THE TRIAD APPROACH: PRINCIPLES AND RECOMMENDATIONS

A Discussion Paper in Support of the SEWG Modeling Initiative

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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 Forest[2]. 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 activiy maintain biodiversity by maintaining the habitat and ecosystem processes that species require for their existence[3]. 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 unworkable[4]. 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 areas[5].

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 protection[6]. Species with very large area requirements (e.g., caribou) will also require special attention[7].

Ecological integrity

Representation alone cannot ensure that natural processes will be maintained or that native species will survive[8]. 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 functioning[9]. Of particular importance is maintenance of natural disturbance regimes, which are responsible for much of the structure, pattern, and ultimately biodiversity of the boreal forest[10]. 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 species[12]. The smaller the protected area, and the more isolated it is, the greater the risk[13]. 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 change[14].

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 requirements[15]. 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 available[16]. This was followed by a High Conservation Value Forest assessment, contracted by Al-Pac as part of their FSC certification process[17]. And in 2005, CPAWS and WWF, with input from Al-Pac, conducted a detailed assessment of priority areas for protection in the region[18].

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 WBNP[19].

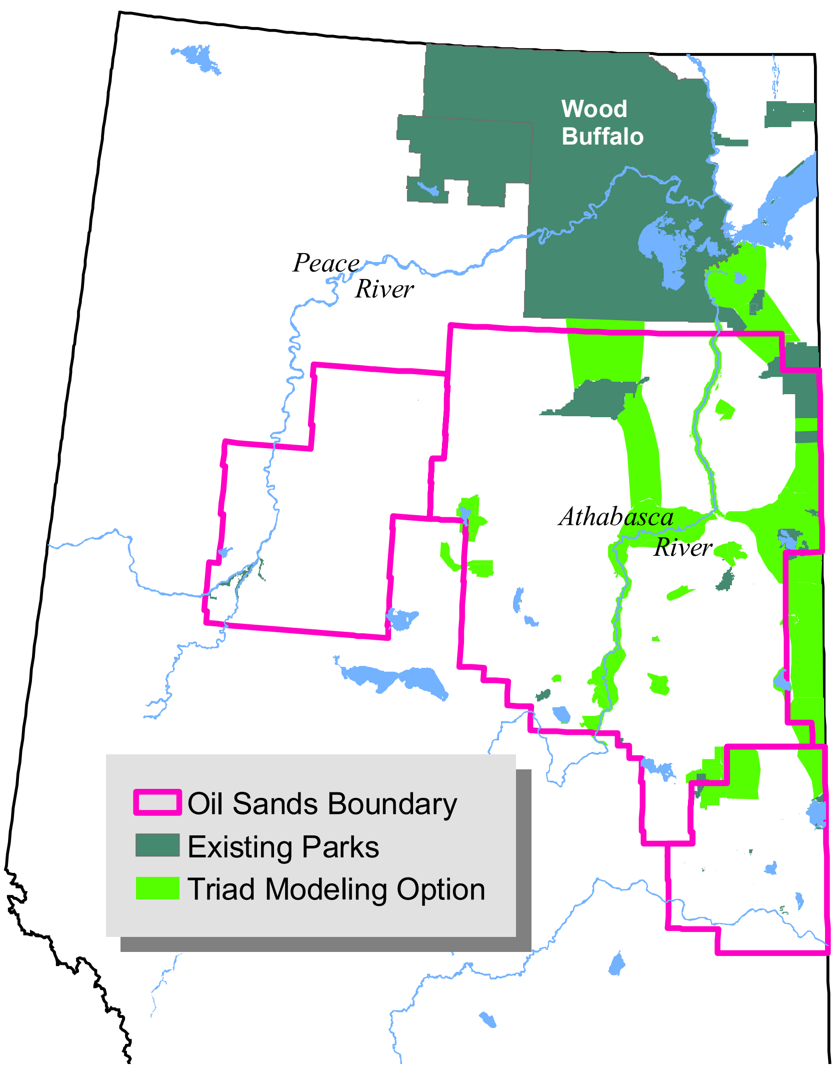
Our proposed triad scenario is based on the application of the principles outlined earlier — representation of ecoregions (coarse filter); sufficient size for maintaining integrity; and connectedness among protected sites. In addition to these ecological criteria we also sought to minimize conflict with 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).

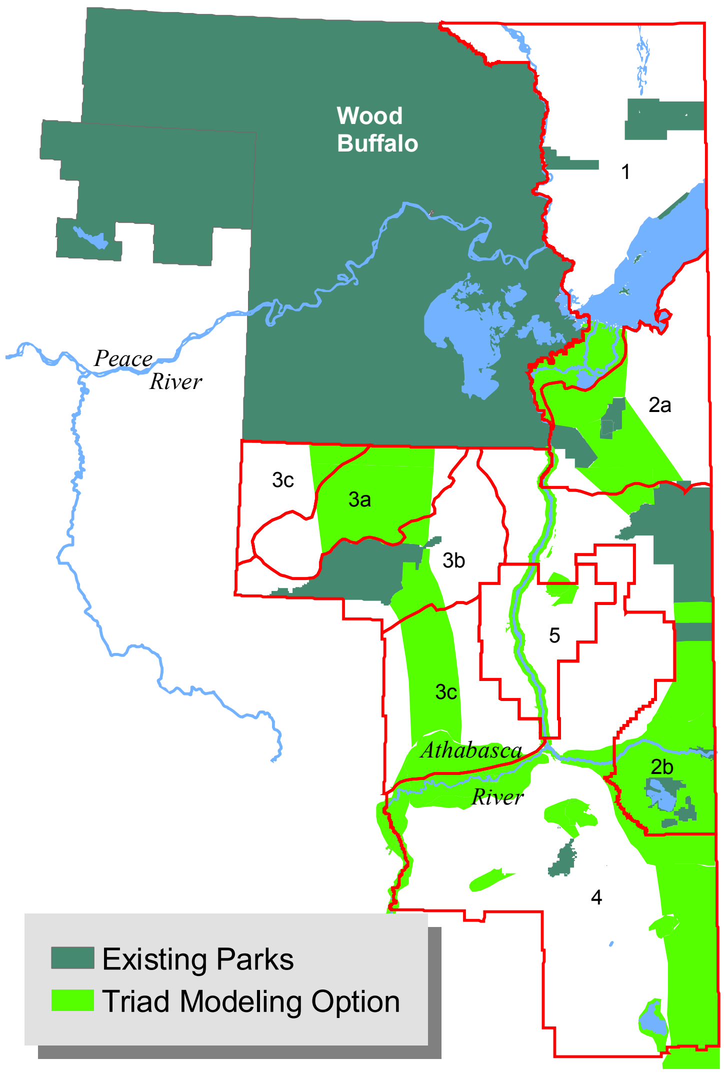


Table 1. Breakdown of existing parks and triad proposal by RMWB and modeling pilot area (LMAs 3c, 4, and 5).

	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

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

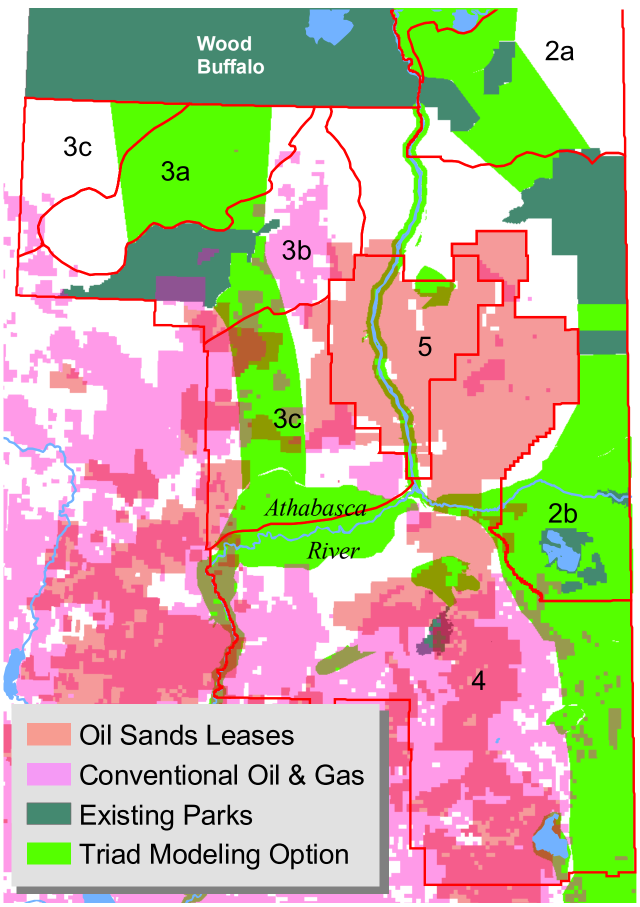
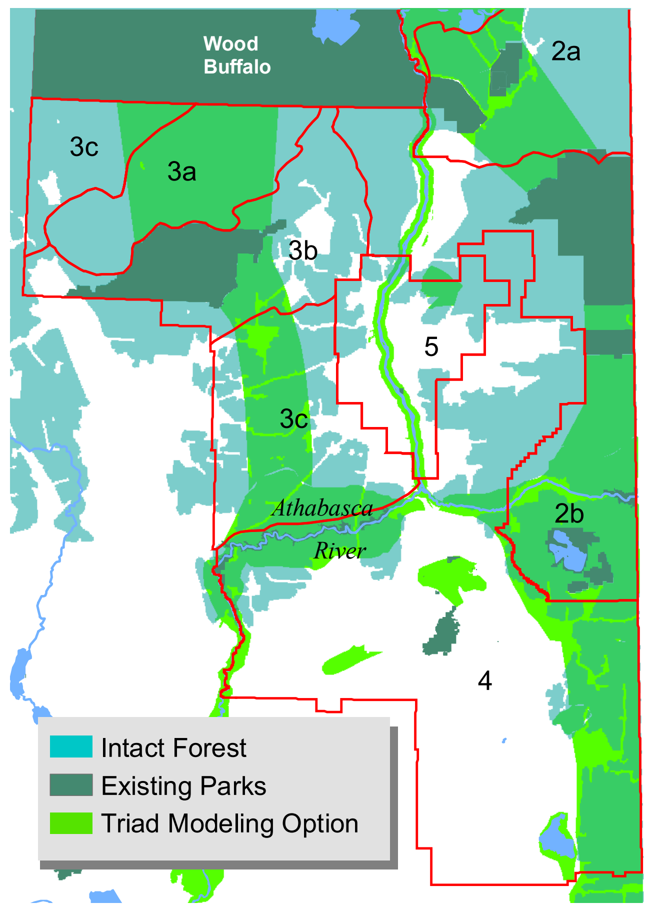


Fig. 4. Triad proposal in relation to intact forest blocks.



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

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