THE TRIAD APPROACH: PRINCIPLES AND RECOMMENDATIONS

A Discussion Paper in Support of the SEWG Modeling Initiative

By CPAWS Northern Alberta and the Pembina Institute

March 3, 2006

Introduction

The triad approach was a central component of the *Alberta Forest Conservation* $Strategy^1$. It was also a key recommendation made by the Senate Subcommittee on the Boreal Forest². SEWG is now incorporating the triad approach into its scenario modeling initiative.

To proceed with the modeling SEWG needs to address the questions of "how much" and "where". These questions require careful consideration at the outset, given that poor choices could result in rejection of the triad concept because of either shortcomings in achieving ecological objectives or because of unacceptable conflicts with the resource industry. We have drafted this discussion paper for SEWG to provide some background on the principles of the triad approach and to suggest a potential triad scenario for exploration in the modeling initiative.

Basic Principles

Representation

Areas that are protected from industrial activity maintain biodiversity by maintaining the habitat and ecosystem processes that species require for their existence³. However, the habitat requirements of most species are not well known (in fact, many species have not even been described). For this reason, among others, an individual-species approach to habitat conservation is unworkable⁴. The alternative, termed the "coarse-filter" approach, attempts to meet the habitat requirements of the majority of species by ensuring that the full spectrum of major ecosystem types is represented within the system of protected areas⁵.

Because the "coarse filter" approach provides a relatively coarse level of representation, some unique habitat types are bound to be missed. Therefore, it is also necessary to employ a complementary "fine filter" approach to ensure that unique habitat types, and the species they support, receive adequate protection⁶. Species with very large area requirements (e.g., caribou) will also require special attention⁷.

Ecological integrity

Representation alone cannot ensure that natural processes will be maintained or that native species will survive⁸. Thus, a complementary goal to providing adequate representation is the maintenance of ecological integrity. Ecological integrity is defined as the degree to which all ecosystem components and their interactions are represented and functioning⁹. Of particular importance is maintenance of natural disturbance regimes, which are responsible for much of the structure, pattern, and ultimately biodiversity of the boreal forest¹⁰. Fire is the dominant disturbance mechanism in northern Alberta; therefore, protected areas in this region need to be large enough to withstand large fire events (i.e., several thousand square kilometers in size)¹¹. Large areas are also better able to withstand the effects of industrial development in the surrounding landscape (i.e., less prone to the "island" effect).

Connectivity

Protected areas that are isolated from each other become habitat islands, prone to the loss of species¹². The smaller the protected area, and the more isolated it is, the greater the risk¹³. It follows that connectivity among protected areas must be maintained in order to maintain biodiversity within the system of reserves. Connectivity reduces the risk of species loss through five main mechanisms: (1) it reduces the size of population fluctuations within individual protected areas, (2) should a species be lost from a given protected area, it enables recolonization with individuals from another (the so-called "rescue effect"), (3) it maintains gene flow among populations, (4) it facilitates the movement of wide-ranging species, whose habitat needs can only be met in the protected area system as a whole, and (5) it permits species to shift their range, as may be required in response to climate change¹⁴.

Protected areas in northern Alberta are separated by large distances. Consequently, for many species, movement of individuals between protected areas will not occur in single dispersal episodes, but over a period of many years. This implies that corridors must not only facilitate movement, but also supply long-term habitat requirements¹⁵. Design of corridors must also take into account the fact that northeastern Alberta has few topographical features that naturally direct the movement of wildlife species over large distances. Therefore, connecting corridors between protected areas will generally need to be as broad as possible and follow the most direct path.

Proposed Triad Scenario for Modeling

Methodology

Much ground work for the implementation of the triad approach in northeastern Alberta has already been done. Through the Special Places 2000 process an inventory and analysis of ecological values was completed and maps of environmentally significant areas were made available¹⁶. This was followed by a High Conservation Value Forest assessment, contracted by Al-Pac as part of their FSC certification process¹⁷. And in 2005, CPAWS and WWF, with input from Al-Pac, conducted a detailed assessment of priority areas for protection in the region¹⁸.

The proposal we present here is an extension of these earlier processes. As before, Wood Buffalo National Park (WBNP) serves as ecological anchor. However, even though Wood Buffalo National Park is very large, many of northeastern Alberta's ecotypes are not represented in it (as evidenced by the fact that woodland caribou are not found in the park). Moreover, there is a significant north-south climatic gradient that must be considered. For example, many bird species found in the Fort McMurray region do not breed as far north as WBNP¹⁹.

Our proposed triad scenario is based on the application of the principles outlined earlier — representation of ecoregions (coarse filter); sufficient size for maintaining integrity; and connectedness among protected sites. In addition to these ecological criteria we also sought to minimize conflict with the resource industry. In other words, we sought an option that would maximize ecological objectives while minimizing conflict, and therefore have a high potential of being implemented.

First Nations

The intent of the triad approach is to maintain some parts of the landscape free of industrial development to ensure that healthy wildlife populations are maintained at the regional scale, in the face of intensive industrial use. We believe this objective is consistent with key First Nations values concerning wildlife and traditional use. Although we did not have access to detailed maps of aboriginal traditional use areas, we have noted that at a coarse scale there is considerable overlap between the areas we have identified and areas identified as "survival" or "still good" areas in CEMA TEK workshops.

Proposed scenario for discussion

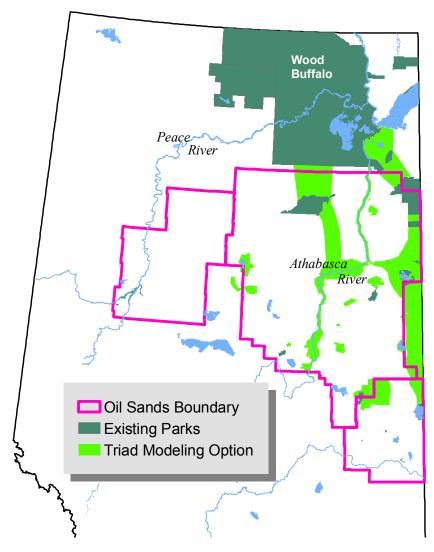


Fig. 1. Overview of the proposed triad scenario, using the oil sands administrative boundary for reference.

This document is focused on the SEWG modeling initiative; therefore, we used the RMWB boundary for our analysis and mapping. However, the oil sands administrative boundary is another appropriate lens to view the triad with (Fig. 1), particularly given that the successor to the MOSS strategy will be considering the entire oil sands region. The main point to be made is that an ecologically based protected area network will generate significantly different percentages of protection depending on the management area chosen. In this case, the proportion protected is roughly twice as high using the RMWB as the boundary (Fig. 2) as compared to the oil sands boundary.

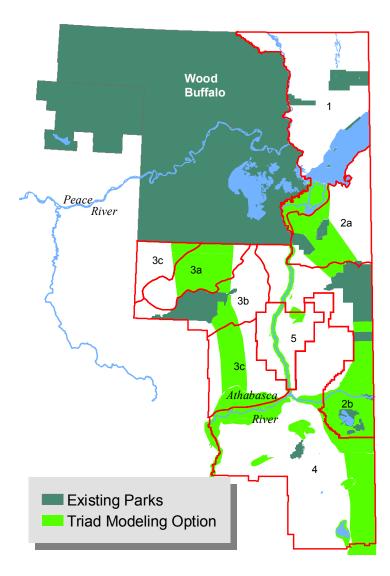
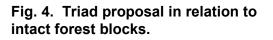


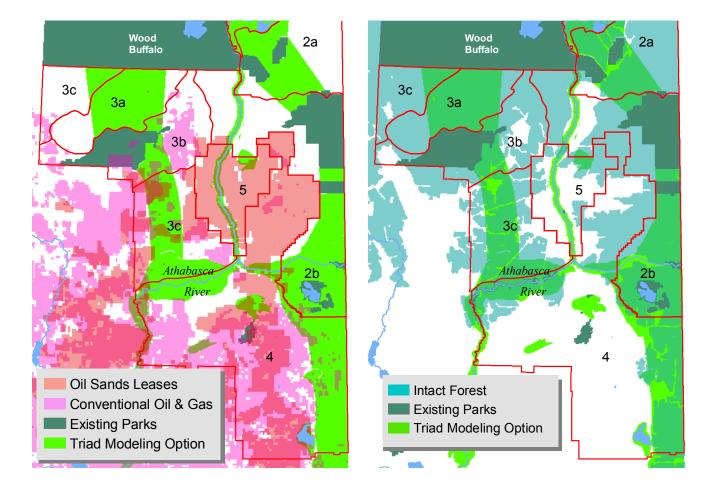
Fig. 2. Overview of the proposed triad scenario, using the RMWB boundary for reference (with SEWG LMAs labeled).

	Area within RMWB (km ²)	Percentage of RMWB	Area within pilot area (km ²)	Percentage of pilot area
Existing Parks	5,666	8.3	356	1.2
Triad Proposal	19,424	28.4	9,242	30.2
Total	25,090	36.7	9,598	31.3

Table 1.	Breakdown	of existing p	oarks and	triad pro	oposal by	RMWB an	d modeling
pilot area	ı (LMAs 3c, -	4, and 5).			-		_

Fig. 3. Triad proposal in relation to conventional oil and gas and oil sands leases.





Figures 3 and 4 demonstrate the extent to which the triad proposal minimizes conflicts with the petroleum sector and maximizes representation of remaining intact forest in the region. The triad sites also fill key gaps in ecosystem representation including old growth forests (see *Identification of Priority Areas for Protection Within the Al-Pac Management Area Based on Ecological Criteria*¹⁸ for details).

Citations

- 1. AFCSSC (Alberta Forest Conservation Strategy Steering Committee). 1997. Alberta forest conservation strategy. Alberta Environmental Protection, Edmonton, AB. (Available at: <u>www.borealcentre.ca/reports/reports.html</u>).
- Senate Subcommittee on the Boreal Forest. 1999. Competing realities: the boreal forest at risk. The Senate of Canada, Ottawa, ON. (Available at: <u>www.parl.gc.ca/36/</u> 1/parlbus/commbus/senate/com-e/rep-e.htm)
- 3. Noss, R. 1992. The wildlands project: land conservation strategy. Wild Earth 1:10-25.
- 4. Franklin, J. 1993. Preserving biodiversity: species, ecosystems, or landscapes? Ecol. Applic. 3:202-205.
- Kavanagh, K., and T. Iacobelli. 1995. A protected areas gap analysis methodology: planning for the conservation of biodiversity. World Wildlife Fund, Toronto, ON Page 10.
- 6. Noss, R. 1995. Maintaining ecological integrity in representative reserve networks. World Wildlife Fund, Toronto, ON. Page 13.
- 7. Hummel, M., and S. Pettigrew. 1991. Wild hunters: predators in peril. Key Porter, Toronto, ON.
- 8. Noss, R. 1995. Maintaining ecological integrity in representative reserve networks. World Wildlife Fund, Toronto, ON. Page 6.
- Quigley, T. M., R. W. Haynes, and R. T. Graham. 1996. Integrated scientific assessment for ecosystem management in the interior Columbia basin and portions of the Klamath and Great Basins. U.S. Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-382., Portland, OR.
- Johnson, E. A., K. Miyanishi, and J. M. H. Weir. 1998. Wildfires in the western Canadian boreal forest: landscape patterns and ecosystem management. J. Veg. Sci. 9:603-610.
- 11. White, P. 1987. Natural disturbance, patch dynamics, and landscape pattern in natural areas. Nat. Areas J. 7:14-22.
- 12. Newmark, W. D. 1995. Extinction of mammal populations in western North American national parks. Cons. Biol. 9:512-526.
- 13. Diamond, J. M. 1975. The island dilemma: Lessons of modern biogeographic studies for the design of natural reserves. Biol. Cons. 7:129-145.
- 14. Simberloff, D., J. A. Farr, J. Cox, and D. W. Mehlman. 1992. Movement corridors: conservation bargains or poor investments? Cons. Biol. 6:493-504.
- 15. Harrison, R. 1992. Toward a theory of inter-refuge corridor design. Cons. Biol. 6:293-295.
- 16. Alberta Environmental Protection. 1994. Alberta protected areas system analysis. Alberta Environmental Protection, Edmonton, AB.
- 17. Kevin Timoney. 2003. An Environmental Assessment of High Conservation Value Forests in the Alberta Portion of the Mid-Continental Canadian Boreal Forest Ecoregion. Alberta-Pacific Forest Industries, Boyle, AB.
- Canadian Parks and Wilderness Society (CPAWS) and World Wildlife Fund Canada.
 2004. Identification of priority areas for protection within the Al-Pac management area based on ecological criteria. CPAWS, Edmonton, AB.
- 19. Federation of Alberta Naturalists. 1992. The atlas of breeding bird of Alberta. Federation of Alberta Naturalists, Edmonton, AB.