



**Yukon Government, Department of Energy, Mines, and Resources**  
**Re: Yukon Biomass Energy Strategy, Draft for Public Consultation (April 2015)**

26 June 2015

Thank you for the opportunity to respond to the Draft Yukon Biomass Energy Strategy prepared by Yukon Government, Department of Energy, Mines and Resources. The following comments address action item 5 (p.3), 'Ensure sustainable timber supply based on completed forest resources management plans', and section 4.5 (p.16), 'Ensure a sustainable timber supply'. WCS Canada (Yukon office) supports the following proposed actions in section 4.5 as they relate to the ecological sustainability of harvesting for biomass:

- a. Continue working with First Nations, communities, interest groups and the public to complete forest resources management plans throughout the territory;
- b. Ensure that biomass that could potentially be used for energy purposes is considered in timber supply assessments and annual allowable cut determinations;
- c. Continue to ensure that social, environmental, and economic goals are considered in making annual allowable cut determinations, as per the requirements of the *Forest Resources Act*;
- f. Continue to encourage the use of waste wood for biomass operations, including cut timber from land and road right-of-way clearing or forest thinning projects, and sawmill wastes, etc.

WCS Canada does not support action bullet 'e' as currently stated, 'Continue to encourage the harvest of fire-killed wood and insect-killed wood for use in biomass operations'. Our contention is not that harvesting should be prohibited in naturally-disturbed, i.e. burned or beetle-killed, forests, but that naturally disturbed forests have significant ecological value and thus a biomass strategy should not preferentially target harvesting in these forest types or treat these forests as 'waste'. The following comments address this concern and describe considerations for ensuring ecologically-sustainable harvesting of post-disturbance forests.

In 2012, WCS Canada submitted to Yukon Energy Corporation and various departments within Yukon Government a report titled, 'Sustainability of Energy Production from Yukon's Forests: Review of Morrison Hershfield Assessment'. This review, prepared by D. Daust (RPF) and K. Price (PhD) for WCS Canada, specifically addressed the preliminary assessment of the feasibility of generating electricity from tree biomass by Morrison Hershfield Ltd. in a report to Yukon Energy Corporation in 2011

([http://yukonenergy.ca/media/site\\_documents/1081\\_Biomass%20Report%20Final%20Sept%202013\\_2011\\_DM.pdf](http://yukonenergy.ca/media/site_documents/1081_Biomass%20Report%20Final%20Sept%202013_2011_DM.pdf))

f). Much of the content of the 2012 report by Daust and Price is highly relevant to the Draft Yukon Biomass Energy Strategy. Thus, it is attached to these comments and referenced below.

1. Ecological Value of Post-disturbance Forests: Yukon's boreal forests are shaped over space and time by the natural disturbance regime, i.e. the amount, distribution, and frequency of forest fire and insect outbreaks across a landscape. Post-disturbance, i.e. burned and beetle-killed, forests have high ecological value, providing critical habitat for many wildlife species, including moose, hare, and breeding birds. In other boreal regions, studies of forest biodiversity across successional stages have demonstrated that recently burned and old forests are of highest value to forest biota, including many species that specialize on one or the other forest stage. For example, recently burned forests support both unique bird species and higher abundances of some bird species, particularly those that depend on tree cavities for nesting and roosting. Further, future forest structure and composition is shaped by the legacy of remnant live and dead trees in a forest stand regenerating after fire, adding unique and critical ecological values in early- and mid-successional stands. **WCS Canada contends that naturally disturbed forests have high ecological value and thus should not be considered 'waste' to be 'salvaged' through logging or prioritized for harvest over undisturbed forests.** *For further discussion of the ecological value of post-disturbance forests, and the ecological legacy of post-disturbance structures within regenerating forests, please refer to section 4.4. of Daust and Price (2012).*
2. Ecosystem-based Management of Post-disturbance Forests: Burned and beetle-killed forests provide habitats that are not emulated by green-tree harvesting in undisturbed stands. These naturally-disturbed forests should be managed, along with other stand types and successional stages, within their 'range of natural variability' at both temporal and spatial scales. In other words, forest resource management plans and associated Annual Allowable Cut (AAC) levels should ensure the total area of each stand type (e.g. white spruce, lodgepole pine, etc.) and successional stage (e.g. post-disturbance, early-successional, late-successional, etc.), including recently burned and beetle-killed forests, are maintained within the natural historic range across the landscape and over the long term. This 'natural disturbance model' for forest management is based on the premise that boreal wildlife have evolved with changing amounts and distributions of habitats across a landscape as a result of the natural disturbance regime and associated regeneration and forest successional pathways. The impact of timber harvest on boreal wildlife is presumed to be minimized if forest planning ensures the amounts and distribution of stand types and successional stages across a landscape are comparable to those resulting from the natural disturbance regime in the absence of logging. Large-scale biomass production can potentially alter the supply of naturally-disturbed habitats at the landscape scale. Similarly, extensive fire suppression activities can also alter supply of this critical habitat. At the stand scale, removing live and dead trees from burned and beetle-killed forests decreases the value of this important habitat for wildlife species that depend on it for foraging, breeding, and cover. **WCS Canada recommends that biomass harvest levels a) meet ecosystem-based management goals derived from the natural disturbance model for forest management (coarse-filter approach) and b) ensure sufficient habitat supply for key wildlife species that specialize on post-disturbance forests (fine-filter approach).** *For*

*further discussion of the potential impacts of post-disturbance logging at landscape and stand scales, please refer to section 4.4.1. and 4.4.2. of Daust and Price (2012).*

3. Cumulative Effects of Disturbance: Consideration of a strategy to produce biomass from Yukon's naturally-disturbed forests must also consider the potential cumulative effects of disturbance. Landscape-scale effects on wildlife and wildlife habitat accumulate when green-tree logging and post-disturbance logging are added to natural disturbance. Additional cumulative effects arise from new access for timber harvest. **WCS Canada recommends strategic forest resource management planning be completed prior to implementation of large-scale biomass production to ensure landscape-scale cumulative effects will not significantly reduce wildlife habitat supply.** We further recommend that strategic land use planning be completed for those regions that will be targeted for biomass production to ensure the cumulative impacts of all resource development projects and associated access and infrastructure are not threatening critical wildlife habitat, ecological values, and landscape connectivity.
4. Planning for Uncertainty: The Yukon has very limited experience with large-scale forestry operations and no experience with large-scale harvest for biomass. Additional uncertainties arise because of potential changes in forest composition due to climate change. This could include changing forest successional trajectories following a disturbance and changing rates of fire and insect outbreaks. **WCS Canada strongly recommends implementation of long-term monitoring within naturally-disturbed forests to determine the ecological impacts of post-disturbance logging for biomass.** A long-term monitoring program should include control sites at both the landscape and site scale. For example, at the landscape scale, long-term monitoring should be conducted within recent burns with logging and in separate burns without logging. At the site scale, monitoring should be conducted at different locations with and without logging in a single burned or beetle-killed area. **WCS Canada also recommends synthesis of existing scientific, Traditional, and local knowledge, and implementation of new research projects, to determine the best management practices for minimizing the impacts of post-disturbance logging on ecological values and wildlife habitat in the Yukon.** Finally, we recommend scenario modelling to explore potential future outcomes of various forest management and climate change scenarios. *We refer you to section 5 of our attached report for a brief summary of best practices for post-disturbance logging as described for other boreal forest systems.*

We welcome the opportunity to answer any questions or provide additional information on the points outlined above. Thank you for your time in considering our comments.

Sincerely,



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