

DAWSON PLAN ALTERNATIVES

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COMMENTS BY

WILDLIFE CONSERVATION SOCIETY CANADA,

Whitehorse, Yukon

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Introduction

Wildlife Conservation Society Canada (WCS Canada) is providing these comments as part of the public review process to the Plan Alternatives made available in early February 2014. These comments have been put together by Donald Reid and Hilary Cooke of the WCS Canada Whitehorse staff. Thanks for the opportunity to provide input.

The mission of WCS Canada is to conserve wildlife and wild places by understanding the issues, developing science-based solutions, and working with others to carry out conservation actions across Canada.

We have supplied these comments to the Planning Commission using the on-line survey monkey format provided by the planning staff. We are submitting this document mainly because the tabular format of some of our comments in the final section did not paste into the on-line submission. Our text follows the format of the on-line Survey and Comment Form (numbers and titles in *italics*).

4. Do the zones used in the proposed land designation system adequately explore a range of conservation options?

WCS Canada's assessment is that the land designation system lacks a strong conservation zone (true Protected Area (PA)), despite the initial impression of providing for a wide range of conservation – oriented land use zones. Our specific comments are outlined in section 6.

WCS Canada strongly recommends inclusion of full Protected Areas in the final plan. Such areas are increasingly important as “benchmarks” where species and ecosystems can persist and adapt to a changing world in the relative absence of anthropogenic stressors (other than climate change and long-range pollutants). Such benchmarks then provide us with “control” areas in the ongoing experiments we undertake on the land with industrial, agricultural and tourist developments. These “control” areas allow us to compare species and ecosystem responses to change resulting from anthropogenic activities across an ecologically-similar landscape. In addition, benchmarks, when well situated as corridors, also provide species and ecological communities with enhanced options to adapt to change by moving in response to changing climate and habitat conditions.

5. Do the zones in the land designation system adequately explore a range of development options?

Yes, the proposed land designation system provides a wide range of zones with different options for development, where development is thought of as extraction of natural resources and development of infrastructure and access corridors.

WCS Canada is of the opinion that the zoning system, as proposed, is too complex (see detailed comments in 6. below).

6. Describe any changes you would make to the proposed land designation system.

WCS Canada suggests the following changes to the land designation system (detailed below):

- A. Strengthen the real conservation zone – Protected Areas (PAs).
- B. Remove the Conservation Area (CA) zone.
- C. Rename the Traditional Economy Area (TEA) zone.
- D. Provide improved boundaries for the Yukon River Corridor (YRC) zone.
- E. Collapse the IMA zones into only 2 or perhaps 1 zone.
- F. Provide more complete direction for the Community Area (ComA) zone.

A. Protected Area (PA) zone.

WCS Canada would like to see a plan that includes a true conservation zone. This means a Protected Area zone with no grandfathering of sub-surface rights, as well as withdrawal of sub-surface rights (as is currently proposed). Such Protected Areas could be subsequently designated as Territorial Parks or Habitat Protection Areas.

Our principal reservation with the current proposal is the grandfathering of sub-surface rights in the Protected Area (PA) zone. Grandfathering sub-surface rights quite strongly compromises conservation opportunities, primarily because it results in a high likelihood of consequent road building to access claims and possibly develop mines and oil and gas wells. The result of industrial road building and associated increase in access is an increase in disturbance to and harvest of wildlife, not only along the transportation corridor but widespread across the landscape with off-road vehicles. PAs are then not truly protected.

WCS Canada recognizes that road or other access to IMA zones may be allowed through PAs. If this is the case, then these PAs need special attention with respect to off-road vehicles (wheeled and tracked, including snowmobiles). PAs with public road access through them will no longer be PAs, especially in the Ogilvie and Mackenzie Mountains, because road access will open up large parts of the PA to off-road vehicles because of the sparse forest cover and extensive subalpine and alpine habitats. The Plan needs to specifically provide for exclusion of off-road vehicles in PAs. This is best done directly in the wording of the Plan. To supplement such a definition of access restrictions, the Plan needs to assert, and provide mechanisms, that such roads to access industrially-extracted resources will be industrial roads only, with no public access.

One potential tool for influencing off-road vehicle use is the Off-Road Vehicle (ORV) Special Management Area zoning provided for in the recent amendments to the Territorial Lands Act (Bill 64; December 2013). In our opinion this legislation is not sufficient in that it does not preclude snowmobiles. However, it does have real value for managing disturbance and impacts of wheeled vehicles. WCS Canada recommends that the Dawson regional plan puts in place a Special Management Area designation to exclude ORV use in each Land Management Unit (LMU) that it proposes as a PA or

other designation with an emphasis on conservation. The SMA designation will go a long way to realising conservation in these LMUs, especially in the lag time it might take to get official legal conservation zoning in place through the Parks and Land Certainty Act or the Environment Act.

B. Conservation Area (CA) zone.

We think the Conservation Area zone, as presently described, is not worth including in the designation system because it differs little from the IMA zone.

Once again, our principal reservation is the grandfathering of sub-surface rights in the Conservation Area (CA) zone, and, in particular, the lack of withdrawal of sub-surface rights in this zone. The designation system provides no substantive difference in the range of land uses (industrial non-renewable resource extraction, agricultural, tourist, renewable resource extraction) that can be promoted in CAs or Integrated Management Areas (IMAs). If mineral claims and oil and gas dispositions continue to be awarded in Conservation Areas, then these LMUs effectively become part of the IMA zone.

The only potential for any distinction between CAs and IMAs lies in the need for a Management Plan for CAs, which would supposedly reflect the higher level of protection for ecological and cultural resources. We are not confident that such Management Plans provide real options for additional conservation above and beyond IMAs because: (i) the Management Plans would still be subject to the higher-level authority of this Regional Land Use Plan that asserts that there will be no withdrawal of sub-surface rights; (ii) the history of acceptance of conservation-oriented Management Plans for Habitat Protection Areas in Yukon is very poor (quite a few HPA Management Plans with reasonable conservation objectives have reached the stage of acceptance by stakeholders but the Yukon government has persistently delayed in ratifying them).

Overall, we think that a zoning system that includes a true PA zone does not then need a CA zone which provides dubious conservation value above and beyond the IMAs.

C. Traditional Economy Area (TEA) zone.

WCS Canada generally supports the approach to land use outlined in the TEA zone description. We are somewhat confused by the naming of this zone. One of the most “traditional” of economic activities in the region is placer mining which, at first reading of the designation system, appears to be curtailed (i.e. limited to grandfathered claims) in this zone. Meanwhile agricultural land conversions and commercial timber harvesting (often viewed as more modern economic activities) would be allowed. So the word “Traditional” seems inappropriate, and a more meaningful name might be Renewable Resource Area (RRA). The question of grandfathering of existing placer and quartz claims needs some specific wording in the text describing this zone.

The TEA designation is for a renewable resource extraction zone. This could provide better conservation options than the Conservation Area zone if the interim withdrawal of sub-surface rights is upheld (WCS

Canada supports this interim withdrawal). However, if poorly managed, the TEA zone could result in poor conservation outcomes because agricultural land conversion and timber harvesting can be quite detrimental to ecological services and wildlife habitat values. Much depends on the details of the management regime, and these details lie in such processes as Strategic Forest Management Planning, agricultural land dispositions, and management direction for the trail and river networks that are also at the heart of this designation. The TEA would be a particular form of Integrated Management Area, with numerous land uses being integratively managed. This raises the question of what management regime will oversee the TEA zone. The default, and likely future, is the existing management regime in which particular resource values are managed by specific regulatory bureaucracies (e.g. Agriculture Branch, Forest Management Branch, Yukon Environmental and Socio-economic Assessment Board, etc.). The Dawson Plan can proceed on the assumption that this default approach will work for the TEA zone, but WCS Canada has some thoughts on how this higher level plan should provide direction to these regulatory bureaucracies for their ongoing management.

WCS Canada thinks that this regional plan can and should provide direction to Strategic Forest Management Planning (at least to future reviews of the existing Plan), and also to agricultural land dispositions. In particular, the biggest conservation risk from timber harvesting occurs when annual harvest rates, sometimes combined with fire suppression, push the regional age class distribution outside the range of natural variability (RONV) (i.e. more or less of any one age class than would be found in the absence of the management activity). The frequency at which different age classes of forest are found regionally depends primarily on natural disturbances (fires and insect epidemic). Clear-cut timber harvesting has the same general effect on age class distributions as these natural disturbances, by starting young forest stands. So timber harvesting can be additive in its tendency to shift forest to younger stands, depending on whether or not fires are suppressed.

The specific point of this discussion is that the Dawson regional land use plan needs to address the question of fire suppression (is the current wild lands fire management zoning system to be upheld? Would the TEA zones be subject to fire suppression throughout?). In the wilderness zone, where fires would generally burn unabated, the Plan needs to provide direction for conservative annual allowable cuts (AACs) that, when combined with the ongoing frequency of stand conversion by fire, would not push the age class distribution outside the historic range in the frequency of stands of various age classes (i.e. outside RONV). WCS Canada recognizes that much of the current timber harvesting in the region is selection cutting (and not clear-cutting). Although such silvicultural issues are beyond the scope of this land use plan, WCS Canada is not opposed to clear-cutting as a harvest prescription.

With regard to agricultural land dispositions, the key conservation issues are removal of (i) highly productive valley bottom wildlife habitats, and (ii) wildlife movement corridors across and within valley floors. These are fairly site specific issues. They require a more detailed level of inventory and planning than this regional land use plan can provide. But these intricacies, and the issues of access corridors and subsistence harvesting areas, which have also stimulated the proposal for a TEA zone, appear to create the need for another level of planning, or at least an integrated set of inventories, which has to be

addressed, at least conceptually, in this Dawson Plan. How would the diverse, and often site-specific, land uses allowed in this zone be managed? Are existing management regimes sufficient?

Specifically, WCS Canada recommends that the Dawson Plan provide direction to the wildlife management agency (Yukon Environment) to develop and/or complete their inventories of habitat suitability, key wildlife areas (relatively fixed and high-value habitats), and movement corridors in the TEA zones. These need to be addressed at least for all ungulates, bears and raptors. Only with such inventories can wildlife values be realistically addressed in the ongoing land management processes and decisions.

D. Yukon River Corridor (YRC) zone.

WCS Canada strongly supports the Yukon River Corridor zone, but thinks that it requires better definition geographically than presently provided. The document for review seems to provide two definitions: (i) a 6 km wide corridor centred on the river centre; (ii) a variable width corridor defined alternatively by toe-of-slope or 3 km from river centre. The maps clearly do not show a standard 6 km wide corridor.

Valley bottoms provide productive and important wildlife habitats and corridors. The slopes that define the main valley of the Yukon River also provide many important wildlife habitats. These include the often un-forested slopes themselves which support relatively uncommon and sometimes endemic plants and insects, Dalls's sheep range, and raptor nesting sites (most often peregrine falcons). It is essential that these slopes be part of the YRC zone. This can be mostly accomplished by using a viewscape model to define the corridor, because the great majority of the slopes in question would be visible from the river centre line. Where the viewscape includes land in tributary valleys well away from the main river valley, or includes disjunct and distant slopes, then the 3 km buffer on each side of the river centre line could be used to over-ride the viewscape.

WCS Canada specifically supports the need for sub-regional planning in the YRC zone. Our ultimate interest is conservation of wildlife habitats in this zone. However, we recognize that the zone is one of the most heavily used portions of the region and includes numerous valid land uses (industrial access, commercial resource extraction, subsistence harvesting and camps, cultural and heritage sites, recreational sites especially campsites). All of these are relatively localized or site-specific land uses, but require adequate buffering, and sometimes associated corridors, to maintain their value and function, and also to maintain sufficient space and/or separation in time that the uses do not conflict (e.g., industrial activity or recreational camping close to raptor nests; recreational camping too close to subsistence harvesting camps or access corridors). Most of these land uses are increasing in extent, so planning is becoming more and more imperative.

WCS Canada recommends that the Dawson land use plan promote the use of Special Operating Areas (SOAs) as a management tool to protect wildlife habitat values in sub-regional planning. SOAs are a land use option available through the Quartz and Placer Mining Acts (Bill 66; December 2013). Particular

wildlife habitats (e.g., sheep range; raptor nests) would be identified and mapped, buffered spatially (based on avoidance of disturbance), with specific timing windows (seasonality) applied to allowable land uses within the spatial buffer.

E. Integrated Management Area (IMA) zones.

WCS Canada supports the need for an Integrated Management Area designation. A significant portion of the regional land base will continue to support industrial resource extraction, in conjunction with numerous other land uses. We think that the proposed designation system is too elaborate, and that the number of IMA and other zones (as itemized above) could be reduced.

Although the land designation system proposed here includes numerous zones not labelled as integrated management, a closer look indicates that all zones call for some, if not extensive, integration of land uses. Even the PA zone would be required to integrate existing sub-surface rights and subsequent land uses as well as access corridors. The TEA zone is an integrated management zone requiring careful attention to avoidance and mitigation of potential conflicts. As we outline above, the proposed CA zone is an IMA with some potential, though unguaranteed, constraints. This general observation raises two key points: (i) the proposed Plan lacks a really strong conservation zone; (ii) tools for dealing with integration will have to be found, and apply, throughout the planning region.

The concept of integrated management allows that many land uses, values and functions need to take place on the same land base. Consequently various tools have to be employed to avoid or mitigate the possibility of conflict among these land uses. The principal classes of tools are: (i) localized (sometime called “small-scale”) zoning for specific land uses; (ii) application of limits to the intensity of human activities at broad scales (i.e. across the entire IMA zone); (iii) access management to avoid the large increase in land use conflicts that arise with public, especially motorized, access. Localized zoning can work for resource values occupying small sites (e.g., rare plant occurrences, raptor nests, south-facing open habitats). Sites are buffered spatially, and sometimes seasonality restrictions (timing windows) are applied, with the result that the site is protected either throughout the year or during the season when it is sensitive to disturbance. Limits to intensity of human activity can be applied broadly when there is scientific evidence for thresholds beyond which human activity becomes detrimental to other values.

WCS Canada recommends that the Dawson Plan focus on localized zoning and access management. Many of the conservation values can be defined as relatively small sites so are amenable to local zoning. However, the science to define thresholds of human activity or footprint in a hard-rock mining context (the predominant source of footprint in the IMA zones) is, as far as we know, lacking. Within IMA (and TEA) zones most of the land base will remain as natural, though changing (due to natural disturbance and climate change), habitats in the foreseeable future. In this matrix, there is a need to position mineral and hydrocarbon exploration (very extensive) and subsequent extraction (fixed sites), timber harvesting areas (somewhat flexible sites), agricultural dispositions (somewhat flexible), access corridors (somewhat flexible routes), and to control the nature and intensity of use of the access corridors (fixed nodes of control). From a conservation point of view, some key ecosystems and wildlife habitats are

smaller scale fixed sites or areas (sheep range; raptor nests; mineral licks; south-facing open slopes; special ecological elements), some only with seasonal relevance . Other high value habitats (e.g., wetlands, old growth forest, bear denning and foraging areas) are more extensive; wetlands being quite fixed, but old growth forests more changeable. Some conservation values are very extensive and somewhat changeable over time (e.g., caribou range). The land management challenge is to define the fixed sites as completely as possible, design the flexible sites and routes around the fixed ones, and uncover thresholds at which more extensive values may be impacted. The details of this are beyond the scope of this Plan, but the Plan needs to give direction as to the management tools, the inventories, and the sufficiency of the ongoing (and default) land management regulatory processes. This is specifically important with regard to the number and nature of the different IMA classes.

A three class IMA zoning system is borrowed from the North Yukon land use plan, where classes were discriminated based on levels of human footprint. This model was used because of the over-riding importance of caribou in that region, and because the dominant extractive resource industry was oil and gas. Oil and gas exploration and extraction in the Boreal Plains ecoregion has been detrimental to caribou population persistence, and thresholds had been identified. WCS Canada thinks that this model does not pertain to the hard-rock geology portion of the Dawson planning region. Although we have not done an exhaustive search, we are not aware of any thresholds of human footprint that could be used to discriminate classes of IMA in the hard rock geology portion of the region. The exploration and development footprint of hard rock and placer mining activities, as found in much of the Dawson region, is quite different from the oil and gas footprint. WCS Canada therefore recommends that the North Yukon Plan's thresholds for discriminating among IMA zones **not** be applied in the hard-rock geology portions of the Dawson region.

It might be suitable to use the North Yukon approach in the hydrocarbon basins of the northern portion of the Dawson region. The primary rationale would be (i) that this area is contiguous with the North Yukon planning region and a consistent management regime would be useful, and (ii) that caribou are one of the key conservation values in the northern portion of the Dawson region. However there is evidence that the thresholds of human activity derived for boreal woodland caribou (east of the Rocky Mountains) do not pertain to northern mountain caribou, at least in the southern portion of the territory (Reid, D.G., S.R. Francis and T. Antoniuk 2013. Application of herd viability models for boreal woodland caribou (*Rangifer tarandus caribou*) to a northern mountain caribou herd. Canadian Wildlife Biology and Management 2: 67-79). Borrowing thresholds from boreal regions is therefore somewhat suspect. If it were to be done, then we think planners could only justify two IMA zones, rather than a more intricate set of thresholds.

Overall, this drives home the fact that we lack good science to understand how the specific geographical layout and intensity of use of the human footprint, as it is currently developing in the northern boreal mountains of Yukon, might be affecting wildlife values. Such research is needed in order to better understand potential cumulative effects of an increasing footprint. Yukon Environment and consultants are addressing this issue (Shawn Francis, pers. commun.). Without such direction, our strongest tool (at

least conceptually) is access management, which would immediately put limits on intensity of use of new access corridors and the easily accessed habitats they go through.

WCS Canada recommends that the Dawson Plan give general management direction on the following issues:

- Access management: New roads to access industrial activity should not be public access roads. This means that they will require carefully sited control points (preferably barge or boat access from major rivers, or gated bridges over major rivers or canyons near to existing public roads). This also means that a cumulative zone-wide planning approach needs to be taken, preferably led by YESAB, to identify control points (barge landings, river crossings). YESAB should then be charged, in the Environmental Impact Assessment review process, with directing access routes through suitable control points.
- Forest management: The Dawson Plan, as a higher level plan, can provide some direction to the Strategic Forest Management planning in the region. A considerable proportion of wildlife habitats in the Dawson region are in forest. Maintaining wildlife populations in forests that are changed by people requires (i) good inventory of the forest types, (ii) planning harvest and fire suppression such that the range of age classes, stand compositions and spatial arrangements found as a result of natural disturbances are still occurring on the land base (coarse filter), and (iii) planning harvest to avoid fixed sites of high ecological value (e.g., raptor nests, wetlands) (fine filter). Specifically, WCS Canada recommends that the Dawson Plan (a) directs government to implement a wetland inventory in the region, (b) recommends any desirable changes to the fire suppression zoning; (c) directs forest planning to integrate fire suppression with allowable cut determinations in maintaining a valid coarse filter approach to habitat representation; (d) directs government to fill in gaps in inventory of fine filter elements, and provides rationale for conserving these with spatial buffers and timing windows.
- Sensitive ecosystems: Certain ecosystems (south-facing slopes, wetlands, alpine habitats) are attractive sites for establishment of camps and off-road vehicle travel routes. These ecosystems are sensitive to physical disturbance, and often contain uncommon and endemic species. Their conservation value can be better insured by producing an inventory of their occurrence, and restricting the placement of camps and off-road vehicle travel routes. The Plan can direct YESAB to enforce this approach in reviews of environmental impact assessments, and of mineral exploration notifications and plans.
- Sensitive wildlife habitats. Some wildlife habitats are quite restricted spatially, and these are often key or critical habitats for the species in question. Examples include sheep range, some moose calving grounds, some caribou post calving areas, raptor nest sites, mineral licks, concentrated bear denning areas, fish spawning reaches or beds. The Plan can provide a better integration of land uses with these sensitive habitats by advocating for an inventory of such sites, and application of spatial buffers and seasonal timing windows to avoid disturbance impacts. The Plan can direct YESAB to enforce this approach in reviews of environmental impact assessments, and of mineral exploration notifications and plans.

- Class 1 Mineral Exploration Notifications. It has previously been held that class 1 mineral exploration has limited or no environmental impact. However, class 1 exploration can include intensive helicopter activity and poor siting of camps, such that sensitive habitats and wildlife are adversely impacted. WCS Canada recommends that the Dawson Plan call for mandatory notification of proposed class 1 exploration activities to all pertinent government agencies, as per the process outlined in the recently passed Bill 66. This would give governments and YESAB the ability to act in the conservation interest of sensitive ecosystems and habitats.

F. Community Area (ComA) zone.

WCS Canada supports the need for a well-defined community area zone, for municipal expansion and planning. We note that a considerable portion of this zone will be agricultural land, which seems appropriate, and this needs to be explicitly listed as a viable land use.

WCS Canada recommends that the Plan provide some specific direction regarding this zone, on the following points:

- The zone overlaps other LMUs. Although there may not be any obvious conflict in land uses, there is a question of which zone has priority in directing land uses. We suggest that the community zone be an exclusive land use zone with a land base that is not shared with other zones.
- Like the YRC zone, the ComA zone will contain a wide variety of potentially conflicting land uses that will require more small-scale or site specific attention. WCS Canada thinks that the Dawson Plan can recommend that the ComA zone be subject to sub-regional planning, with the best model being the Local Area Plans administered by Yukon Community Services. From a wildlife conservation point of view there are localized habitats, and travel corridors, in this ComA zone which would deserve attention in a Local Area Plan. We recommend that the Dawson Plan identify these, among other issues, as topics for the local area planning.

7. When considering Alternative A, what elements do you like and why?

TEA in LMUs 11, 14, 15, 16.

- We consider the TEA to be a relatively conservation-oriented integrated management zone. The areas surrounding Tombstone Park would benefit from some buffering.
- These LMUs are close to human settlement and therefore the most likely to be used for the community- and family-based renewable resource economy and harvesting.
- Parts of these zones are already within the timber harvesting areas in the Dawson Strategic Forest Mgmt Plan.
- These LMUs include substantial portions of the higher capability agricultural lands in the region.

Inclusion of the YRC zone.

- We strongly support the existence of this zone (but see caveat about boundaries in next section).

8. When considering Alternative A, what elements don't you like and why?

Lack of a true Protection Zone

- This Alternative does not provide any PA zone.
- Although the CAs proposed here include the best ecological benchmark areas for higher conservation protection (i.e. LMUs 3,4,5,7 and 8 in the Taiga Cordillera ecozone; LMUs 23, 27, 28 in the Boreal Cordillera ecozone), we are very sceptical that the CA zone can provide substantial conservation protection (see section 6. above).

Yukon River Corridor definition

- The mapped edges of the YRC do not encompass the full suite of ecological value and sites (notably valley slopes) that this zone needs and deserves, especially if it is to manage wildlife habitats and ecological values that are at risk from other YRC functions (see section 6. above)

9. When considering Alternative B, what elements do you like and why?

LMU 11 as a TEA

- It makes sense to put a number of the LMUs which are near Dawson and have high renewable resource values into the TEA.

Inclusion of the YRC zone.

- We strongly support the existence of this zone (but see caveat about boundaries in next section).

10. When considering Alternative B, what elements don't you like and why?

Lack of a true Protection Zone

- This Alternative does not provide any PA zone.
- Although some of the CAs proposed here include the best ecological benchmark areas for higher conservation protection in the Taiga Cordillera ecozone (i.e. LMUs 3, 4, 5, and 7), we are very sceptical that the CA zone can provide substantial conservation protection (see section 6. above).
- There is no inclusion of a conservation oriented zone (either PA or CA) in the Boreal Cordillera ecozone which is mostly the non-sedimentary geology region (the southern half of the planning region). This means that the Plan would lack a benchmark zone against which to compare any of the management approaches and land use changes in the very extensive integrated management zones that this ecozone/region covers

Inclusion of LMU 8 in the IMA zone.

- The Tatonduk watershed (LMU 8) is the highest value LMU in the sedimentary geology of the Taiga Cordillera ecozone (northern half of the region) for inclusion in a PA because it has the most extensive lower elevation forests (compared to LMUs 2,3,4,5 and 7) and a wide range and high density of known high value ecological elements (rare species occurrences; unusual sites

and habitats). Also it borders the Yukon Charley PA in Alaska, and would provide ecological connectivity through the Ogilvie Mtns from Alaska to the Ogilvie and Miner drainages.

Yukon River Corridor definition

- The mapped edges of the YRC do not encompass the full suite of ecological value and sites (notably valley slopes) that this zone needs and deserves, especially if it is to manage wildlife habitats and ecological values that are at risk from other YRC functions (see section 6. above)

11. When considering Alternative C, what elements do you like and why?

Substantial inclusion of PAs to provide benchmark function in both the Taiga (sedimentary) and Boreal (metamorphic or hard rock) portions of the planning region.

- In addition to providing for conservation of ecological and wildlife values, ecological benchmark zones are essential for adaptive management and monitoring of the Plan. There needs to be a benchmark in each of the Taiga and Boreal zones.
- In the Taiga zone, LMU 8 is the highest value for a PA and ecological benchmark. LMUs 2, 4 and 7 would provide an excellent addition by linking the Yukon Charley Preserve in Alaska to the Fishing Branch protected areas in Yukon, through the Miner drainage. This connectivity would enhance ecological capacity to adapt to climate change.
- In the Boreal zone, LMUs 23 and 28 are the highest value candidates for PA because they encompass the widest range of ecological conditions and habitats without a prior history of extensive human footprint.

Inclusion of LMUs 11 and 16 in the TEA.

- It makes sense to put a number of the LMUs which are near Dawson and have high renewable resource values into the TEA.
- Including LMUs 11 and 16 as TEA would provide some buffering function for the existing Tombstone PA.

Inclusion of the YRC zone.

- We strongly support the existence of this zone (but see caveat about boundaries in next section).

12. When considering Alternative C, what elements don't you like and why?

LMUs 2, 3, 7 and 22 as CAs

- Although the intention of classing these LMUs as CAs is in support of their ecological values, we would prefer to see them (or some of them) classed as PAs because we have little conviction that the CA zone is more than an IMA.

Yukon River Corridor definition

- The mapped edges of the YRC do not encompass the full suite of ecological value and sites (notably valley slopes) that this zone needs and deserves, especially if it is to manage wildlife habitats and ecological values that are at risk from other YRC functions (see section 6. above).

13. When considering Alternative D, what elements do you like and why?

Effort to provide ecological benchmarking, with CAs and PAs, in both the Taiga and Boreal portions of the region.

- Designating the Tatonduk (LMU 8) a PA is a significant positive feature of this Alternative.
- Joining the Tatonduk through to the Fishing Branch protected areas with LMUs 2, 4 and 7 as PA or CA is also good. We would prefer these all be designated PA, thereby ensuring much of the existing ecological connectivity.
- Effort to provide benchmarks in the southern half of the planning region is good, specifically LMUs 23, 27 and 28 as CAs. However, given our strong reservations of the conservation value of CAs, these LMUs should be designated as PAs.

Inclusion of the YRC zone.

- We strongly support the existence of this zone (but see caveat about boundaries in next section).

14. When considering Alternative D, what elements don't you like and why?

Lack of true conservation zoning (i.e. PA instead of CA) in the southern region (Boreal, metamorphic or hard rock).

- LMUs 23 and 28 would function as ecological benchmarks if zoned as PA, but the CA zoning is of questionable value compared to an IMA.

Lack of TEA zone

- The TEA zone, with renewable resource extraction only, is a valid zone and worth considering. It is absent in this alternative.

Yukon River Corridor definition

- The mapped edges of the YRC do not encompass the full suite of ecological value and sites (notably valley slopes) that this zone needs and deserves, especially if it is to manage wildlife habitats and ecological values that are at risk from other YRC functions (see section 6. above)

15. When considering Alternative E, what elements do you like and why?

Substantial protection (PAs) in both the north and the south of the region.

- The inclusion of LMUs 8, 2, 3, 4 and 7 in a continuous PA is excellent, providing connectivity between existing PAs in Alaska (Yukon Charley) and Yukon (Fishing Branch). This full choice of LMUs also provides hydrological connectivity for the Miner drainage within a PA.
- LMU 22 in the south (Ladue drainage) is a reasonable choice for PA, though not as high value as an ecological benchmark as LMUs 23 and 28.

Removal of the CA zone

- The CA zone is ambiguous. It seems to provide conservation value, but could readily act as an IMA. Replacing CAs with PAs is a preferable conservation agenda.

Inclusion of the YRC zone.

- We strongly support the existence of this zone (but see caveat about boundaries in next section).

16. When considering Alternative E, what elements don't you like and why?

Lack of TEA zone

- The TEA zone, with renewable resource extraction only, is a valid zone and worth considering. It is absent in this alternative.

Yukon River Corridor definition

- The mapped edges of the YRC do not encompass the full suite of ecological value and sites (notably valley slopes) that this zone needs and deserves, especially if it is to manage wildlife habitats and ecological values that are at risk from other YRC functions (see section 6. above)

17. Is there other information you feel should have been considered in the development of the plan alternatives?

No

18. How did this information package help you understand the Dawson planning process and the plan alternatives?

d. Easy to understand.

19. What other information would have been helpful to have in this package?

20. Do you have any additional comments or suggestions for us?

We have two further points, - one about the psychology of involvement in planning, and one about monitoring.

Many sectors of society reviewing this planning process are being forced into a psychological space within which they are viewing a shrinking world, and trying to mitigate loss. That is true of the conservation community, and the mining sector. For the conservation community, the entire land base has until recent history been a set of wildlife habitats and relatively intact ecosystems. The search for Protected Areas is an attempt to maintain some of that historical legacy, in the knowledge that some of those habitats and ecosystems will be substantially altered over considerable portions of the land base as industrial expansion and human footprint expand. For the mineral industry the entire land base has been open for exploration and development. The desire to maintain much of the land base in that state of access is analogous to the conservation community wanting to maintain ecological integrity over as much of the land base as possible. Both sets of interests are in the same psychological space, - trying to mitigate what amounts to loss, - and therefore have a lot in common.

The strength of the Plan will increase significantly if it includes an adaptive management and monitoring component to inform on how the prescriptions of the zoning and the general management direction are working to achieve specific goals. It is through adaptive management and monitoring that the Protected Areas have high value as benchmarks, or ‘control’, landscapes against which to compare the ongoing effects of more intensive human activity in the integrated management portions of the region. A monitoring plan needs to be established to take advantage of this opportunity and provide data for future reviews of the Plan.

WCS Canada suggests the following general format for monitoring within the matrix (i.e. IMA, TEA, and YRC zones) and benchmark areas (i.e. PAs). The monitoring framework must be hypothesis driven. It needs to address all expected agents of change. We present the following table to illustrate our suggestions for such a monitoring and adaptive management framework. This is not an exhaustive survey of agents of change; potential values or features of interest that may be affected by the agent of change; hypotheses relevant to change in the value or feature of interest; or, the model or method for monitoring change in the value/feature of interest. The following table is for example only.

<i>Agent of Change</i>	<i>Resource Value or Parameter (i.e. the feature / value to be measured across zones)</i>	<i>Hypothesis</i>	<i>Model /Indicator</i>	<i>Method</i>
Renewable resource development (i.e. forestry & agriculture)	Riparian floodplain habitat	Riparian floodplain habitat declines in extent in association with increasing renewable resource development in productive valley bottoms	Riparian floodplain habitat extent in IMA zones	Satellite imagery
	Breeding habitat for Rusty Blackbirds	Site-specific management practices at wetlands (i.e. buffers) are sufficient to maintain critical breeding habitat for this threatened species	Wetland extent in IMA zones and benchmark areas	Satellite imagery
	Wetland connectivity	Wetland connectivity declines with increasing renewable resource development in valley bottoms	Wetland connectivity, e.g. nearest neighbour distance or similar measurement, within IMA zones	Satellite imagery

Climate Change	Land cover classes	Shifts from mixed boreal and dense boreal forests, to southern boreal and aspen parkland forests	SNAP-Cliomes / land cover classes	Satellite imagery
	Wetland extent	Loss of wetlands through drying	Wetland extent	Satellite imagery
	River flow	Reduced flow volumes	Hydrological catchment / rate of flow volume	Hydrological stations
	River break-up	Earlier breakup	Timing of spring ice cover & loss	Direct observations
	Temp & Precip regimes	Increasing mean daily & monthly temperatures; Increasing precipitation (in what seasons?)	Temp; Rainfall & Snowfall	Direct observations
Roads & trails	Human footprint	Human footprint will increase with mineral exploration and development	Classification of footprint types	Satellite imagery
	Big game harvest	New public roads facilitate game harvesting	Geo-referenced harvest locations; Population inventories	Direct reporting
	New roads as industrial only (not public)	Access control sites reduce public use of new roads	Traffic volume and type	Camera monitoring of old & new roads
Yukon River corridor boat traffic	Recreational & industrial boating volume	Recreational & industrial boat traffic increasing	Boat counts	Aerial surveys; ground interviews
	Recreational boating experience	Quality of recreational experience is declining	Visitor satisfaction	Personal or web-based surveys
	Dall's sheep habitat use	Use of key habitats by sheep does not decline when spatial buffers and timing windows are applied	Seasonal habitat occupancy; population size	Aerial (drone) or ground surveys (remote photography); population census
	Peregrine Falcon nest success	Nest occupancy and success in river corridor are maintained by buffering and seasonality provisions	Falcon nest occupancy, and productivity	Field surveys (boat and/or drone) (Would falcons attack drones? 😊)