

APPENDIX 1: Sample of Quotes Organized by Category

Note: This is a sample to show how quotes were organized by topic and does not include all topics or all quotes for listed topics.

SEVERITY (FIGURE 2)

Factors driving Severity

Fuel Type

Because there's, if you got a fire in the big timber like we have here, it'll be hard to uh, get it out. It'll be really hard to get that fire out when it just burn right through it, nothing will stop the fire.

and some places here, down here on the, like, on the hills, there'll be a fire started, could be, uh, it'll just burn up. It'll burn up by itself and you can't really do much for it. It, uh, it, brush is too thick. You know.

The brush, uh, call it jack spruce, they're small, small trees, but they're, uh, so thick that once the fire get in there it, it'll just keep burning, burning until it burned out.

I'd say it, well, some areas it burns. Depends on the, dead fall, and all the bark beetles that's been here, through the area and stuff, and, I'd say it's, you know, just depends on the, on the material. Some'll burn hot, some won't, you know. And then when they, when I saw a burn a long time was back in 60, late 60, and the fire just started at Kobuk and ended at the Yukie up here. And it burned all the way to October.

Conditions

'cause it's windy and it's so dry, the grasses are that tall, and it's just like, gas on paper and then watchin' it explode.

'Cause when fire moves and it's unpredictable, and the wind helps it.

it was no time, in one hour, just burned. So dry if there was a fire it's really so dry that it'd be hard to fight.

That the way it was burning, nobody would believe that fire would burn like that. The flames were goin' straight across. That's how fast it was goin'. Just from, not this way, you know. The flames were blowin' and it was, came to the road we were on, it just blew, the flames just, we were goin' so straight at it, you know.

Yeah. Well, there's just a lotta dry stuff out there, that burnt from that previous fires, but, uh, sometimes it's just like it moves in certain areas every year and, uh, you don't come back to the same place every year, you know. So it changes, just depends on the fuel, I guess, and the season. Yeah, how much it dries out, but every year it's dryin' out more and more, you know. Getting' hotter and hotter.

I've seen that, where, you know, grass fire and all of a sudden the fire, it's just ground fire mostly, 'cause it's cool in the mornings and the fire just creeps along, and it leaves a lot of those trees green, you know. And it's burning slow and not burning hot. And I've seen some where it's burning hot, and, uh, and it seems like it just skipped across the trees, you know, and didn't hardly touch anything on the ground, you know. Yeah. Depending on the wind, you know. And how dry the fuel is. So it, it changes every year. You know, it will continue to change, you know. We're either gonna get more fires later on or we're gonna get hardly any. I seen where it rained... long, used to rain the whole summer, start in June that don't quit until the end of August.

Um, and especially now, I would guess that if fires went through some of those areas, no doubt fires have gone through in the past. But I'd say they're more vulnerable now. Uh, because of the permafrost melting. They're probably very vulnerable, some of it

The willows, the willows don't fall. They burn, yeah. But they'll, uh, sometimes they burn and then sometimes sometimes they won't. You know, depending on how hot the fire was, you know. When it's overgrowth it does burn fast once it gets started, especially with the sun and the wind.

Severe Wildfire Effects

Oh, the, uh, it's really, really, two of 'em in particular, um, just, I think burned so hot and so long that they, it just kind of, sort of turned that area into a moonscape, I think. It's empty, there's, uh, you know this, you hear scientists saying that it's better for, for, uh, moose and animals that browse and all that, that's nonsense. The fires that are more across the surface, are that way, you know, and stuff grows over, but the deep burn ones, they just, are no good for, well there's areas right up here, north of Galena, north of Bear Creek, that still nothing in 'em for, been 40 years now

Uh, there, uh, that hill burned, that was about 20 years ago. This side of my cabin about 5 miles. But that was a big burn. And it's just now growing back to where there's animal in there. After 20 years. But then, if it's different um, different soil that was left, I think, a very thin soil layer that, that the plants grow in and I remember that was just sad and so forth. And, and the last, probably four or 5 years there's finally, you know, rabbits, and moose livin' in that area, wintering in that area. Uh, so it's now turning good again, whereas before, you know, when I first started trappin' that area it was good trappin'. Now it's just finally come back after 20 years.

And then if you get a big fire goes through there, sometimes, if it's deep enough, where all the trees fall over, you have to cut it all out again.

But it's, it's an area where it once, probably once burned really, really too hard, because, um, uh, it's not that brushy.

Moderate Wildfires

Depends on if there's, if there was enough seedlings there to, to regrow it. Uh, lots of times it, it, when a fire goes through, it burns over the top. It doesn't burn down in the roots. Uh, unless the, the peat catches on fire and the moss catches on fire, and then it burns it out underneath. But in over the top,

uh, it usually doesn't burn clear to the ground it flashes on, all the dry stuff on the top. So the, the stuff would regrow again. Because just the top of it burned up. Not the root section, and the main trunk. The main trunk would still be there. So, and it would make a lot of, the ash would make fertilizer and so the stuff would grow again fast.

Well, one place, well, one place that burned around Nulato was before my time. And, um, it, um, what fire does is it burns what, a lot of times it depends on how hot it is, or what kind of fuel is there, but if it's basically a swampland, like over in the Kaiyuh flats, it'll burn through right away and it'll basically just be a ground fire. Um, well, what happens is that, you know, a ground fire will actually, um, you know, because it burns the way, all the dead that's out there, it's primarily good for what's left, because it, the ash and what's left is actually good fertilizer. So a lot of times, willows will start up really quick, like in the first couple years, and that'll be really a good moose browse. It's actually good for the moose population. And a lot of areas, ... you know, it's good for the berries,

there's been a couple of fires the last, well actually last 3 years up in that area. Uh, they're a more surface burn and kind of, uh, interesting. There's some, um, area that grow that fast.

CHANGES IN LANDSCAPE AND CLIMATE INFLUENCING LANDSCAPE FLAMMABILITY (FIGURE 3)

Overgrown Vegetation

it's getting warmer so everything is growing up, closing into the places there's cranberries. I remember it used to be wide open, now it's uh, it's all grown over, you know.

Milder break up/ Less flooding in lakes and sloughs

Oh, yeah, we go to uh, high ground when there's a lot of snow. They know it's gonna be high water. Old Town did flood. Uh-huh. So everybody stay in the high ground like here. Uh-huh. Us too. Yeah. Water all over. Yeah. And, uh, whole time we stayed in high ground. Nice. Just one hill, just alone. And then on the other side it's all hilly. And there we stayed. Mmm, everywhere it's like ocean. Lots of water. Right now everywhere is grass lake. No water.

Yes! I remember when water used to get high, we used to ride around way back big Willow Lake he's talkin' about. We used to drag the motor around all over. Now water never get that high for how many, thirty years?

Them years but uh, the river break up, the ice break up was more, uh, more violent, I guess. But we camp, our camp was, oh, probably 4 miles, maybe, maybe, between 4 and 5 miles as the crow flies from the river. Yet we could hear the breakup. Yeah. So it was really loud, you know, trees breaking, big trees and all that. So it was pretty loud.

Because Kaiyuh is that rich. And it still is now, but uh, it's not gonna be much longer, because, uh, you know, and global warming is beginning to take its effect up there now, you know, and it's more in the form of drier summers and uh, shorter winters, I mean seems like, I don't know, every other year is

different, you know, some years you have very little snow, other years you have a lot of snow and, uh, but, uh, the bottom line is the lakes are dryin' out. You know, uh, I can remember back in, every spring you had high water or you have floods, or but the lake was filled with water. And that doesn't happen no more. You don't hardly ever see that. I think the last flood we saw in, Nulato is build on a 25 years flood plain. And, uh, we haven't seen a flood down there since sixty - the last big flood was in 1963. So it's been quite a while. So they're due for a flood, but, but from '63 to now, our water never gotten high, high, high enough to fill our lakes so that they stay filled with water, you know, so now the vegetation's taken over. And it's happening all over the, the Interior on the lakes. It's really noticeable. And Kaiyuh's no different, you know.

Permafrost thawing

It used to be like a lot of willows in really deep water and permafrost when the land was cold and other animals were able to survive, because they're cold water animals. Well, they, in my time I've seen all the, lot of lakes dried up where there used to be a lot of water, and beavers in there and all the, it's just that dry grass there, ready for burnin'.

The lakes are drying up, and where they used to be nice ridges of ground, it's just sinking. All that permafrost is thawing out. Like back here, where we call Long Lake spring camp. That, the hill used to go all the way back, all the way across, that used to be high. High ground. Now all you see stumps in the water sticking up. That's all, all that warm weather's really thawing the permafrost out, you know.

Oh, yeah. Um, that area's, uh, a lot of that area, the, the lakes are drying out. Uh, I dunno, I suspect it's from, from, uh, maybe the permafrost is melting and it's just allowing drainage. And so, uh, it's huge, huge areas that were, were, uh, you know, water-filled lakes there are now these grass lakes and, and, uh, some of those big, big lakes that were full of water in, uh, for instance late '60s, early '70s are, they're all grown over now.

Um, and especially now, I would guess that if fires went through some of those areas, no doubt fires have gone through in the past. But I'd say they're more vulnerable now. Uh, because of the permafrost melting. They're probably very vulnerable, some of it.

You know, when they, like when they used to have 50, 60 below 0 winters, the permafrost, it holds back a lot of, uh, moisture that go into the ground.

Drying lakes

This Fish, place they call Fish Lake down here. Long time ago that place used to be, well it's still known today as, uh, the native name is Fish Lake. But, uh, if you translate it, the native name say that's where they catch fish. They call it Fish Lake. And it's known for the white fish. Just a lotta really fat white fish in that lake. And, then, the people, people that lived there was my wife's parents, they lived in that area. Had spring camp there. So spring time they set fish net in there. Then they, they, uh, catch the fish, they cut it and they hang it and there's hook holes. And my uncle Steven told me after they're done huntin' muskrat, huntin' up that way them flats, instead of comin' to here, they go on to there. Because they

know that there's a lot of fish down there. There's good fish, they can eat fish. And in their smokehouse where they hang the fish, the ground is just greasy. Because the fish, you know that's drying, the grease drip. And that's how rich the fish was. So they just made this special trip down there just to eat that fish. So, and then this spring, I went down to that lake. Me and (name). We drug a canoe back to that lake, one mile, over a mile. We drug that canoe back to that lake. There's no water in that lake.

One of us who had nothin' to do would snowshoe up on the north side of Bear Creek and get kind of in the low hills back there. We found some beaver houses that were in 'em, what you call Bow Lakes. And some of the beaver houses were, I would say, good 20, 30, 35 feet above the water level. And it, it had a lot of water back some time, you know. And gradually it's been goin' down, goin' down like that, so. And there, like when I was a teenager, you know, we used to go along these roads up there, kids ride and haul our canoes up there. And any one of those lakes up here, we'd, uh, haul our canoes right in the lake, paddle back and carry it over to another lake and paddle and you can't do that anymore, 'cause all those lakes are grass lakes most of 'em. Dried out. I tried that about 10 years back, I bought a canoe from Ruby and paddled back so far and the rest of the lake was dried out. I thought, he heck with that!

Cripe! he just walk all over the place where we used to go with boat!

Steamboat, they call it. We seen that kind lotsa time. When I was kid. And even that boat can't come around here hardly.

And that's where they used to hunt long ago. With canoe. And that's where, where we used to stay. It's this low creek, deep water. Right now here, and there's big bowl. No water. Gee! Just can't believe it. And no muskrat.

We never thought that it's going to be like this. Always muskrat. Always fish. Now the lakes is dry. Just like me and my husband one time, we were in the camp, so we start to go, used to be our trap line. Can't believe that's the place. What was lakes, all grass. And middle of those places, big willows. Gee, only place I remember is that willow tree. That's all. In this one place there's a creek and there's a mink den right there. We used to just trap for mink all the time. We see that. We seen it. But no water. My, talk about, I think about it sometime. Honest we gonna get lost. My! My! I sure think about it long time after.

Drier vegetation

Oh, there's tons of it, whole forest is dried up. Not whole forest, but I'd say miles. Like, mile and a half, two miles, even up to three miles of trees. Tree stands are just dryin' out. Find like thirty cords where there used to be all green trees. 'Cause the lakes are dryin' up, I guess.

And, I've seen that there where you can trap for miles and it's just dried up and you don't see anything. That would be like, I say, that place is just dried up, all the woods are dry. uh, it's just a dry, looks green, but it's dry.

all that rain, and all those flood lakes used to be long time ago is just sinkin' into the ground, you know.

That's from lake to lake, and finally, you have to cut brush. There's no brush to cut. It's all dried up and fell down. 'Cause of the permafrost melting.

Where you have to start watering trees and stuff, you know you're in trouble. You know it's dry, you know.

Loss of fire breaks

Right now is worse because, you know, all the lakes dry out! If there's fire around here on these flats, there's nothing can hold it back 'cause all, just the lakes are all dry! No water. Man! People used to go down there, at Uncle Edwin's camp. Fish Lake they call that place. Big lake! Everybody used to go there in spring time to have fish net under the ice. Just when the fresh snow and uh, fat, everybody, used to be really fat white fish. Man! And right now is just little hole out in the middle, that's all. All dry. Not no water!

More lightening

One elder explained that she didn't see fires start because in the past "You never heard thunder...we never seen fires start. Right now it does. So when there's thunder, we hear thunder we're scared. Sure enough. See it starts, see the smoke."

Less Rain

Well, I think it's better to put it out because, 'cause it don't rain like long time ago and there's hardly no water. All the grass lake is dry. Grassy lakes are dry. And there's no way it'll go out.

Milder winters

Long time ago weather used to be cold. Weather is so cold. What, what I used to hear is fox tail used to freeze. Yeah. And dog's tail too, they said.

We used to see more richer land when there was 50, 60 below zero in wintertime. What I see and that's to me, back in those days was healthier. Healthier, uh, forest. Less fires. You know. Lotsa rain, off and on. So that's the way I look at it, I look with global warming it's hot all the time. Dry. We get rain, but not as hard as it used to be. Like in August, probably middle of July or something used to be our rainy, rainy, uh, season. That was, maybe before September then everything start getting cold. So, I see, to me, I see, I think, uh, back in the cold weather days I think I see more richer land than I see today.

Uh, and when I say cold, I mean it used to be really cold. You know, like, like for the whole month of January, and the whole month of February, for some years in my younger days it never used to get less than 50 below for those two months.

Unpredictable weather

You know with this weather anymore, it's so crazy you can't - like, the last time I trapped there, really I had traps for wolves and back there it was really bad for trapping because you know, it would melt, and the ice, and the traps would freeze solid, and - so a lot of people just went for snares.

Later freeze up

But, uh, that was fun. We moved down there in May 13, we went down there, and we came back here on October 2nd, that's how long the summer. And long time we used to move down there on June 1, first week of June, right after school is out, uh, May 23, or something, that school was out, our kids, we move down there, that was in '80s. we live in camp. And then we'd come back right before school starts, sometimes August 21, and then freeze up by Sept. 10 or somethin'. Not anymore! Last year it was almost November it was, never freeze up.

We used to get a lot of rain in September, and now we hardly even get that. The snow is comin' later. You'd see snow in October, everything was froze over in October, I seen it froze over in September, September 14, and was froze solid around here. You know, first week in September. And, uh, haven't seen that in quite a while.

Yeah, not, not that, it's just, ah, I dunno, it's, uh, seems like the freezeups we have are a lot warmer and its not safe to go on the ice right away, and then you know, we don't have enough snows, so it's too rough to cross those, grass hummocks and stuff, you know, then you gotta have maybe a foot and a half of snow where it'll stay on top.

Use of term "Global Warming or Climate Change"

So what happened is that, uh, the water that was formed around that island, you know. That water it keep eating away on the, the permafrost on the bottom, it just sink. So that's the way we, we, uh, we figured it. You know. That's what's happened. Like they say, you hear the news all the time. Global warming. (laughs) Yeah.

Uh, I know the climate's changed. Yeah. Lot. Uh-huh. You know, back then, when I was like about 10, 12 years old, we had cold weather. All winter. We were used to 50 below. All winter long.

Earlier Green up

you just have to stop hunting, everything, because that's when they have young ones and I think it was when the leaves first come out. But it used to come out two weeks later in those days.

Hotter drier summers

The permafrost is melting. That's what's changing, that's why all that erosion, the permafrost, everything's getting hot. Last summer we came up here for 4th of July, that's the hottest I notice it. You know, 90's is really hot, 80's is very hot. But when we came here and they were having bike races, everybody was hosing each other down. And then this one guy said down at his house it was hundred and two degrees. I believed it.

it got really hot, you've got to keep your head covered. You burn. You have to, it's too hot. So it is getting hotter.

New Places burn

Um, the fires was always way out from the village. And back then they did not, uh, fight the fires at all. You know. They just let it burn out. As long as it wasn't close to the area. But just lately it seem like it, it's, it's in, anywhere just burns. Like up in Ruby also, out where we go pickin' berries, that was burned out.

And the forest fires has a lot of, change a lot of difference too, 'cause there's a lot of fires all over, you know.

Longer fire season

Fire starts earlier and burn longer. Yep.

Increased risk

A lake that's all dried up and full of grass, it, it burn like a mine in just a few minutes and probably no escape.

Last year there was, uh, so much grass. You know, the grass just grew here about, four feet. All over! About every lake. So that was, uh, what I see last year. You come to the lake, look, you look around for a moose you could just barely, uh, look over grass, grass is so long. So that's, uh, that was last year. And, uh, early this spring we went out, you know, walking around in the woods. Um, all that dead grass was just layin' on the ground. You can't set fire anywhere. You can't build a fire anyplace, it's just, it's just dry.

DRIVERS FLAMMABLE CONDITIONS (FIGURE 4)

Dead or dry vegetation

Spruce Beetle

The bugs. You know, like there's been, how many years ago they were saying that, uh, there's a whole bunch of certain kind of bugs in trees, you know, and I could tell that back here that, um, there's something wrong with some of these trees because, um, they're all brown, they just turn brown. So I think they must have bugs. Uh-huh. And then you look at other trees and they're nice and healthy.

You know, like, I know that the crops there, on that land, there's, uh, those trees, they look like something is just eating them. They're ... getting dried up like it burnt or something, but there's no fire. Seem like there was just, um, lot of, um, trees that was eaten by beetles. In that it was kind of just dried out and dead. And it burned up

It's, there's too much dry, dry trees, beetles are eating them. It's really thick. That fire really, it was coming this way, and then the wind shifted, and it went, and then it went right back into the burned area.

Road Chemicals

You know, do you think a lot of that, lot of it is close to the roads though. I think a lot of it's that stuff they put on the roads in the summertime. I think that has a lot to do with it.

Wildfire

Well, you could see there's, all the trees are dry. Burned up.

Well, there's just a lotta dry stuff out there, that burnt from that previous fires,

Yeah, I saw, uh, there was forest fire all the way, from way out Huslia River, all the way on the hill all the way out to the, uh, Huslia River and over this way, but uh, uh, all that was burned up about, maybe 20 or 30 years ago. And all the, there's a lotta dead trees on the ground.

Landscape drying/lakes converting to grass

Oh, there's tons of it, whole forest is dried up. Not whole forest, but I'd say miles. Like, mile and a half, two miles, even up to three miles of trees. Tree stands are just dryin' out. Find like thirty cords where there used to be all green trees. 'Cause the lakes are dryin' up, I guess. it's a fire hazard, yeah.

A lake that's all dried up and full of grass, it, it burn like a mine in just a few minutes and probably no escape.

Well, I think it's better to put it out because, 'cause it don't rain like long time ago and there's hardly no water. All the grass lake is dry. Grassy lakes are dry. And there's no way it'll go out.

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I mean, it used to be full of water. It's all dried up. And that causes the grass to come up, so the grass sucks up all that water too. And so the grass gets higher.

Mostly the lakes that are dryin' up are turning into grass and there's, and there's, I guess hardly nothin' can survive in 'em, I'd say, uh mosquitos. (they laugh) But, um, I don't know what eats grass, just moose, maybe. You know, maybe birds, I don't know, I'm not sure, but uh, it's kinda like a grass that nothin' can survive on, it's a tall dry grass that's just good for burnin', I don't know what else. It used to be like a lot

of willows in really deep water and permafrost when the land was cold and other animals were able to survive, because they're cold water animals. Well, they, in my time I've seen all the, lot of lakes dried up where there used to be a lot of water, and beavers in there and all the, it's just that dry grass there, ready for burnin'.

Grass from humans

And where they make trail it's all grass now. Especially out there by the lagoon. When we were doin' town cleanup the other day I noticed that grass get about, that's about 3 feet high.

But not in the town. Like even right back here along this hill right here, this whole place is all grass and about this thick, you know, top soil. That'll burn really hard.

The way I look, I mean. But um, my cabin I've been trying to build a fire break around it, I, it's filled up with leaves and grass every year so it's a yearly thing. And every year I hear people burn the grass right along the airport where it's a real fire hazard. A fire can move, like, you know, a mile in a few minutes, and people can't run.

Unknown deadfall

Lot of blown down trees. Maybe because the roots are getting weak or the, it's just, I don't know. Hasn't it changed? Lot of big trees are falling over.

Natural Mortality

Trees gonna die anyway

Thick trees

That is not really too thick, where you come to a birch patch and it's really thick. Those, those are too, they, uh, they get too much water and they're kinda dried out like. Then there's too much, too much, uh, too much trees in one place and then they start drying up right away, it takes too much to keep that tree maintained at, you know.

Jack Spruce

Those spruce trees? And then they're not green, they're dry. And the whole forest is like that, down right outside of town. That's because, uh, um, that burn there a long time ago, that's how they grew back. But they're so close together.

jack spruce, they're small, small trees, but they're, uh, so thick that once the fire get in there it, it'll just keep burning, burning until it burned out.

Um, it was jack, jack spruce. Seem like they, you know, where there's lots of, you can't do nothing with those ones when they catch on fire. You have to wait till, what we usually do is just trench from lake to

lake before it get there. Try to hold it back with, you can't, you can't do. Look behind you! Yeah. Yeah, that's the hardest, was jack spruce to jack spruce.

Thick brush

a lot of places where we could walk and travel, it's so thick and grown up and bushy, we can't walk through it anymore. Uh, but I don't know how they'd control it, so where it would just, if there happened to be a fire there

Time since wildfire

it's better to let it burn 'cause it's gonna burn sometime. Sooner or later it's gonna burn up. They keep getting the fire out before it even, uh, starts, I mean, uh, before the forest fire. That's why it's so hard to get the fire out, because it's so, they let it get so thick, the trees get so thick and, once it, the fire starts and they can't get the fire out, it's just, it just keep kinda grow

I know what, uh, areas that never burn for years and years, just gets worse and worse and so when the fire does come, you know, everything will burn. Like this whole hill right here that we live on, this place burn before too. that's why there ain't no brush all over, you know, there's like this much top soil or whatever.

Less human use

Nice little cabin, it's all brushed in.

Rabbits

You can't even see the lakes anymore, they grow so fast. I say, a lot of it has to do with, you know, we used to have a lot of rabbits.

Getting warmer

it's getting warmer so everything is growing up, closing into the places there's cranberries. I remember it used to be wide open, now it's uh, it's all grown over, you know.

POSITIVE AND NEGATIVE EFFECTS OF WILDFIRES (FIGURE 5)

Fire ruins country

I went around there but there was nothing there. Still kind of burned, just different land altogether after it burned up.

But most of the country where a lot of animals been born, the State took over, you know, the State of Alaska. Took over the land. And they let the country burn right up. But the state would, can't afford to have firefighters knock it out, you know. Lettin' big countries burn up, you know. I don't know why they allowed the state to take over the country. They're gonna kill the country.

Fire kills small animals

You know young was born in May, and they can't help themselves these small marten, you know. They're born in the den, and they burn right up, you know. Nothing you can do, even the mother burn too, I think, but it's that, they can't, no place for her to run, you know.

MATURE SPRUCE-DOMINATED FOREST BURNS (FIGURE 6)

Small animals burn

Well, I think it burned lotta marten, lotta small game. You know, like the martens, you know, they don't run. They'll climb trees. You know, they, they're tree climbers so they don't run from fire.

Combat Spruce bark beetle

And the idea was, some of it that burned I think was to stop the bark beetle or somethin', but that was, uh, it was a good idea at the time. I thought.

New growth-willows, birch

Loss of habitat for furbearers living in old growth

So anything in regard to wildlife that pertains to spruce trees, they're gone forever. They're not gonna come back. They don't, their, martens don't deal well in birch trees. Mink don't deal well in birch trees. Linx might, because they get rabbits. But all the other fur-bearin' animals will go where the spruce trees are.

Food for moose, mice, rabbits, lemmings

Uh, 'cause it opened up a, it opened up a big huge area. Uh, and so there was young, young growth after, after the fire burn and the young stuff sprouts up and so, uh, the different animals would come in and eat the younger vegetation. Then that, seemed like after a year then the, was like they were always there.

Thick brush/birch hard for travel

Yeah, no, and after a fire a lotta birch trees grow along the bank, and it, it made it tough to go back to the lakes 'cause the birch trees grow close together, they're harder to cut and everything else, so. But, uh, I don't know if the moose care too much for birch trees either. 'Cause I notice in that Bear Crick area there's not that many more moose like there used to be.

Spruce grows

It grows back that fast, yeah. The trees, spruce trees, you know, that's mainly what's up there.

Jack spruce grows

Yeah, it grew back too, but they're, they're all jack spruce. Where there used to be big tall spruce trees.

Extensive deadfall

Travel difficult/impossible/trails must be re-cut

Well, the trees that burnt, all the trees fell over, and the stumps stickin' out all over. You can't go back to the same area. Where, like where you had quotas before, if that country burn up, then all those, trees fell over, the stumps come up too. All the roots, the roots come up and the roots standin' up like this, you know. They're like that all over the place. Where it burns. And you can't go through it. You have to go through like this, you know. Around all them stumps.

Dry firewood

Well, actually, if a fire burn close to a village we don't have to go too far to make rafts or, fall time spring time we go up the river and float down logs, both for firewood and for cabin.

Habitat for birds and small animals

Uh, more moose moved in. Some of the animals, some of the smaller animals moved in, into the, into the downed trees where the trees would make a protected area. Uh, oh, lots of more different kinds of birds.

Deadfall blocks lake exits and kills fish

Not since, not since, uh, fire burned up all the trees, trees fall over lakes and block off the creeks and wipe out a lot of fish in there. Not only on top of the land, but inside the lakes also.

Loss of calving habitat for moose

Well, you know, that the, it used to have nice heavy timber along both sides of Bear Creek. Used to be good for moose and stuff like this. You know, moose would have their calf and they, they like that shade. Where the spruce trees give you shade. After it burnt up they don't have any more shade, it's - and then the other thing is, uh, when it was, the snow gets deep in the winter, always inside the spruce tree line the snow was not so bad. They can walk around good in there.

Loss of shelter from wind and snow for humans and moose

Yeah, because another problem with, uh, that area that burned over, uh, the wind blows in there. And, it, get drifted and a lot of the trailsite is (slanted) like this. It keep, it just drifted you know, the drift. And you go a long way you just have to stay sideways. And, because all those trees burned, they all fell down and then wind start blowin' and the snow piled up a certain ways and by the time it get there the trail is like this(slanted).

Harder to hunt without cover

Mmm, actually, all the trees would not be there if there's fire. And, we can see further in the woods, and if we can see further the animals can see us further too and they'll run off.

Loss of valuable large timber

It's probably pretty hard to find next, 'cause all the fires actually burned all the good timber.

Timelag

And when I say forever, I'm talking in terms of, like, 50 years. 60 years. Gonna take that long for that thing to regrow. The big trees, never. It'll take you another hundred years just to get a tree half the size of the one that burn up. The little guys, in the meantime, are gonna overgrow. Wherever there's spruce

trees, fire come through there, and for the next 30 years all you're gonna have in there is gonna be alders and birch.

NON-SPRUCE FEATURES BURN (FIGURE 7)

Overgrown, bushy area

Well, if it's a brushy area I would, I would be happy that it burned out. So it will get more vegetation back in that area. More animals for our subsistence, more hunting for our subsistence.

New growth attracts moose

I'd like to see some of it, uh, because uh, a lot of places where we could walk and travel, it's so thick and grown up and bushy, we can't walk through it anymore. Uh, but I don't know how they'd control it, so where it would just, if there happened to be a fire there ... they let it burn. And they let it burn and, uh, in a season or two it makes new growth. And, uh, so a lot of animals kinda go back in there. Where they couldn't go before because the brush was too thick.

I think so too. Because they gotta have new, fresh vegetables. (they laugh). New willows, Especially the, especially the moose

So a lot of times, willows will start up really quick, like in the first couple years, and that'll be really a good moose browse. It's actually good for the moose population.

Dry Vegetation Revives

I mean, we're kinda happy 'cause um, we could get more moose in that area. More vegetation's coming out not so dried out. Uh-uh. .We were kinda, kinda happy it burned out there. 'Cause it was gettin' dried out and too, too thick with brush

Human travel easier

Kinda hard to get to places. Because of, um, brush, um, being too brushy and stuff. Then, then after that people, it was easy for people to make, uh, to travel, in that area.

Rhubarb grows better

(Rhubarb grows along) the river bank. Creek. Sometime, after a burn, we usually find more. But then they wipe out rest of the game and rest of the plants.

Berry patch burns

Overgrown berries rejuvenate

They got bigger. And then, the cranberries, I don't know how long ... they came back. And the blueberries. But the one that's slow is blackberries (crowberries). Gee, they took up just the same size every year. They're gettin' little bigger finally. So, some, some plant grow fast, I guess.

in Kaiyuh area in some places there wasn't, where it burned there wasn't like, salmonberries. And now salmonberries is comin' back in that area. Probably because it's more open. More open, there's more light. There's more light getting there, in those areas. Yeah. Seem like when it's, um, place is blocked off, um, like lot of brush, along where the berries are, they hardly grow. 'Cause there's not enough sunlight. And see, after the area burn out, it's more open, seem like.

Deep burn: berries replaced with something else

(Q: Do berries re-grow after a burn?) Depends on if there's, if there was enough seedlings there to, to regrow it. Uh, lots of times it, it, when a fire goes through, it burns over the top. It doesn't burn down in the roots. Uh, unless the, the peat catches on fire and the moss catches on fire, and then it burns it out underneath. But in over the top, uh, it usually doesn't burn clear to the ground it flashes on, all the dry stuff on the top. So the, the stuff would regrow again. Because just the top of it burned up. Not the root section, and the main trunk. The main trunk would still be there. So, and it would make a lot of, the ash would make fertilizer and so the stuff would grow again fast.

Oh, yeah, there's a lot of places where you can see, uh, where it had burned before. You know, and uh, like say, they had big forest fires. Um, and, after after the fire, you know, everything starts growing. Like, say, over here, you know, and they had that big fire across the river, that goes right out to the bank? And I was saying, once things start going on there it's gonna be really good for berries, because Mom said, you know, they used to pick blueberries over there. Last summer there's some people went over there and said there was a lot of blueberries. Oh, yeah. Seem like they just really grow back because there's not, it's not brushy, it's all in the opened. That's where we lose all our blueberries, I think. Because they choked out with all these trees and willows, and everything.

Berries to grass

Yeah, they (berry patches) burn fast though. You know, I haven't, they don't mostly come back for years, like maybe 20 years, but uh, grass will pop up, grass and anything else. And it might, that might not give up the, um, space once it takes it.

No need to burn functioning berry patch

Um, they're, uh, fire is really dangerous for certain berry-pickin' areas, for example, like I recall one instance, when, um, back in the days when there would be families, or sometimes three or four families would go berry picking, you know, and camp out for a few days. Uh, and, uh, some of 'em started a little forest fire. Everyone had to pitch in and stop that thing. To not destroy this berry-pickin' spot that's, you know, everyone's gone to or everybody in that area, to pick cranberry.

Less Berries

they say after a fire it comes up a lot better. But I don't know. 'Cause, uh, over here where we used to go pickin' berries, that got all burnt up and, um, the berries is not as abundant. You know.

Takes time

It's hard to get the blueberries, it's gonna take a few years for blueberries to come back.

It (cranberry picking area) burned up now, so maybe 10, 15 years down the road it might be good again. And, uh, just depends, 'cause it almost burned that whole area where I would pick cranberries every year. But it stopped just short of it. And it was good, you know, and then, another area would've been hard to find cranberries. Have to go further, that's all.

Lichen burns

Caribou may leave

Uh, yeah. I remember my grandma talking about, uh, as we were traveling along the river between Ruby and Kokrines, there were, uh, caribou that would come across. Uh, we didn't see it anymore because the herd moved because of the fires up around in this area. They would either move further, uh, west, or further east. So they didn't come through this, this area very often. But they did at one time. Uh, and because of the fire, yeah, uh, the caribou eat, uh, lichen, and, uh, type of moss. And so if the fire burns that out, uh, they wouldn't go there. They'd go someplace else where, they might move, uh, as much as a hundred miles.

And it takes 50 years for lichen to grow where the caribou food.

SOIL OR ORGANIC MAT BURNS (FIGURE 8)

Soil composition changes

we see brown sand, because it burned out a long time ago. Burned out hill.

Oh, the, uh, it's really, really, two of 'em in particular, um, just, I think burned so hot and so long that they, it just kind of, sort of turned that area into a moonscape, I think. It's empty, there's, uh, you know this, you hear scientists saying that it's better for, for, uh, moose and animals that browse and all that, that's nonsense. The fires that are more across the surface, are that way, you know, and stuff grows over, but the deep burn ones, they just, are no good for, well there's areas right up here, north of Galena, north of Bear Creek, that still nothing in 'em for, been 40 years now.

Erosion

And it, um, uh, when somethin' burns it washes out too. Rain just washes everything out. You know. You have to make a new trail, like a, we had pretty much cut out a whole new trail through that mountain after it burned. Not just one, not just one time. Every year.

Like the erosion, like, I think. Hills, like washouts, and all that, that's the only thing I can think of now.

Permafrost

And that's a lotta, land to open up to the sun, I mean, you know, sun melts all that permafrost and never comes back, I guess.

Drives out mice

Yep. Because actually, initially it gets poor, for like the first couple of years, because a lot of bears eat mice or shrews. So, you know, those get driven out, you know. Because a lot of fires are ground fires. Those little tiny animals that predators like marten and lynx, and even wolves feed on mice, you know, so until those things start to come back it's kind of like, a poor trapping area.

Hummocks

So it spoiled a lot of portages because, where we had trails, you know, that, uh, when you got them, right now they call 'em grass hummock you know, and as long as they've got all that grass and stuff there, you can cross 'em pretty easy. But when they are all burned up they're just like a stump stickin' up and you wham and you tip over and, really really hard traveling after that.

Lakes Dry

Yeah, after the fire wipe them out, come up with more different brush, willow trees, and berries is out in the tundra sometimes, which wipe out all the water, water don't hold any more after it burns. Just make drainage, open up more drainage. We're losing lot of lakes out this way.

Crazy Trees

You ever notice them, uh, birch trees? They're all, looks like somebody just laid them down. And they're not burnt or anything, I think they're just kind of burnt under the ground.

Fish

The broth of these little animal. So, I, I ask that, uh, you people study everything on this lake, and I want you to study those big lakes out there, or any place off the flat, where there used to be lots of this kind of fish. And I tell them, I want you to answer if you find what happened, but for one thing, ashes wouldn't, the animal, fish, wouldn't live in ashes. And you know how much ashes come round to these lakes. And just by myself I just think that might, you know. Kill them. Because they have, uh, underground cache. They bury their blueberries in the summer for the winter. With birch bark basket and put cover on it, then they bury it. They get fish eggs, hide it in there, and they sew cover on it for birch bark. And they bury them. Then they, you know, cover it with something, then they cover it. And up on top, they have fire and all the charcoal, and like, all the animal, they don't like charcoal. Because you can't, you know, sniff it. They just keep away from that ashes. And that's why they cover their cache with it. Okay, and, if they do that, then it might affect fish. They have no way to find out. But ashes were, they could, you know. They could try it on fish. See if they live in there. Then they would come back with the answer.

Yeah, he trap there, but the animals would move out of a burned area. 'Cause it's either not cold or they, it's not, it's new to them, or foreign to them or somethin' you know. But maybe it's uh, ash in the ground. But they seem to move away from there and some animals would stay there, but others will move.