Appendix 8 to the TH April 30, 2024, Submission to the Dawson Planning Commission
Consideration of Climate Change in the Recommended Dawson Regional Land Use Plan

The Dawson Regional Land Use Plan (the Plan) is the first opportunity the people of the Yukon have had to fully address climate change as part of a regional planning process. Neither the Peel nor North Yukon Regional Land Use Plans identify climate change as an important factor affecting Yukon lands and waters. We are happy the Plan acknowledges climate change as an issue that should be addressed, but we do not believe the Plan goes far enough in recommending measures to combat it. The Dawson Planning process is an excellent opportunity to promote meaningful and effective action on climate change. The implementation of the Dawson Regional Land Use Plan may be the earliest opportunity to implement the Yukon Government's *Our Clean Future* (*OCF*) - the Yukon's strategy for climate change, energy, and a green economy - through regional planning. Part of the *OCF Vision* (p.9) is:

> *We will recognize the inherent value and importance of our natural environment and prioritize solutions that protect, conserve and harness natural capital and ecosystem services.*

The strategy outlines objectives for people and the environment (OCF, p.50):

- *Respond to the impacts of climate change on wild species and their habitats.*
- *Maintain our ability to practice traditional and cultural activities on the land.*
- *Protect and enhance human health and wellbeing in a changing climate.*

The strategy also aims to meet objectives through land use planning, among other means, in recognition of *"how broadly climate change can affect our lives"* (OCF, p.23).

OCF Action C6 (p.55) requires the Yukon Government to *"Continue to make recommendations to consider the impacts of climate change in regional land use and local area planning processes,"* while *Action P5* (OCF, p.51) states the Yukon Government will *"Continue to incorporate climate change into the design of protected and managed areas using landscape conservation science in order to allow native species to move, adapt and survive in the face of climate change."*

TH is of the opinion that a major shortfall of *OCF* is the failure to take in account the enormous volumes of carbon dioxide and methane that will be immediately released through climate-related permafrost degradation, and ground and vegetation disturbance. These can be considerable but are currently not included when emissions and targets are being assessed by the territory. Regional land use planning may be the best, and perhaps only, mechanism by which these can be calculated and addressed.

The magnitude of climate change impacts on virtually all aspects of the planning region and, in particular, Tr'ondëk Hwëch'in rights, titles, and interests, require climate change to be central to the Plan. The Recommended Plan (p.99) states its recommendations are *"guided by the reality of the climate change emergency that currently exists in the Yukon."* Yet there remain unfulfilled opportunities within the Plan to reflect that reality. In our view the Plan can better emphasize the disproportionate effects of climate change in the north and properly reflect the fundamental impacts it imposes on Tr'ondëk

Hwëch'in. We are in a climate crisis, not an industry crisis or an economic one, yet the promotion of industrial development, and business as usual, applies to most of the planning region.

Addressing climate change requires fundamental, and often difficult, shifts in philosophy, priorities, and practices. While the Dawson Regional Land Use Plan cannot be the only means to tackle the climate crisis, it remains a critical part of the solution.

1.2 VISION

The inclusion of Tr'ëhudè as a key principle is a positive step. Better acknowledgement and consideration of how climate change is interwoven into all aspects of land uses and practices in the region - and tackling its impacts in a holistic manner that reflects and focuses on Tr'ondëk Hwëch'in stewardship and natural solutions - can help the Plan more fully achieve Final Agreement Chapter 11 Objectives. Business as usual will continue to undermine our ability to adequately address and adapt to climate change.

1.3 PLANNING VALUES, ISSUES AND GOALS

1.3.1 Resource Values and Issues and 1.3.2 Plan Goals

The Yukon First Nations' Climate Change Emergency Declaration, of February 2020, stated "*there is no greater threat today to our culture and way of life and the wellness of our citizens and communities than the impacts of climate change.*" The Tr'ondëk Hwëch'in Climate Change Declaration states "*The land, water, wildlife, fish, trees, and plants of these ecosystems are critical to our survival and identity. It is a priority for Tr'ondëk Hwëch'in to do what we can to ensure our ecosystems and culture are preserved and not lost because of climate change."*

Climate change is listed as one of the Ecological Integrity, Conservation and Stewardship issues (Table1-1; p.10). Three climate change-related objectives are incorporated into the Plan's Ecological Goals (p.11):

1. Preserve ecologically representative areas and important ecosystem services within the context of climate driven shifts to maintain the natural integrity of those areas.
2. Connectivity between areas of key habitat, while considering climate-driven shifts in habitat.
3. Awareness, mitigation, and adaptation to the effects of climate change on the landscape, fish and wildlife populations, and the people of the region.

TH believes #3 should have greater significance than an "Ecological Goal" and should be fundamental to the Plan's direction and outcomes. Including it as an essential part of the Plan's Vision can help to address the fast-paced and widespread transformations wrought by climate change and enhance the Plan's effectiveness and influence.

Climate change is, and will continue to be, the biggest threat to "Culture and heritage" and can be incorporated as a planning issue within that Value. Strengthening connections to the land and sustaining traditional harvesting rights and practices cannot be successful if the land is irrevocably changed and

access hindered through climate changes. Equally, acknowledging and addressing its impacts on our traditional and "sustainable" economies merits mention as a socio-economic goal.

If establishing "access infrastructure" (Recommended DRLUP, p.11) is to be a key consideration, it should acknowledge its adverse effects of exacerbating climate changes; particularly ground disturbance and thawing, increasing emissions, and habitat degradation and severance.

TH strongly believes that focusing on climate change is fundamental to sustaining an environment where people and nature thrive; and that recommendations and mechanisms are placed throughout the Plan to ensure climate change considerations are acknowledged and addressed. If the Plan reflects this, it can provide robust and enforceable guidance that will have a meaningful impact on climate changes in our region.

1.8 INDIGENOUS PLANNING AND RECONCILIATION

1.8.3 United Nations Declaration on the Rights of Indigenous Peoples

It is widely acknowledged that climate change and Indigenous Peoples' rights are inextricably linked. The United Nations confirms the connection between Indigenous rights and sustainable development – and supports the realization that the impacts of climate change directly restrict First Nations' ability to enjoy and use traditional lands and infringe upon Indigenous rights. Highlighting the crucial link between Indigenous rights and climate change should be an integral part of the Plan. Moreover, supporting the spirit and intent of the Final Agreements and UNDRIP and unequivocally acknowledging a co-governance (not simply co-management) approach to climate change will certainly improve the Plan's ability to *"strengthen Tr'ondëk Hwëch'in's ability to determine and develop priorities for their Traditional Territory"* (Recommended DRLUP, p.22).

The Federal and Territorial governments promote Indigenous climate leadership as a cornerstone of climate action and *"efforts must uphold the rights of First Nations….in accordance with the minimum standards set out in the United Nations Declaration on the Rights of Indigenous Peoples"* (Canada's National Adaptation Strategy, 2020, p.17). The Plan is an opportune vehicle to recommend the concept of free, prior, and informed consent as the pathway for Yukon First Nations to address climate change in the territory.

1.9 GUIDING PRINCIPLES

We propose that addressing climate change be specifically incorporated as a guiding principle for the Plan, with recommendations and mechanisms throughout to ensure climate change considerations are acknowledged and addressed. This is fundamental to the success of the Plan. The principle could be stated thus:

> **Climate Change:** Addressing the causes and impacts of climate change is fundamentally necessary to create an environment where people and nature thrive. This is central to the Plan and essential to the continued health and well-being of the region.

The Plan promotes the principles of sustainable development and community stewardship as part of creating a sustainable plan; and *hopes "this Plan will in turn encourage all people to act as stewards of the Region"* (Recommended DRLUP, p.22). The intent of the Plan in this regard could be strengthened by:

- Acknowledging the legacy of historic and contemporary unsustainable development in the Territory as a component of the ongoing, and worsening, effects of climate change.
- Approaching the issues through legislated means and not aspirations.

1.9.1 Sustainable Development and 1.9.2 Stewardship

The Plan notes that economic activities that degrade the land and that the land cannot recover from are not considered sustainable. From the TH perspective, development cannot be considered sustainable if it contributes to climate change or worsens its effects; and this includes emissions from disturbing land. Adherence to this principle should be one of the priorities for achieving environmental sustainability.

1.9.3 Precautionary Principle

We fully support the adoption of the Precautionary Principle. Including emissions and other contributions to climate change, and activities that may exacerbate climate-change induced effects, can result in harm to the environment. Equally, activities that lead to habitat destruction and fragmentation should also be considered from a climate change perspective and proven not to adversely impact the abilities of species to relocate or adapt to the changing environment.

1.9.4 Adaptive Management

Adaptive management can be adopted for all aspects and impacts of climate change; irrespective whether sources or causes are outside of the geographical boundaries of the Plan and even if there are no immediate or effective mitigations. Incorporating recommendations for wider action to consider and reduce the Yukon's and Canada's greenhouse-gas emissions will help our regional land use planning process to meet its governance, cultural and sustainability responsibilities as required by the Final Agreements.

2 DESCRIPTION OF THE PLANNING REGION

2.3 ENVIRONMENT

Climate change, which has led to substantial environmental changes and impacts in the region, should be referenced in this summary.

2.5 ECONOMY

This section would be better served by highlighting the potential impacts climate change may have on future development for each sector – as it has done for Transportation. For example, placer mining and agriculture may benefit from increasing temperatures while forestry could be restricted due to wildfires. Access to the land and to traditional renewable resources may become limited as the

environment changes. Equally, industrial development contributes to the causes of climate change through emissions (direct and ground-released) and a reduction in sequestration.

2.7 CLIMATE CHANGE

We appreciate the expanded consideration climate change is given in the Recommended Plan, as opposed to the Draft Plan. The increased attention, while welcome, is focused on climate projections with only a short paragraph on impacts. Climate change consideration as a guiding principle is the best means to adequately address the extent of climate change impacts on virtually all aspects of the planning region.

3 PLAN CONCEPTS

3.1 LANDSCAPE MANAGEMENT UNITS

Nature plays a critical role by providing two key climate change solutions; sequestering and storing carbon and allowing nature to adapt to the changing climate. Protecting and restoring habitats could provide over one-third of the national emission reductions needed and help the Federal Government's commitment to protect at least 50% of wilderness by 2050. Equally, this can play an enormous role in preserving biodiversity and adaptation. We reiterate: Protecting more of the region from development and disturbance will enhance the potential for climate-change solutions within the region.

In addition, 'nature-based solutions' or 'natural climate solutions' are becoming increasingly supported and implemented to remove carbon dioxide from the atmosphere. Spanning a wide range of practices, these fall into three categories relevant to our region: forestry practices, wetland-related practices, and restorative agriculture. Forestry practices include preservation, allowing forests to regrow naturally where they have been cut down, and improved forest management. Wetland-related practices focus on conserving and restoring peatlands and wetlands. Restorative agriculture ranges from practices that build soil carbon, such as no-till agriculture and cover crop rotation, to agroforestry and improved livestock management.

Natural conservation is important in helping wildlife and people adapt to some of the changes that we are already experiencing because of climate change. Wetlands, forests, and grasslands provide a buffer or refuge from extreme weather events, such as floods and droughts. Intact, connected natural habitats will also help some species shift their ranges in response to climate change. Land Management Units should be based on the preservation of key values like water, caribou or salmon and not altered to suit the artificial existence of mining claims or industry dispositions.

3.2 LAND USE DESIGNATION SYSTEM

Management intent for the designation system needs to include the potential to address the causes and impacts of climate change. If our climate and landscapes change to the degrees predicted, the role of our environment in climate-change resilience will become ever more important. While some LMUs refer to conservation and habitat protection, they need to also take account of the importance of natural and stable environments in carbon sequestration and storage, and of the emissions released when land is disturbed.

3.2.1 Integrated Stewardship Areas

Just as the most at-risk members of society need the highest level of care, the most damaged and vulnerable natural environments need the highest levels of protection, and equally, restoration to the highest standards. As we look to nature and our natural environment to help reduce and mitigate the effects of climate change, we should consider and give priority to those areas that have surpassed designated or identified cumulative thresholds. It is a key responsibility of this Plan to introduce specific requirements for 'Integrated Stewardship Areas' that will help minimize industry's contributions to climate change, investigate methods to increase sequestration and help preserve critical habitat.

3.2.2 Special Management Areas

Priority should be given to retain, preserve and re-establish our natural landscape. Otherwise, the incalculable benefits it provides in addressing climate change will be lost and we will continue to suffer the consequences of unsustainable development. In this respect the provision for Special Management Areas is critical from a climate change perspective. Increasing the quantum of Special Management Areas and moderating the pace and intensity of industry will increase our abilities to minimize climate change and help adapt to its impacts. It supports the premise that "Retaining the natural landscape is a way to maintain ecosystem resilience in the region" (Recommended DRLUP, p43)

The Recommended Plan promotes further work (e.g., to monitor changes, forecast future conditions, etc.) to understand how climate change is affecting our lands and help inform conservation approaches. Mandating the precautionary principle until this work is complete will remove uncertainties about how land will be impacted; and allow us to be surer of the effects of development, and of climate changes. A moratorium on industrial activities within SMAs would assist governments, regulators, or proponents to learn how activities will contribute to, or exacerbate, climate changes.

3.2.3 Sub-Regional Planning Areas

The three areas identified for future planning are locations where climate change-induced effects could have the biggest impact on our abilities to function as a community. TH supports sub-regional planning for the Klondike Valley and Dempster Corridor but believes the Yukon River Corridor in the Dawson Planning Region should be a Special Management Area. TH appreciates the Commission's future vision of developing a coordinated Plan for the entirety of the Yukon River Corridor in Yukon. Creation of sub-regional and Yukon River plans should be subsequent to a comprehensive analysis from a climate change vulnerability perspective.

3.2.4 Overlay Areas

3.2.4.1 Caribou Stewardship Area

It is well understood that climate refuges and supporting the abilities of species to find alternate habitats are crucial to species adaptations when confronted by climate changes. The intent of Caribou Stewardship Areas, to protect the caribou population and habitat, can be improved from a climate-impacts perspective by aligning overlay areas with caribou habitat (as opposed to LMU boundaries), increasing areas slated for preservation, and limiting support for existing dispositions and access.

The effect of existing mining operations on the proposed corridors also needs to be taken into account. It is unacceptable that mining claims continue to be given preference over a species so important to Tr'ondëk Hwëch'in and so vulnerable to climate change.

If we are uncertain about the effects climate change has, and will have, on caribou behaviour and breeding and migration, then we should adopt the precautionary principle and preserve as much of their current and expected-future habitat as we can. This will require continued observation and sampling, and predictive modelling.

3.2.4.2 Wetland Stewardship Area

Wetland integrity is vital to climate resilience. The abilities of wetlands to sequester and store carbon are at risk through industrial development of wetlands and their supporting watersheds. In addition, the enormous volumes of carbon released when wetlands are disturbed may have significant impacts on the territory's emissions. From a climate change perspective, all wetland types should be permanently protected.

3.3 GENERAL MANAGEMENT DIRECTION and 3.4 SPECIAL MANAGEMENT DIRECTION

Much of the Plan seems based on accommodating development and then trying to reduce subsequent conflicts. This approach does not support the climate-change benefits of preserving the environment or accounting for the contributions activities make to climate change. Climate change considerations should be included as a specific management direction:

- Elimination or minimizing of activities that contribute to the causes and adverse impacts of climate change

A definition of the "best use of land" (Recommended DRLUP, p.48) would be useful for clarity and should incorporate the value of retaining the natural state of the environment as a solution to climate changes. It should also allow for land to be preserved in its natural state for the public good as a provider of cultural, social, physical, spiritual, and direct and indirect economic benefits. In the light of climate change stresses these attributes are becoming increasingly important.

3.6 CUMULATIVE EFFECTS MANAGEMENT

3.6.1 Overview and 3.6.2 Background

The Plan's definition of cumulative effects focuses on net changes to the environment, or a society, which result from land-use activities in specific Land Management Units. This definition limits consideration to local or regional land uses, and thus omits many climate change implications. Climate Change has been described as "*the mother of all cumulative effects*" (FNND, Written Submission to the Commission, Dec 21, 2021, p.9) and these wider climatic, physical, and biological implications need to be assessed as a cumulative effect in and of itself. It should also be part of environmental impact and cumulative effect assessments. It is vital for our regional and wider well-being that climate changes and their widespread impacts are a focus of cumulative effects assessment. Failure to do so can lead to

uninformed management decisions that leave us, and our environment, bearing the brunt of severe climate change consequences.

In summary, potential effects of climate change should be considered as a component of cumulative impact assessments during evaluations for land-use plans. Until these changes are better understood in a cumulative context and incorporated into the Plan, it will be difficult to predict the environmental, social, and cultural outcomes of particular land-management designations and allowable activities. This can be achieved by:

- Adding climate change to the primary list of cumulative effects indicators.
- Incorporating and setting measurable thresholds for climate change-induced effects.
- Considering the direct consequences that climate change may have on other indicators and activities.
- Addressing how allowable land uses and activities may exacerbate the causes and impacts of climate change.

These would enable specific and measurable thresholds to be developed that consider direct climate change consequences, and the degree of influence of climate change within Land Management Units.

3.6.2 Background

The Plan definition of Cumulative Effects (CE) is effects "that result from a land use activity in combination with other past, present, and future activities" (Recommended DRLUP, p. 52). It would be advantageous, and more accurate, to take account of climate changes from a CE perspective, and particularly those experienced in the planning region from causes that are created outside of the territory.

3.6.3 Recommended Plan Indicators

The Plan's primary Cumulative Effects Indicators are Surface Disturbance and Linear Density; chosen as they indirectly relate to a range of regional values and issues. Climate change shares these characteristics, and indeed surpasses their spheres and range of influence. Thus, climate change should be defined, incorporated, and evaluated in the same manner. Equally, climate change should be a key component of the Cumulative Effects Framework and properly tracked utilizing appropriate and adequate baseline measurements.

Consideration of climate change takes one of two forms: contributing to the causes of climate changes; or assessing its direct and indirect impacts.

Contributions to climate change: Certain land-management designations and allowable activities may contribute to the causes of climate change. While the Yukon's overall 'carbon footprint' is small at the national level, the territory has one of the highest rates of fuel and resource consumption in the country on a per capita basis; transportation and mining being the main contributors. Industry and the levels of development supported within Land Management Units directly determine emissions, while the removal of wetlands and other carbon-

sequestration ecosystems weakens the environment's ability to absorb CO_2. Both the federal and territorial governments have established medium and long-term emission reduction and carbon-capture targets which could translate to thresholds for cumulative assessment of contributory components.

Direct impacts: Cumulative effects assessment should consider how the changing climate affects assessment parameters, and in particular CE indicators. For example, the cumulative threshold for wetland removal or disturbance should not be limited to that directly caused by the activity but include losses contributed by climate changes. A wetland may reach its disturbance threshold purely through climate change-induced permafrost degradation or may be expected to surpass its threshold when this is combined with human disturbance. Quantifying the expectations of climate-induced cumulative impacts will require research, modelling, and monitoring; and can comfortably be applied to other cumulative effects' indicators (which could be expanded to include permafrost) and other plan parameters.

Indirect impacts: Support for development in some LMUs can exacerbate impacts experienced due to climate change or provide new avenues for climate-induced alterations. Mining disturbance or the construction of roads and trails is known to adversely affect permafrost. The cumulative extent of this cannot be considered solely from a development 'footprint' perspective. Surface disturbance and linear density alone are insufficient to determine the total extent of the impacted permafrost. Modelling and monitoring have major roles to play.

There are three key challenges when considering climate change within cumulative impacts assessments:

1. We have no records for climate changes as rapid as the rate we are currently experiencing.
2. The high degree of uncertainty and the difficulties of modelling and predictions leave us open to potentially significant errors.
3. Combinations of climate change effects can serve to intensify and widen its impacts beyond those expected for individual components.

The consequences of this current episode of climate change will differ markedly from those of previous events, in part because of the extent of cumulative environmental impacts and interactions, which impair some systems' mechanisms for resilience and increases their sensitivity to change. Ecosystems now are highly fragmented by land-use activities and previous spatial shifts (like migration) that could provide an outlet may no longer be available or possible. Thus, assumptions for expected behaviour, and indeed available options, must be tempered with expectations of high variability and uncertainty. The Plan does address ecological integrity and interconnection in its recommendation on Special Management Areas from a climate change perspective. However, forecasted alterations to ecosystems, unexpected changes to species migration and distribution and a host of other climate change related factors will require predictive modelling to ensure potential future habitats remain available and connected.

Several approaches to land management have been developed in the face of high climate change uncertainty. The most common approach, and one incorporated in the Plan, is the "precautionary principle": if the outcome of an activity is uncertain and harmful effects are possible, be conservative until outcomes are better understood. This is essential from a climate-change perspective if potentially catastrophic errors are to be minimized. It requires detection and documentation of the climate-mediated changes that are occurring, beyond those currently listed as cumulative effects indicators. More importantly, it requires a robust recognition of potential "threshold" behaviours, beyond which a system begins to respond in a new (and potentially unforeseen) way once conditions change beyond a particular point. A second approach is "adaptive management," which is also referenced as a Guiding Principle in the Plan and specifically recommended for climate change consideration. Appropriate forecasting and monitoring can evaluate the efficacy of an action or actions and allow redesign to improve future applications of the technique. Such an approach will be particularly useful as the climatic context for land-management decisions and activities changes. While the Draft Plan suggested refining the application of cumulative effects indicators and thresholds, the Recommended Plan does not provide much in the way of climate change-specific actions or requirements. TH strongly believes the Final Recommended Plan should provide strong, comprehensive, and effective actions related to climate change.

Assessments of climate hazards often study the effects of each exposure individually. Focusing on only a single or small number of climate change impacts may ignore the combined threat they present in conjunction with other impacts, resulting in incomplete assessments of the consequences of climate change on valued components. Projections should anticipate a future beyond individual hazards such as heatwaves or droughts, and plan for one in which we will experience the impacts of multiple types of concurrent climate hazards. Cumulative effects assessment with regard to climate change is complicated. The accumulated impacts of one component must be considered concurrently with others to fully comprehend the extent of impacts. Cases where one impact aggravates the effects of another (run-off on a hillside after heavy rainfall events will differ considerably after a wildfire, for example) require careful consideration. This is further complicated when a “collision” of multiple cumulative climate change impacts may be involved.

There should be potential in the Plan to cease development activities if they are *projected* to move to critical levels of CE, even if they currently fall short of indicator limits. Interim (even in the long term) pauses could be introduced in these cases to reduce the likelihood of reaching critical levels, and to ensure more accurate assessments and mitigations.

In addition to the other cumulative effects indicators identified in section 3.6.3, the Recommended Plan proposes that other indicators will be evaluated and implemented later. While supporting this principle, it is imperative these are introduced, monitored, and assessed as part of the current plan development. Delaying assessments will limit the effectiveness of adaptation strategies relating to climate change if factors such as wildfires, permafrost degradation, and extreme weather events are not considered in the Plan. Equally, the cumulative impacts of climate change on community, mental and physical wellness should be addressed in the Final Plan. And perhaps most importantly, the cumulative effects of climate

changes on First Nation Citizen rights, titles and interests should be a fundamental component of the cumulative effects strategy.

A decision by the BC Supreme Court found the BC government infringed the Blueberry River First Nation's treaty rights by allowing decades of industrial development in their traditional territory[1]. The First Nation argued cumulative impacts of activities constituted a breach of treaty rights, a claim that the court upheld. One example presented of the cumulative impacts was declining caribou populations. Justice Burke accepted expert witness testimony that "anthropogenic disturbance, including industrial disturbance, has largely caused or contributed to that decline" (*Yahey v British Columbia*, 2021 BCSC).

In the ruling, the Judge noted that the Crown may justifiably infringe treaty rights through the "taking up" of lands for development deemed to be in the public good. But there is, or should be, a limit: "I find that the province's conduct over a period of many years – by allowing industrial development in Blueberry's territory at an extensive scale without assessing the cumulative impacts of this development and ensuring that Blueberry would be able to continue meaningfully exercising its treaty rights in its territory – has breached the Treaty" (*Yahey v British Columbia*, 2021 BCSC). Supporting the First Nations request for a halt on all further development, the decision noted "The province may not continue to authorize activities that breach the promises included in the Treaty, including the province's honourable and fiduciary obligations associated with the Treaty, or that unjustifiably infringe Blueberry's exercise of its treaty rights" (*Yahey v British Columbia*, 2021 BCSC).

Given the far-reaching implications of the decision it would be prudent for the Plan to recognize the potential for cumulative effects to surpass acceptable levels when impacting the rights of Tr'ondëk Hwëch'in. It may be a complicated process to identify and set thresholds and monitoring regimes, but it would serve to enhance the Plan's cumulative effects assessment regime. It may also be pertinent to consider if climate changed-induced cumulative impacts could be held responsible for infringing on Indigenous rights – either in conjunction with development activities or solely.

Surface Disturbance

The Plan notes that disturbance footprints represent a decrease in habitat. Many of the physical environmental disturbances will be initiated and/or exacerbated by climate change; and it is recommended to incorporate these impacts within calculations of cumulative effects. Equally, advocating further research before taking action is contrary to the precautionary principle.

The primary limitation apparent in the Plan is the assessment of what is considered the 'footprint' of activities. Thus, the cumulative assessment of a disturbance will be restricted purely to the percentage of land that will be disrupted in a given LMU. It takes no apparent account that while placer mining, for example, may account for only a small percentage of an area within the context of an LMU, it may disturb 100% of an important or sensitive riparian valley; or it may affect an area susceptible to climate change, such as wetlands. Other activities will similarly affect large percentages of key, rare, sensitive, or

[1] *Yahey v British Columbia*, 2021 BCSC

climate-susceptible habitat while remaining within prescribed thresholds for that LMU. It is uncertain that the implied 'values-based' approach will be sufficient to rectify this issue – particularly if 'climate change' is not considered a value. This approach may result in the loss of vital habitat and areas of cultural significance.

Some activities have a greater impact than others - a seasonal activity may have minimal impact on the surface compared to a more permanent one, for example. Seasonal impacts, both in terms of when activities take place and how seasonal conditions affect their impacts, can vary considerably – particularly when climate changes are taken into account. The Plan should ensure that CE assessments adequately differentiate levels of impact.

Surface Disturbance and Reclamation

It may be reasonable to subtract "reclaimed" or "restored" areas from the disturbed index, but these should be defined with acknowledgements that carbon sequestration levels should be proven to have returned to previous levels before an area can be considered adequately restored. It should be noted that reclaiming disturbed land may require a considerable amount of time before it is once again available for development. This will require moderating the pace and intensity of mining but is the only way to minimize climate changes and keep temperature increases to an adequate level.

Linear Feature Density

The plan currently weighs all linear density features equally, with the acknowledgement that assessment regimes will alter and be improved as data becomes available. If the precautionary principle is indeed a key principle within the Plan, restrictions will have to be placed on new access until the cumulative impacts can be adequately measured. Projected impacts of climate change are an important component of the "*adequate baseline data required prior to any development activities*". Impacts of access on the underlying ground and vegetation from a climate change perspective should be considered. Access routes can contribute to permafrost thaw or disrupt hydrological cycles and flows – thus exacerbating the impacts brought on by climate change. These impacts should be accounted for in cumulative assessments.

The Plan's current approach to linear disturbance takes little account of the length, location and dispersion of access routes. An isolated 10km long route can be expected to have a greater impact on caribou than an equivalent combined length of access routes running parallel to each other or in a grid system. The longer route has a much greater sphere of influence in this case than the more contained alternative. For some wildlife species habitat fragmentation is the greater threat, while for others access density (grid exploration trails for example) has more of an adverse impact. Linear density needs to be redesigned and reviewed from this perspective. Equally, some access routes have more impact than others. A winter road does not have the same effects as a permanent or all-season one – yet they are classed the same. Using aerial photographs makes it hard to differentiate. This needs to be rectified before meaningful CE analysis and thresholds can be set.

Access or transport routes should not be considered 'reclaimed' until vegetation has fully recovered to the level of the land immediately adjacent, it has re-established its carbon sequestration potential, or travel is no less restricted than on other land in the vicinity.

Please note that TH supports the recommended linear density and surface disturbance thresholds in the Recommended Plan as initial CE framework indicators but believes the climate change related limitations of these indicators need to be more fully expressed in the Final Plan, along with a more nuanced discussion about additional considerations assessors/approving bodies/regulators should contemplate when assessing a project.

4 CUMULATIVE EFFECTS FRAMEWORK

4.2 CUMULATIVE EFFECTS FRAMEWORK: FOUNDATION

4.2.1 Values

Consideration of climate change is fundamentally necessary to create a comprehensive and effective cumulative effects framework. A framework which does not reflect this cannot provide robust and enforceable guidance that will have a meaningful impact on climate changes in our region.

4.2.2 Indicators

It is in the best interests of planning in the region to identify the most appropriate indicators and plan to monitor and measure these in advance of planning decisions - Relevant baseline information is fundamental to planning, and the Plan should acknowledge and support this, particularly with the uncertainties of climate change. Decision-making and activities should not proceed until this information is obtained and assessed. The lack of available data should not be used as rationale to authorize activity with potential negative effects.

The sample list of potential indicators should include climate change; particularly as it affects every indicator on that list. It is noted some climate change indicators may be referenced to priority values, but this remains an inadequate approach. The example of **4.2.4 Recovery from extreme events** is a partial illustration of how climate change as an Indicator needs to be properly incorporated in this section.

4.3.1 Current Conditions

There are concerns that the CE standards are being set at levels based on our understanding of the effects of disturbance at this time. This may underestimate climate change impacts, many of which are not fully realized or understood in our region. In addition, there are areas within proposed LMUs that have already surpassed CE thresholds (and not simply from a climate change perspective), strategies for which should be considered within the Plan. The Plan should recommend that CE thresholds be periodically reviewed and updated to reflect our growing understanding of the effects of Climate Change. This should be a joint exercise among TH and YG.

4.3.2 Future Scenarios

Future scenarios need to incorporate climate change and ecological values in order for the Plan to remain relevant and effective. The key principle in planning is to determine the best way to shape the future, and not simply find ways to try to mitigate the cumulative impacts of development.

4.4 CUMULATIVE EFFECTS FRAMEWORK: MANAGEMENT

Cumulative effects are often difficult to identify and assess. Neither YESAB nor the regulators currently have the resources to adequately consider the issue, especially from a climate change perspective. The Plan's Recommendations are welcomed, particularly monitoring to ensure those responsibilities are sufficiently resourced, undertaken to an acceptable standard and effective.

4.5.1 Cumulative Effects Framework: Recommendations to the Parties

Limiting environmental cumulative effects assessments to surface and linear disturbance equally limits the potential for climate change and environmental Policy Recommendations. TH would like to see other cumulative effects indicators incorporated in the Plan to better assess the impacts of climate change. These might include wetland quantum, populations of salmon, caribou, and moose, and other environmental, socio-cultural, and socio-economic factors - sometimes referred to as VESECs or Valued Environmental and Socio-Economic Components. The Plan alludes to identifying other environmental cumulative effects indicators, but these are not clear in the Plan. In our view, climate change and climate change-induced/exacerbated effects should be added to proposed Indicator Recommendations. TH proposes including a Policy Recommendation that the "*Parties should continue to develop values-based indicators for ECOLOGICAL and CULTURAL values listed in the Plan*." The Commission should identify appropriate values-based indicators that could be included as part of a values-based Cumulative Effects framework – beyond consideration of surface and linear disturbance.

The proposed recommendation to incorporate the impacts of projected climate change should be expanded to include the contributions to the causes of climate change – assessing emissions, loss of sequestration, carbon release from disturbed environments etc.

5 GENERAL MANAGEMENT DIRECTIONS

5.1 OVERVIEW

Managing climate change risks and the necessary mitigation and adaptation will likely consume a significant proportion of management resources in the region in the coming decades. Thus, much of Climate Change 5.2.6 should be incorporated into this section. Climate change should be given greater profile throughout the Plan. In comparison to the Draft Plan, reference to climate change has improved but the recommendations remain insufficient, often limited to monitoring potential impacts and not recommending practical mitigations or adaptations. References to climate change in relation to the Sustainable Economy are mostly restricted to the impacts that climate change is having on land uses and not the impacts many industrial activities have as causes of climate change, or how they intensify impacts.

5.2 ECOLOGICAL INTEGRITY AND CONSERVATION

Perhaps the greatest threat to ecological integrity and conservation is climate change, and it certainly merits mention in the introduction to the section. At present, the levels of protection in the Plan are not as effective as they should be to address climate change or protect vital ecosystems.

The **Ecological goals** should emphasize preserving and enhancing natural landscapes as a solution to climate change. Consideration of ecologically representative areas and ecosystem services is critical when considering climate change, as almost our entire environment will change. Thus, ecological goals should include:

- Preserve, enhance, and increase the natural features and landscapes that help mitigate climate changes.
- Develop adaptations to the effects of climate change on the landscape, fish and wildlife populations, and the people of the Region.

5.2.3 Water

The Plan notes that "interconnectedness of water" and its ever-changing state "necessitates a holistic approach" (Recommended DRLUP, p.91), yet the apparent focus is on minimizing impacts from its use as a resource, as opposed to a value to be protected in its own right. We propose:

- Greater recognition of TH rights related to water.
- Greater emphasis should be given to modelling to predict and mitigate alterations due to climate change.
- Researching baseline hydrological cycles should be encouraged. There are recognized gaps in our knowledge of the hydrological cycle within the region, especially the groundwater regime, which are being aggravated by climate change.

Climate change should be specifically addressed as part of the discussion of the following issues:

***Habitat*.** Section 5.2.1.3 discusses salmon habitat but only mentions climate change to say that there is uncertainty of its impacts on habitat. Climate change is having enormous direct and indirect impacts on salmon and other fish and aquatic species and their habitats. Warming waters, changing melt and flood cycles, habitat alteration and disruptions and invasive species can all be attributed to our changing climate. These considerations, and subsequent research, should be the backbone of recommendations made in relation to aquatic habitats.

***Rivers and watercourses*.** In order to ensure the ecological, economic, and cultural integrity of rivers remains intact, the impacts of climate changes should be specifically considered and incorporated into recommendations. Permafrost degradation, slumping and landslides, uncertain flow levels, flooding, increasing water temperature, and release of heavy metals is impacting all our rivers and streams. Climate change impacts are referenced as a **Key Planning Issue** but deserve more focus in management practices and recommendations. Aside from incorporating special management direction for individual LMUs, the Plan needs an overarching acknowledgement of the impacts of climate change on rivers and streams and recommendations to reduce and respond to its effects.

Yukon River Corridor Special Management Directions. The Yukon River is the main artery of life in the Dawson Planning Region. It is vital that the Plan identifies and considers climate changes on the river and within its watershed to help ensure the river's ability to retain its present and future value.

***Community*.** Water for community consumption should be considered in the context of climate change and potential impacts to supply and demand. A fuller consideration of water-related climate change impacts and issues can be found in the review of section **6.3.5.1 Community Water** within this submission.

Flooding represents one of the greatest natural disturbances in the region. Flooding is most commonly caused by ice jams that form during spring break-up. Flooding can also occur during the spring freshet and during heavy rain fall events. In addition, the potential for landslides due to slumping and permafrost melt can increase flood risks for the community.

***Economy*.** Water resource systems are already under stress from many of the economic activities in the Region. Projected changes in the timing, intensity, and variability of temperature and precipitation associated with climate change are anticipated to affect many aspects of water resource systems. Collectively, these impacts are likely to significantly alter future water supply conditions in the region. In addition, climate change is anticipated to influence, and possibly amplify, trends in the demand for water resources as the community and industry attempt to adapt to more variable physical environments.

Climate change will affect both water supply and demand, and likely have a considerable impact on economic activities and local businesses. TH proposes the Plan recommend research into the impacts of climate change on our water-dependent economy, and include a review of water supply, demand, use and disposal. Monitoring alone, even in conjunction with the proposed mitigations to minimize direct disturbance from activities, will not be enough. There will be considerable economic costs associated with climate change impacts. A clearer picture of its effects in our region would be invaluable.

5.2.4 Rivers and Watercourses

Climate change impacts should be expanded to incorporate those related to human activity, including water contamination, sedimentation, and changes to water regimes and fish habitat. Policy Recommendation 39 should be expanded to support the Parties allocating resources to develop capacity for ***modelling***, monitoring, and guardianship. The suggested Recommended Management Practices could be expanded to add "Use an integrated approach considering climate-change and other cumulative effects" (Recommended DRLUP, p.95).

5.2.5 Wetlands

The Recommended Plan has placed increased importance on wetlands from a climate change perspective – but there remains a need to include some additional considerations. The "Objective" should be to "Retain wetland ecosystems to support ecological and socio-cultural values." The word 'functioning' implies changes can be made to wetlands and these altered or replaced systems will retain

the same ecological and cultural values – which is certainly not the case. The following should be added to the list of "key planning issues":

- Wetlands are vital components to minimizing the impacts of climate change, and disturbance can contribute vast quantities of stored GHG emissions into the atmosphere.
- Wetlands are complex and are impacted by changes at a watershed level.

Recommended Management Practices

The success of development and implementation of the Yukon wetlands policy is uncertain, requiring new regulations and perhaps new mining legislation. This places particular importance on the recommendations in the Plan.

A Ramsar Convention Wetlands resolution in 2018 acknowledged the significant contributions made by First Nations to wetland conservation and wise use through their traditional knowledge, innovations, and practices (including mitigating and adapting to climate change). The Convention:

- Noted the need to review and revise the *Guidelines for Rapid Cultural Inventories in Wetlands* with a view to ensuring that these guidelines are effective in evaluating the cultural ecosystem services of wetlands, including in relation to climate change mitigation and adaptation
- Encouraged governments to continue to seek to integrate wetland cultural services into all relevant national and regional policies, particularly where such wetland services may change over time and due to climate change
- Called upon support to implement the resolution through supporting capacity-building for governments, and encouraging climate-related investment programmes that integrate the traditional knowledge, innovations, and practices of First Nations in order to support the development of context-appropriate and cost-effective local solutions

The Plan should better support the integration of traditional knowledge and culture into its wetlands strategy.

Mitigation Hierarchy

The proposal for offsetting to compensate for loss of wetlands or wetland function is extremely worrisome for several reasons:

- It presupposes that the effects of industrial development can simply be offset elsewhere. This supports business as usual and does not address the key issues.
    - To our knowledge there is no way to restore the wetland "functions" of peat wetlands and fens once they are disturbed.
- Offsetting cannot be effective within the timeline of required climate change action.
- It is incredibly difficult, if not impossible, to determine how much a differing ecosystem will offset the loss of a wetland, especially when carbon release, and sequestration rates are calculated.

Tr'ondëk Hwëch'in does not support offsetting because it does not address the root causes of climate change.

Wetland Thresholds

The importance of wetlands and their precarious positions within the Planning Region is reflected in the Plan's objective to identify and protect key wetland areas. Even partial development is inextricably and unavoidably linked to ecosystem loss, the immediate emissions of considerable quantities of GHGs, and subsequent removal of carbon sequestration benefits. In addition, as mentioned earlier, 'offsetting' (if it is possible) takes many, many decades and is therefore not effective within the timeline of required climate change action. Thus, thresholds and trade-offs should not be considered a strategy for wetland preservation.

Tr'ondëk Hwëch'in wants substantially increased protection for all wetlands within the Planning Region.

Climate Change and Wetlands

The Recommended Plan acknowledges the role that wetlands play in the mitigation and adaptation of the effects of climate change; and is "guided by the reality of the climate change emergency that currently exists in the Yukon" (Recommended DRLUP, p.99). This can be better borne out by more stringent recommendations which avoid destruction of all wetlands in the region and subsequent and irreversible loss of wetlands and the functions they serve. Addressing our climate crisis should be the focus of this section.

Recommendations for the Parties should simply state that no development is to be permitted in wetlands throughout the planning region. This should apply to all new permits, including those on existing mining claims. If we are to be serious in protecting wetlands, particularly in light of their importance in climate change impact reduction and rarity within the planning region, we should acknowledge their value as a true ecosystem resource over any destructive uses, regardless of economic prosperity derived from their destruction.

The research recommendations are welcomed and will certainly assist in facilitating urgently needed studies and in key areas too. Public awareness could be expanded to specifically include the mining industry and representative bodies. Raising awareness and highlighting the importance of wetlands may help mitigate some of the industry's objections when restrictions are introduced.

5.2.6 Climate Change

Consideration of climate change and its impacts would best be served at the forefront of the Final Recommended Plan - and explicitly referenced in the introduction and throughout subsequent sections in a manner similar to the Plan's requirement to reflect the intent of the Final Agreements.

While a 20-year scope and longer-term approach is laudable, the Plan should consider and promote more immediate action and timescales for climate change mitigations and adaptations.

Planning Strategy Objectives

The objectives for Climate Change in the Recommended Dawson Regional Land Use Plan are consistent with the Yukon Government's *Our Clean Future*. However, OCF has serious omissions and shortcomings which include:

- Omitting some emissions from calculations including stored carbon release
- Allowing mining to have intensity-based targets
- Promoting trade offs:
    - Net-zero emissions targets are increasingly coming under scrutiny
- Lack of certainty in definitions of 'renewable' energy
- Variation in what constitutes 'green' in environmental and economic terms

Additionally, the Plan's four listed objectives are limited. The objectives should be expanded to include:

- Promoting opportunities to respond to climate change in ways that go beyond resilience and support a more sustainable region.
- Addressing the way climate change is affecting Indigenous rights and regional governance and capacity.
- Recommend measures to mitigate all causes of climate change and monitor and address its impacts.
- Support the development of self-sufficiency initiatives, food security and truly sustainable renewable energy development.

These are fundamental to the development and implementation of the Plan.

It is hoped the Final Plan will go farther to incorporate definitive and effective recommendations and management practices that better reflect realities and First Nations aspirations.

Key Planning Issues and Interests Related to Climate Change

The list incorporates many key issues and concerns. TH proposes adding the following:

Cumulative effects: Climate change effects can exacerbate natural and human changes to the environment, while its specific impacts may surpass threshold limits even without direct human intervention.

Community capacity: Existing issues relating to isolation and capacity are being exacerbated by the disproportionate impacts of a changing climate in the North. The difficulties of governing are multiplied by these new pressures.

Extreme weather: Unpredictable and severe weather events will become more common. This will equally affect communities and traditional land users. While an extreme weather event may be short in duration, impacts could be potentially dangerous, long-lasting, and overwhelming.

Potential new developments: A transition to a 'green' economy and renewable energies may bring new requests for land use, additional infrastructure, access, and exploration potential for minerals associated with new technologies and increased battery storage.

Recommended Management Practices

The four recommended practices are limited and relate solely to development proposals. Planning Strategies should recognize and address the causes and impacts of climate change as a priority and incorporate recommendations that address the multifaceted adaptations that are required for a coordinated and adequate response. The Plan should incorporate strategies to:

- Minimize contributions to climate change and its impacts.
- Identify and assess ***all*** impacts of climate change on the planning region.
- Seek and present potential solutions for effective adaptations and to improve resiliency.

These strategies, and other climate related actions, should be incorporated into every other facet/section of the plan, as applicable. Following a strategy of referencing and addressing climate change in all applicable sections of the Plan is the best way to practically and effectively incorporate climate change considerations. We support the recommendation to "*Consider potential climate change threats and take pro-active measures to improve resilience and mitigate the impacts*" (Recommended DRLUP, p.106) but would like to go beyond that and see several recommendations that are specifically tailored to climate change.

Recommendations to the Parties

Many of the recommendations for policy or action can have a positive impact on addressing climate change. In our view, this highlights opportunities to strengthen the remainder of the Plan. Recommendations to "*consider climate driven shifts in habitat*" (Recommended DRLUP, p.105) should not be limited to caribou but should apply to all flora and fauna. The necessity for "*Self-sufficiency*" should not be limited to food production but be a mandate for other aspects of the plan, such as renewable power (that does not adversely affect salmon as would be the case with re-commissioning the North Fork hydro project). Developing "*alternatives*" is not just about renewable energy but should be applied to transportation and the consumption and supply of goods, to technology, and our economy. Building capacity is not required only for flood forecasting, but for governance, communications, monitoring and modelling, and implementation.

Addressing climate change requires fundamental and often difficult shifts in philosophy, priorities, and practices. It requires practical solutions. Having a five-page climate change section within a regional plan, albeit with some limited references elsewhere in the Plan, does not address the climate crisis we now face.

5.3 CULTURE, HERITAGE RESOURCES AND COMMUNITY

We are pleased to note that management practices and recommendations for the conservation of heritage and cultural values are not to be "read in isolation" and "these values are addressed throughout the Plan's General Management Directions as they are closely tied to the land, and as such, tied to the activities that occur on the land, and the habitat that the land provides" (Recommended DRLUP, p.108 We would like climate change considerations to be similarly broad and interconnected.

The potential threat of climate change to First Nations' culture and heritage makes climate change an issue of fundamental human rights. The need to maintain access to the land and to cultural resources and harvesting in the face of climate-change induced changes should be a **Socio-cultural Goal**.

5.3.1 Heritage Resources and Sites

The Recommended Plan acknowledges the potential of climate change to significantly impact the cultural resources and values in the Dawson Planning region. This is a good start. However, we would like to see more emphasis on the urgency of addressing climate change through improving our management practices and more specific recommendations.

5.3.5 Community Growth

The Plan makes reference to sustainable community development. However, our community has no plans in place to determine the rate of population growth or to decide on the optimum size of the community. Even though the core of the Dawson community area is outside the scope of the Plan, the Plan does address the Klondike Valley, whose residents utilize the City of Dawson as their community hub. TH recommends this issue be addressed within this Plan, especially given the added pressures on community infrastructure from climate changes, and the risks to access and communication infrastructure. The Plan may not be applicable to Dawson City itself but should recommend that the standards for environmental and cultural protection within the City of Dawson should be at least as high as the standards outside municipal boundaries. This is especially true when it comes to climate change, since so much of the energy within the greater planning region is consumed within the municipal area.

5.3.5.1 Community Water

The Plan tries to ensure the continued availability of potable water in the Dawson Region, both within the municipal area and surroundings – and acknowledges risks from climate change-related impacts. Implementing a climate change assessment specifically for municipal potable water sources (existing and proposed) within the Planning Region should be a **Recommended Management Practice** – incorporating assessment of flooding, slumping and landslides, heavy metal release from melting permafrost, increased sedimentation, damage to water infrastructure and emergency response.

Health and Wellbeing

In addition to the growing burden of climate-related impacts, health systems in the region are also faced with physical risks to health infrastructure. The growing risk of weather-related disasters from climate change is not only a threat to the health of people in the Dawson region, but a threat to local health infrastructure. Floods, wildfires, and extreme weather events can directly impact heath service infrastructure and provision. Equally, climate changes may restrict emergency highway or air access due to expected increases in adverse weather conditions and physical disruption to access routes due to slumping, landslides, and flooding. The Climate Change section does recommend infrastructure projects consider climate change - but this should be made explicit for health and emergency planning as well.

Again, this highlights the need for consistency between the Dawson Regional Land Use Plan and the Plan that applies within the City of Dawson.

As a minimum the Plan should direct the Parties to incorporate climate change considerations into all levels of emergency response as a matter of urgency.

5.3.6 Recreation

Similar to accessing the land for traditional harvesting, climate changes may adversely impact potential for outdoor recreation. Consideration of climate change impacts to trails should be expanded to cover all outdoor recreation, and again should extend to the lands both within and outside the City of Dawson.

5.4 SUSTAINABLE ECONOMY

The economic value of land

The Recommended Plan could better recognize the true economic value of wilderness and 'undeveloped' areas. In some cases, the economic value of retaining wilderness can exceed the financial benefits of developing those areas. Wilderness provides many valuable "services," including flood and fire control by wetlands. This value will only increase and become more important as we face climate-changed impacts to our environments and safety. Natural areas also provide direct employment, development of and access to renewable resources, local access and recreation, tourism, scientific research, and access to clean water and renewable energies. We are happy that the 'economic value' of undeveloped land, flora and fauna, forests, rivers, and waterbodies is starting to be recognized and the spiritual and aesthetic values of wilderness considered in economic terms. In addition, research has indicated natural amenities/resources become an important part of a region's economic base, and locations with a greater extent of wilderness exhibit higher measures of local economic vitality and diversity. Public and protected lands can also play a role in attracting new businesses to an area, luring knowledge-based, technology-driven firms to communities. These economic aspects should be considered if an economic assessment is to be accurate and leads to a truly sustainable economy.

5.4.1 Mineral Exploration and Development

Mineral exploration and development account for a significant portion of Yukon emissions – well beyond the figures presented in *OCF*, when related transportation is considered - in addition to the loss of carbon sequestration caused by the destruction of natural features like wetlands. The Recommended Plan acknowledges that "*the need to prioritize some areas for conservation over other interests, including mineral staking, exploration, and potential mining, is key to achieving balance and sustainable development in the planning region*" (Recommended DRLUP, p.125). The Plan advocates for a "balanced" approach. Yet this "balance" seems in favour of mining, with only a small percentage of the planning region fully protected from development when grandfathered mining claims in proposed SMAs are considered. The benefits of conservation include retention and reinstating of natural landscapes as a component of nature-based solutions to climate change, in addition to its other benefits. Expanding the mining sector under the current mining regime will only contribute to climate change and should not be promoted.

There is nothing in the Plan regarding our responsibility as human beings in the wider context to move on from resource extraction and to reduce our resource use. Extractive industries are responsible for a

large portion of our region and the world's carbon emissions and biodiversity loss. There are no recommendations for the mining industry to comply with government emissions reductions – beyond ineffective intensity targets.

Recommendation to the Parties
The Plan suggests that recommendations from the Yukon Mineral Development Strategy to support efforts to improve the process by which mineral exploration and development projects should be implemented. It would be prudent to include an acknowledgement of mining's direct and indirect impacts on climate change and make recommendations that these are considered and minimized.

5.4.3 Transportation and Access
Transportation is vital to the planning region. It is also one of our biggest contributors to greenhouse gas emissions. Aside from addressing the environmental and wildlife impacts of access, priority should be given to reducing emissions, minimizing the need to travel, and energy efficiencies and self-sufficiency – all of which have considerable economic importance. Equally, climate changes have an enormous impact on the integrity of transport corridors. While a subsequent **Research Recommendation** later in the Plan references permafrost – the potential economic impacts of permafrost degradation on transportation should be specifically referenced in this section.

The **Overall Objectives** for this section should include:

- Minimizing the need to travel in order to reduce emissions, bring energy efficiencies, and help sustain self-sufficiency.
- Addressing climate change consequences and impacts for transport and access throughout the region.

5.4.3.4 Air Access
Aviation worldwide contributes more than the emissions of most countries. Air access to and within our territory and region similarly contributes to our emissions, although this is not recognized in *OCF* nor in government emissions calculations or targets. While it may be beyond the remit of this Plan, some recommendations to help address emissions from aircraft of all types would be beneficial as part of a climate change strategy.

At the regional and local level, changing and potentially worsening weather conditions and extremes may affect aircraft safety.

5.4.3.5 Water Access
Access to and use of waterways, throughout the year, will invariably be affected by climate change and should be considered in this section of the Plan. Impacts and potential hazards should be referenced and incorporated as part of the Planning Strategy. Equally, recommendations should include raising awareness of the issues, monitoring conditions (including on ice) and providing advice on access and travelling.

5.4.4 Agriculture

Worldwide, agriculture contributes a significant share of the greenhouse gas emissions that are causing climate change. To help counteract agriculture's contribution to climate change, alternative farming techniques can be introduced. The planting of "cover crops," prevents soil depletion when other crops are out of rotation. Shifting to no-till agriculture protects the soil by leaving it undisturbed during cultivation and harvesting; healthier soil can serve as a "carbon sink. The Plan could include research into alternative farming techniques as a **Key planning issue** – with an **Objective** to "Minimize the climate change impacts of agriculture." If the Plan is to truly support increased agriculture, it similarly needs to investigate and recommend the introduction of climate change-friendly farming methods.

In addition, the potential impacts on agriculture practices and production from climate changes should be better identified – with appropriate mitigations and adaptations.

5.4.5 Tourism

The tourism sector is highly vulnerable to climate change and at the same time contributes to the emission of greenhouse gases. Addressing climate action in tourism is therefore important for the future and resilience of the sector. According to the UN World Tourism Organization, carbon dioxide emissions from tourism were forecast to increase at least by 25% from pre-Covid levels by 2030. Therefore, the need to implement climate action in tourism remains pressing. The Plan should acknowledge climate change impacts as a **Key planning issue**, with an **Objective** to "Minimize the climate change impacts of tourism." The Plan can support low carbon tourism development through recommendations to:

- Research the measurement and disclosure of CO_2 emissions in tourism.
- Investigate and implement emissions reductions in tourism operations.
- Engage the tourism sector in carbon removal.

5.4.7 Forestry

Research Recommendation 126 encourages the Parties to continue to explore the feasibility of advancing the use of biomass energy in the Dawson planning region. The burning of biomass fuels is likely not the only solution to climate change as outlined in the OCF or the *Yukon Biomass Energy Strategy*. It has benefits as a locally available and potentially renewable fuel source – and energy security and self-sufficiency may be equally as important as emissions reductions – but fails to address issues relating to greenhouse gas emissions.

Other issues arise from biomass fuels and will need further research or clarification:

- Is there enough 'waste' wood to satisfy demand, especially if biomass is being promoted? If demand outstrips supply, then trees will need to be harvested solely for the purpose. This may impact the supply of fuel for domestic wood stoves, lead to price increases as demand grows, and present land-use conflicts.
- Black and brown carbon particles associated with biomass burning increases atmospheric warming in by deflecting and absorbing sunlight within clouds to heat the atmosphere and, as

heating dissipates clouds, more sunlight is transferred to the ground ultimately resulting in warmer ground and air temperatures.

- Additional demand in the region would likely increase wood harvesting, with impacts to local wildlife and flora.
- Exposure to biomass burning particles is strongly associated with cardiovascular disease, respiratory illness, lung cancer, asthma, and low birth weights.

The **Research Recommendation** to continue to explore the feasibility of advancing biomass energy should be rewritten to assess the position of biomass in the context of climate change in the region.

5.4.9 Traditional Economy

The Plan notes the traditional economy contributes to cultural and social wellbeing, and much of it is based on the harvest of natural resources. Potential restrictions to access to the land and changes to natural resources are key components of climate change impacts. We are just beginning to comprehend the magnitude of the effect of climate change on the harvesting of fish and wildlife. We already know that the effects of warming water in the Yukon River and North Pacific Ocean is having a devastating effect on Yukon River salmon. While the direct impacts of climate change on the harvest of other subsistence species is less well known, they are sufficient to warrant that climate change-induced restrictions to access be noted as a **Key planning issue** and incorporated as a **Research Recommendation**: "The parties should support research into how climate change induced impacts affects access to traditional harvesting and natural resources and the traditional economy."