KEEYASK HYDROPOWER LIMITED PARTNERSHIP

Rebuttal to D. Soprovich Report and Presentation, Keeyask CEC Hearings

December 31, 2013

BEAVER MODEL

A number of criticisms were made of the beaver section of the habitat quality modelling report, the methods for modelling, and of model validation. Several of these criticisms are essentially irrelevant to the model and its results. Concerns relevant to the model and its results were the use of a 100-m rather than 50-m buffer, the perceived exclusion of aquatic vegetation in the habitat model, and the inclusion of inactive lodges in validating and verifying the model. For the reasons outlined below, these criticisms do not affect the model or its results – beaver are known to reside in and near water and to prefer deciduous trees and shrubs for food.

1. *"In the test of its habitat quality model, Ecostem et al. (2013) considered coarse habitat types within 100 m of the shoreline. …Given that it is the first 50 m of coarse habitat types that is important, considering coarse habitat types beyond 50 m is not appropriate, and can only serve to mask, or hide, reality. This is a fatal flaw respecting Ecostem et al.'s (2013) test of the model. And when one does not fit the scale of one's test to the known biology of the animal, one should not be surprised if the model fails the test."*

The paper referenced by Mr. Soprovich (Stoffyn-Egli and Willison 2011) reviews a number of studies that indicate that beaver forage within 18 to 100 m of waters edge. Other sources (e.g., Johnston and Naiman 1987, Johnston and Naiman 1990) indicate that beaver use habitat within 100 m of a waterbody. Stoffyn-Egli and Willison (2011) also references at least two sources that state "aspen, the favourite food of beavers, has been reported cut as far as 200 m from the water (Smith et al. 1994; Muller-Schwarze and Sun 2003)."

The purpose of the model was to assess Project effects on beaver habitat, that is, to quantify the potential loss of beaver habitat. To exclude habitat 51 to 100 m from waterbodies and watercourses, which are used to some extent by beaver, could minimize the calculation of habitat loss on this species. While beaver appear to make more use of habitat nearer their lodges and closer to shorelines than farther away, the use of a 100-m buffer in the habitat model from the literature reviewed, and for practical model application purposes, was deemed appropriate.

2. *"Ecostem et al.'s (2013) approach to lump the active and inactive lodges together in a validation exercise seems, for lack of a better term, silly."*

Beavers are known to reoccupy old lodges, and in some cases a main lodge and secondary lodges are used. As such, apparently inactive lodges (those with no food caches) are not necessarily abandoned. As

described on page 6-18 of the habitat quality modelling report, "inactive lodges can indicate habitat that is no longer suitable because of existing food limitations or potentially suitable future beaver habitat when the vegetation recovers." As Mr. Soprovich suggests, "perhaps disease killed all of the residents," or there may be other reasons such as a lodge being trapped out. Such examples are not related to habitat quality, but reflect other extrinsic factors affecting beaver populations. Inactive lodges were included to account for all potential beaver habitat, and the test of the beaver habitat model was considered appropriate.

3. *"In summary, given that aquatic plants may often represent a significant component of the diet of beaver, and offer a high source of energy during the winter, it seems incredible that one would effectively ignore the aquatic habitat when attempting to construct a habitat model for the semi-aquatic species."*

Aquatic vegetation was identified as a component of beaver diet in the habitat quality modelling report:

*   "Preferred forage species vary by region; however, the leaves and growing tips of willow, poplar, and alder (Baker and Hill 2003) and some aquatic plants (Jenkins 1980) are generally consumed" (p. 6-3).
*   Table 6-1 lists aquatic vegetation as important food items several times, including the coarse habitat type of marsh.

Water was included in the habitat model:

> "The first iteration model defines primary (preferred) habitat for beaver as being near shorelines and water. Primary riparian environments have low exposure or low water velocity with aspen nearby, such as broadleaf mixedwood or broadleaf treed habitat, and willow, such as habitats dominated by tall shrubs (Table 6-7). The likelihood of beaver using water and vegetation farther than 200 m surrounding a creek, or upland habitats located farther than 100 m from a lake or pond shoreline is assumed low, thus potential and desirable plant foods outside this boundary were not considered as beaver habitat" (p. 6-22).

As described by the model parameters above, without water, there is no beaver habitat. While aquatic plants were not specified as important winter food, the inclusion of water in the model inherently incorporated aquatic vegetation. As such, and not surprising, shallow water was the third variable listed in the model validation as a potential component of beaver habitat. Because there is no seasonality associated with the model (i.e., winter habitat versus summer habitat), it is irrelevant at what time of year aquatic vegetation is consumed.

Literature Cited:

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