



BACKGROUND REPORT

December 2015

TAGISH LOCAL AREA PLAN



*building
bridges*

Acknowledgments

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Contents

Contents	1
1. Tagish Local Area Planning Process.....	2
2. History of the Tagish Area	4
3. Demographics.....	8
4. Vision, Values, and Guiding Principles.....	10
5. Governance	11
6. Environment and Wildlife	12
7. Geology and Soils.....	22
8. Current Land Uses.....	24
9. Infrastructure and Public Services	28
10. Concurrent Planning Processes	31
11. Hydrology, Groundwater, Flooding and Erosion.....	33
12. Economics and Business.....	35
13. Physical Constraints	36
14. Planning Considerations and Next Steps	37
References	38

List of Maps

Map 1 – Tagish Planning Area

Map 2 – Land Tenure

Map 3 – Wildlife Key Areas for Birds

Map 4 – Surficial Geology

Map 5 – Natural Environment

Map 6 – Physical Constraints

1. Tagish Local Area Planning Process

Introduction

The purpose of the Tagish Local Area Plan (LAP) is to guide future land use and development in the community in a way that is compatible with existing land uses and activities and is aligned with residents' values. The Local Area planning process is being undertaken jointly by the governments of Carcross/Tagish First Nation (C/TFN) and Yukon.

A Local Area Plan is a special type of land use plan that sets out what land uses are appropriate, and where, for unincorporated communities in the Yukon.

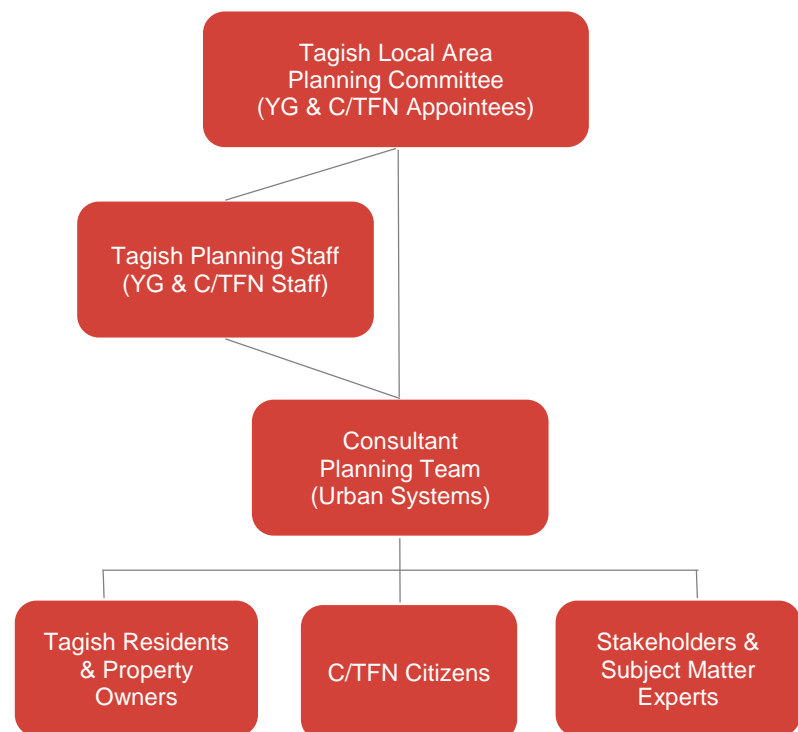
The planning area for Tagish includes the developed areas of community and is shown on Map 1. The area falls within the Traditional Territory of the C/TFN and will be carried out according to Section 31.0 of the C/TFN Self-Government Agreement. The objectives of this cooperative planning process are:

- To achieve the safe, healthy and orderly development and use of land within the planning area;
- To maintain and improve the quality, compatibility and use of the physical and natural environment;
- To consider the use and development of land and other resources in adjacent areas; and
- To determine a process for subsequent review or amendment of the local area plan.

This planning process will be overseen by a six-person Planning Committee, with three members appointed by each government. Once completed, the Tagish LAP will apply to private, Yukon, and C/TFN Settlement Land within the planning area. The final plan will be submitted by the Planning Committee to the Yukon Government (YG) and the Government of C/TFN for approval.

Tagish Planning Area

Tagish is a small rural community located in Yukon's Southern Lakes region, approximately 100 km southeast of Whitehorse. It is a vibrant and growing community that, despite the limited resources, provides a wide range of services to residents and visitors. Statistics Canada census data shows that the population of Tagish increased 76% between 2006 and 2011 to an estimated 391 residents. This growth has been accompanied with changing demographics, and changing ideas about the future of the community.



'Who is Who' in the Tagish Planning Process

The planning area for the Tagish LAP is 2,396 ha. The area runs from just north of Tagish Bridge at the south end of Marsh Lake, along both sides of the Six Mile River, and south to include the residences along the northwest shore of Tagish Lake. Land in the area is by owned by C/TFN, YG, and private land owners and land tenure is shown on Map 2.

What is the Background Report?

The purpose of the Tagish LAP Background Report is to compile the information needed to make good land use decisions and to set the stage for the development of the draft plan. This includes:

- Describing the social/cultural, heritage, and economic context;
- Characterizing the bio-physical situation;
- Compiling up-to-date information on current land uses and ownership;
- Understanding the assets, challenges, and opportunities in the area; and
- Identifying key planning considerations.

The Planning Process

The Tagish LAP process is split into four phases and is expected to wrap up in summer 2016. Each phase builds on the previous one and will provide a range of opportunities for the community members, C/TFN citizens, and other land owners to get involved. Meetings will be held in Tagish, Carcross, and Whitehorse as needed.

Public Engagement to Date

In order to kick-off the planning process and to begin to gather the information needed to complete this report, two Lunch N' Plan events were held, one in Tagish and one in Carcross. A complete report on what was heard during these meetings has been produced and is available as a separate document.

Tagish Planning Week, held between June 28 and July 1, 2015, was a focused multi-day round of public events in Tagish and Carcross. During these events, the planning team solicited feedback on the draft vision, values, and guiding principles and gathered information and input on community and land use issues that the LAP will address. A document has been produced that summarizes what we heard during Tagish Planning Week and is available separately.



Public Engagement Events

Tagish Community Lunch N' Plan

Saturday May 30th, 2015

Attendance: Approximately 45 people

Carcross Lunch N' Plan

Wednesday June 3rd, 2015

Attendance: Approximately 15 people

Tagish Planning Week

Sunday June 28 to Wednesday July 1, 2015

Many Events, Total Attendance: 100-120

2. History of the Tagish Area

The Carcross/Tagish people are a blend of coastal Tlingit and interior Tagish (Tagish Kwaan) First Nations cultures who have used Tagish and surrounding areas to gather, hunt and fish for centuries. Some Carcross/Tagish families recognize their heritage as either or both of Tagish and Tlingit people. The Traditional Territory of the Carcross/Tagish people, as specified in the C/TFN Final Agreement, extends from Kusuwa Lake in the west to Johnsons Crossing in the east and, from just south of Whitehorse into British Columbia in the south. The Traditional Territory includes the community of Carcross, which is called Naataase Héen (“sleeping water” in Tlingit) and Todezáané (“sand blowing all the time” in Tagish) and the community of Tagish called Taagish Tóo’e’ (“the sound of ice breaking up river” in Tagish). It’s Tlingit name is Taagish Héeni (“Tagish river”). The areas around Marsh Lake, Little Atlin Lake, Bennett Lake and Tagish Lake are also included in the Traditional Territory of the Carcross/Tagish people.

Prior to and during the 19th century, Tagish was a place where local First Nations families gathered for trading and seasonal celebrations. The area has abundant fish and place names such as Fish Trap reflect this history and close relationship to the land and water. The region is home to a herd of caribou which once provided a sustainable source of food for the Carcross/Tagish people.

From early days the Carcross/Tagish people presided over an extensive network of hunting, fishing, trapping and, trading trails and waterways connecting southeast Alaska with the Yukon Interior. In the 1880's as traders, explorers and prospectors began to enter the area, the Carcross/Tagish people acted as middlemen in the exchange of goods between the coastal Tlingit, inland First Nations and the newcomers.

The Carcross/Tagish people figured prominently in the Klondike Gold Rush, and both Dawson Charlie and Skookum Jim have been credited with the discovery of gold at Bonanza Creek in 1898. Kate Carmack, a Carcross/Tagish woman, was with the party that made the discovery and then went on to prospect with her husband George Carmack. During the years that followed, thousands of gold seekers came up the Chilkoot Pass (Jilkoot) and through Bennett, Tagish and Marsh lakes and finally down the Yukon River (Shaanakheeni) on their way to the Klondike. During this time, many Carcross/Tagish people made a living guiding newcomers and packing goods and equipment over the Chilkoot Pass.

The name Tagish means ‘the sound of ice breaking up’. The area is also named by some ‘Fish Trap’.



Keish, a.k.a Skookum Jim, in the Klondike Gold Fields
Photo Credit: Candy Waugaman Collection, www.nps.gov

The North West Mounted Police established a post at Tagish where the Six Mile River formed a natural bottle neck on the water route to the gold fields. The purpose of Tagish Post was to control the huge influx of prospectors and was in operation from 1897 until 1901. During this time the Mounties registered the names of 28,000 people as they headed north. In 1900 the White Pass and Yukon Route railroad was completed. As the route passed through Carcross, 35 km from Tagish, many people moved there to take jobs and access services in that community.

In 1902, Kishxóot (Jim Boss), chief of Ta'an Kwäch'än people and of Tagish decent, sent a petition to the Superintendent General of the Department of Indian Affairs in Ottawa, demanding that over-hunting by newcomers be controlled and that his people be compensated for lost land and impacts on wildlife. This letter contained the now famous quote "Tell the King very hard we want something for our Indians, because they take our land and our game". The only response Kishxóot received stated that the police would protect his people and their land. In his petition Kishxóot included census data, which amounted to 810 individuals for the communities of Lake Marsh, Tagish, Hoochi, Kluchoo, Iseag, Klukshoo, Gaysutchu, Tatsuchi, Kloosulchuk and Haseena, whereas eight years prior to the gold rush the populations estimate for these First Nations was in the thousands. This drastic population decline was due to the introduction of smallpox, influenza, measles and tuberculosis brought by the newcomers. While Kishxóot's plea for compensation for lost game and land was denied, the letter is now recognized as the first attempt at settling land claims in Yukon



Receiving Mail at Tagish Post 1898

Photo Credit: National Library and National Archives.



Mr. and Mrs. Patsy Henderson Heading for a Winter on their Trapline

Photo from C/TFN

The Choooutla Indian Residential School opened in Carcross in 1903. It was operated by the Anglican Church with the goal of transforming [native] children in to 'better' Canadians and to separate the students from their 'heathen' path. The Choooutla Residential School housed students from many communities including Old Crow, Tahltan, Atlin, Kluane, Big Salmon, Selkirk, and Moosehide. As with other residential schools, some families, in particular if they were from a nearby place, would settle near the school to be closer to their children. Job opportunities in

Carcross, especially with the railway and the lumber mill further facilitated the movement of families from Tagish to Carcross (Coates 1984).

Tagish remained a permanent home for some; a seasonal camp and valuable fishing destination for others. It retained a post office, telegraph office, and trading post until the next major influx of change was brought about by the building of the Alaska Highway. In 1942, a road was built from the Highway at Jake's Corner through Tagish to link up with the White Pass and Yukon Route railroad in Carcross. A one lane wooden bridge was built over the Six Mile River and for the first time Tagish was linked by road to the rest of Yukon.

In 1973, Yukon First Nation leaders presented *Together Today for our Children Tomorrow* to the Prime Minister of Canada, mapping the way to Yukon First Nation land claims and self-government. This negotiation process would eventually lead to the signing of the Carcross/Tagish Self Government Agreement in 2005, giving them the authority to govern their people and lands.

The population of the Yukon, and particularly Whitehorse, has increased over the years and so has the desire for nearby recreational properties. Over time, accessible waterfront properties were developed along Tagish Lake and the Six Mile River. The first recreational lots in Tagish were created along the river in the 1960s as lease properties and Tagish slowly took on the character that is seen there today.

Today, Tagish residents are diverse and include retirees, Carcross/Tagish citizens, families with young children, working people who commute to Whitehorse, weekenders, and people who move to the area to get away from it all. The locals value the beauty around them, access to nature, and freedom to live as they choose.

Tagish remains very special to the Carcross/Tagish people. The area is the old headquarters of the First Nation and is considered sacred. Many people have a desire to rebuild the First Nations connections to this place.

Heritage Sites

There are a number of documented heritage sites in the planning area including historic structures, known archaeological sites, heritage routes, areas of archaeological potential, and First Nation Heritage Sites. A map of these sites has been produced, but is not included in this report as it contains confidential information.

For many generations First Nations people have lived and travelled through this area's rivers and lakes by boat and by foot along the shorelines. These historic trails provided access to a variety of resources and destinations and were used during different times of year.

The entire Six Mile River area is an important heritage area and includes the North West Mounted Police site, the old Carcross/Tagish village site, and many other heritage resources. There is also an important rock, called the White Rock, located near California Beach. According to Carcross/Tagish stories this rock use to be human, specifically a Dakleweidi man.

There are archeological sites in Tagish that are dated to over 7,000 years old, some of the oldest in Yukon. There are nineteen known archaeological sites within the planning area. If development occurs, these sites should be left undisturbed or carefully managed to reduce the risk to heritage resources. These sites include campsites, burial sites, hearths, and burned bones. According to traditional knowledge, longhouses were also known to exist near the old Tagish Village at the Tagish Narrows.

There are fourteen heritage structures that still exist in the Tagish area including the Trading Post, the NWMP Tagish Post, and the Johnnie Johns Homestead. A summary is provided in the table below.

The White House/Trading Post	Constructed by Alf Dickson in 1917 on Tagish Creek and operated as a mink farm and trading post from 1926. Was operated by Harold White from 1942 as a fur ranch and trading post until the mid-1970s and has been a private residence since then.
NWMP Tagish Post	The post was established on the east side of Tagish River in 1897. Several structures still exist including a cabin built in the early 1900s and other foundations. The property is owned jointly by the C/TFN and Commissioner of the Yukon.
Johnnie Johns Homestead	A group of several buildings near Tagish Creek, one moved to this location from Conrad, and one from an army camp on Tagish Road. This property was bought by Johnnie Johns, a well know Carcross/Tagish outfitter, in 1938. Now owned by Art Johns who lives in a newer home on the property.

In 2011, field work was completed by Ecofor as part of Yukon Energy's Southern Lakes Enhanced Storage Concept. The purpose of this work was to identify areas where erosion may be impacting heritage resources and archeological sites. The study found that there are several areas near Tagish with moderate to high archaeological potential that may be impacted by erosion. The C/TFN old village and cemetery near the Tagish Narrows is already being impacted by erosion, and graves have already been lost. Ongoing management of this area is required.

Demographics

3. Demographics

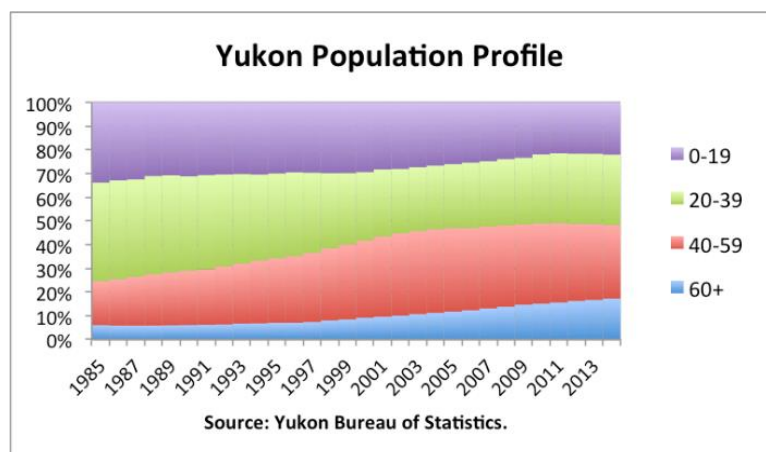
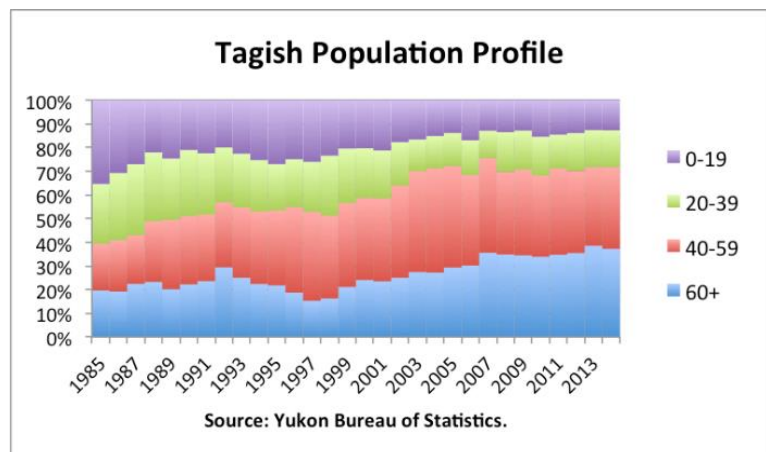
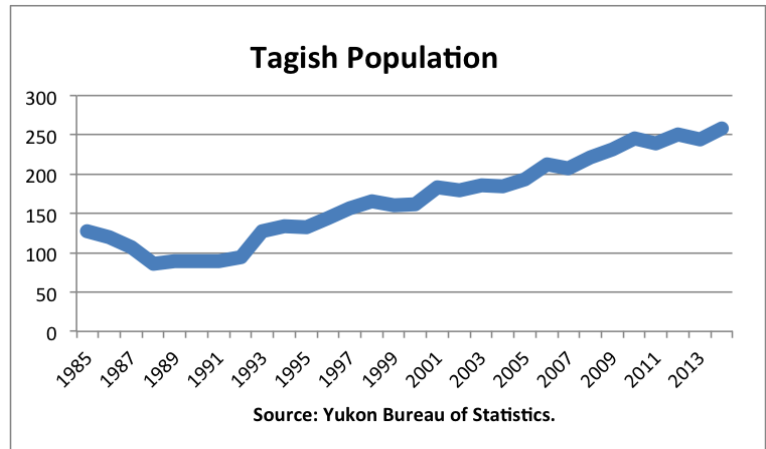
Tagish has a diverse population. Carcorss/Tagish people maintain their centuries-old physical and cultural presence in the area. The First Nation population living in the planning area ranges from 20 to 60, depend on the season and the year. The recreational opportunities and wide open spaces that Tagish offers have also drawn a mix of retirees, working age residents, dog mushers, families, wilderness tour operators, tradespeople, and telecommuters.

Over half of all properties are owned by people whose primary residence is located elsewhere, mainly in Whitehorse. To these owners, Tagish is a second home where they spend weekends and holidays. Much of the recent population growth can be attributed to former “weekenders” who converted their recreational properties into year-round homes to become full-time residents.

According to the 2011 Canada Census, the population of Tagish was 391. The Yukon Bureau of Statistics, however estimates that the population peaked at 258 in December 2014, with the numbers steadily rising from a low of 86 in 1988. According to Yukon statistics, the Tagish population has doubled over the last 30 years.

The population estimates from the Canadian census and YG are quite different. The YG numbers are based on the listed address from health care files. One possible reason that the Canadian census population estimate is higher is that people living in Tagish may be using a Whitehorse mailing address. Interestingly, the YG population estimate for 2006 is 212 and the 2006 Canada census number is 222. According to the Canadian census, the Tagish population increased by 76% from 2006 to 2011. This increase seems high enough to be unreasonable, making the YG population estimate seem more believable.

The age profile of the Tagish population indicates that, compared to the Yukon overall, Tagish is home to a higher proportion of retirement-age people and a smaller proportion of children. As of the end of 2014, 37% of Tagish residents were over 60, while only 17% of all Yukoners were over 60. At the same time, 13% of Tagish residents were under 20 while 22% of all Yukoners were



younger than 20 years. The lack of schools in Tagish makes it difficult for families with children to live in Tagish all year.

According to the Canada Revenue Agency's Locality Code Statistics a total of 120 Tagish residents filed personal income tax returns for the 2010 tax year (the most recent year for which statistics are available). In 2010, 42% of Tagish residents reported pension income, compared with just 17% of the overall Yukoner population. The average income reported by Tagish taxfilers with taxable income was \$44,000 in 2010. The average taxable income for the overall Yukon population was \$61,249.

Thus, a key demographic characteristic of Tagish is the significantly higher number of retirement-age individuals living in the community. As the number of Yukoners reaching retirement age will grow in future years, with more baby boomers reaching retirement age, the number of Tagish residents of retirement age is also expected to grow. Further growth in the overall Tagish population will be moderated by the limited availability of new building lots in the area.



Community Board at the Tagish Community Hall

4. Vision, Values, and Guiding Principles

The vision, values, and guiding principles for the Tagish LAP were developed based on input received at the first meetings in Tagish and Carcross, and were presented for comment several times during Tagish Planning Week. The statements were then revised to reflect the input received from the public and from the Planning Committee.

Vision

In 2035, Tagish will be a vibrant rural community with clean water and healthy fish and wildlife populations. First Nations and non-First Nations people will continue working together to rekindle the connection to the past and build a strong sense of community.

Values

Tagish residents value:

- A pristine natural environment with thriving fish, bird, and wildlife populations;
- Clean water and healthy watersheds both in the community and across the Southern Lakes region;
- The rich Carcross/Tagish First Nation culture;
- The colourful local history dating back to the gold rush;
- A quiet, peaceful, and rural way of life;
- A strong social fabric where volunteerism thrives and neighbours help and respect each other;
- Personal independence and the ability to pursue diverse lifestyles;
- The ability to make a living locally;
- Partnerships that result in local solutions to community challenges; and
- Community services, small businesses, recreation opportunities, programming, and infrastructure that meet the needs of community members of all ages.

The **Vision** is one statement that summarizes the kind of future the community wants.

Values are common, fundamental beliefs that bind community members together.

Guiding Principles outline how land use decisions will be made.

Guiding Principles

1. Community growth and economic development is gradual and carefully managed to maintain quality of life for existing and future residents.
2. Decision-making is transparent and involves collaboration, partnerships and open dialogue between governments, residents, community groups and other stakeholders.
3. Infrastructure and services are developed at a scale equivalent to community capacity and in a manner that maximizes local benefits.
4. Land use decisions take a precautionary approach with respect to the environment and protection of ecosystem and watershed health in Tagish, across the Southern Lakes region, and beyond.
5. The provisions of the Carcross Tagish First Nation Final Agreements shall be respected.

5. Governance

Local Advisory Council

The Tagish Local Advisory Council (LAC) is an elected group that seeks input from the community and communicates with YG on matters of concern to local residents. The Tagish LAC has been in place since 1995 and consists of six members; five elected every three years and one appointed by the government of C/TFN. LACs exist in unincorporated areas and follow the Yukon Municipal Act. The LAC is an advisory body and has no regulatory or other authority to pass bylaws. An OIC was passed in 2015 that makes the boundaries of the LAC official.

Government of Carcross/Tagish First Nation

The Carcross/Tagish First Nation Final Agreement was signed in 2005 and through this agreement the First Nation has the authority to govern their people and lands. Under the Self-Government Agreement C/TFN can: make laws related to its administration, operation, and internal management; collect taxes; manage over 1,552 km² of Settlement Lands; and decide how to spend, invest, and manage its money.

The Government of C/TFN (GC/TFN) is based on their traditional clan system. There are six clans within C/TFN: the Daklaweidi and Yan Yedi clans are part of the Wolf moiety, and the Deisheetaan, Ganaxtedi, Ishkahittaan and Kookhittaan clans are part of the Crow moiety. Each of these six clans selects representatives that advise and shape government policy and processes through participation in various councils, committees and boards.

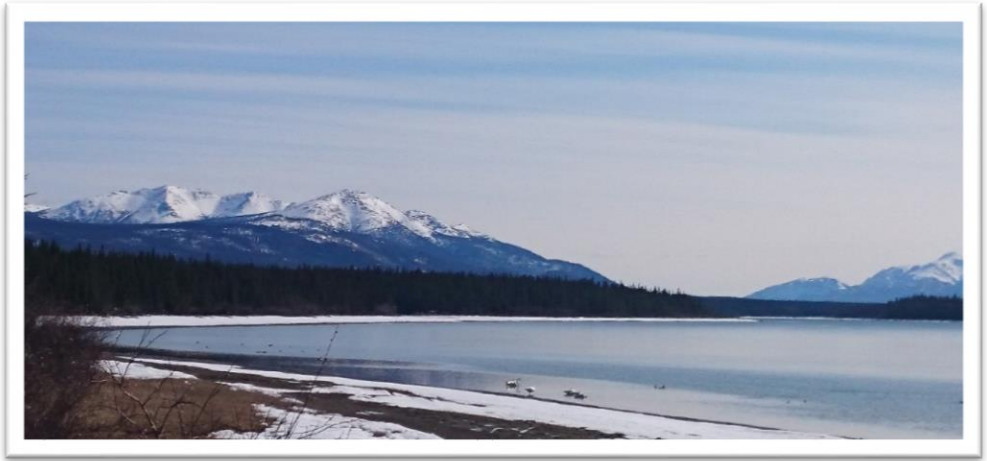
Carcross is the current seat of the GC/TFN. This is where the Governance Building and most of the First Nation's housing, services, and infrastructure are located. In Tagish, there are 19 C/TFN houses on the east side of the Six Mile River, housing between 20 and 60 citizens depending on the year. C/TFN Citizens also live on Site Specific Settlement Land parcels that are situated throughout other neighbourhoods, with at least six located west of the Tagish Bridge near Tagish Creek. Some C/TFN citizens live on privately owned land. In addition, there is a small playground, a well, a sewer pump-out truck, and a building that houses a water truck used to deliver water to C/TFN citizens and other residents. GC/TFN also owns and operates the Tagish campground.

Government of Yukon

As Tagish is unincorporated, YG is responsible for providing drinking water, solid waste management, maintaining the local roads, and assisting with emergency services. The Community Affairs Department also provides funding and support to the LAC. A Community Advisor is available to assist the community and to act as a liaison with other YG departments.

6. Environment and Wildlife

Tagish is located on the Six Mile River (also called the Tagish River or Tagish Narrows) which runs from Tagish Lake into Marsh Lake. This area forms the headwaters of the Yukon River and is located within the Yukon Southern Lakes Ecoregion, an area characterized by broad valleys and large lakes (Yukon Ecoregions Working Group 2004). Set within the rain shadow of the St. Elias Mountains, this ecoregion's climate is dry and cool. The soil tends to be alkaline and is underlain by discontinuous permafrost. The area supports the highest mammalian diversity in the Yukon, and is home to at least 50 of the 60 species known to occur in the territory currently.



Looking South from the East Side of the Six Mile River

Local Ecosystems

Tagish falls with the Southern Lakes region and is largely open coniferous and mixed wood forest. About 73% of the Southern Lakes area is forested, with plateaus, rolling hills and broad valleys occupied by lakes and rivers. Medium shrubs dominate higher elevation slopes with dry dwarf shrub tundra on mountain summits. Set within the rain shadow of the Coast Mountains, the local climate is dry and cool. The Yukon Southern Lakes Ecoregion lies in the sporadic discontinuous permafrost zone, where permafrost underlies less than one-quarter of the landscape. The ecoregion supports the highest diversity of mammals in the Yukon, with at least 50 of the 60 species known to occur in the Yukon at present.

The Tagish planning area is fairly flat, with low elevations throughout. On the east side of Six Mile River, outside of the planning area, the landscape rises up towards Jubilee Mountain, with a peak elevation of over 1,600 m. On the west side of Six Mile River, the planning area consists of open forest with some mixed pine/spruce lichen forests that provide important local caribou habitat. The shoreline along Tagish Lake includes both rolling sand dunes and steeper banks. The shoreline along Six Mile River is also variable, with wetlands, gravelly banks, and some areas that are prone to erosion.

There are also several important wetlands areas in the area. One of the most important wetlands near Tagish is at the north end of the Six Mile River, but the part of this wetland along the south-east shore of Marsh Lake is outside the planning area. There are also wetlands along the Six Mile River and along Tagish Creek. These wetlands, especially those within the Tagish Habitat Protection Area, provide important habitat for migratory birds.

Vegetation

The Tagish area is dominated by open coniferous and mixed forests that reflect a dry continental climate and a history of forest fire. The main tree species are lodgepole pine, white spruce, and trembling aspen with some birch and black spruce on cold wet sites. Understory vegetation in dry, open stands typically includes kinnikinnick, twinflower, lingonberry, and lichens, while feathermosses dominate in closed canopy areas. Woody plants such as willow, alder, and dwarf birch are also common.



Typical Vegetation in the Tagish Area

Notable uncommon habitat, called an ‘alvar’ has been identified within 2.5 km of the Tagish planning area boundary. This is a globally rare, naturally open habitat with either a thin covering of soil or no soil over a base of limestone (Nature Conservancy Canada 2015). Alvars are unique landscapes, caused by seasonal fluctuations in water levels, and are known to be species-rich communities. Currently, YG does not track this type of rare vegetation community.

No federally or territorially endangered or threatened plant species are known to occur in the planning area (COSEWIC 2015; Government of Canada 2015; Yukon CDC 2015b). In 2010, a rare plant survey was conducted on the shores of Marsh Lake, Tagish Lake, Nares Lake, and Bennett Lake, as part of a terrestrial baseline assessment for Yukon Energy Corporation. No

rare plants were found during those investigations. Known rare plants closest to the planning area are concentrated in and around Carcross and include Baikal’s sedge, water pygmyweed, and water awlwort.

Wildlife and Habitat

The planning area supports the highest mammal diversity in the Yukon and many wildlife species in this region have the potential to occur near Tagish throughout the year. The box to the right lists the species that are commonly found in the Tagish area. In order to better understand wildlife habitat in this area numerous data sources were reviewed. This included YG reports and maps, the federal Species at Risk Act Public Registry, Yukon Southern Lakes Ecoregion summary, and the Yukon Conservation Data Centre (CDC).

There are several potentially vulnerable animal species at risk found within the planning area (see Table 6.1). Species at risk are monitored both territorially and federally and are classified under

Wildlife Species Potentially Found in the Planning Area:

American marten	Arctic ground squirrel
Beaver	Black bear
Canada lynx	Coyote
Ermine	Fisher
Grey wolf	Grizzly bear
Least weasel	Little brown myotis
Mule deer	Muskrat
Porcupine	Red fox
Red squirrel	River otter
Snowshoe hare	Southern red-backed vole
Wolverine	

three systems; the Yukon Conservation Data Center (CDC), the Species at Risk Act (SARA), and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Under each of these systems, special strategies may be recommended to ensure that animals and their habitat are managed as needed.

Table 6.1: Vulnerable Species in Tagish Local Planning Area				
Common Name	Latin Name	COSEWIC	SARA	Species at Risk Yukon CDC
Woodland caribou	<i>Rangifer tarandus caribou</i>	Special Concern	Special Concern	Special Concern
Grizzly bear	<i>Ursus arctos</i>	Special Concern		Special Concern
Wolverine	<i>Gulo gulo</i>	Special Concern		Special Concern
Little brown myotis	<i>Myotis lucifungus</i>	Endangered	Endangered	Endangered
Gypsy cuckoo bumble bee	<i>Bombus bohemicus</i>	Endangered		
Western bumble bee	<i>Bombus occidentalis mackayi</i>	Special Concern		
<p>Special Concern: A species that is particularly sensitive to human activities or natural events.</p> <p>Endangered: Facing imminent extirpation or extinction.</p> <p>Yukon CDC: Yukon Conservation Data Centre - Gathers, maintains and distributes information on animals, plants and ecological communities at risk or of conservation concern in Yukon.</p> <p>COSEWIC: Committee on the Status of Endangered Wildlife - Group that provides advice about species at risk nationally.</p> <p>SARA: Species at Risk Act - Canadian legislation that lists and classifies species at risk.</p>				

Caribou

The planning area falls within the habitat of the Carcross woodland caribou herd, which has an estimated population of 800 animals (YG Environment 2012). Woodland caribou occupy a variety of habitats including coniferous forests and alpine tundra. The Carcross caribou herd, however, tend to occupy open or semi-open habitats within the alpine and subalpine areas for much of the year, and typically spend winter in lower areas with coniferous forests with shallower snow cover (Hegel and Russell 2013). In the early 1990s the Carcross caribou herd declined to under 400 and was the focus of intense management (Hegel and Russell 2013). This decline was attributed to overharvest, habitat loss, and human disturbance and a recovery program was initiated to help get the



Carcross Caribou

Photo Credit: John Meikle

herd to its current stable state (Farnell 2009; SLWCC 2012). With the dramatic decline of the Carcross Caribou Herd, the C/TFN partnered with YG to implement the Southern Lakes Caribou Recovery Program.

Through the 1990s, this program saw the delivery and implementation of intensive education, outreach, monitoring and recovery programs. Since then, C/TFN citizens continue to voluntarily give up their aboriginal rights to hunt the caribou to allow the herd to recover to a sustainable level. Meanwhile, spot land applications around Mount Lorne, Carcross, Tagish and Jake's Corner have generally been unsuccessful due to impacts on caribou habitat.

The Caribou Recovery Program paved the way for the creation of the Southern Lakes Wildlife Coordinating Committee, a group made up of traditional knowledge holders and technical members from territorial, provincial and federal governments, and six first nations. The mandate of this committee included assessing populations of wildlife and their habitats and preparing management and conservation recommendations for implementation by the parties. Years of work led to the 2012 publishing of the Regional Assessment of Wildlife in the Yukon Southern Lakes Area Volume 1 and 2, with Volume 1 containing the committee's recommendations for protecting caribou habitat.

Caribou Recommendations

Regional Assessment of Wildlife in the Yukon Southern Lakes Area Volume 1

2.17 - Monitor the status of caribou populations.

2.18 - Carefully manage human use of caribou habitats, with a particular focus on limiting access, development and human disturbance in important caribou habitat.

2.19 - Develop and implement a managed harvest for caribou.

2.20 - Develop and implement measures to reduce loss of caribou due to highway traffic collisions.

2.21 - Promote continued development and implementation of education and outreach programs and materials that further caribou conservation goals and public appreciation of caribou and caribou management.

The Northern Mountain populations of woodland caribou, including the Carcross herd, are considered Special Concern under the federal *Species at Risk Act* (Government of Canada 2015) and are being tracked by the Yukon Conservation Data Centre. Other factors that may influence caribou populations are habitat destruction or fragmentation, human disturbance, and predation (Government of Canada 2015). Due to loss of winter range, high levels of human access, and vehicle collisions and without increased conservation measures, the herd may never recover to historic levels.

The herd's annual range runs throughout the Southern Lakes Region, north to Lake Laberge and south into BC. Winter range is found throughout the region in low elevation forested valleys and is critical as winter is the most challenging time of year and these areas tend to be under more development pressure. According to both local knowledge and previous survey data the entire planning area is within the Carcross herd's core winter range. The community of Tagish occurs at the 'cross-roads' of the northern and southern parts of the herd's annual range. There are at least two important migration routes in the area: along the Tagish Road, between Crag Lake and the community of Tagish, and Jubilee Mountain to Little Atlin Lake-Judas Creek. There have been a high number of recorded caribou mortalities resulting from vehicle collisions along the Tagish Road.

In 2015, YG completed an *Assessment of the Carcross Caribou Herd Range in Yukon* (Francis and Nishi 2015). As part of this work the zone of human influence and the most effective winter habitat are mapped and management recommendations are given for each area. C/TFN does not agree with the assumptions behind this study or the mapping that was developed as part of the document. For this reason, it has not been included in this review.

Moose

Moose frequent the planning area and are a species considered to be of local and cultural concern. Although moose are not a species of concern throughout most of the Yukon, the Southern Lakes region has experienced a decline in numbers as a result of overhunting, loss of habitat, and increasing human activity in the area (SLWCC 2012; YEWG 2004). In the late 1980s, licenced harvest of moose was restricted and, although the population now seems stable, it has not recovered to levels seen before the decline. In general, the availability of resources and the presence of predators are more important than human settlements in determining where moose take up residence. Moose have been noticed wintering in Tagish, especially near Tagish Creek.

Moose Recommendations

Regional Assessment of Wildlife in the Yukon Southern Lakes Area Volume 1

2.22 - Establish a moose population recovery goal that is supported by the public, ensures moose will continue to be on the land over the long term, and is capable of sustaining a harvest for future generations.

2.23 - Continue to develop and implement moose monitoring initiatives in support of moose recovery efforts.

2.24 - Develop and implement a managed harvest framework for Southern Lakes moose.

2.25 - Work towards understanding predator/prey interactions and decreasing moose predation rates, where appropriate.

2.26 - Identify existing moose habitat and habitat requirements, and carefully manage important moose habitats

2.27 - Provide education and communication initiatives to support moose recovery.

Wolverine

Wolverine are a species of “special concern” (COSEWIC 2015) and based on their broad distribution could occur in the planning area. The Wolverine is not listed in the Species at Risk Act. Wolverines have very large home ranges (50–1,580 km²) and are sensitive to landscape fragmentation or human disturbance (COSEWIC 2003; SLWCC 2012). Because of the large home range, it is likely that wolverine would use this area only occasionally and might pass through, but not stay, within the area.

Bears

Grizzly bear is a species of special concern (COSEWIC 2015) and, based on their broad distribution, could occur in the planning area. They are not listed in the federal *Species at Risk Act*. They are likely to pass through, but not be seasonal residents due to the area’s human inhabitants and the small size of the planning area relative to a typical bear home range.

Although bears are unlikely to inhabit the planning area annually, they could be attracted to human waste, livestock, dog teams or improper storage of food (D. Bakica, pers. comm., June 2015). The coexistence of humans and wildlife is important and avoiding negative interactions with bears will help to ensure that they do not see developed areas as food sources (pers. comm., June 2015).

Bats

Little brown myotis is listed as endangered in the *Species at Risk Act* (Government of Canada 2015) and is also on the Yukon CDC's track list (2014). Based on broad range maps, the little brown myotis likely occurs within the planning area (YG 2014). Due to substantial increase in mortality of little brown myotis in the past six years, little brown myotis has been listed as endangered (Government of Canada 2015b). The mass mortality has been associated with a fungus that is suspected to originate from Europe called White-nose Syndrome (WNS) (Government of Canada 2015b). Many bats have been affected by WNS in United States as well as Eastern Canada, and it is suspected that the decline in numbers will continue as WNS spreads across populations in Canada (Government of Canada 2015b; Jung and Kukka 2014). WNS has depleted the eastern sub-population in Canada, resulting in a 94% decline in known numbers of hibernating myotis bats in Nova Scotia, New Brunswick, Ontario, and Québec" (Government of Canada 2015b).

Little brown myotis may roost in trees and structures within and around Tagish, making it important for investigations to occur prior to clearing or modifying any structures within the TLAP. In 2012, bat houses were established at the Tagish Narrows, but there is mixed information about whether these are being used.

Amphibians

Wood frog (*Lithobates sylvaticus*) is widespread across most of the Yukon and is likely to be abundant within the planning area (YG 2013; Rach 2012). They are not of conservation concern and are not on watch or track lists (YG, 2013). Western toad is of Special Concern under both the federal SARA (YG 2013 p. 1) and COSEWIC (2015), but the planning area does not fall within their known range. Columbia spotted frog and boreal chorus frog have been found within the Yukon and could potentially be found in this area. Both of these species are of conservation concern within the Yukon, but very few sightings have been observed (Yukon CDC 2014). However, within Canada they are not considered to be species of conservation concern.

Birds

Tagish is home to significant bird habitat and is an excellent place for birdwatching. The Tagish Bridge is one of the best places in Yukon to view both Trumpeter and Tundra swans, and other water fowl, at close range. In spring time, this area sees the territory's second highest number of migratory swans, with birds stopping in Tagish to rest for several days.

Swans are not the only waterfowl that visit Tagish; there are also tens of thousands of ducks and shorebirds migrating north every spring. In April the overwintering Common Mergansers and Common Goldeneye are joined by their kin, and by other ducks including Mallards, Northern Pintails, Green-winged



Tagish River Habitat Protection Area

Teal, Greater and Lesser Scaup, Rink-necked Duck, Red-breasted Merganser, Barrow's Goldeneye, Bufflehead, American Wigeon, and Northern Shoveler, as well as Canada and Greater White-fronted Geese. Snow Geese will sometimes appear in large flocks, collecting on the spit separating Six Mile River from Marsh Lake. The wide diversity of birds found in Tagish are part of what makes it such a special place.

The Six Mile River has been identified as a Habitat Protection Area and is undergoing a joint planning process intended to protect this area's natural features while respecting the rights of First Nations. The area is particularly important habitat because it is the first open water in early spring and as such vital for migrating waterfowl and shorebirds (YEWG 2004). More information about this process can be found in Section 10: Concurrent Planning Processes.

As shown on Map 3, the Six Mile River is identified as a Wildlife Key Area, and provides habitat for waterfowl for "various seasons and functions" (YG Environment 2013). There is a bald eagle Wildlife Key Area to the north of the planning area, on the east side of the river (YG Environment 2013).

Many bird species may be found periodically or annually in and near Tagish. Many of the species are of conservation concern (Table 6.2) and should be assessed prior to development with consideration of their tolerance to human presence. Many of the bird species that may inhabit the area are considered to be of local or cultural value, including "Birds of prey [which] are highly revered and honoured by First Nations people in Southern Lakes area with owls carrying great spiritual importance" (SLWCC 2012 p.91). Migratory birds found here are protected internationally by the *Migratory Birds Convention Act*. It is known that there is a colony of nesting cliff swallows on the underside of the Tagish Bridge. Although not currently a species of concern, they are protected by the *Migratory Birds Convention Act*.

Table 6.2: Bird Species of Conservation Concern that Could Occur in the Planning Area

Common Name	Latin Name	COSEWIC	SARA	Species at Risk in Yukon
Bank Swallow	<i>Riparia riparia</i>	Threatened	Not Listed	Threatened
Barn Swallow	<i>Hirundo rustica</i>	Threatened	Not Listed	Threatened
Common Nighthawk	<i>Chordeiles minor</i>	Threatened	Threatened	Threatened
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Threatened	Threatened	Threatened
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Special Concern	Not Listed	Special Concern
Horned Grebe	<i>Podiceps auritus</i>	Special Concern	Not Listed	Special Concern
Peregrine Falcon	<i>Falco peregrinus</i>	Special Concern	Special Concern	Special Concern
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Special Concern	Not Listed	Special Concern
Rusty Blackbird	<i>Euphagus carolinus</i>	Special Concern	Special Concern	Special Concern
Short-eared Owl	<i>Asio flammeus</i>	Special Concern	Special Concern	Special Concern

Special Concern: A species that is particularly sensitive to human activities or natural events.

Endangered: Facing imminent extirpation or extinction.

Yukon CDC: Yukon Conservation Data Centre - Gathers, maintains and distributes information on animals, plants and ecological communities at risk or of conservation concern in Yukon.

COSEWIC: Committee on the Status of Endangered Wildlife - Group that provides advice about wildlife species at risk nationally.

SARA: Species at Risk Act - Canadian legislation that lists and classifies species at risk.

The Canadian Wildlife Service has provided the following information for consideration on the impacts of development with respect to migratory birds:

- Firesmart activities remove standing vegetation and alters forest habitat for some birds. Consideration should be given to maintaining areas of undisturbed forest habitat. Also, firesmarting should occur outside the core breeding season, which is from May to mid-August.
- The loss or degradation of habitat due to residential development, especially along the Six Mile River, has been identified as a threat to several species of migratory birds and Species At Risk.
- Increased disturbance related to human activity along the shoreline, especially in spring and fall staging areas, is shown to have detrimental impacts on the foraging efficiency and body fat acquisition of migratory waterfowl. Disturbance from human activities includes dogs running loose, ATV use, boat use, fishing, and walking along the shoreline.
- Increased erosion, related to the Southern Lakes Enhancement Storage Concept or other causes, could have detrimental impacts on swallow's nesting habitats.

Fish and Fish Habitat

The planning area lies within the Upper Yukon River Watershed in the Southern Lakes region and includes the southern end of Marsh Lake, the northern end of Tagish Lake, and the Six Mile River. Several tributary streams flow through the area, including Tagish Creek, Austins Creek and Pennycook Creek as well as many unnamed tributaries.

The Six Mile River is a very important area for the people of Tagish. The northern end of the river is crossed by the Tagish Bridge. All fish species in Table 6.3 potentially use the river, either as a migration corridor between the two lakes, and for spawning and rearing. Table 6.4 provides a detailed summary of information available on the specific watercourses within the planning area. For those watercourses without any existing information, we have provided an assessment based on professional judgement. Additional study would be required to confirm fish habitat values and actual fish presence.

The Tagish Bridge and surrounding area is a very popular destination for recreational fishing, particularly for lake trout. This area is well known as a migration corridor for lake trout and other freshwater fish species between Marsh and Tagish lakes. Other species commonly caught from the bridge include northern pike, Arctic grayling, least cisco and lake whitefish (Millar, Barker, and Jessup 2012). According to local knowledge, sturgeon was also found in this area at one time.

Table 6.3: Southern Lakes Area Fish Species

Salmonids – Salmon, Trout, Grayling, Whitefish, Pygmy Whitefish	Lake Trout
	Chinook Salmon
	Arctic Grayling
	Lake Whitefish
	Broad Whitefish
	Least Cisco
	Round Whitefish
	Inconnu
Other Fish Families – Chub, Cod, Pike, Sucker	Lake Chub
	Slimy Sculpin
	Burbot
	Northern Pike
	Longnose Sucker

On occasion, Chinook salmon adults have been documented migrating through Marsh Lake, past the Tagish Bridge, and into Tagish Lake. Chinook salmon spawning areas have not been documented in the Tagish River (Matthews 1998). Juvenile Chinook salmon may use tributaries to Marsh Lake as non-natal rearing habitat (AECOM 2013; Maddigan 1999) and have also been documented in Pennycook Creek (von Finster 1988). Hatchery-raised Chinook were released into nearby Judas Creek in the 1990s (Maddigan 1999). Salmon enhancement studies and work being planned by GC/TFN for Six Mile River and Tagish Lake for spring of 2016.



Tagish Creek

Table 6.4: Summary of Fisheries Values for Tagish Streams

Stream	Fisheries Value	Comments
Six Mile River	High	<ul style="list-style-type: none"> ■ Important migration corridor and rearing area for freshwater fish species. ■ Lake trout, Arctic grayling, lake whitefish, least cisco, round whitefish, and northern pike, have been documented in the river. ■ Popular recreational fishing area. ■ Sustains flows through winter, providing overwintering habitat for fish.
Tagish Creek	High	<ul style="list-style-type: none"> ■ Small lakes and wetlands in headwaters, wetland and beaver dams in lower reaches. ■ Based on proximity to Tagish River it is likely used by several fish species such as pike, grayling and whitefish. ■ Could be used as non-natal rearing habitat by juvenile Chinook salmon. ■ Likely supports fish year round based on lakes and wetlands in headwaters.
Austins Creek	Unknown	<ul style="list-style-type: none"> ■ A small stream with two small lakes and a few wetlands in its headwaters. ■ No specific fisheries data available. ■ Based on proximity to Tagish Creek and Tagish River it is likely used by freshwater fish species, if access and flow are maintained. ■ Likely supports fish year round based on lakes and wetlands in headwaters
Pennycook Creek	Moderate	<ul style="list-style-type: none"> ■ A small stream that has a moderate gradient in the lower reaches and a higher gradient above, which likely limits fish use (von Finster 1988). ■ Juvenile Chinook salmon, grayling, and burbot were documented in the creek. ■ It is likely that other fish species use the lower reaches at least for rearing in the summer months. ■ May support fish year round, depending on flows through the winter.

Table 6.4: Summary of Fisheries Values for Tagish Streams

Stream	Fisheries Value	Comments
Unnamed Creeks (Tributaries to Tagish Lake)	Unknown	<ul style="list-style-type: none"> There are three unnamed tributaries on the west side of Tagish Lake that are located in the Tagish Estates and California Beach areas. No specific fisheries data available, although whitefish, grayling, and pike have been found. Fisheries potential is low (based on small drainage areas and subsequent low flows throughout the year). Based on proximity to Tagish Lake, they may be used as rearing habitat for some species, but use is likely limited to the lower portions.

Climate Change

The Tagish planning area is located in the Southern Lakes ecoregion. There are no climate data in the planning area; the closest weather station is located in Whitehorse. Mean annual temperature is near -1°C. In the immediate vicinity of large lakes, spring can be delayed up to two weeks due to ice cover (Yukon Ecoregions Working Group, 2004). Winter temperatures are cold with temperatures around -16 °C. Annual precipitation is approximately 268 mm.

According to Whitehorse Climate Adaptation Plan the climate around Whitehorse and the Southern Lakes will get warmer and wetter (Northern Climate Exchange, 2011). Warming will differ seasonally; winter is projected to warm the fastest with an increase of 3°C to 5°C over the next 40 years. Mean annual precipitation is anticipated to increase 14% to 22% by 2050. Based on the projected shifts in temperature and precipitation, the number of frost-free days for Whitehorse is expected to increase, rising from 150 days to 168-175 days by 2050, an addition of 18-25 days.

The Southern Lakes region is already being impacted by climate change and more change is projected in the near future. The key sectors being impacted are natural hazards (especially fire and flood), infrastructure, food security, environment and energy security. Climate change is complex and impacts will result from the recent and projected trends in climate, but also from changing intensity, frequency, variability, and duration of weather events. Not all impacts are negative (for example longer, warmer growing seasons), and out of challenges, opportunities may arise.

7. Geology and Soils

Bedrock Geology and Mineral Potential

The Tagish planning area is located at the southern end of a geological feature known as the Whitehorse Trough. The area is underlain by three rock formations: limestone and dolostone are the oldest formations and occur in the south; overlying these are younger mafic volcanic rocks in the central part of the area; and these in turn are overlain by shale, sandstone and conglomerate to the north. These rocks are intruded by younger granite, quartz monzonite to granodiorite intrusions in the Jubilee Mountain area located to the east of the planning area.

The Yukon Minfile database lists one mineral occurrence within the Tagish planning area. This occurrence (Tagish Occurrence Minfile #105D 094) is old and of unknown status and commodity. Outside of the planning area, immediately east and northeast are four other mineral occurrences listed on Minfile: the Jubilee copper, silver, molybdenum, gold skarn showing on Jubilee Mountain; the Pennycook copper, silver, gold vein quartz occurrence (a drilled prospect); the NLC quartz-gold vein showing; and the Marsh nickel, copper, platinum group metal occurrence (a drilled prospect). All of these four occurrences are covered by mineral claims; however, none of them has defined a mineral resource. There are no mineral (quartz) or placer claims within the Tagish planning area.

Certain streams on the east and north side of Jubilee Mountain, outside of the planning area are covered by placer claims and leases. More locally, placer potential has been identified in Pennycook Creek on the northwest side of Jubilee Mountain.

Surficial Geology and Geomorphology

The Tagish planning area was covered by the Cordilleran Ice Sheet between 20,000 and 13,000 years ago (Jeff Bond, personal communication, 2015). Following retreat of the Ice Sheet the area was submerged under a glacial lake that was controlled by a sediment dam in the Yukon River near Marsh Lake. Sediments from both the Ice Sheet and the glacial lake are common in the planning area. The distribution of surficial sediments is shown in Map 4. They consist of ground moraine (till) that was deposited directly by the Ice Sheet, glaciolacustrine sand and silt related to deposition in a glacial lake and fluvial sand and gravel from post-glacial river processes (Morison & Klassen, 1991, Whitehorse, GSC Map 12-1990). Reworking of glaciolacustrine and fluvial sediments by aeolian processes (wind) near the shoreline has also resulted in a discontinuous layer of sand near the surface. These dunes remain active near California beach. Considerable thicknesses of till and glaciolacustrine sediments are present in the valley bottom (>20 m) and they thin considerably towards the valley sides (< 1 m). Soils & Permafrost

The Southern Lakes region tends to have peat accumulations and weakly weathered mineral soils that are more than one metre thick. Alkaline glacio-lacustrine deposits (classified as Eutric Brunisols) are dominant in the major valleys. Humic Gleysols are dominant in depressions, and Gleysolic or Regosolic soils are dominant in floodplains, if no soil development has happened (Robert and Turney 2012).

The Southern Lakes region is within a sporadic discontinuous permafrost zone, meaning that less than one quarter of the area is underlain by permafrost (YEWG 2004). In areas with

Gleysols – Wetland soils that have been saturated.

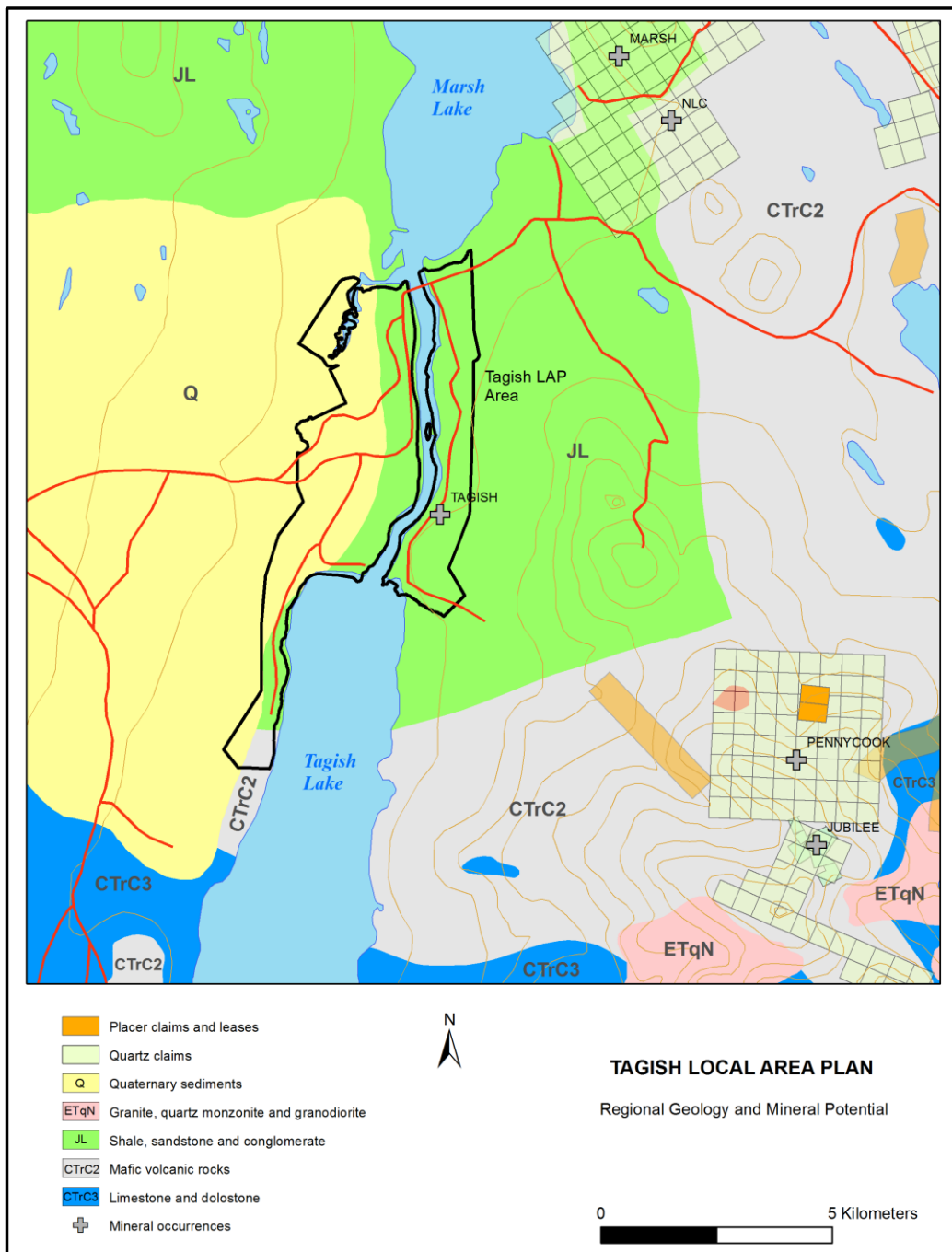
Humic Gelysols – Dark-coloured soil that are poorly drained and usually have organic layers made from grass, moss or forest vegetation.

Regosols – Weak mineral soils that are common in eroding lands, and semi-arid and mountain regions.

permafrost, the active layer is commonly greater than 1.5 m thick making permafrost areas difficult to identify (YEWG 2004). The warm dry summers, caused by the rain shadow, are the reason why continuous permafrost does not persist in this region (YEWG 2004). Generalized permafrost in the area is shown on Map 5.

Mining and Mining Claims

There are no mining claims within the planning area, however there is a large quartz mining claim registered to the north-east of the planning area, running over Judas Mountain from Marsh Lake, and extending all the way to the Alaska Highway in some areas. There are also several quartz claims and several placer claims on Jubilee Mountain, south-east of the planning area. The map below provides a summary on mining claims in the area.



8. Current Land Uses

Overview

Land ownership in Tagish is split between C/TFN, YG, and private holdings, as seen in Table 8.1. While the main land use in the area is residential, there are also several lots with agricultural or commercial uses.

According to the Yukon Property Tax Assessment Roll, there were a total of 460 properties in the Tagish area in 2013. Land uses, as assessed by YG, are listed in Table 8.2.

Residential Uses

Tagish is home to Carcross/Tagish First Nation people. Given the lack of school and employment opportunities in Tagish, a number of Carcross/Tagish families stay in Carcross or Whitehorse during the school year and use their Tagish properties during summer and vacation times.

Given the community's proximity to Whitehorse, which is home to three quarters of the total Yukon population, Tagish is a recreation destination mainly for Whitehorse residents. There are also many properties owners from Europe and the United States who use their home periodically.

Residences in Tagish are spread throughout a number of distinct neighbourhoods. Many houses front along Tagish Lake and the Six Mile River. People value their waterfront access. Throughout the area, there is a public setback that runs 30.48 metres upland from the ordinary high water mark (Waterfront Reserve). While this area is public land, it is treated by some as an extension to their properties. The residential lots are summarized in Table 8.3.

Six Mile West (Tagish River Road)

The lots along the Tagish River Road were the product of the first recreational subdivision in Tagish. Lots in this area were sold in the 1960s and 70s. Most front along the Six Mile River. The 45 lots in this area

Table 8.1: Tagish Land Tenure

Land Owner	Area (ha)
C/TFN	1,079
C/TFN / Commissioner of the Yukon	7
Lease/Reservation	12
Private	504
Road Right of Way	117
YG	677
Total	2,396

Table 8.2: Tagish Land Uses According to the YG Tax Roll

Type of Land Use	Economic Land Use	Number
Agriculture	Agricultural or Agricultural Residential	13
	Grazing	1
	Total	14
Commercial	Commercial Highway or Tourist	1
	Commercial Service	1
	Commercial, Central or Comprehensive	4
	Total	6
Industrial	Industrial, Service or Light	1
	Quarry	1
	Total	2
Institutional	Institutional	1
	Total	1
Open Space and Parks	Open Space - Hinterland	19
	Parks - Recreational or Cultural	1
	Total	20
Residential	Country and Rural Residential	169
	Recreational Cottage	248
	Total	417
Grand Total		460

Source: Yukon Property Tax Assessment Roll (2013 Tax Year)

are small; generally between 0.2 ha to 0.6 ha. In the 1990s, a series of lot enlargements were approved, and there is now very limited space for expansion. The Six Mile Resort is at the north end of this area on a slightly larger lot. There are also 22 lots to the north of Tagish Road accessed via Sidney Street, with some lots fronting Tagish Creek.

California Beach Subdivision

The north-western shore of Tagish Lake along California Beach is home to many waterfront homes and cabins, some new and some that have belonged to families for many years. An additional subdivision in the 1970s added more waterfront lots. The 87 lots in this area are small, with most under 0.2 ha, and a few larger ones that are up to 1 ha. These lots are accessed via Reid Road, Beachfront Road, and Lakeview Road. There are public pedestrian access corridors on the subdivision plan, but the corridors are not cleared or signed making it difficult for visitors and residents to get to California Beach.



Residences at California Beach

Taku Subdivision

The Taku Subdivision was created in the 1970s. Lots in this area are fairly uniform in size and range between 0.2 ha and 0.5 ha. There are 164 lots in this subdivision, some with direct waterfront access and some with excellent views of the lake and surrounding mountains. The lots are found along Taku Boulevard and numerous cul-de-sacs. There is a boat launch at the end of Willow Way. Some of the access roads and driveways in this area are narrow and winding and would be difficult or impossible for emergency vehicles to access.

Tagish Estates

Tagish Estates lots are varied in size, but generally larger than lots in other neighbourhoods. Many lots in this neighbourhood were created in the mid-1980s through the subdivision of a large agricultural parcel. The smallest lots here are 0.3 ha, many are around 2 ha, and several are over 5 ha. There are three further large agricultural parcels, both south and east of Tagish Estates and across Tagish Creek. They range from 55 ha to 65 ha in size. Two of these agricultural lots will be eligible to subdivide in coming years. However, subdivision of these parcels is now restricted to one 6 ha parcel for each lot that has been owned by a particular person for at least 10 years and is used as a primary residence.

Six Mile River East

There are three small pockets of residential development on the east side of the Six Mile River. North of the Tagish Road are 12 lots ranging in size from 0.05 ha to 0.4 ha. This is the location of Tagish Services, which is currently not operating, and the Tagish Marina. South of the Tagish Road is a C/TFN subdivision. There are 19 homes for C/TFN citizens in this area along Chinook Road, Squanga Creek Road, and Mile Creek Road. There are also 13 lots along the Six Mile River accessed via Pennycook Road. In this area, property owners travel 8 km to reach their lots, and only the first 1.5 km of the road is regularly maintained by YG.

Table 8.3: Summary of Lots in Residential Neighbourhoods

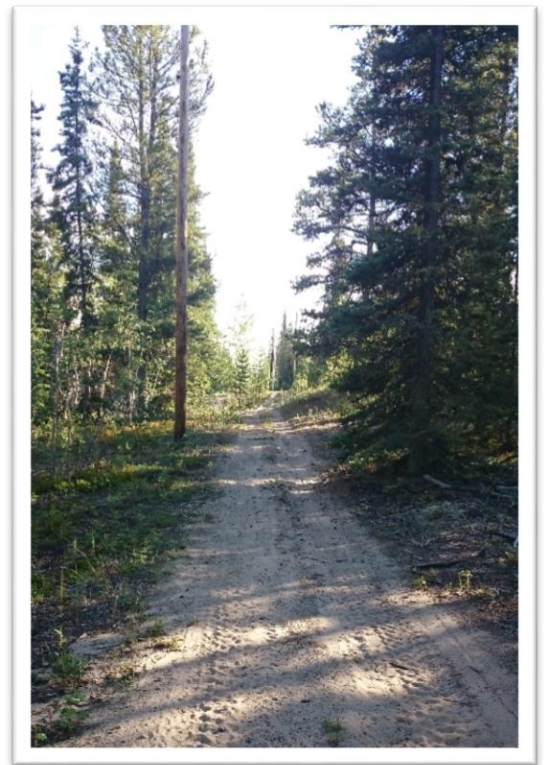
	Approximate Number of Lots	Size
Six Mile West	45 on Tagish River Road + 26 Sidney Street Area	0.2 to 2.5 ha
California Beach	87	Most under 0.2 h
Taku Subdivision	164	0.2 to 0.5 ha
Tagish Estates	77	Small 0.3 to 5 ha Large 55 to 65 ha
Six Mile River East	12	0.05 to 0.4 ha
Pennycook Lane	13	0.2 to 0.4 ha

Recreation

Two formal recreation areas are found near the Tagish Bridge. The Tagish Campground is situated on the east side of the River and is owned by C/TFN and operated by its government. It consists of 15 sites accessible for both RV's and tenters. There is also a boat launch close to the bridge which is owned by YG and is difficult to use especially when water levels are low. On the west side of the river, near the bridge, is an YG owned day use area and boat launch. This is a popular spot and, on busy days, many people park here to use the launch and to fish off the bridge. The area can get congested, which limits access to private properties and makes it difficult for emergency vehicles to manoeuvre.

The only local indoor recreation facility is the Tagish Community Hall, which hosts a wide range of community events and indoor recreation activities. At this location, there is also an outdoor skating rink, a playground, horseshoe pitch, and a baseball field.

Boating and fishing are very popular activities in Tagish. There are four community boat launches in Tagish; one at the day use area, one at the C/TFN campground that is owned by YG, one on Logan Lane, and one on Willow Ave in Taku Subdivision. The YG day use area boat launch is the easiest to use early in the season. The campground launch is only usable in summer when water levels come up and is in need of some repair.



Multi-Use Trail near California Beach

Trails

Owing to Tagish's historical and cultural importance, the community is a crossroads for numerous First Nation traditional trails, some of which connected to other traditional use areas and communities in the Marsh Lake, Carcross, and Atlin areas. Portions of the Tagish Road are believed to be one of these traditional routes. These routes, such as the traditional trail that connected the trading post at the head of Marsh Lake to Carcross, have

become disjointed as a result of residential property development in recent decades. Also, Tagish Road is part of the Trans Canada Trail.

These traditional trails have been augmented by a network of local trails that have developed from informal but regular use and intentional clearing. Residents speak to a wide variety of recreational uses, both motorized and non-motorized on the local trails. Residents report that overcrowding and user conflicts on the trails are not common; instead, several noted that the biggest trail-related challenge in Tagish is keeping corridors clear of vegetation due to the relatively low numbers using them. Local dog mushers use the same network of trails. While there is little incompatibility of uses on the trails between dog mushers and other users, the Renewable Resources Council and GC/TFN are concerned about dog mushing and trails in caribou habitat. Caribou are known to avoid areas frequented by dogs and wolves known to travel far more easily on packed trails. As such, the construction and use of trails must be carefully considered and controlled.

The most frequently used trails in the area are network of local trails (reportedly built as ski trails) located to the west of Taku subdivision, as well as trails connecting Taku subdivision to the Tagish cemetery and beyond to Tagish Estates. Another key trail starts at the end of Reid Road and traverses C/TFN parcel C-42B before joining up with the Tagish Road at the 90-degree corner. Yet another key trail, particularly well-used by local motorized recreationists, runs along the Tagish Road in the power line corridor. There is no coordinating effort in place at this time to groom, maintain, or sign any of Tagish's local trails. Several dog mushers and another resident reported having been approached while using trails located on Settlement Lands and told that they were trespassing.

Hunting and Trapping

There are three trapping concessions that overlap with the Tagish planning area. These are Concession 309 on the east side of Six Mile River, Concession 416, south of Tagish Road on the west side of Tagish Lake. Concession 413 is the Tagish community concession that allows elders (both First Nations and non-First Nations) to trap. Neither hunting nor trapping are allowed within one kilometer of a residence, which excludes most of the Tagish planning area for hunting and trapping use.

Commercial

Commercial operations are limited in Tagish. There are a number of small home-based businesses that operate in residential neighbourhoods, including home offices, contractors, and personal services. The Six Mile Resort provides seasonal tourist accommodation, a restaurant, and a dock. There has been a gas station near the eastern approach to the bridge, but as of summer 2015, it was not operating. There is also a marina on the east side of the river that is operating, but is not currently selling gas. The small population, low number of visitors in the off-season, and higher costs of doing business in an isolated location limit local economic opportunities.

Land Use Permitting and Dispositions

In addition to the land owned privately and by the governments of C/TFN and Yukon, there are also several land reserves and leases in the planning area. Land reserves generally set aside public land for community purposes, such as the landfill and cemetery. There are also several leases that provide additional space for land owners to use on a temporary basis. Current leases include an area for recreation just south of the Community Hall, and waterfront areas adjacent to Six Mile Resort and the Tagish Marina. There are also several water lot leases in place to allow for private docks. While the Tagish LAP process is underway, no new land disposition applications (including sales, leases, licenses of occupation and reserves) will be accepted by YG within the planning area.

9. Infrastructure and Public Services

Community Hall

The heart of the Tagish community is the Tagish Community Hall. The building is owned and operated by the Tagish Community Association, a non-profit society. The Community Hall has a large room and a full kitchen and the facility is frequently used for meetings, weddings, community events, and indoor recreation activities. The community library, a thrift store, and the Southern Lakes Renewable Resources Council office are also in this building. This location is home to an outdoor skating rink, a playground, horseshoe pitch, and a baseball field.

The Tagish Community Association receives core funding and administrative support from the Sports and Recreation Branch of the YG Department of Community Services. The remainder of its funding comes from its ongoing fund raising efforts and other sources, such as Canadian Heritage, Lotteries Yukon, Youth Directorate, Recreation and Parks Association of Yukon and the Elder Active Association. A Recreational Director is hired to manage the day to day activities at the Community Hall.



Tagish Kick-Off Meeting at the Community Hall

Roads

Tagish Road connects Tagish with both Carcross (33 km) and Jake's Corner (21 km). This road is paved and is in fair condition. Reid Road provides access to the landfill, fire hall, and community well and is chip-sealed, as is Taku Boulevard. The roads that access other neighbourhoods are gravel and are also in fair condition. The exception is Pennycook Road, which is maintained by YG for the first 1.5 kilometres south of the Tagish Road. After this point, the condition of the road deteriorates significantly. The Tagish Bridge is also in fair condition.

Drinking Water

While there are some homes that have their own wells or take water directly from the lake or river, most Tagish residents rely on the



New Water Treatment Facility on Reid Road

community well or water delivery. The community well is located on Reid Road and is owned and maintained by YG. The well is self-serve and provides automatic chlorination and iron filtration. A new well and water treatment facility are under development and are expected to be operational by the end of 2015. The existing well will be upgraded and will continue to be used for firefighting.

A second source of drinking water is the delivery service managed by GC/TFN. A well is located on the east side of the bridge and there is a building and a truck used to make deliveries to C/TFN Citizens and other area residents.

Wastewater

There are currently no public wastewater systems within the Tagish area. Residents rely on private systems, including pump-out holding tanks, septic systems or out-houses.

Solid Waste

The Tagish landfill site located on Reid Road is a transfer station where residents can deposit domestic garbage, waste construction materials, scrap metal, brush, recyclables, and compost. The site is now gated and waste is no longer burned at this location; rather it is transferred to the Whitehorse landfill.



Tagish Regional Transfer Station Recycling Area

Emergency Services

Fire protection in Tagish is provided by the Tagish Volunteer Fire Department. The fire hall is located on Reid Road near the corner of Taku Boulevard. It has three vehicle bays and a training room. The volunteer fire department strives to have a minimum of 15 members and recruitment is ongoing. Residents are concerned about the risk of forest fire in the area, and the volunteer fire department is working to increase protection. A four by four truck has been recently purchased with support from YG to enable the fire crew to respond to brush fires.

Tagish is served by an on-call ambulance service that is staffed by volunteer emergency responders. They are trained by YG's Protective Services branch and work closely with staff at the Carcross Health Centre. The ambulance is kept at the fire hall.



Tagish Volunteer Fire Fighters

Police services are provided by the Carcross or Whitehorse RCMP detachments.

Electricity and Communication

Electrical distribution in Tagish is owned and operated by ATCO Electric Yukon. Powerlines run to Tagish from both Carcross and Jake's Corner. Electricity service is available in the community's main residential neighbourhoods.

The most populated areas of Tagish are covered by 4G service as of October 2015. There are gaps in cell coverage along the Tagish Road both towards Carcross and Jake's Corner. Homes with internet are generally connected by DSL.

Cemetery

The Tagish Community Cemetery is located on a large, fenced area at the corner of Tagish Road and Reid Road. It is managed and maintained by a volunteer community association.

School and Health Services

Some local students are bused to the school in Carcross or are home-schooled by their parents in Tagish. The school in Carcross only goes up to grade nine, so students attend high school in Whitehorse. Residents access health services either at the Carcross Health Centre or in Whitehorse.

Post Office

A post office operated in Tagish until 2014. The office is now closed and most people collect their mail from mail boxes located at the community hall.



Tagish Community Cemetery

10. Concurrent Planning Processes

Whitehorse and Southern Lakes Forest Resources Management Plan

The forest resources management plan process for Whitehorse and the Southern Lakes region is currently underway and the Tagish planning area falls within this planning area. The planning process is a collaboration between the governments of Yukon, C/TFN, Kwanlin Dün First Nation, and Ta'an Kwäch'än Council. The Forest Resources Management Plan will be a strategic level plan that will provide guidelines on forest resources management. The plan will identify areas where forest resource harvesting may occur and can provide forest management recommendations relating to habitat, trails, access management, timber and non-timber values, and development impacts.

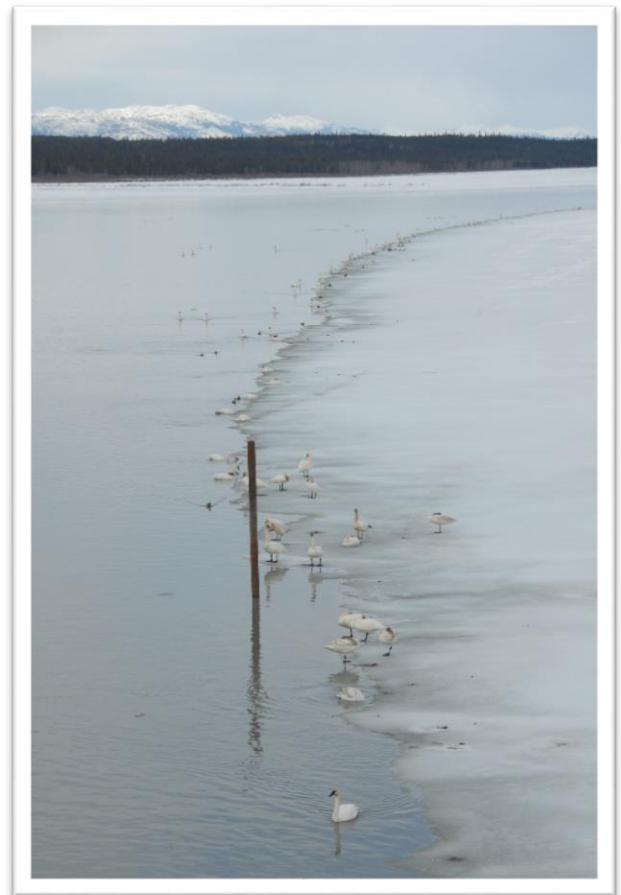
The Southern Lakes Forest Resources Management Plan will make recommendations related to both personal and commercial fuelwood harvesting and fuel management. This plan is in stage three of a six stage process as of November 2015. It is anticipated that the plan will be available for review in spring 2016.

Tagish River Habitat Protection Area

Given its importance as a staging area for migrating waterfowl, the Six Mile River (Tagish River) and adjacent wetlands to the north have been identified as a special management area in C/TFN's Final Agreement. A management plan for this area must be developed, and Chapter 10, Schedule C specifies how this planning process is to be undertaken.

The planning process started in early 2015 with the appointment of the planning committee members. GC/TFN and YG appointees. The process is expected to take approximately two years. The objectives of this planning process are to:

- Establish a habitat protection area in the Tagish River area;
- Conserve nationally and locally important fish and wildlife and associated habitat for the benefit of all;
- Recognize the current and traditional use of the Area by the Carcross/Tagish people and other Yukon residents;
- Recognize and honour the history, heritage and culture of the C/TFN through the establishment and operation of the HPA;
- Encourage public awareness, appreciation and enjoyment for the natural resources of the HPA;
- Recognise the HPA as a multi-use area including uses for recreation and for the storage, use and management of water for hydro electric production for the benefit of all Yukon people; and
- Provide economic opportunities to the Carcross/Tagish people to participate in the development, operation and management of the HPA.



Swans Along the Six Mile River

Photo Credit: Environment Canada, Jim Hawkings

The management plan that results from this planning process is expected to provide recommendations about how to best manage this habitat to support healthy wildlife populations and protect C/TFN's aboriginal rights to the area. The management plan will contain policies that, once the plan is approved, will be implemented by the various levels of governments. As the Tagish River Habitat Protection Area is located in the midst of the Tagish Local Area Plan with its borders meeting at the ordinary high water mark of the waterway, the plans will need to speak to and support each other.

Southern Lakes Hydro Enhancement Storage Concept

Yukon Energy is considering a hydro enhancement project called the Southern Lakes Hydro Enhancement Storage Concept. This project is based on a proposal to maintain higher water levels through the fall and winter in Marsh, Tagish and Bennett lakes. The proposed project considers storing more water in fall and decreasing lake levels in spring to provide for an increase hydro generation through the winter months. C/TFN citizens as well as many local residents are concerned about the impact of this project, including an increase of erosion and flooding of shorelines of the Yukon River headwaters, the degradation of fish and wildlife habitat, as well as safety of travel over ice during winter months. More details about the potential impacts of this project can be found in Section 11.

FireSmart Projects

There has been a recognized need for FireSmart in the Tagish area and activity began as early as 1999 (*pers. comm., Colin Urquhart, FireSmart and Fuels Management Specialist – YG*). There have been approximately 41 areas where the understory vegetation has been removed under the program. These projects have been administered by GC/TFN, YG Community Services, Wildland Fire Management with the assistance of Tagish Volunteer Fire Department and Tagish Community Association.

A multi-year FireSmart plan was developed for GC/TFN in 2006 to address the risk of wildfire and to prescribe effective treatments to mitigate these risks. The plan focused on significant social and cultural values associated with the communities of Carcross and Tagish, as well as outlying subdivisions, heritage values and C/TFN Settlement Lands. As of 2015, projects have covered approximately 73.45 ha of forested area within the planning area, including areas along most egress routes and adjacent to subdivisions.



Area under FireSmart along Taku Boulevard

Opinions relating to the importance of FireSmarting are mixed in the community; some people feel that this treatment is key to protecting homes from fires and others feel that it compromises habitat, especially for caribou, and looks unnatural.

11. Hydrology, Groundwater, Flooding and Erosion

Tagish and Marsh lakes are the main waterbodies near the community of Tagish; these lakes along with Bennett Lake, are part of the Southern Lakes system. The headwaters of the Southern Lakes system are characterized by numerous glaciers and ice fields in the coastal mountains near Atlin British Columbia.

The water level in the Southern Lakes system is regulated by Yukon Energy for hydropower generation at the Lewes Dam in Whitehorse. Target water levels in Marsh Lake are defined in the water license, and no retention of the flow is allowed between May 15 and August 15 each year unless Marsh Lake levels are low in early July.

While the system is regulated for a portion of the year, peak lake levels occur between July and October and are associated with peak glacial melt. The nearest hydrometric station that monitors the water levels in Tagish Lake is on the shore at 10 Mile Road.

Southern Lakes Enhanced Storage Concept

Yukon Energy is proposing the Southern Lakes Hydro Enhanced Storage Concept (SLESC) as a way of increasing hydro-generated energy production during the winter. Yukon Energy is proposing a change to its current water licence to allow the storage of water for winter energy demands. According to Yukon Energy, this would involve a change to the existing lake level stipulated in the current water licence that would increase lake levels 30 cm from August 15 to May 15 and increase the spring draw down an additional 10 cm.

Yukon Energy has completed numerous preliminary studies on the impacts of the proposed changes to lake levels including baseline studies, and investigations into the changes related to groundwater, erosion, and impacts on fauna and flora related to this project. More studies are scheduled to be conducted to better understand the potential impacts.

Over spring and summer 2015 Yukon Energy contacted property owners where impacts to groundwater and erosion are anticipated to occur to discuss options for mitigation and financial compensation. According to information from Yukon Energy in June 2015, they hope to make a decision about the future of this project by fall 2015. If Yukon Energy decides to proceed with getting regulatory approval for the project, they will need to undergo detailed environmental impact assessment under YESAB as next step.

During public meetings, many residents as well as GC/TFN expressed serious concern about the negative impacts associated with the proposed project. Property owners, including GC/TFN, worry about impacts to their shorelines and groundwater tables. Many people expressed concern about the projects potential impacts on fish and wildlife and their habitat. Local people are also concerned about the safety of ice for travel during winter months.

Groundwater-Related Impacts

The groundwater level in the planning area is closely tied to the water level in the Southern Lakes system. According to Yukon Energy, the SLESC will not increase the maximum groundwater level, but may result in the groundwater level remaining high for a longer period in some areas (Hemmera 2014).

In 2011, AECOM created a numerical groundwater model to predict potential areas of groundwater impact (Hemmera 2014). According to this model, most areas around Tagish Lake should be unaffected by higher sustained groundwater levels, however several properties on the Tagish River could potentially be impacted (Hemmera 2014). Specifically, changes to lake levels could lead to the flooding of crawl spaces and inundation of

septic fields. According to YG regulations, septic fields must be 1.2 m above the seasonal high water level, but many existing septic fields are below the current average lake levels and are likely already being inundated regularly. As groundwater levels vary locally and septic systems and crawl spaces are different on each property, Yukon Energy is proposing site-by-site mitigation. Decisions about specific mitigation will be made based on discussions with individual property owners.

Flooding

Tagish residents are concerned about potential flooding in the Southern Lakes Region. High water levels related to climate change, increased water storage, or other cause could damage property and the lead to increased erosion. The 1:200 flood levels (658.39 m) are shown on Map 5.

Erosion-Related Impacts

Erosion assessments were conducted on Tagish Lake in 2010 and early 2011 as part of the SLESC. Assessments included shoreline inspections, bathymetry data collection, beach sediment samples and aerial flights over Tagish Lake. Potential erosion areas are shown on Map 5.

Shorelines that were identified as susceptible to erosion contained one or more of the following characteristics: shorelines with a partially or completely exposed sediment bank up shore, trees immediately adjacent to the shoreline that are leaning towards the water and turbid water along the shoreline not associated with a tributary outlet (AECOM 2011b).

As part of this work, AECOM produced a map that identifies areas with high, medium, and low levels of erosion. A high ranking for an erosive shoreline would have one or more of the following: high bank height, fine grained sediments, aspect is facing prevailing wind direction, and/or absence of vegetation on bank. In contrast, a low ranking for an erosive shoreline would be characterized by one or more of the following: low bank height, coarse grained sediments, not facing prevailing wind direction, and/or colonizing vegetation on bank (AECOM 2011b).

Two areas showing extensive erosion were identified on the shoreline at the north end of Tagish Lake, one on the east side and one south of California Beach in the northwest corner of the lake. These areas contain high banks made of erosion-susceptible glacio-lacustrine deposits consisting of clay, silt, and sand (AECOM 2011b). California Beach showed no sign of erosion except for a small bluff adjacent to the Tagish River outlet (AECOM 2010).

Erosion and erosion potential was also observed along the west bank of the Tagish River. Wave action and erosion by moving water likely contribute to the high levels of erosion found along the Tagish River (AECOM 2011b).



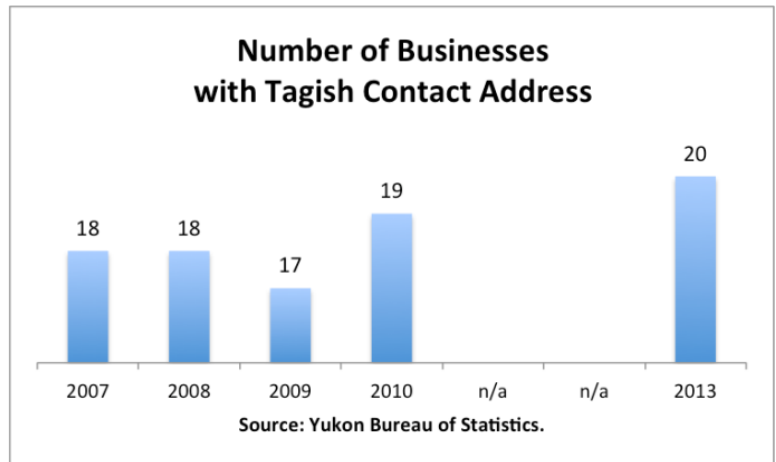
Signs of Erosion on California Beach at the Tagish River Outlet

12. Economics and Business

Local Businesses

There are a number of small business owners in Tagish, running a range of operations including, home-base businesses, contractors of various sorts, trades people, marinas, tourist services, rental cabins, and a restaurant. These businesses are important to the local economy and quality of life as they provide an income for residents as well as local services.

The number of businesses operating in the area goes fluctuates from year to year. In 2013, a total of 20 businesses listed a Tagish address in a Yukon Business Survey. Data which describes the nature of business conducted by these enterprises is not available.



Running a successful business in Tagish is challenging given the small population base. People who live in Tagish would like to have access to a local gas station and a store. At the same time many residents travel daily or weekly to Whitehorse and take advantage of lower prices and a wider selection available in stores there.

Economic Opportunities

There are no major industries or commercial ventures in Tagish nor is there any mineral extraction or harvest of any other material in the Tagish area. There are several parcels that were purchased for agricultural uses within the planning area and agriculture could potentially become a more important in the future. Tourism businesses have been growing in Tagish. At a meeting in Carcross, C/TFN citizens spoke to their wish of increasing the tourism potential of Tagish by drawing on their cultural heritage and the natural beauty of the surrounding area.

Tourist Related Services

Several of the businesses in Tagish are based on tourist related services and rely on the natural beauty of Tagish to succeed. Maintaining the natural areas, the wildlife, and the rustic feel are very important to these business owners.

13. Physical Constraints

As part of this background report, a map has been produced to show which areas have land that is potentially developable. As such, Map 6 identifies areas that have physical constraints that will make future development difficult. This map does not include other factors related to residential development such as road access, existing development, surrounding land uses or views.

On the map, the green areas are easily developable, yellow areas are moderately developable, and orange areas are difficult to develop. This map combines information about slope, wetlands, flooding and surficial geology and gives a general idea of areas that have fewer physical constraints to development. The usefulness of this map is, however, limited by the scale of the data that was available to create it. Analysis on a finer scale may be required before detailed land use decisions are made.

Table 13.1. Physical Constraints to Development	
Feature	Classification
Wetlands	Difficult to Develop
Slope	0-5% Easily Developable 5-15% Moderately Developable 15% + Difficult to Develop
Areas of Potential Erosion	Difficult to Develop
1:200 flood levels (658.39 m)	Difficult to Develop
Surficial Geology	Bedrock – Easily Developable Morainal – Easily Developable Glaciofluvial – Easily Developable Eolian – Moderately Developable Fluvial – Moderately Developable Glaciolacustrine – Moderately Developable

14. Planning Considerations and Next Steps

The information in this report will provide a basis for the Tagish Local Area Plan. Once the report has been reviewed and finalized, the information collected will be used, along with the guidance of the planning committee, and further public input, to develop a series of discussion papers. These discussion papers will focus on key planning issues and will be used to get specific input on key questions. The results of these discussions will be the basis of the draft plan.

Potential topics for the discussion papers are:

- Community services and sustainability;
- Recreation;
- Area development (zoning) regulations;
- Waterfront issues;
- Future development;
- Culture and history; and
- Environment and habitat.

References

- AECOM, 2011a. Marsh Lake Fall-Winter Storage Concept: 2010 Geomorphology Study Report. Prepared for Yukon Energy Corporation.
- AECOM, 2011b. Marsh Lake Storage Concept: 2011 Geomorphology Field and Associated Studies Report. Prepared for Yukon Energy Corporation.
- AECOM, 2011c. Marsh Lake Fall-Winter Storage Concept Hydrology Baseline Report. Prepared for Yukon Energy Corporation.
- AECOM, 2012a. Tagish River Erosion Analysis. Prepared for Yukon Energy Corporation.
- AECOM, 2012b. Run-up Analysis – Tagish Lake Locations. Prepared for Yukon Energy Corporation.
- AECOM. 2013. Southern Lake Enhanced Storage Project: Aquatic Baseline Report. Prepared for Yukon Energy Corporation. October 2013.
- Ardea Biological Consulting, 2013. Yukon Energy Corporation Southern Lakes Enhanced Storage Project – Preliminary Terrestrial Effects Assessment. Prepared for Yukon Energy Corporation.
- Bakica, D. June 04, 2015. Conservation Officer. Fish and Wildlife Branch, Yukon Department of Environment, Whitehorse, Yukon.
- Canada Revenue Agency. *Locality Code Statistics*. 2010 Tax Year.
- Coates, Kenneth. 1984. "Betwixt and Between": The Anglican Church and the Children of the Carcross (Choooutla) Residential School, 1911-1954. BC Studies, Winter 1984/85, pp. 27-47.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2015. Wildlife Species Assessment. http://www.cosewic.gc.ca/eng/sct0/index_e.cfm. Accessed May 15, 2015.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2003. COSEWIC assessment and update status report on the wolverine *Gulo gulo* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ISBN: 0-662-35346-3.
- Doyle, F.I. and L. Turney. 2012. Southern Lakes Terrestrial Baseline Studies - 2010 Aquatic and Wetland Bird Surveys. Unpublished report prepared for AECOM Canada Ltd. and Yukon Energy Corporation by Ardea Biological Consulting Ltd., Smithers, British Columbia, Canada. 37 pages + appendices.
- EBA Engineering Consultants Ltd. 2003. Regional Ecosystem Classification and Mapping of the Yukon Southern Lakes and Pelly Mountains Ecoregions. Prepared for Government of Yukon, Department of Environment, Whitehorse, Yukon. http://www.env.gov.yk.ca/animalshabitat/elc/documents/ecosystemclass_slakes_pellymntns.pdf. Accessed May 15, 2015.
- EBA, 2013. Completion Report for Tagish Community Fire Hall Well 2 (TFHW-02). Prepared for Government of Yukon, Community Services Branch.
- EDI Environmental Dynamics Inc., 2006. Multi-year FireSmart Plan for the Carcross and Tagish Region. Prepared for Carcross/Tagish First Nation. September 2006.
- Farnell, R. 2009. Three decades of caribou recovery programs in Yukon: a paradigm shift in wildlife management. Department of Environment, Government of Yukon, Whitehorse, Yukon. 18 pp.

- Florkiewicz, R., R. Maraj, T. Hegel, and M. Waterreus. 2007. The effects of human land use on the winter habitat of the recovering Carcross woodland caribou herd in suburban Yukon Territory, Canada. *Rangifer Special Issue* 17: 181–197.
- Francis, S., and J. Nishi 2015. Range assessment as a cumulative effects management tool: Assessment of the Carcross Caribou Herd Range in Yukon. Prepared for Environment Yukon. Yukon Fish and Wildlife Branch Report MRC-15-01, Whitehorse, Yukon, Canada.
- Geomatics Yukon. Various shapefiles (.shp) containing resource spatial data for Agriculture Land Dispositions, Agriculture Land Applications, Forestry Cutting Permits, Forestry Harvest Licenses, Oil & Gas Dispositions, Placer Mining Claims, Quartz Mining Claims, Trapping Concessions and Wind Energy. (<http://www.geomaticsyukon.ca/>).
- Government of Canada. 2013. Birds Protected in Canada Under the *Migratory Birds Convention Act, 1994 and Regulations*. <https://www.ec.gc.ca/nature/default.asp?lang=En&n=496E2702-1> Accessed June 01, 2015.
- Government of Canada. 2015. Species at Risk Public Registry. http://www.registrelep-sararegistry.gc.ca/species/schedules_e.cfm?id=1. Accessed May 15, 2015.
- Government of Canada. 2015b. Species at Risk Public Registry. Species Profile: Little Brown Myotis. http://www.registrelep-sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=1173 Accessed June 03, 2015.
- Government of Yukon. 2011. *Yukon Land Status*. Mineral Resources Branch, Energy Mines and Resources, Whitehorse, Yukon. http://www.eco.gov.yk.ca/aboriginalrelations/pdf/land_status_map_aug2011.pdf Accessed June 01, 2015.
- Government of Yukon. 2013. *Management Plan for Yukon Amphibians*. Fish and Wildlife Branch, Yukon Department of Environment, Whitehorse, Yukon. ISBN: 978-1-55362-611-4.
- Government of Yukon. 2014. *Yukon Bats*. Fish and Wildlife Branch, Yukon Department of Environment, Whitehorse, Yukon. ISBN 978-1-55362-690-9
- Government of Yukon. 2015. Yukon Species at Risk. Fish and Wildlife Branch, Yukon Department of Environment, Whitehorse, Yukon. <http://www.env.gov.yk.ca/animals-habitat/speciesrisk.php> Accessed June 01, 2015.
- Hegel, T.M. and K. Russell. 2013. Status of northern mountain caribou (*Rangifer tarandus caribou*) in Yukon, Canada. *Rangifer* 33, Special Issue 21: 59-70.
- Hemmera, 2014. Southern Lakes Groundwater Effects Mitigation. Prepared for Yukon Energy Corporation.
- Jung, T. S., and P. M. Kukka. 2014. Conserving and monitoring little brown bat (*Myotis lucifugus*) colonies in Yukon: 2013 Annual Report. Yukon Fish and Wildlife Branch Report PR-14-03. Whitehorse, Yukon, Canada.
- Lipovsky, P.S. & Bond, J.D. (compilers), 2014. Yukon digital surficial geology compilation, digital release 1, 08-Apr-2014. Yukon Geological Survey.
- MacBride Museum 2010. Two key letters began land claim process 100 years ago. Yukon News. March 3, 2010. Retrieved from <http://www.yukon-news.com/letters-opinions/two-key-letters-began-land-claim-process-100-years-ago>.
- Maddigan, K.A. 1999. Chinook Salmon Utilization and Restoration Options for Monkey Creek, Tributary to Marsh Lake (CRE-06-98). Prepared for the Yukon River Restoration and Enhancement Fund. Prepared by Yukon Conservation Society. March, 1999.
- Millar, N., O. Barker, and L. Jessup. 2012. Angler Harvest Survey: Tagish Bridge 2007. Yukon Environment, January 2012.

Morrison and Klassen 1991. Whitehorse, GSC Map 12-1990.

Nature Conservancy of Canada (NCC). 2015. Alvares of Ontario. <http://www.natureconservancy.ca/en/where-we-work/ontario/our-work/alvares-of-ontario.html>. Accessed May 15, 2015.

Northern Climate Exchange. Whitehorse Climate Adaption Plan. 2011. Yukon Research Centre, College

Personal Communication: Huggard, M. May 26, 2015. Natural Resource Manager, Heritage, Lands & Natural Resources, Carcross/Tagish First Nation. Yukon Territory, Canada.

Personal Communication: Urquhart, C. June 6, 2015. FireSmart and Fuels Management Specialist, Wildland Fire Management, Yukon Government – Community Services, Yukon Territory, Canada.

Rach, L. 2012. Southern Lakes Terrestrial Environment Baseline Studies - 2010 Amphibian Surveys. Unpublished report prepared for AECOM Canada Ltd. and Yukon Energy Corporation by Ardea Biological Consulting Ltd., Smithers, BC. 10 pp. + appendices.

Roberts, A. and L. Turney. 2012. Southern Lakes Terrestrial Environment Baseline Studies - 2010 Wetland Vegetation Community Mapping. Unpublished report prepared for AECOM Canada Ltd. and Yukon Energy Corporation by Ardea Biological Consulting Ltd., Smithers, BC. 51 pages + appendices.

Southern Lakes Wildlife Coordinating Committee (SLWCC). 2012. Regional Assessment of Wildlife in the Yukon Southern Lakes Region: Volume 2: Species Status Assessment. Department of Environment, Government of Yukon, Whitehorse, Yukon. 168 pp.

von Finster, A. 1988. Letter Memo RE: Pennycook Creek. Dated August 24, 1988. Letter to D.L. Deans, Chief Habitat Management, Fisheries and Oceans, Government of Canada, Vancouver BC.

von Finster, A. 1996. Memorandum RE: Bridge Tagish Creek. Dated May 1, 1996. Letter to Winston Fillatre, Fishery Officer, Fisheries and Oceans, Government of Canada.

Walker, C.E. Letter Memo RE: Tagish Creek fisheries. Dated February 8, 1974, to G. McLeod.

Williston, P. 2012. Southern Lakes Terrestrial Environment Baseline Studies - 2010 Rare Plant Surveys. Unpublished report prepared for AECOM Canada Ltd. and Yukon Energy Corporation by Ardea Biological Consulting Ltd., Smithers, BC. 9 pp. + appendices.

Wheeler, 1961. A Geological Survey of Canada Map (1093A). Geology, Whitehorse, Yukon Territory. Yukon Geological Survey.

Yukon Bureau of Statistics. *Socio-economic Web Portal*. Health Care Population Estimates for Tagish. (<http://www.sewp.gov.yk.ca/>)

Yukon Bureau of Statistics. *Socio-economic Web Portal*. Health Care Population Estimates for Yukon. (<http://www.sewp.gov.yk.ca/>)

Yukon Bureau of Statistics. *Socio-economic Web Portal*. Yukon Business Survey for Tagish. (<http://www.sewp.gov.yk.ca/>)

Yukon Community Services. *Property Tax Assessment Roll*. 2013 Tax Year.

Yukon Conservation Data Center. 2014. Rare Plant Information Sheets of the Carcross/Tagish Traditional Territory. http://www.env.gov.yk.ca/animals-habitat/documents/CTFN_2014.pdf. Accessed May 15, 2015.

Yukon Conservation Data Centre. 2014b. Rare species database. Yukon Department of Environment, Whitehorse, Yukon. Website <http://www.env.gov.yk.ca/animals-habitat/cdc.php> Accessed April 29, 2015

Yukon Department of Environment. 2013. Yukon Wildlife Key Area Inventory. Digital database and software produced by Habitat Programs Section, Fish and Wildlife Branch, Department of Environment, Government of Yukon, Whitehorse.
Accessed 29 April 2015:
http://www.env.gov.yk.ca/animals-habitat/wildlife_key_areas.php
<http://www.environmentyukon.ca/maps/view/detail/2/27/298>

Yukon Department of Environment. 2012. Overview of the 24 Caribou herds within the Yukon. Digital database and software produced by Habitat Programs Section, Fish and Wildlife Branch, Department of Environment, Government of Yukon, Whitehorse.
Accessed 01 June 2015 from: <http://www.environmentyukon.ca/maps/view/detail/1/8/68>

Yukon Ecoregions Working Group. 2004. Yukon Southern Lakes. In, Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes. C.A.S. Smith, J.C. Meikle and C.F. Roots (eds.). Agriculture and Agri-Food Canada. PARC Technical Bulletin No. 04-01, Summerland, British Columbia, p. 207–226.