 that were placed within the last 3-5 years.
- 2018 • Small or no caribou impact on northern portion of the Sawtooth Mountains.
- Graphite One [Resources, Inc.] is assessing graphite quantity and quality.
- 2019 • There were concerns about pollution around Imuruk basin.
- Graphite project is messing up moose habitat.
- I don't know if the GCI towers have any effect. But there are several in the areas that we hunt – they put those transmitters in the area. I don't know if that has any impact.
- The towers are north from Unaglik to Granite Mountain. In the winter months, the batteries run low and the generator kicks in. The caribou in close proximity are probably disturbed.

14 What have you noticed regarding any conflicts between local and non-local hunting in the area of your community? Do you have any suggestions for how to reduce conflicts?

**Kotzebue**

- 2011 Not asked in 2011
- 2012 Not asked
- 2013 • Kivalina – more non-local hunters.
- Noatak – also seeing quite a few non-local hunters.
- 2014 • Transported hunter and guide camps on Noatak River interfering with migration.
- Planes flying low on rivers make caribou slow to cross. These can be guide/transporter/private planes, but also can be enforcement officers observing hunting.
- Noted that local hunters customarily camp on or stage hunting from the south sides of rivers to avoid disturbing the caribou as they are approaching river from the north to cross. Guided and transported hunters are dropped on both sides of the river; those on the north side can disturb the migration.

- 2015 • Concern about conflicts between local hunters on the rivers. In Fall 2015, there was a lot of combat hunting (was not as big a problem in 2014). Concern about wild shooting; safety issue. When you are out there with 20 or 30 boats in one area and a herd comes out all the boats are taking off. The main place is right above Kiana on the Kobuk River. Even gets boat from Noatak.
- Local combat hunting making noise and shooting first of caribou is just as bad as sport hunters. It is aggressive. People think that if you don't shoot the first caribou you are going to go hungry because someone else is going to shoot them.
  - You can't blame it all on young hunters, it's everybody. Everyone wants to get enough to feed their families.
  - Noorvik - A lot of non-local hunters in our area. We had one trespass hunter (on NANA lands). Nothing happened in terms of enforcement follow-up. They reported they were getting moose [moose carcasses with no horns].
  - People are leaving meat out there. They are going to do it again this fall if we don't stop them.
  - Discussion about native allotment holders letting people (in some cases, non-local hunters) hunt on their land.
- 2016 • Never hear.
- Modify the Kiana Elders Council's hunter success letter [and distribute throughout the region to reduce conflicts].
- 2017 • No caribou/no conflict.
- 2018 • No conflict but lots of outside hunters in our area (Unit we)
- Closure of some federally-managed areas to non-federally qualified hunters is working to reduce conflicts
- 2019 • We got nonresident hunters year-round. NANA pulls out trespass officers then the nonresident hunters come. That's a big conflict. You can tell if they're not from our area. Lots of complaints from Kotzebue about outside hunters.
- We have Cabelas convention every fall.
  - Two years in a row, someone goes around the airport, takes photos of airplanes, posts them on internet, tells people to shoot them down. I take that personally. We need education. I'm not out there harassing caribou from 2000'. There's no merit to the complaints, rumors get spread and spread and spread.
  - Somebody actually shot at a plane in the region years ago.
  - So restrictive now, what more can you do. Starts making conflicts among the guides, getting congested where no one can hunt without bothering others. So many corridors, closures, etc.
  - You have all the problems down near Kotzebue. On the upper Kobuk, we like seeing someone new around.
  - We [guide and] hunt where no one in the villages can reach. At least 10 miles from anywhere where a local person can get to. I never see anyone else out there except my own hunters. Zero. I don't bother subsistence hunters at all. One of the problems is instant media, Facebook.

### **Koyukuk Middle Yukon Region**

2011 Not asked in 2011

- 2012 Koyukuk –
- There is a drawing permit for non-resident hunters
  - Non-resident hunters can't hunt within 60 miles of village on Koyukuk
  - The drawing permit program helps minimize conflict with sport hunters.
  - No problems with transporters noted
- Allakaket –
- Too many sport hunters coming in air boats down Koyukuk from Haul Road
  - Too much air traffic
  - Villagers can't compete with sport hunters
- 2013 Koyukuk –
- Just for moose, not for caribou. Drawing permits for moose – 150 permits this year, but only 20 permit holders came through.
- Allakaket –
- No issues.
- Fairbanks –
- Nothing recent.
- 2014
- In past, hunters did not throw bones into the river.
  - Concerned that sport hunters in Gates of the Arctic are changing the caribou migration, by disturbing the leaders of the migration (“chase them back west”). Very few caribou coming through Atigun Pass in recent years.
  - Wildlife managers need to listen to elders.
  - Don't leave caribou meat to rot or caribou won't come back through that way.
- 2015
- In past, hunters did not throw bones into the river.
  - Concerned that sport hunters in Gates of the Arctic are changing the caribou migration, by disturbing the leaders of the migration (“chase them back west”). Very few caribou coming through Atigun Pass in recent years.
  - Wildlife managers need to listen to elders.
  - Don't leave caribou meat to rot or caribou won't come back through that way.
- 2016
- Sport hunting is happening [in our area]. They kill the [caribou] leaders going to our areas.
  - None.
- 2017
- Upper Koyukuk River. There is low number of moose and caribou. We can't hunt alongside sport hunters.
- 2018
- People come up the haul road, not only to look at the mountains, but they hunt, trap, and fish in the areas we use for subsistence lifestyle.
  - The fish and game is limited in most areas. We can't compete with outside hunters.
- 2019
- No specific response to this question

### **North Slope**

- 2011 Not asked in 2011
- 2012
- No issues with outside hunters because there are none in their area.
- 2013
- Wainwright – No non-local hunters. No conflicts.
  - Brooks Range Aviation (North Slope) – Do not guide near local hunters.

- 2014 • Airplanes scare the caribou away. More personal airplane use. Mostly an issue in August and September.
  - Sport hunting causes disturbance of migration by getting in front of the herd leaders and disturbing their movements/routes.
  - More conflict from sport hunting based out of Kotzebue than in other areas.
- 2015 • Point Hope – A lot of planes flying around in early July, August, September.
- 2016 • I heard our regional Alaska Native Corporation bought the fly-in/fly-out hunting business in our area and closed them down. Anaktuvuk Pass finally got caribou this year after that happened.
- 2017 • I have not seen any conflicts as to regards of hunting with locals and nonlocals. I have no locals come up to me for advice though.
- 2018 • No comment at this time.
- 2019 • We need to regulate sport hunters and transporters. They are diverting caribou left and right. They put their camps in the path of migrating caribou and divert them. Had 30 sport hunters in an area and it was too much. They leave too much meat in the field and waste it. Most of meat gets left in the field and doesn't get reported.
  - Saw a flier for sport hunting in Barrow (Utqiagvik) for first time. Haven't had any problems in Atqasuk area – no conflicts. Maybe don't have gas/access for guides.

### **Seward Peninsula**

- 2011 Not asked in 2011
- 2012 • Conflicts and competition not an issue in Seward Peninsula region
  - Lots of local hunters in Nome.
  - Noted that in Koyuk area, not competition – people share information.
- 2013 • Not really much user conflict.
- 2014 • No comments about user conflicts.
  - Koyuk – Noted that they don't mind Unalakleet hunters coming to their area.
- 2015 • Nome – No conflicts.
  - Koyuk – No user conflicts that he's heard of. I haven't seen or heard of foreign or domestic battles been fought over caribou yet.
- 2016 • Caribou hunting takes place when snowfall is sufficient to travel by snow machine (Dec. to mid April).
  - I have not noticed any user conflicts but that does not mean it [is] non-existent.
- 2017 • Few more fly in hunters 2016 not 2017.
  - Nothing.
- 2018 • No conflicts
  - Adjusting to weather changes for potential wildlife harvest.

- 2019 • There's a proposal with the new guide wanting to open up Unit 22D remainder for moose. The guy said some unflattering things about the Northern Norton Sound Advisory Committee. Then he got convicted for doing that exact thing. His successor is putting proposals in to make it legal what they were doing (chasing animals). Definitely some heat between Shishmaref villagers and this guide.
- I didn't have any conflicts with anyone – when you fight over animals they're going to disappear.
  - In summer, there are planes flying all around.

15 Is there anything else that you have seen this year that you would like to mention?

**Kotzebue**

- 2011 Not asked in 2011
- 2012 No specific response
- 2013 • Lots of moose near Noorvik; healthy.
- 2014 • Local hunting activity is concentrating on the Kobuk River, because there are fewer caribou crossing near villages on the Noatak.
- Because it has been difficult for a number of villages to get caribou in recent years, there is more competition among local hunters in the middle Kobuk River area, where migration crosses the river (this is between local hunters, not involving non-local or nonresident hunters). On the rivers, boats race to get to the crossing caribou and there is more “combat hunting” as local hunters all try to get meat.
  - Local hunting patterns – People from far away (Noatak, Shishmaref, Unalakleet) are coming to Kiana and Noorvik area to hunt for caribou.
- 2015 No response to this question.
- 2016 • Airlines flying too low.
- Lack of snow, difficult traveling.
- 2017 • No caribou.
- 2018 • Climate change issues
- 2019 Nothing Additional

**Koyukuk Middle Yukon Region**

- 2011 Not asked in 2011
- 2012 Koyukuk –
- Not many geese or ducks this year (2012). The geese left early.
- Allakaket –
- Bird areas are not being used as much
  - Beaver trapping for food is common
  - People are using dogs (more?) than they used to.
- 2013 Koyukuk –
- Very concerned about Ambler Road and its impacts. “Hard times will be ahead in this area.”
- “Once the road is put in things will maybe be cheaper, but this will come at a cost.”
- Allakaket –
- Live in same way as grandfather and father. Want to preserve the caribou and lifestyle. This is why we come to meetings like this.

- 2014 • All caribou herds are down in numbers.
  - Moose numbers are down in numbers.
  - Furbearers are down in numbers.
  - Can't explain it all – think its habitat related.
- 2015 • All caribou herds are down in numbers.
  - Moose numbers are down in numbers.
  - Furbearers are down in numbers.
  - Can't explain it all – think its habitat related.
- 2016 • Wolves and bears kill lots moose and caribou, need to have open season on them. If we kill some of this animals, we would save more moose and caribou.
  - Low snow & lots ice in lake & river.
- 2017 • There is more bears and wolves. They kill young caribou. The state and the feds could do well in dispatching some of the predators. Bears and wolves don't know of not to kill caribou calf. While that we subsistence users are not allowed to take caribou calves.
- 2018 • There are more bears around, lots of grizzly bears in the interior. They kill moose calves, caribou calves. We need to kill more bears. People don't eat bear today, so there are more bears.
  - We need sport hunters to kill more grizzly bear in villages.
  - There is no super meat stores so we need to hunt moose and caribou.
- 2019 • No specific response to this question

### **North Slope**

- 2011 Not asked in 2011
- 2012 • Wainwright - Wainwright hunter had harvested a caribou that had a radio collar and that the hunter thought that the collar was too tight and that the caribou wasn't moving very much. Lincoln Parrett (ADF&G) said that collars that are adjusted to fit properly sometimes look tight to people, but that it is much better for them to have a snug fit than to be too loose. When they are loose they can rub the caribou's neck and bang on the caribou's chest and jaw. I have the collar in my office and it looks like a typical adjustment for a female caribou.
  - Lincoln confirmed the long history with this particular collared caribou. It had been re-collared twice, had been on the air for about 6 years, and had traveled all over the North Slope and beyond. She was harvested at 7.5 years.
- 2013 • Wainwright – Heard that last year or before, reports of caped-out caribou (several? 10?) between Wainwright and Atqasuk. Possibly two summers ago? Hearsay.
- 2014 • Younger hunters from the region tend to stay out to hunt for 12-hour day and then return home, rather than staying out for several days or a week.
  - Even younger hunters from the region need to be reminded to let the first caribou go through without disturbance.

- 2015 • Snow machines allowing folks to make more day trips for hunting rather than a two or three week trip. Machines are more reliable.
- Still an effort to teach young hunters the old ways, e.g., letting first group of caribou pass through.
- Climate change is affecting access to animals and areas.
- Local hunters are impacted by climate change, research activities, caribou decline, regulation change.
- Regulations:
  - Point Hope – Don't think about the regulations that much, because they have to get caribou when they are there.
  - Barrow – Regulations are a problem, specifically the bag limit. Hunters want to take more because sometimes the animals are only around for a limited time.
- 2016 No response provided
- 2017 • None at this time.
- 2018 • Not at this time.
- 2019 • When you hear whistling in the wind, that's wolves.

### **Seward Peninsula**

- 2011 Not asked in 2011
- 2012 • Subsistence hunters on Seward Peninsula want access to the satellite collar data; this was recently taken off of the website.
- Want study of caribou that stay on the Seward Peninsula and mingle with reindeer.
- Include similar questionnaire in Caribou Trails to collect more local input.
- 2013 • Only about six active reindeer herders left on Seward Peninsula.
- Concern about summer resident caribou and affect on reindeer industry.
- Bad fishing year.
- 2014 No comments.
- 2015 Regulations
  - Just wishes the Alaska Board of Game would be more subsistence friendly.
  - Discussion and concern about the changes in bull regulation. People are upset about not being able to shoot bulls. People are getting cited for taking a bull; this is needless, since we are not in a critical management stage for the herd. Villages are saying that this is a big concern. It is a hard regulation to follow (hard to distinguish cow/bull in winter. Number of bulls typically harvested on Seward Peninsula (maybe 900?) is not enough to affect the population. Change in how Caribou Roundtable is conducted?
  - Would like elder historians to be a part of this discussion. They have stories of climate change and animal movements, and predators.
- 2016 • Bulls were the first to arrive around Agiapuk River/American River in mid November main herd was around Serpentine Plot Springs/Kuzitrin River the lava beds.
- More wolves & bears and the migratory route change because of these predators.
- Movement of herd is not a benefit to folks on Seward Peninsula. (Hard to get to).
- 2017 • Nothing out of the usual.

- 2018 • Freeze-up is coming later.  
• “Where’s the caribou?” seems to be the users’ questions.  
• Our bay [at Elim] never freeze up as of today 12-13-18.  
• Cooler summer days with little or no rainfall for the first months of summer.
- 2019 • No additional responses

16 Did you find this questionnaire helpful to your group's discussions?

**Kotzebue**

- 2011 • Like this small group breakout format; more time to get your story out.  
2013 Not asked 2013

**Koyukuk Middle Yukon Region**

- 2011 Like this small group format. There is more time to get your story out.  
2012 Not asked  
2013 Not asked 2013

**North Slope**

- 2011 No response  
2012 Not asked 2012  
2013 Not asked 2013

**Seward Peninsula**

- 2011 • Yes, good to hear other perspectives.  
• Add question about how caribou is used and distributed.  
2012 Not asked  
2013 Not asked 2013

17 Would you like to continue these discussions each year? In this same format?

**Kotzebue**

- 2011 Yes  
2013 Not asked 2013

**Koyukuk Middle Yukon Region**

- 2011 Yes  
2012 Not asked  
2013 Not asked 2013

**North Slope**

- 2011 No response  
2012 Not asked 2012

2013 Not asked 2013

**Seward Peninsula**

2011 Yes

2012 Not asked

2013 Not asked 2013