

Research, part of a Special Feature on [Crossing Scales and Disciplines to Achieve Forest Sustainability](#)
**Indigenous Knowledge and Values in Planning for Sustainable Forestry:
Pikangikum First Nation and the Whitefeather Forest Initiative**

[R. Michael O'Flaherty](#)¹, [Iain J. Davidson-Hunt](#)¹, and [Micheline Manseau](#)¹

ABSTRACT. Although still posing challenges, science-based knowledge (including interdisciplinary work) is leading current forest-management planning. How then can indigenous communities mobilize their own knowledge to support their desire to develop new ways of managing the forest? In northern Ontario, the provincial government has developed a cross-scale planning approach that allocates certain responsibilities to First Nations in order to support their vision and knowledge, yet at the same time addresses provincial planning goals.

Within this context, research on woodland caribou (*Rangifer tarandus*) was conducted in collaboration with Pikangikum First Nation to support their participation in forest-management planning. The outcomes of this research are used as a focal point for discussing some of the stressors that influence cross-scale planning for forestry in northern Ontario. The paper concludes that resolving cultural differences in a forest-management planning context is not entirely necessary to move forward with collaborative planning for the conservation of woodland caribou habitat.

Key Words: *Cross-cultural research; indigenous knowledge; northwestern Ontario; woodland caribou*

INTRODUCTION

Bringing together indigenous and science-based knowledge systems in a unified forest-management planning effort can be a real challenge. Planning partners working within two different knowledge traditions may share facts, and they may agree on the details of discrete data points to be entered into a common database; however, they may differ on the meaning and implications of the shared data (Worsley 1997, Roots 1998, Huntington et al. 2006). For example, when planning for woodland caribou (*Rangifer tarandus*) conservation, people may agree on the location of a calving site, but may differ on the relative importance of different parts of the range to the viability of the species. In a forest-management planning context, it is often the latter, the relational aspects, that are more significant.

Resolving differences of understanding between two different knowledge systems is rarely just a matter of good translation. As linguist Edward Sapir has noted, "the worlds in which different societies live are distinct worlds, not merely the same world

with different labels attached" (Sapir 1958: 69). This suggests that a cross-cultural approach to engaging northern indigenous peoples in commercial forest management will require addressing not only the role of indigenous knowledge in decision making, but also the role of indigenous people, the carriers of indigenous knowledge (cf. Stevenson 2006).

Friedman (1973, 1987) emphasizes that planning is often an instrumental process managed by technicians who seek public input that may, at best, modify or enhance a predefined set of goals. Friedman calls for a reorientation of planning toward transactional processes in which participants, experts and non-experts alike, engage in public negotiations, allowing for the transformation of private knowledge into concrete collective action in the public domain. Seen in this way, it is important to understand the mechanisms by which local people consider both their own knowledge and that of scientists and planners in creating approaches that move their own values forward (Lane 2002, Edwards and Heinrich 2006, Healey 2006). Thus,

¹Natural Resources Institute, University of Manitoba

in striving for full participation in planning for sustainable forest management, it is not sufficient that indigenous communities merely document and share the information they hold; they need the ability to participate in planning decisions in ways that enable them to mobilize their knowledge (see Davidson-Hunt and O'Flaherty 2007).

In this paper, we present the lessons learned from our research with Pikangikum First Nation, which was undertaken to support the First Nation's desire to turn their knowledge of woodland caribou into effective collective action in a cross-scale forest-management planning context. We discuss some of the complexities in implementing cross-scale planning, including those arising from different expectations of people operating at different planning levels. People at different planning levels held different sets of assumptions about what their information means, what conclusions to draw from research results, and what actions to take based on research findings. In particular, one of the main tensions has been between the community's desire for decentralized planning and the desire for a more centralized approach expressed by interests at higher levels on the organizational scale.

THE WHITEFEATHER FOREST INITIATIVE IN A REGIONAL CONTEXT

Pikangikum First Nation is a remote-access community located on the Berens River headwaters in northwestern Ontario (see Fig. 1). Like most First Nations in northern Ontario, Pikangikum is a rapidly growing community, a large proportion of which is made up of youth and children. The population officially recognized by the federal government numbers over 2100 (Indian and Northern Affairs Canada (INAC) 2006); the First Nation itself says the population is over 2300 people. Some 86% of the population is under the age of 39, with over one-third being under 9 years of age (Independent First Nation Alliance (IFNA) 2006).

Local First Nation incomes are derived from employment, trading, and transfer payments. The community has seen a significant decline in wealth following the collapse of the fur market under pressure from animal rights activists (see Wenzel 1991) and the decline of commercial fishing; unemployment is estimated to be about 70%. Although an increasingly large number of Pikangikum people no longer derive a significant

portion of their domestic and livelihood needs from the forest, a large proportion of the community supplements their household incomes through hunting and fishing on a seasonal basis.

In 1996, Pikangikum First Nation started the Whitefeather Forest Initiative—a land-based community economic development renewal and resource stewardship initiative—in order to create economic opportunities for their youth through resource-based tribal enterprises including, in particular, commercial forestry. In 2000, the Ontario Ministry of Natural Resources (OMNR) committed to working with Pikangikum to acquire commercial forestry tenure within the Whitefeather Forest, a 1.2 million-ha tract of Crown land (see Fig. 1). This area comprises the traplines currently held by Pikangikum members, and represents a portion of the traditional territories of Pikangikum people.

In 2001, the OMNR adopted the Northern Boreal Initiative (NBI) with the goal of providing several northern First Nations with opportunities to take a leading role in the development of new, commercial forestry opportunities, including working collaboratively with the Ministry on planning for such opportunities (OMNR 2001b).

To enable the NBI policy, the OMNR implemented the Community-based Land-Use Planning (C-LUP) policy in which NBI communities were given the opportunity to take the lead in planning for their defined planning areas. The provincial government retains the lead responsibility for ensuring local planning is consistent with priorities at broader eco-regional and provincial planning levels (OMNR 2002). The C-LUP policy lays the foundation for cross-scale planning following the subsidiary principle that states a higher organizational level should not take on management functions that can be adequately performed by a lower level (see Stern et al. 2002). Schematically, the cross-scale approach of the C-LUP policy is presented in Fig. 2.

Our understanding of the terms “scale” and “cross-scale” follows the recent discussion provided in this journal (Cash et al. 2006): scale is an analytical dimension (e.g., geographical, temporal, or jurisdictional) and, on any given scale, there are different “levels,” which are the units of analysis (e.g., local, provincial, and federal levels of administration on the organizational scale). The term “cross-scale” refers to the links between different scales (e.g., provincial and federal

Fig. 1. The Whitefeather Forest: an area of provincial Crown land that represents the portion of Pikangikum traditional territories in which forest management and other new land uses, including protected areas management, have been proposed through the community-based land-use planning process.

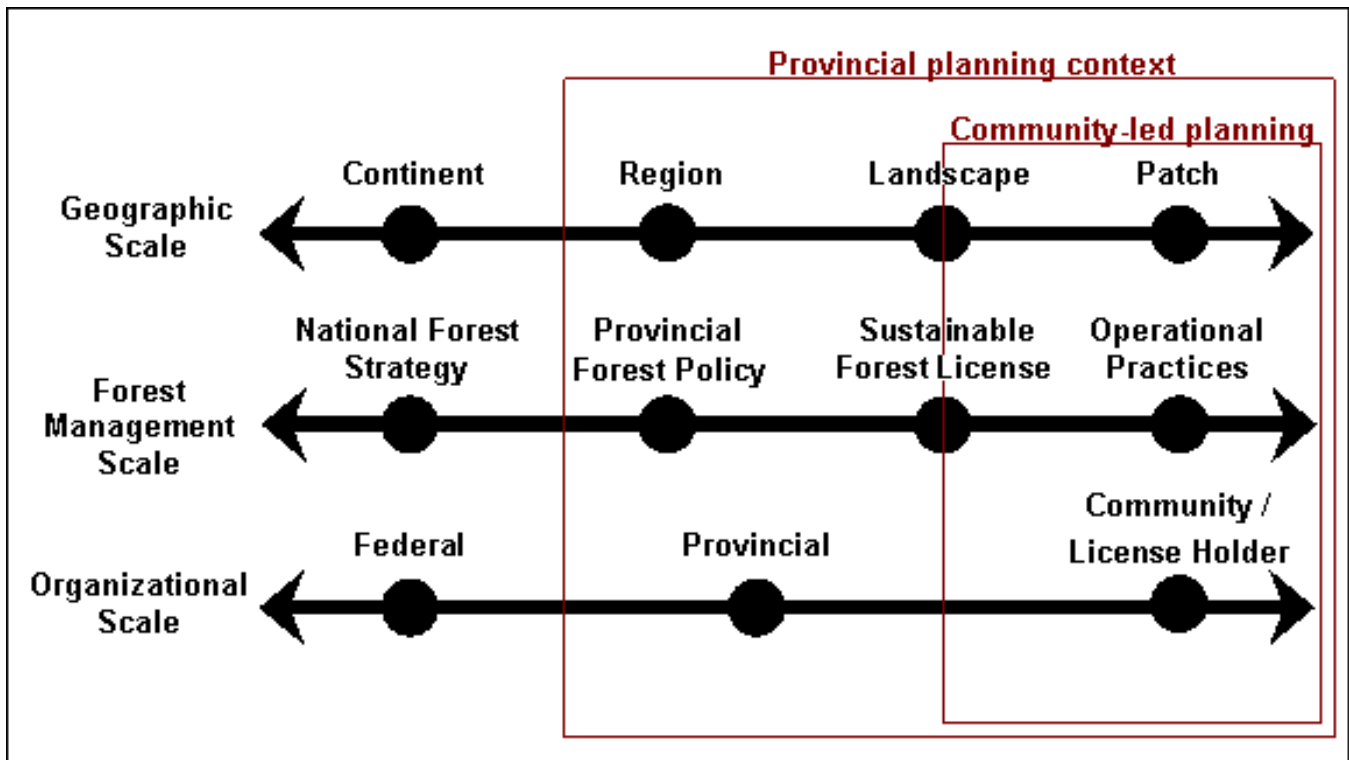


jurisdictions have responsibilities at different geographical levels). Cross-scale links are not one-to-one, mutually exclusive correspondences (e.g., provincial policy is not limited to regional concerns). Rather than indicate all possible cross-level and cross-scale links, Fig. 2 indicates there are zones of cross-scale interaction, as shown by the red boxes (e.g., “provincial planning context”). In

Canada, implementation of Crown (i.e., public) forest management is a provincial responsibility.

Within this cross-scale, cross-level planning approach, the OMNR is responsible for ensuring compatibility with broader landscape and provincial-level planning concerns (e.g., adjacent First Nations interests, endangered species,

Fig. 2. The cross-scale planning context for forestry in Ontario enabled through the community-based land-use planning policy: the scales represent aspects of forest management planning, and the boxes show the levels on each scale that are addressed by the Province (OMNR) and the levels shared with the community (WFMC).



protected areas planning). At the time of writing, First Nations have not been substantially involved in developing policy related to woodland caribou (e.g., provincial endangered species legislation, woodland caribou recovery planning, or OMNR landscape-level guidelines for forestry). In the Whitefeather Forest context, and presumably in other future C-LUP processes, there are some significant cross-scale links between the community level of the organizational scale and different levels of the forest management scale. For example, the terms under which a Sustainable Forestry License (SFL) is issued, as well as the forestry operational practices adopted in harvesting, silviculture, and renewal, will be tailored to meet the specific conditions of the First Nation license holder, including especially the direction set out in the Whitefeather Forest land-use strategy (Whitefeather Forest Management Corporation (WFMC) 2006).

At the local level, in Pikangikum, the WFMC is responsible for representing the First Nation. Decision making by the WFMC is itself rooted in direct consultation with Pikangikum elders who make up a steering group. As described in the Whitefeather Forest land-use strategy (WFMC 2006: 12), the senior trappers and other elders with a lifetime's experience on the land are central to governance and the reproduction of knowledge in Pikangikum; as the President of the WFMC has said, these are the people "who are the keepers of our lands, the ones with authority to protect them." In Pikangikum, authority to provide indigenous knowledge of the land comes from age and experience on the land (cf. Davidson-Hunt and Berkes 2003, Legat 2007); since the time of the fur trade, this authority has been strongly associated with trapline areas (see Fig. 3). Pikangikum elders make a further distinction between those who have

land-based knowledge (*Ahkeeweekeekaytuhmuhweeneeng*) rooted in personal experience and the authoritative knowledge held by esteemed elders (*Keecheeauhn-eesheenaubay weekeekaytauuhmuhween*) (Davidson-Hunt et al. 2006); anyone can have knowledge about the land, but only respected elders are considered to hold the specialized knowledge associated with the stewardship responsibilities of a senior keeper of the land.

Integration across organizational levels is to be achieved through a partnership approach in which First Nations and OMNR share responsibility for ensuring that broader-scale interests (e.g., other First Nations and local communities, industry, interest groups, such as environmental NGOs) are consulted and integrated with community-led processes. Flow of information across organizational levels, and laterally through consultation with interested parties, is expected to be key to a successful C-LUP approach (OMNR 2001a: 10).

SHARING UNDERSTANDINGS OF WOODLAND CARIBOU

In Ontario, forest-dwelling woodland caribou are primarily found north of the 50th parallel, the area covered by the NBI policy under which Pikangikum is negotiating with the Province for rights to manage Crown land. Although the current range of woodland caribou is a vast landscape (379 000 km²), it corresponds to only 40%–50% of their historical range (Schaefer 2003). The range retraction cannot be attributed to one factor, but more likely results from the interaction of diverse land-use activities (Ontario Woodland Caribou Recovery Team 2005). Woodland caribou (forest-dwelling ecotype) is listed as threatened under Canada's Species at Risk Act and the Ontario Endangered Species list.

Apart from site-specific habitat needs (e.g., calving sites), woodland caribou range occupancy is rooted in landscape-level habitat needs (i.e., extensive tracts of undisturbed older conifer forest and treed muskeg). The conservationist approach has been to call for broad landscape-level, conservation-based planning across the north in advance of any resource development (see, e.g., Canadian Parks and Wilderness Society-Wildlands League (CPAWS-WL) 2007a, b). Thus, at the provincial planning level, there is intense interest over how resource-management planning proceeds in the Whitefeather Forest. With woodland caribou having become the

focal point for conservation interests in the boreal forest (see, e.g., Caribou Nation 2007), this raises a complex, cross-scale challenge: how to accommodate First Nations' desires for a decentralized approach to land-use planning and large conservation organizations' desires for a more centralized approach.

In early community meetings, it became apparent that there was not even a common starting point for discussions about woodland caribou. There were significant conceptual and methodological differences that reflected differences both of scale and culture. One elder questioned why all these outside people had come to Pikangikum with their concerns about caribou. The OMNR wildlife biologists responded by stating that the scientific data demonstrate a historical decline of woodland caribou in the province, although it was later clarified that the woodland caribou in the Whitefeather Forest were in fact healthy. Provincial experts stressed that their interest in research was to support planning for new land uses, such as forestry, in ways that ensured the long-term viability of woodland caribou in the Whitefeather Forest and the broader landscape.

However, Pikangikum elders remained unconvinced of the premise that planning for the Whitefeather Forest would need to account for the failure of other jurisdictions to keep woodland caribou on their lands. The Whitefeather Forest is the only area Pikangikum people are planning for and the only area Pikangikum elders will speak about. Pikangikum elders were not going to discuss the state of caribou populations on other First Nations' lands, let alone what would need to be done to ensure their protection. Responsibilities at the community level for woodland caribou conservation were understood to be restricted to the Whitefeather Forest; if Pikangikum people maintained woodland caribou habitat in the Whitefeather Forest, then woodland caribou would be free to use the area if they chose to.

Thus, although the historical decline of woodland caribou may seem to be a fairly straightforward justification for research and planning, in this case, the discussion was complicated by the fact that two very different worldviews were slipping past one another. At regional and provincial levels, external agencies were saying woodland caribou had to be protected from the effects of future logging in the Whitefeather Forest. From the Pikangikum elders' perspective, they had already provided their

Fig. 3. Pikangikum head trapper Larry Pascal leading research on his trapline with OMNR staff Robert Partridge and Myles Perchuck.



direction in the Whitefeather Forest land-use strategy that all land-use practices are not to threaten woodland caribou, or any of the other creatures with whom they share the lands and waters. Harvesting and silvicultural methods have not been determined at this point in the planning process; however, the land-use strategy directs that if any proposed methods threaten the integrity of land and water, they are not acceptable. In effect, Pikangikum elders were saying they have never engaged in such destructive activities, and had no intention of adopting what amounts to a foreign cultural

perspective on the land. Elder Solomon Turtle has explained it this way: “We have not led to their decline so why should we be concerned about their decline? Something out there is causing their decline but I can’t relate to that” (21 July 2006; all quotations from elders have been taken from transcripts of simultaneous translation).

The customary stewardship approach of Pikangikum people is rooted in their understanding of their personal responsibility for ensuring the land, water, and all creatures are protected as sacred gifts from

the Creator (WFMC 2006). In this view, Pikangikum people have been placed on this land with all other living beings; they have been given everything they need to survive by the Creator (cf. Davidson-Hunt 2005). The gift of life, in turn, is respected whenever people harvest other beings. It is within this customary stewardship perspective that Pikangikum elders understand their relationship to woodland caribou. For instance, several Pikangikum elders have said that, if there has been a decline in woodland caribou numbers on their ancestral lands, the decline has not simply been caused by the rise in non-indigenous people using the land to the south but by Pikangikum people no longer hunting caribou. By not hunting caribou, in effect, Pikangikum people are not acknowledging this particular gift from the Creator; they are no longer engaging in a relationship of reciprocity with the Creator (and the land) through the hunting of caribou. As elder Solomon Turtle explained, "We used to work the traplines, harvest its abundance, and it would return again. This was the Creator's way of looking favorably upon us" (11 December 2003).

It is the Pikangikum customary stewardship approach that Pikangikum elders would like to see guiding all new resource-management activities in the Whitefeather Forest. Pikangikum is, therefore, advocating for a single management approach applied across the entire Whitefeather Forest (see O'Flaherty et al. 2007). Thus, for example, the elders have resisted identification of certain portions of the Whitefeather Forest as more important to woodland caribou, insisting that the entire Whitefeather Forest is important to woodland caribou and, therefore, requires uniform protection. Pikangikum elders further question the value of separating the land into different land-use zones with protected areas being managed separately from the working forest, each with its own separate sets of regulations governing stewardship. Pikangikum elders view the entire Whitefeather Forest as equally important to both woodland caribou and Pikangikum people; they are therefore doubtful that demands to assign specific tracts of woodland caribou habitat as protected area (see, e.g., Care2.com 2006, Green Party Ontario 2006) will help ensure the long-term viability of woodland caribou. Elder Gideon Peters (1 March 2006) expressed his concerns this way:

*If you want to preserve the land for caribou,
to keep them in a certain area, this is only*

*going to invite trouble; the wolves are going
to hear about this. Once the wolves hear
about this they are going to come with their
tribes and ravage the caribou herds.*

The elders' concerns are rooted in a desire to allow all life, including woodland caribou and Pikangikum people, to flow freely across the landscape. As elder Charlie Peters (1 March 2006) has suggested, neither parks nor commercial forestry should impede the ability of woodland caribou to make their own choices about where to travel and meet their needs; as with any creature, woodland caribou need to be free to follow their own path with the Creator:

*The caribou were given life to live on the
land by the Creator; the Creator's plan has
been initiated. We cannot give the caribou
what they want to eat, we cannot tell the
caribou where to live, only the Creator can
do this. Even though we create boundaries
on maps, we create all kinds of maps and
boundaries, saying where the caribou are
and where the caribou will eat, we don't
know what the Creator's plan is.*

It would not be possible to do effective cross-cultural collaborative research without understanding how knowledge is culturally mediated. Concerns for woodland caribou conservation at a landscape level, including those concerns from within provincial planning agencies, are rooted in the cultural experience of a set of relations to the land that have pushed woodland caribou to the margins; hence, the anxiety over the potential for forestry in the Whitefeather Forest planning area to further reduce caribou habitat. Pikangikum people, on the other hand, have had a different historical experience rooted in their land-based livelihoods and customs that have not led to the decline of woodland caribou habitat; it is this historical experience they expect to see reflected in future forest management. How then to bridge the cognitive and experiential gap, the cultural divide, that separates actors at different organizational levels while respecting the divergent perspectives that exist?

CROSSING SCALES THROUGH CROSS-CULTURAL RESEARCH

An early assumption in the woodland caribou research was that maps that combine both indigenous and science-based knowledge would help communication between the community and provincial levels. Maps have been helpful, to a point, in communicating Pikangikum indigenous knowledge to people outside of the community. The WPMC has developed considerable capacity for map making and, indeed, it would be difficult to embark on any land-use planning and forest-management activities without spatially representing one's values (cf. Kendrick and Manseau 2007).

However, as much as maps can present information provided by Pikangikum elders, maps cannot properly express the content of Pikangikum people's knowledge system that is largely transmitted through oral and non-verbal means. Pikangikum elders and trappers are highly map literate; however, maps are a cultural text originating in a worldview Pikangikum elders may encounter regularly, but are not themselves immersed in. Thus, although there was agreement across organizational levels that a line on a map represents an important caribou travel route, it has been much more difficult to get consensus on the value of more abstractly conceived boundaries drawn around, for example, woodland caribou habitat areas, or land-use planning zones. Significantly, it is these more abstractly conceived lines on maps that are typically used to make decisions about how the land will be managed.

Scientific models receive their authority by being impersonal and generalizable (cf. Latour 1993); they are expected to transcend a specific set of observations and be relevant (replicable) in other contexts where the same set of conditions is assumed to exist (e.g., the same species on a comparable landscape). This is in stark contrast to the Pikangikum customary approach of consulting people who are experienced on the land. A map can point to the location of certain features and values, but it cannot adequately tell you about the land from a Pikangikum indigenous perspective; that form of understanding flows from direct experience. As elder Whitehead Moose has expressed in his own, rather pointed terms: "There are two different types of people: those who live off of the land, that can experience the land, and those who just talk about what they haven't experienced" (21 April 2005).

This, then, is the source of the disjuncture referred to earlier: the concerns for woodland caribou habitat needs at the landscape level are being brought into decision making at different organizational levels through the artifacts of another knowledge system. Pikangikum elders, at least, perceive planning issues from a perspective that is situated within an intimate first-hand experience of the landscape. A landscape ecology perspective, on the other hand, is largely built up from the artifacts of another knowledge system (e.g., maps and models) that represent the landscape from an external perspective. The tension between these two perspectives—the locally situated "looking out" and the externally constructed "looking in"—and the corresponding desires for either a decentralized or centralized planning approach, is likely present in any cross-scale planning effort; however, this tension is amplified in a context of cross-cultural difference. Using maps and landscape models as a foundation for working across knowledge traditions enables, maybe even requires, external researchers and planners to reinterpret Pikangikum elders' knowledge and experience within a mode of representation that is familiar but not integral to how that knowledge is shared and put into use by Pikangikum people (cf., Stevenson 2006).

CONCLUDING COMMENTS

The goal of collaborative research on woodland caribou with Pikangikum First Nation was to help mobilize knowledge of woodland caribou, both indigenous and science based, in support of planning for culturally appropriate sustainable forest management in the Whitefeather Forest; however, very different understandings of the research subject matter created different assumptions about the scope and specific objectives of the research. The divergence in understanding how forest management can help keep woodland caribou on the land illustrates the complexity of bringing different cultural systems into dialog through research.

At the same time, resolving these cultural differences in a forest-management planning context is not entirely necessary to move forward with collaborative planning for the conservation of woodland caribou habitat. The Community-based Land Use Planning policy adopted by the Ontario provincial government commits to sharing planning responsibilities at different organizational levels (i.

e., community and province), and as long as the respective goals at each level are met, a variety of approaches to management and conservation should be possible. To achieve effective cross-scale (and cross-level) planning for conservation of woodland caribou habitat, WPMC and OMNR planning partners need to agree on specific outcomes (i.e., maintenance of sufficient functional and connected woodland caribou habitat) and a means for evaluating whether or not agreed-upon outcomes are being achieved. Agreement on goals and evaluation criteria allows for the emergence of a hybrid approach that is based on community-level stewardship principles and practices, yet at the same time addresses provincial responsibilities. Following the subsidiary principle (Stern et al. 2002), the OMNR need not determine the approach taken at the community level as long as the approach achieves the conservation objectives of the Province.

Thus, despite the obstacles to mutual understanding, the cross-scale NBI planning framework can accommodate cultural differences without needing to resolve them, as long as partners remain committed to respectful cross-cultural dialogue. Collaborative research has been effective in facilitating this kind of dialog on woodland caribou conservation across planning levels. The late Jake Keejick, who was instrumental in providing direction for woodland caribou research, spoke directly to the need to continue cross-level, cross-cultural dialogue in the context of research on woodland caribou:

Just talking about caribou would not be fair; it is not enough. We must go on the land to learn, to bring into light our knowledge so that it can be seen at work. It would not be good for the MNR to do research by themselves. It is good for our people to be involved with the MNR. I will continue to support this research because we are on the land. (13 October 2006)

Thus, although actors at different organizational levels may hold divergent views about how best to address planning for woodland caribou at different geographical levels, before any meaningful achievements are made in cross-scale planning efforts there must be a significant commitment to cross-cultural dialogue (Huntington et al. 2006). Insofar as community members perceive management direction as having originated from the

provincial level, and consequently see it as prescriptive, this dialog may break down (cf. Adger et al. 2005). Although this has not yet occurred with Pikangikum First Nation, the future of cross-scale planning efforts enabled through the NBI is uncertain as the Province (i.e., OMNR) faces pressures from conservation interest groups to adopt a single, centralized planning approach for the northern part of the province.

One of the important lessons emerging from this research is that despite best efforts to develop a planning framework that seeks to allocate responsibilities across different planning levels, and to address concerns at different geographic levels, these efforts can potentially be undermined by conflicting assumptions about how best to address cross-scale concerns, the protection of woodland caribou habitat being just one example. The pressures being brought to bear on the Province to accommodate local First Nations' interests, as well as provincial and international conservation interests, is just one example of how political pressures operating at different levels of all relevant scales complicate attempts at cross-scale planning.

Responses to this article can be read online at:
<http://www.ecologyandsociety.org/vol13/iss1/art6/responses/>

Acknowledgments:

This research was made possible by the wisdom and generosity of Pikangikum First Nation elders who have shared their knowledge with us. Meegwetch. Thanks also to Paddy Peters, Land Use Planning Coordinator for the Whitefeather Forest Management Corporation, who assisted with the research and provided translations for the elders and external researchers. This research has been supported by: Living Legacy Trust, Ontario Ministry of Natural Resources, Indian and Northern Affairs Canada, Industry Canada, Environment Canada, Social Science and Humanities Research Council, Sustainable Forest Management Network, Canada Research Chair in Community-based Resource Management.

LITERATURE CITED

- Adger, W. N., K. Brown, and E. L. Tompkins.** 2005. The political economy of cross-scale networks in resource co-management. *Ecology and Society* 10(2). [online] URL: <http://www.ecologyandsociety.org/vol10/iss2/art9/>.
- Canadian Parks and Wilderness Society-Wildlands League (CPAWS-WL).** 2007a. *Conservation land-use planning*. [online] URL: <http://www.wildlandsleague.org/display.aspx?pid=6&cid=65> (accessed 2 June 2007).
- Canadian Parks and Wilderness Society-Wildlands League (CPAWS-WL).** 2007b. *Our Vision*. [online] URL: <http://www.wildlandsleague.org/display.aspx?pid=1&cid=51> (accessed 2 June 2007).
- Care2.com.** 2006. *Protect the Valhalla block*. Petition. [online] URL: <http://www.thepetitionsite.com/takeaction/138867445?tl=1156701749> (accessed 25 August 2006).
- Caribou Nation.** 2007. *Caribou Nation—a place, a clan, an attitude*. [online] URL: <http://www.caribounation.org/article.php?list=type&type=4>.
- Cash, D. W., W. Adger, F. Berkes, P. Garden, L. Lebel, P. Olsson, L. Pritchard, and O. Young.** 2006. Scale and cross-scale dynamics: governance and information in a multilevel world. *Ecology and Society* 11(2): 8. [online] URL: <http://www.ecologyandsociety.org/vol11/iss2/art8/>.
- Davidson-Hunt, I. J.** 2005. A contribution to Anishinaabe (Ojibway) ethnobotany of northwestern Ontario, Canada: toward a holistic representation of Iskatewizaagegan (Shoal Lake) plant knowledge. *Journal of Ethnobiology* 25:189–227.
- Davidson-Hunt, I. J., and F. Berkes.** 2003. Learning as you journey: Anishinaabe perception of social-ecological environments and adaptive learning. *Conservation Ecology* 8(1): 5. [online] URL: <http://www.ecologyandsociety.org/vol8/iss1/art5>.
- Davidson-Hunt, I. J., and R. M. O’Flaherty.** 2007. Indigenous peoples, researchers and place-based learning communities. *Society and Natural Resources* 20:291–305.
- Davidson-Hunt, I. J., J. Shearer, and P. Peters.** 2006. *Keekeenuhwuhcheecheekun* “reading the signs”: constructing a cultural landscape framework for understanding environmental change within the Whitefeather Forest. In *Proceedings of Sustainable Forest Management Network Fourth International Conference, Sustaining Canada’s Forests: Building Momentum*. Edmonton, Alberta, Canada, 20–22 June 2006. CD-ROM.
- Edwards, S. E., and M. Heinrich.** 2006. Redressing cultural erosion and ecological decline in a far North Queensland aboriginal community (Australia): the Aurukun ethnobiology database project. *Environment, Development and Sustainability*, 8(4):569–583. [online] URL: <http://www.springerlink.com/content/q333704757u11756/>.
- Friedmann, J.** 1973. *Retracking America: a theory of transactive planning*. Anchor Press, Garden City, New York, USA.
- Friedmann, J.** 1987. *Planning in the public domain: from knowledge to action*. Princeton University Press, Princeton, New Jersey, USA.
- Green Party of Ontario.** 2006. *Need to reverse the decline of the woodland caribou in northwestern Ontario*. Press release. [online] URL: http://www.greenparty.on.ca/news/press_release/fulltext.shtml?x=381 (accessed 25 August 2006).
- Healey, P.** 2006. *Collaborative planning: shaping places in fragmented societies*. Second edition, Palgrave MacMillan, Basingstoke, Hampshire, UK.
- Huntington, H. P., S. F. Trainor, D. C. Natcher, O. H. Huntington, L. DeWilde, and F. S. Chapin, III.** 2006. The significance of context in community-based research: understanding discussions about wildfire in Huslia, Alaska. *Ecology and Society* 11(1): 40. [online] URL: <http://www.ecologyandsociety.org/vol11/iss1/art40/>.
- Independent First Nation Alliance (IFNA).** 2006. *IFNA—Pikangikum First Nation*. [online] URL: <http://www.ifna.ca/pikangikum.html> (accessed 21 August 2006).
- Indian and Northern Affairs Canada (INAC).** 2006. *General information: registered population: Pikangikum*. [online] URL: http://sdiprod2.inac.gc.ca/FNProfiles/FNProfiles_GeneralInformation.asp?

[BAND_NUMBER=208&BAND_NAME=Pikangikum](#)
(accessed 21 August 2006).

Kendrick, A., and M. Manseau. 2008. Representing traditional knowledge: resource management and inuit knowledge of barren-ground caribou. *Society and Natural Resources*, in press.

Lane, M. B. 2002. Buying back and caring for country: institutional arrangements and possibilities for indigenous lands management in Australia. *Society and Natural Resources* 15:827–846.

Latour, B. 1993. *We have never been modern*. Translated by C. Porter. Harvard University Press, Cambridge, Massachusetts, USA.

Legat, A. 2007. *Walking the land, feeding the fire: a Tâichô ethnography on becoming knowledgeable*. Dissertation, University of Aberdeen, Scotland.

O'Flaherty, R. M., I. J. Davidson-Hunt, and M. Manseau. 2007. *Keeping woodland caribou (Ahtik) in the Whitefeather Forest*. Research Note No. Sustainable Forest Management Network, Edmonton, Alberta, Canada. 27. (online) URL: <http://www.sfmnetwork.ca/docs/e/E27%20Caribou%20in%20the%20Whitefeather%20forest.pdf>.

Ontario Ministry of Natural Resources (OMNR). 2001a. *Northern boreal initiative: community-based land use planning, a land use planning approach, concept document*. OMNR, Northern Boreal Institute, Thunder Bay, Ontario, Canada.

———. 2001b. *Northern boreal initiative: a land use planning approach*. OMNR, Northern Boreal Institute, Thunder Bay, Ontario, Canada. [online] URL: <http://www.mnr.gov.on.ca/mnr/nbi/>.

———. 2002. *Northern boreal initiative—community-based land use planning approach*. OMNR, Northern Boreal Institute, Thunder Bay, Ontario, Canada. [online] URL: <http://www.mnr.gov.on.ca/MNR/nbi2002/>.

Ontario Woodland Caribou Recovery Team. 2005. Recovery strategy for forest-dwelling woodland caribou (*Rangifer tarandus caribou*) in Ontario. Species at Risk Unit, Biodiversity Section, Fish and Wildlife Branch, Ontario Ministry of Natural Resources, Peterborough, Ontario.

Roots, F. 1998. Inclusion of different knowledge systems in research. Pages 42–49 in M. Manseau, editor. *Terra borealis 1: traditional and western scientific environmental knowledge*. Institute for Environmental Monitoring and Research, Goose Bay, Newfoundland and Labrador, Canada.

Sapir, E. 1958. The status of linguistics as a science. Pages 160–166 in D. G. Mandelbaum, editor. *Culture, language and personality*. [Originally published in 1929.] University of California Press, Berkeley, California, USA.

Schaefer, J. A. 2003. Long-term range recession and the persistence of caribou in the taiga. *Conservation Biology* 17(5):1435–1439.

Stern, P. C., T. Dietz, N. Dolšák, E. Ostrom, and S. Stonich. 2002. Knowledge and questions after 15 years of research. Pages 445–489 in E. Ostrom, T. Dietz, N. Dolšák, P. C. Stern, S. Stonich and E. Weber, editors. *The drama of the commons*. National Academy Press, Washington, D.C., USA.

Stevenson, M. G. 2006. The possibility of difference: rethinking co-management. *Human Organization* 65(2):167–180.

Wenzel, G. 1991. *Animal rights, human rights, ecology, economy and ideology in the Canadian Arctic*. University of Toronto Press, Toronto, Ontario, Canada.

Whitefeather Forest Management Corporation (WFMC). 2006. *Keeping the land: a land use strategy for the Whitefeather Forest and adjacent areas*. WFMC, Pikangikum, Ontario, Canada. [online] URL: http://www.mnr.gov.on.ca/Mnr/csb/news/2006/jun26bg_06.html.

Worsley, P. 1997. *Knowledges: culture, counterculture, subculture*. New Press, New York, New York, USA.