

GRADE 9 SCIENCE:

CARIBOU AND THE IMPACTS OF CLIMATE CHANGE



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Content excerpted from:

SOUTHERN LAKES CARIBOU IN THE SCHOOLS: A COMMUNITY-BASED LEARNING RESOURCE

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Southern Lakes Caribou in the Schools:
your local Southern Lakes Yukon First Nation
Community Booklet or Southern Lakes Caribou
in the Schools: Learning Resource

Gathering and editing of the stories, content, and Elder contributions was made possible by funding from the Carcross/Tagish Renewable Resources Council, Laberge Renewable Resources Council, Department of Education & Department of Environment (Yukon Government), MakeWay, Yukon Fish and Wildlife Enhancement Trust and support from Teslin Tlingit Council, Kwanlin Dün First Nation, Ta'an Kwäch'än Council, Carcross/Tagish First Nation, Taku River Tlingit First Nation, Champagne and Aishihik First Nations, Southern Lakes Caribou Steering Committee and Rivers to Ridges.



GRADE 9 SCIENCE:

CARIBOU AND THE IMPACTS OF CLIMATE CHANGE

BIG IDEAS

- The biosphere, geosphere, hydrosphere, and atmosphere are interconnected, as matter cycles and energy flows through them

LEARNING STANDARDS:

CONTENT	CURRICULAR COMPETENCIES
• Matter cycles (water, human impacts) • Sustainability of systems (matter and energy as interconnection in equilibrium) • Yukon First Nations knowledge of interconnectedness and sustainability	• Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing and local knowledge as sources of information • Analyze cause and effect relationships • Consider social, ethical and environmental implications of the findings from their own and others' investigations

LEARNING TARGETS

1. I am able to consider interconnections and sustainability for the Southern Lakes Caribou.
2. I am able to experience and interpret the local environment to understand how matter and energy systems are interconnected sustainably.
3. I am able to analyze cause and effect relationships of human impacts on the Southern Lakes Caribou (water cycle).

PRIOR LEARNINGS

Prior to teaching the following activities and games, it would be helpful if the students had a basic overview of Southern Lakes Caribou seasonal movement and seasonal rounds. Some helpful resources are listed below.

- C. (n.d.-a). *Southern Lakes Caribou* | <https://southernlakescaribou.com>
- *Caribou in the Schools: Community Booklet (for your community)*

MAKING IT HAPPEN

PART 1: FIRST NATIONS ENVIRONMENTAL INTERCONNECTEDNESS

LEARNING TARGET:

I am able to consider the social, ethical and environmental implications of including Yukon First Nations knowledge of interconnectedness and sustainability as sources of information on the Southern Lakes Caribou.

TIME: 60 MINUTES

OPENING: CONNECTING TO CARIBOU

Gather in a circle outside and pass the Caribou artifact around, allowing each student to have a moment to closely examine it. Invite the students to share any stories or connections they have during this time. The Southern Lakes Caribou (SLC) have an extensive and intimate history with the Yukon First Nations and there are many stories to share that highlight this relationship. Invite the Elder or Traditional Knowledge Holder to speak on the importance of learning through stories and sharing knowledge passed down through generations.

ASK STUDENTS:

- Are there any thoughts or feelings that come to mind as you are holding the artifact?
- Do you have any connections to the First Nations people of the Southern Lakes?
- Do you know any stories about Caribou?
- Do you have anyone in your family that you can ask about the history of First Nations and Caribou?
- What do you know about the importance of storytelling in Indigenous communities?
- What does interconnections mean to you?

Share ideas.

MATERIALS

- **Caribou artifact: sewing materials, Caribou tufting, snare, clothing, lichen sample, or swatch of Caribou hide (Appendix 1A)**
- **Pictures of artifacts (Appendix 1B)**
- **The Blind Man and the Loon told December 6, 1950 by Carcross Elder Jimmy Scotty James (Appendix 6A)**
- **Bandanas**
- **Rocks/pine cones**
- **Targets made out of natural materials**
- **Community Booklet (for your community)**



ACTIVITY: THE BLIND MAN AND THE LOON

Share the story **The Blind Man and the Loon** told December 6, 1950 by Carcross Elder Jimmy Scotty James (Appendix 6A)

You can begin this activity in an open area outside. The students will need to be paired up and each set of partners will create a Caribou target out of natural materials that they will need to hunt “blindly.” They also will collect five hunting “tools” found in nature.

One partner will be blindfolded, relying on their senses and familiarity of the environment around them, along with guidance from their partner, to hunt their Caribou target. The partner of the blindfolded student will be instructing them in which direction to step (left, right and how many steps to take) and when to throw their chosen hunting tool (rock/sticks) at their Caribou target. Each blindfolded hunter will start with five hunting tools to attempt their hunt. When they have used up their five hunting items, the partners can switch and take turns to hunt their target.

EXTENSIONS

Ask the Elder or Traditional Knowledge Holder to share stories and/or knowledge about the seasonal movement of Caribou, and how the changes in the evolving environment have affected the ranges. Create obstacles in the open area that could mimic different challenges that might occur while hunting Caribou by:

- Putting the Caribou targets into a forested area.
- Hiding targets in shrubs where Caribou might take refuge from predators.

CLOSING

Gather in a circle with the Elder or Traditional Knowledge Holder and share reflections from this activity.

The environmental implications of climate change have had a massive impact on the Southern Lakes Caribou herd and the connection that First Nations people have with them. A lot of work has been done to mitigate the damage, but there is still a long way to go. We can always look back to history (especially to traditional stories like the Blind Man and the Loon) to teach us these connections, to bring us back to the core of Yukon First Nations ways of Knowing, Doing and Being that can help us strengthen our knowledge, understanding and respect for the land and water that we share together with the SLC.

ASK STUDENTS:

Why is it important to include Yukon First Nations knowledge on SLC in decision-making?

ASSESSMENT OPPORTUNITIES

Are students able to:

- Create a connection between the story “The Blind Man and the Loon” and Yukon First Nations Knowledge of interconnectedness and sustainability as sources of information of the SLC?
- Consider social, ethical and environmental implications of the findings from their own ideas and from Yukon First Nation perspectives?
- Clearly reflect and respect the importance of Traditional Storytelling as a way of sharing knowledge and teaching in Indigenous communities?
- Recognize the impact of cause and effect relationships?

PART 2: CLIMATE CHANGE AND SOUTHERN LAKES CARIBOU (SLC) POPULATION DYNAMICS

LEARNING TARGET:

I am able to experience and interpret the local environment to understand how matter and energy systems are interconnected sustainably.

MATERIALS

- **Caribou artifact(s) or examples (Appendix 1B)**
- **Energy and matter flows within the ecosystem (Appendix 7A)**
- **Web of life cards (Appendix 2E)**
- **Chart paper and writing tools**
- **Titles written on large chart paper, a whiteboard or chalkboard:**
 - climate change impacts
 - human impacts
 - predator impacts
- **Cones (optional)**
- **Pinnies**
- **Community Booklet (for your community)**

TIME: ~90 MINUTES

OPENING: ADAPTATIONS WITHIN THE WEB OF LIFE

Review the Energy and Matter Flows Within the Ecosystem diagram (Appendix 7A) as a class.

ASK STUDENTS

- What does interconnectedness mean to you?
- What is matter? What is energy? Can you define these terms?
- How are matter and energy interconnected within the ecosystem of the Southern Lakes?
- What are other parts of the ecosystem?
- Which parts of the ecosystem are Caribou connected to?

Share ideas.

Gather in a circle outside.

Distribute Web of Life cards, one to each student. Each student will have a turn to connect their card (their part of the Caribou ecosystem) to another classmate's card. Use the names in Dän'ke, Kwanlin Dün dialect. Components of Web of Life could include: **sun, udzí njī/lichen, k'ây/willow, nose bot fly, ts'ûrk'i/raven, Udzí/Caribou, tth'j/mosquito, ägay/wolf and ätsi shäw/grizzly bear.**

“Caribou share their habitats with an astonishing variety of creatures. They are all part of the ecosystem, and support and sustain themselves to mutual benefit. A naturally functioning ecosystem is more than a food chain. Predators chase Caribou, and so do tiny insects, whose larvae grow inside a Caribou host. Caribou scour the tundra and forest floors to devour lichen, but their traveling hooves help other plants spread and take root elsewhere. Their fecal pellets return nutrients to feed such things as mosquito larvae in wet areas and plants”.

(Kirsten Madsen. (2018). Project Caribou. An Educator's Guide to Wild Caribou of the North, p. 9)

- One student starts the web, holding one end of the ball of string in their hand, and passes the string to a classmate with a card they feel is connected to their own.

- Each student describes their connection to the student they pass to on their turn. For example, a student with 'sun' can pass to 'plant' and link them because the sun provides energy to plants.
- Students continue to pass the string to someone they are connected to, holding their portion of it, and describing why these two parts of the Caribou ecosystem are connected.
- Repeat until everyone in the circle has received the string. Students may receive the yarn more than once, highlighting the importance of their part of the ecosystem.
- Invite students to reflect on what their web represents.

ASK STUDENTS

- Can you predict what would happen if one component was removed from the ecosystem?
- How might this happen? (Matter: hunting, highways and high predatory populations; energy: changing climate affecting sunlight)

Share ideas.

- Invite students to lift the string, all together, over their heads. Observe the web from underneath. Discuss how this web highlights the tight, interconnected nature of the ecosystem. What happens to one part of the web happens to the whole thing.
- Choose one card to remove from the web. Discuss what might remove this from the web (human activity). On the count of three, with the web pulled taut, have that student drop their string(s).

ASK STUDENTS

- Who felt their string(s) go slack as a result?

CLOSING: CONNECTING THE WEB

Continue until the web has fallen apart. Reflect together on connections and shared impacts of the web of life. Encourage students to share something they noticed during the activity.

ASK STUDENTS

- In what ways are matter and energy interconnected through the web of life?
- What connections surprised you most from the web?
- How does a change in one part of the web affect the rest of the ecosystem?

Begin discussing the relationship between the SLC and climate change in relation to other living organisms. Invite an Elder or Traditional Knowledge Holder to be a part of the discussion and share their personal experiences or stories. Display the titles highlighting impacts on Caribou for students to use while answering these questions and for further reflections.

Climate change is a leading factor affecting the SLC. For example, the warmer the atmosphere, the more greenhouse gases are trapped in the atmosphere creating higher temperatures than normal. This affects the quality of life for all living organisms, including Caribou. A changing climate means there could be a higher chance of forest fires affecting habitats, and higher water levels than usual creating a challenge for Caribou as they move seasonally. It might also mean a reduction in ice patches for Caribou to find refuge from insects in the hotter months.

ASK STUDENTS

- How might climate change impact the SLC?
- How might other animals impact the survival or decline of the SLC?
- How might animals like Caribou need to adapt due to climate change?

Share ideas.

Record this conversation and web of knowledge in a visual representation for students to further reflect on at a later date. Use the subtitles for climate change impacts, human impacts and predator impacts.

ACTIVITY: ICE PATCH TAG

Prep: Set up a clear play area with boundaries (natural boundaries with tree lines or plants/rocks, or use cones).

Gather in a circle outdoors, weather permitting. Focusing on impacts from climate change, share ideas around how animals have had to adapt. In a recent study, there was evidence of polar bears hunting Caribou. This is rather unusual, as polar bears' main food source in the Arctic is seals. With the warmer temperatures, ice is melting and this is a problem for polar bears because they depend on ice patches to hunt for seals, who rely on ice to take care of their young. Polar bears have had to adapt to the change in their environment and seem to be looking for new sources of food: Caribou.

Choose one student to represent a polar bear predator while all other students will be Caribou. The Caribou will all be wearing a pinnie so it is clear who is who in the game. All Caribou will line up along one end of the play area. Their goal is to cross the frozen waterway safely without being caught by the polar bear. When a Caribou is caught, they take off their pinnie and become a polar bear predator. This round of the game ends when there are Caribou who have made it across the ice patch successfully and no more Caribou are moving. Gather data from this round to see how many Caribou survived and how many did not. This information can be graphed later on, especially in comparison to following rounds as seen below.

EXTENSIONS

Introduce the effects of climate change and put out safe zones/ice patches around the waterway. Now, for Caribou to cross safely, they must swim in the water without being caught by the polar bear. Caribou must stop on at least one ice patch where they can take a moment of safety (five seconds) before continuing on to their calving areas.

Introduce more polar bears from the beginning of a round to see how this affects the population on Caribou.

Introduce a heat wave and higher temperatures which means that some ice patches/safe zones will be removed during this round, making it harder for the Caribou to find a safe zone and affecting their survival. Ice patches may not be thick enough to hold their body weight and will crack under the pressure!

CLOSING

Gather in a circle.

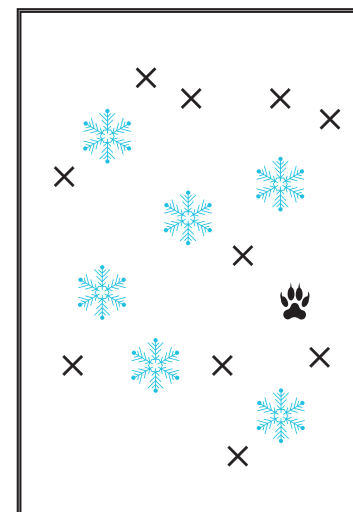
ASK STUDENTS

- What kinds of changes (in energy, matter, human life or wildlife) do you predict the Southern Lakes will experience in ten years? One hundred years? One thousand years?
- How might the effects of global warming create animal adaptations that may affect the SLC population?
- How might flooding due to an excess of snowfall affect the SLC's seasonal movement?
- What might happen to Caribou or other living things when ice patches disappear?

ASSESSMENT OPPORTUNITIES

Are students able to:

- Reflect on the effects of climate change on the environment in relation to the SLC?
- Share ideas about the web of life between animals and plants?
- Grasp how animals adapt to their environment?
- Create a clear statement of commitment in becoming stewards for the SLC?



PART 3: SOUTHERN LAKES CARIBOU WITHIN THE WATER CYCLE

LEARNING TARGET:

I am able to analyze cause and effect relationships of human impacts on the Southern Lakes Caribou (water cycle).

MATERIALS

- **The Weather Network: Flooding Extremes in Northern Canada Are Becoming the New Norm (video)**¹⁴
- **Water Survey of Canada: Real-Time Hydrometric Data Graph for Marsh Lake Near Whitehorse**¹⁵
- **Yukon State of the Environment Interim Report 2011**¹⁶
 - Climate Change**
 - Long-term precipitation and temperature variation (pg. 16)
 - Water**
 - Snow accumulation (pg. 31)
 - Extreme high and low water in lakes and rivers (pg. 33)
 - Water quality (pg. 38)
 - Yukon River ice breakup at Dawson City (pg. 42)
- **Community Booklet (for your community)**

TIME: ~60 MINUTES - 2 HOURS

OPENING: FIRE IN THE FOREST

Gather in a circle outdoors. Bring the focus to discussing the water cycle, including concepts such as water vapor, clouds, precipitation and streamflow patterns.

ASK STUDENTS

- Do Caribou drink water to stay hydrated? (Moisture is very important to a Caribou's survival however, they do not drink water. The structure of a Caribou's nose is called a 'nasoturbinal bones' and they are in a spiral shape much like that of a shell. This spiral shape means that there is more surface area. When a Caribou breathes cold air in through their nose, it has a longer path to go through to reach the lungs. As the cold air makes its way through the spiral bone structure, it warms up and stays humid. As they exhale, the warm air cools down and the moisture stays in their system. This design reduces a loss of heat, moisture and energy, keeping Caribou hydrated and warmer during the colder months.)
- How might climate change affect a Caribou's diet and movements? (In the winter, with temperatures that shift can mean rainfall on top of snow and this makes it harder for Caribou to dig for their food. In the spring there could be warmer temperatures meaning that snow will melt faster and could cause flooding. Flooding from a lot of rainfall is also an issue because this affects how plant life grows. Caribou cannot find the food they need if plant life is oversaturated by water. Although Caribou are great swimmers, they will take the path that seems the easiest and that might mean going out of their way, finding different paths to get to their destination and finding food could be challenging.)
- Are we seeing more or less precipitation in the Yukon in recent years? (More snowfall late in the season means more snowmelt in the spring. The Yukon has seen floods and landslides due to the level of precipitation and melting points.)

¹⁴ Corp, P. (2023, February 1). *Flooding extremes in Northern Canada are becoming the new normal* - The Weather Network. The Weather Network. <https://www.theweathernetwork.com/en/news/climate/impacts/flooding-extremes-in-northern-canada-are-becoming-the-new-normal>.

¹⁵ *Disclaimer for Hydrometric Information - Water Level and Flow - Environment Canada*. (2021, December 14) https://wateroffice.ec.gc.ca/report/real_time_e.html?stn=09AB004&mode=Graph&startDate=2021-12-14&endDate=2021-12-21&prm1=46&prm2=5.

¹⁶ *Yukon state of the environment interim report 2021*. (2021, December 1). Government of Yukon <https://yukon.ca/en/yukon-state-environment-interim-report-2021>.

- How might a rise in forest fires affect Caribou? (There are more active wildfires in the Yukon because of climate change and rising temperatures. Wildfires can change how plants grow, affecting the life span and growth of lichen, which Caribou need for winter survival. Forest fires also help shrubs and other plants to grow, which attracts animals such as Moose and deer, increasing predators in those areas for those animals and for Caribou.)
- How might forest fires affect the waterways of the Yukon? Forest fires create a hard surface in the top soil. This means that the soil is so compact that it cannot absorb much water. More runoff of water can happen in the areas where there have been forest fires and this can add to the already mounting water levels and flooding.)

ACTIVITY: FIRE IN THE FOREST

Invite students to line up in an open play area or a wooded area, side by side. One student will be in the middle to represent a “flame” that sparked from a drought and hot weather. Everyone else will be Caribou (cow, bull or calf) who need to make it to the other side of the forest fire in order to survive.

The Caribou will have a moment to quietly decide which of the Caribou they will represent in this round of the game (cow, bull or calf). Next, the flame will call only one of the names, and those Caribou will attempt to make it across without getting caught by the flame. If tagged, the Caribou must stop and join as a flame for the following round, however they will only be able to move their arms while their feet stay stationary.

When all Caribou names have been called and there are no remaining Caribou at the starting point, the first flame will continue calling out Caribou names as before but now there are more flames, the fire has grown. If the flame calls out “Fire in the Forest”, all Caribou must run to safety on the opposite side. The game ends when all Caribou have been caught in the fire or when one Caribou remains.

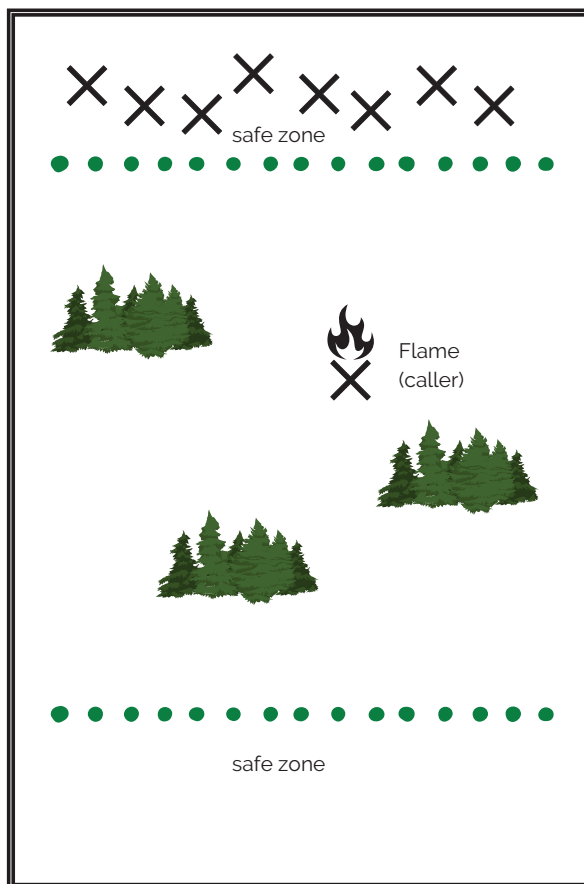
Students secretly choosing 'Cow', 'Bull' or 'Calf'
(or names in a Traditional Yukon First Nations language)

EXTENSIONS:

- Add in “watering holes” as safe-zones or stopping points where Caribou cannot be tagged by the flame. Caribou can remain at the watering hole for only one round of calling, and must move on as soon as it is safe.
- Add in “flooded zones” where the watering holes have overflowed, and are now a dangerous hazard where Caribou cannot cross (making the playing field more challenging)

ASK STUDENTS

- How might Caribou respond to a previously safe watering hole becoming a dangerous flood zone?
- What might Caribou need to do to move from habitat to habitat when water or fire blocks their traditional pathways?
- What could humans do to support Caribou through the hazards of climate change-induced fire and water events?
- How might climate change affect birthing times? Rutting season? Energy levels?



ACTIVITY: STORYTELLING THROUGH DATA

Review how climate change has affected both the amount of precipitation and likelihood of wildfire in the North, and how these may be affecting the Southern Lakes water levels. Watch the short video from The Weather Network and follow up with a group discussion on key messages from the video.

Assign the class into small groups to review a set of data:

Group 1: Review the most recent year of data collected in the **Real-Time Hydrometric Data Graph for Marsh Lake Near Whitehorse (09AB004) [YT]**

Group 2: Review **Yukon state of the environment interim report 2021: Climate Change: Long-term precipitation and temperature variation** (pg. 16)

Group 3: Review **Yukon state of the environment interim report 2021: Water: Snow accumulation** (pg. 31); **Extreme high and low water in lakes and rivers** (pg. 33)

Group 4: Review **Yukon state of the environment interim report 2021: Water: Water quality** (pg. 38); **Yukon River ice breakup at Dawson City** (pg. 42)

Ask each group to come up with a summary of their group's research. This could be a poster, short visual presentation, podcast, art piece highlighting key data or research paper. After listening to each of the summaries, ask students to identify trends, similarities, differences or other relevant insights.

ASK STUDENTS

- Can any trends in Yukon water levels be seen in the reviewed data?
- Are there other sources of data we could seek out? Elders, Traditional Knowledge Holders, community members and Game Guardians?
- How might water trends affect the SLC population?
- How might the SLC adapt to the rising water levels? What actions will they have to take?

CLOSING: NO VOICE PERSPECTIVE

Gather in a circle, outdoors if possible. Use something (e.g., a mat, chair or small table with Caribou artifact or something to represent Caribou) to show that a space is being held in the circle for a non-human 'voice'.

Tell students that the **No Voice** perspective is a way for humans to give a "voice" to the entity being talked about—in this case, Caribou. This is done by leaving an open seat for Caribou to "sit at the table" with those making decisions. This helps foster a sense of cooperation and unity between stakeholders at the table, reminding everyone that the common goal is to make the best decisions on behalf of the Caribou in our care.

Invite students to consider what the Caribou might want to share with the group at this time.

Some questions to pose to students to answer on behalf of Caribou could include:

- If Caribou have existed for over one million years, what does this mean about their resilience and ability to adapt to change?
- What knowledge and experience (data) do you think Caribou carry from living on the land?
- How do you think Caribou take the data they have collected to make decisions about seasonal movement, food and calving?
- We know Caribou are skilled at adaptation. With so many humans now living in the areas where Caribou have always lived, how can your own actions, or the actions of your community, positively impact the SLC as they adapt to the changing climate?

EXTENSIONS

- If possible, welcome local Game Guardians, Elders or community members in-person or online who can share their own experiences as a source of data.
- Email water.resources@yukon.ca for updated flow data for active sites.

ASSESSMENT OPPORTUNITIES

Are students able to:

- Ask questions about how Caribou are affected by changes in the water systems within their habitats?
- Use their research on a set of data to show their understanding of how climate change is affecting water systems in Yukon?
- Share a closing reflection (in small groups, in writing or creatively) about their experience with the **No Voice** perspective that demonstrates active listening?
- Acknowledge differing viewpoints respectfully?

ASSESSMENT

GRADE 9 SCIENCE: CARIBOU AND THE IMPACTS OF CLIMATE CHANGE

Formative and self-assessment opportunities are listed throughout the activity plans. The rubric below can be used or adapted as necessary for summative assessment. It may be used to assess the learning targets set out on the previous pages.

ASSESSMENT FRAMEWORK	1 EMERGING	2 DEVELOPING	3 PROFICIENT	4 EXTENDING
I am able to consider interconnections and sustainability for the Southern Lakes Caribou.	Is not able to consider the social, ethical and environmental implications of including YFN knowledge as sources of information. No questions are formed or little to no curiosity demonstrated	Shows some understanding of the social, ethical and environmental implications of including YFN knowledge as sources of information. A basic question is formed, and some curiosity demonstrated	Shows understanding of the social, ethical and environmental implications of including YFN knowledge as sources of information. Forms thoughtful questions, and demonstrates curiosity	Shows deep understanding of the social, ethical and environmental implications of including YFN knowledge as sources of information. Forms many thoughtful questions, and demonstrates deep curiosity
I am able to experience and interpret the local environment to understand how matter and energy systems are interconnected sustainably.	Not yet able to experience and interpret the local environment to understand how matter and energy systems are interconnected sustainably	Shows some ability to experience and interpret the local environment to understand how matter and energy systems are interconnected sustainably	Shows an ability to experience and interpret the local environment to understand how matter and energy systems are interconnected sustainably	Shows a strong ability to experience and interpret the local environment to understand how matter and energy systems are interconnected sustainably
I am able to analyze cause and effect relationships of human impacts on the SLC (water cycle).	May have little to no ability to analyze cause and effect relationships of human impacts on the SLC (water cycle)	Some ability to analyze cause and effect relationships of human impacts on the SLC (water cycle)	Shows an ability to analyze cause and effect relationships of human impacts on the SLC (water cycle)	Shows a strong ability to analyze cause and effect relationships of human impacts on the SLC (water cycle)

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CARIBOU



LICHEN



CARIBOU HIDE



TENDON USED
FOR SEWING



SNARE



CARIBOU HAIR/
TUFTING

WEB OF LIFE CARDS

Appendix 2E

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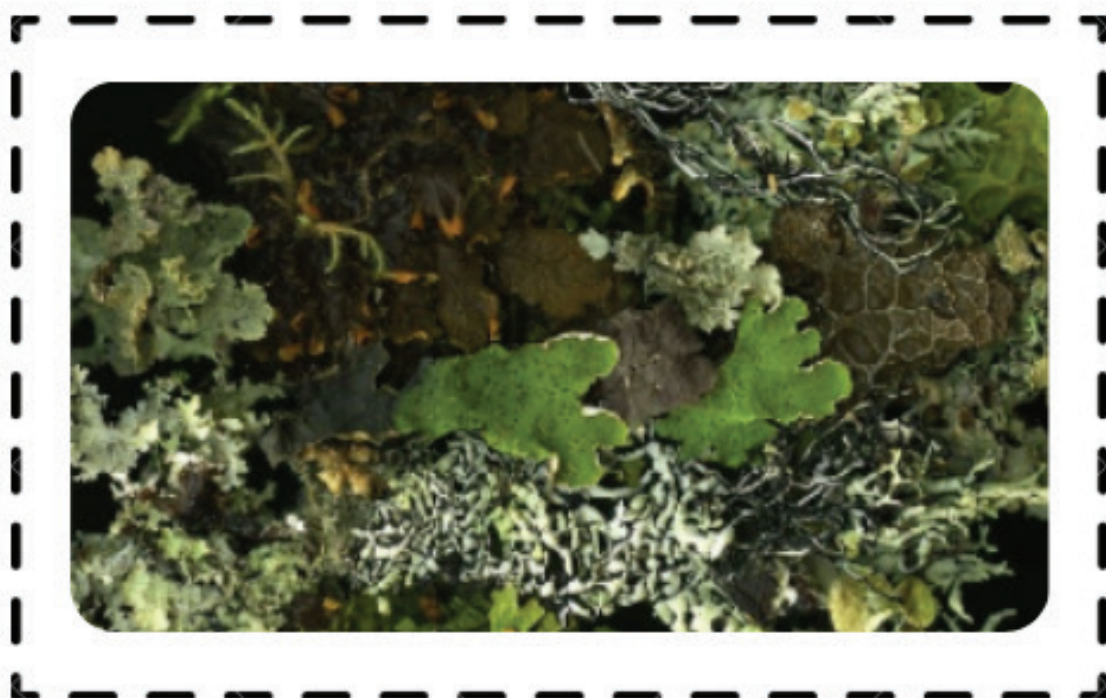
WILLOW

NOSE BOT FLY





SUN



LICHEN



WOLF



GRIZZLY BEAR



RAVEN



CARIBOU

THE BLIND MAN AND THE LOON

Appendix 6A

McClellan, 1950, My old people's stories: A legacy for Yukon first nations part II: Tagish narrators, Carcross elder Jimmy Scotty, James, p. 421.

The Blind Man and the Loon

December 6, 1950, Carcross Elder - Jimmy Scotty James

There is one man who is blind - he can't see anything. His wife leads him around the time. He can't see. His wife get tired, I guess.

After a while, they are moving the camp. By gosh, they come out on a ridge, and by gosh, there is a big bull caribou coming to them, straight at them. His wife tells the old man, "A caribou is coming!" And by gosh, he takes his arrows out and he says, "You move my hand which way the caribou is, and tell me when to let the arrow go" As soon as the caribou is coming straight to them, she says, "Let her go!"

So he hits the caribou all right, but the caribou runs away. Then that woman gets mad and runs away and leaves that man. He hollers, and he hollers, and he tries to follow. I don't know how many days he's out there, crawling around. After a while he hears a loon hollering. And the loon is his ixt' (prouncouniation - "ih-hit" "doctor" or spirit helper).

Finally he finds a little lake down in there, and he goes there. He crawls in there. Every time he hollers, the loon hollers. When he's pretty close to the lake, he hollers again. And he is just walking. He gets his hand into the water, that old blind man, and he stops there.

And that loon, just at that minute, comes to him. And that loon asks him, "What's wrong with you anyway? Where are your people?"

He says, "My wife ran away. I'm blind."

Then the loon says, "You come on my back!" And the loon dives at this end of the lake and he says, "You put your face on the back of my head, and don't look up!" And the loon comes out of the other end of the lake. And then he goes back the same way again. And a third time he goes back again. And then he comes to the other side of the lake again.

And then the loon tells the man, he says, "Look up. Try to look up. See if you can see." By gosh, the man sees the timber a little bit. The loon tells him, "You do it again." And the loon dives to the other end of the lake again to go back for the fourth time. And he comes out this end.

And the loon tells the man, "Look up again. See if you do better."

By gosh, that old fellow is just seeing good. It's just like he is sixteen years of age!

And the loon tells him, he says, "Your wife is just up here a little ways, where you kill the caribou. You go there", he tells him. By gosh, he goes there. He sees the smoke quite a ways.

That woman sees him coming, and just grabs her moccasins. She tells the man, she says "I was just going to look for you."

That's all.

ENERGY & MATTER FLOW

Appendix 7A

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