

**Glacier National Park – Cooperative Ecosystems Studies Unit
Glacier National Park Crown Managers Partnership**

**CESU COOPERATIVE AGREEMENT NUMBER CA-1200-99-007
Final Report**

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Final Report

In the period since inception of the grant in September, 2002 the following tasks have been addressed:

- 1) Technical team development: see below
- 2) Coordination of Steering Committee business including conference calls: see below
- 3) Identify Themes and summarize landscape-gathering data necessary for the Cumulative Effects Assessment: see below
- 4) Develop CMP website: website developed, previewed and now in final review
- 5) Develop student projects: Developed four student project with Southern Alberta Institute of Technology and had seven graduate students from UC/UM attending research workshop held 1/28/03 in Waterton, Alberta.
- 6) Secured additional funding
- 7) Finalized CEA work plan
- 8) Identified stakeholders and study area
- 9) Miistakis staff trained on ALCES model
- 10) ALCES model redeveloped/extended for scale of study
- 11) Developed partnership workshop model for doing ALCES simulation

In addition, the following work products have been advanced:

Provide GIS support to CMP related initiatives including access to transboundary spatial datasets and Crown of the Continent ecoregional maps. The emphasis will be on derived research products rather than raw data.

A Crown of the Continent ecoregional map was generated and reviewed at the Annual Forum April 7-9, 2003 in Pincher Creek, Alberta (see map on website www.rockies.ca/cmp). Access is now available to multiple, integrated spatial datasets through the Miistakis Institute.

Develop a web site for the CMP to outline the partnership objectives, goals, workplans, results, trends, management approaches and additional related information

A website is under final review by the CMP Steering Committee and can be previewed at www.rockies.ca/cmp. It has pages reviewing the partnership objectives, goals, workplan, trends, projects, management approaches and additional related information.

Facilitate an annual Crown of the Continent Managers Forum (CMF) that will be hosted by the Waterton-Glacier International Peace Park

The Forum was held April 7-9, 2003 in Pincher Creek, Alberta and was facilitated by the Miistakis Institute under this grant.

Be accountable to the CMP Steering Committee including arranging conference call, providing meeting minutes and attending Steering Committee meetings

Twelve CMP Steering Committee conference calls and two in-person meetings in addition to the Annual Forum have been arranged and facilitated by Miistakis under the subcontract for this grant. Minutes for all these meetings have been provided by Miistakis.

Conduct a cumulative effects assessment for the Crown of the Continent Ecosystem, using the ALCES simulator model, which includes the following:

-Create a CMP/CEA Technical Advisory Committee: Candidates have been identified from all agencies and commitments have been secured from some of them.

-Populate ALCES model with spatial data from CMP agencies: Requests for spatial data have been made to the appropriate agencies. Montana data is being received, BC and Alberta data are harder to coordinate and obtain, but some has been obtained and negotiations are in progress to obtain the rest.

- Assemble historic data to depict time series analysis for various locations throughout the Crown of the Continent study area: Historic data is being secured and is in progress and completion is expected by the end of August.

- Run preliminary landscape simulations including sensitivity analyses: ALCES has been redeveloped or extended to handle the scale of the analysis. The workshop process model necessary to determine metrics, algorithms for projections and estimates and harmonize data has been developed and accepted by CMP partners. Workshops for biological indicators, transportation and human settlements/population growth will be held in October, November and December, respectively.

- Prepare reports, summarizing ALCES results to be distributed to the CMP- a report was submitted at the April, 2003 Annual Forum meeting. Reports continue to be distributed at CMP Steering Committee meetings.

Provide significant leverage potential with Agency resources through graduate and academic expertise as well as other grants and donations that are not generally available to government agencies

The research workshop in January, 2003 was attended by two faculty and nine graduate students of the University of Calgary and the University of Montana. Faculty have been substantially involved in the review of the website, the technical development of the CEA, and the CMP Steering Committee. Faculty at the University of Montana are reviewing the potential for an National Science Foundation grant to support integration of economic and social measures into assessment of ecological integrity.

More detail on most tasks is in the attached report from the subcontractor Miistakis Institute, which is incorporated here by reference.

Signed,

Len Broberg
Associate Professor
Principal Investigator

Prepared by

The Miistakis Institute for the Rockies

The Miistakis Institute for the Rockies has been contracted by the University of Montana to provide technical and administrative support for the Crown of the Continent Ecosystem Managers Partnership (CMP), including the initiation of an ecosystem wide cumulative effects analysis. This report outlines the activities completed during the project, with an emphasis on the period from January 15, 2003 to July 15, 2003.

Cumulative Effects Assessment Survey

A survey of the participants in the Crown Management Partnership (CMP) began in December and was completed in April 2003. This survey provides critical information about 1) the level of awareness among CMP partners regarding cumulative effects analyses in the Crown of the Continent region, 2) the barriers to pursuing such cooperative land use planning efforts, and 3) likewise the drivers.

Preliminary results of the survey include the following:

- Participation by invitation – CMP participants + knowledgeable
- ~60 invitations
- 36 participants
 - A complete summary of the survey will be forwarded to all CMP agencies by fall 2003
- Participants indicated that 79% of agencies currently participate in some CEA process, 14% are not currently involved in CEA and 7% did not know
- Top 5 drivers of CEA included the following: Leverage benefits of collaboration, Info essential for agency mandate, Fill current info gaps, Agency commitment to TB mgmt, Personal belief in value of approach
- Top 5 barriers of CEA included the following: Lack of resources, Lack of senior mgmt support, Lack of clarity in project goals, Lack of political support, Lack of entity to drive process
- What do agencies hope to get from the CEA process: Awareness of issues (public & mgr), Regional vision, Collaboration, Common data protocols and data sets, Better land mgmt

Cumulative Effects Analysis

A great deal of the work in the past six months on the Regional Cumulative Effects Modeling project has focused on two tasks which, though foreseen, were underestimated.

First, the ALCES model and process have required significant development and adaptation to be applicable to the Crown of the Continent region. Though very robust, the model has never been applied to such a large and jurisdictionally complex study region (though the current Southern Alberta Sustainability Strategy, SASS, is

comparable). Collecting data across two provinces and one state (as well as into two nations), has presented unique challenges.

A new framework for ensuring comprehensive participation across this large, multi-faceted region had to be developed (see ‘Cumulative Effects Analysis Framework’).

Second, building and maintaining the informed participation of all agencies has been more challenging than anticipated. Though every agency has maintained their commitment, budget cuts, state budgeting processes, and internal re-organizations of agencies involved have affected the ability of agencies to predict the level and timing of their commitment. Allocating staff/financial resources and ensuring that all levels internally are supportive has been challenging for the agencies in this shifting and resource-limited environment.

The result has been a greater amount of time than anticipated being devoted to coordinating data collection and to exercises aimed at raising awareness, comfort and ultimately all-level buy-in for the process (See ‘Data Collection’ and ‘Crown of the Continent Forum’).

In summary, a significant evolution of the cumulative effects modeling and analysis project has taken place relative to our first conception of it. However, we feel quite confident that we have been able to avoid numerous implementation problems in doing so, and ultimately ensure a more effective regional cumulative effects analysis.

Framework for Regional Cumulative Effects Analysis

As mentioned earlier, the bulk of the work in the past six months has been in creating, and vetting a framework for executing the regional cumulative effects analysis project. Although the ALCES model has been used several times to support regional cumulative effects analyses, applying it in the Crown of the Continent region required modifying the usual framework.

The new framework had to:

- operate effectively in a multi-national, multi-province/state environment
- be tailored to the limited resources devoted to the project (the resources per square mile devoted to this project are a fraction of those used in previous applications of the model)
- allow for cross-region as well as sub-region simulations to the greatest extent possible
- ensure the on-going buy-in of the people who would be using it and benefiting from it (the Crown of the Continent region resource managers)

The new framework was based on research and learning from other practical applications of the ALCES model in cumulative effects analysis. The Framework (see **Appendix 1: Crown Managers Partnership Cumulative Effects Analysis Framework**) was developed and presented to the Crown Managers Partnership Steering Committee through a conference call, and modified based on their input. It was then presented to the Crown Managers Partnership at the Annual Forum in Pincher Creek in April 2003. Exercises followed which aimed at developing the participation of the CMP managers at an early stage, and at assessing the framework’s utility for the group

The key features of the modified framework are:

- a new workshop process for data collection which has an initial workshop or meeting with experts to lay out the assumptions of the model, followed by a

significant amount of data collection, then finally a second workshop where collected data are vetted and gaps are filled

- a process for converting the output of the model's simulations into plain language 'issue statements' which are analyzed by the CMP and referred back to the model for potential mitigation
- inclusion of a reporting mechanism whereby results from model simulations are conveyed to the CMP from the modeling team, and CMP priorities are communicated to the modeling team
- teams drawn from the CMP members established for project management, data collection, modeling and reporting
- designation of sector representatives drawn from agencies or institutions who liaise between land use sectors and the data collection, modeling and project management teams

Response to the new framework by the CMP has been very positive, and participation levels which were flagging in some areas have been significantly revived. Feedback included a feeling of renewed interest in the project, a clearer understanding of requirements and benefits of the project, and improved clarity on individual or agency roles.

All project work -- but data collection activities, in particular -- have been modified significantly based on the new framework.

Data Manager Identification

At the Crown Managers Forum in Pincher Creek in April 2003, participants engaged in an exercise to identify by land use the individuals and agencies best able to provide spatial, metric and trend data. This exercise significantly boosted the process of identifying the data managers, and an ever-growing database of these contacts has been developed.

Biological Indicator Data

The recent re-write of the ALCES model (dubbed ALCES II) has expanded its capabilities to model the results of aggregated land uses on specific species or guilds. Biologists with a strategic level expertise in the Crown of the Continent region are currently being consulted regarding the appropriate indicator species to be used in the modeling. From this group will come the team who will direct the collection, harmonization and verification of the necessary species-specific data. Those being approached in Montana include the following:

- Len Broberg, Associate Professor, University of Montana
- Jimmy DeHerrera, District Ranger, U.S. Forest Service - Flathead National Forest
- Roy Doore, Natural Resource Specialist, Bureau of Indian Affairs
- Dan Fagre, Ecologist, Climate Change Research Coordinator, U.S. Geological Survey
- Brace Hayden, Regional Issues Specialist, Glacier National Park
- Janet Herbert-Hess, GIS Supervisor, Montana Department of Fish, Wildlife and Parks
- Mark Holston, Public Information Officer, Flathead Basin Commission
- Wayne Kasworm, Wildlife Biologist, U.S. Fish and Wildlife Service
- Rich Moy, Flathead Basin Commission and Montana Department of Natural Resources and

- Chris Servheen, Grizzly Bear Recovery Coordinator, U.S. Fish and Wildlife Service
- Bob Sandman, Manager, Stillwater/Swan State Forest

The first workshop will be held in October, 2003.

Spatial Data Collection

Collection of the spatial data needed to describe the initial landscape in the model has been proceeding relatively smoothly. Most agencies contacted have now at least replied with some measure of data which Miistakis is currently incorporating or modifying for incorporation into the model. Richard Menicke of Glacier National Park has been vital in developing a method for translating the acquired Montana data into a format usable in the model. The following GIS technicians are involved:

- Dennis McCarthy - Forest GIS Supervisor - Flathead National Forest
- Val Diemert - Lewis & Clark National Forest
- Roly Redmond - US Geologic Survey
- Lindy Garner - US Fish and Wildlife Service
- Sean Fields - .US Fish and Wildlife Service (Lost Trail and Swan River)
- Janet Hess-Herbert - Montana Fish, Wildlife and Parks
- Cedron Jones - Montana Natural Heritage Program
- Bob Sandman - Montana DNRC
- Craig Halford - Montana DNRC
- Duane Anderson - Montana Natural Heritage Program
- Diane Adams - Lake County
- Tim Ryan - Salish-Kootenai Confederated Tribes
- Don Wilson - Blackfeet Tribe
- Pete Gillard - - Salish-Kootenai Confederated Tribes

We anticipate the bulk of this task will be complete by the end of August.

Metric and Trend Data Collection

Metric data (non-spatial, non-trend parameters describing land use) and trend data (projections of future trends) are the most difficult data types to collect. Numbers vary tremendously across regions, are not uniformly collected or standardized, and (in the case of trend data) are conjectural. This requires collecting those people with the expertise in each field who can represent the various geographic and jurisdictional areas, and working through a consensus-based process of determining, vetting and substantiating all numbers.

As described in the Framework, this will be a two-stage process, whereby as much data as possible will be collected prior to convening workshops. This will involve contacting the same people who will eventually be approached to participate in workshops. This is contrary to our original vision of starting the metric and trend data collection by convening workshops. That approach was revised based on the experience of other regional cumulative effects modeling projects, and a desire to make the best use of individuals' time (given the harsh constraints) and thereby maximize their participation.

Work has begun in contacting various agency and institutional representatives to provide base data. This will continue through the next couple of months, with the anticipation that a vetting workshop in the area of "Transportation" will be held in

November, and one for “Human Settlements and Population” will be held in December. As well, we are currently negotiating with the Southern Alberta Sustainability Strategy (SASS) to see how much of their metric data is applicable to, and available for, the Crown of the Continent project.

Historical Data Research

Other instances of using regional cumulative effects analysis using the ALCES model have shown the utility of compiling historical trends in a variety of land uses to establish a baseline for discussion about logical future rates of change. As well, the collection of these historical trends is useful in presenting both the public and the agencies with cross-region snapshots of the historical patterns of change in land and resource use.

Work in this area is complicated by the fact that Montana political jurisdictions have been very stable, but those in Alberta and B.C. have been prone to repeated minor and major variations. This makes comparisons over space and time very difficult. We anticipate this task will be done by the end of August.

The base trends for which historical data is currently being collected are:

- forest harvest volumes
- oil and gas production
- number of farms, size of farms
- livestock populations
- population and population density
- industrial / domestic water use
- road density
- land base protected from industrial development

Secretariat

CMP Website

Miistakis has completed the CMP website and Steering Committee members are currently reviewing web page content prior to launching the site. A Communications Strategy is currently being written by Steering Committee members which will facilitate future direction and circulation of the website. Presently the following information is included on the webpage:

- history
- purpose
- support
- documents
- projects
- links
- photo gallery

Research Workshop

Miistakis, together with the UofC/Uof M Transboundary Program hosted a research workshop designed to identify and discuss natural and social science research priorities and strategies for the Crown of the Continent. The workshop was held January 28th in Waterton Lakes National Park. The workshop participants included managers and practitioners from Alberta, British Columbia and Montana and

graduate students from the Universities of Calgary and Montana. The workshop provided an opportunity for knowledgeable practitioners to help prioritize research needs and develop strategies for achieving results.

The purpose of the Research Workshop was twofold:

- 1) To discuss the research items arising from the CMP workplan with selected managers, practitioners and graduate students in an effort to: a) “flesh out” the topics and develop more specific research questions, b) discuss priorities for addressing the research questions, c) identify approaches to initiating, funding and completing the research (Nb – this includes a discussion of who is best suited to completing the research e.g. in-house, graduate students, academic faculty, consultants, etc.).
- 2) To identify information gaps that should be addressed in future workplans.

The workshop included 21 practitioners and 9 students. Participants worked in three groups, focusing ½ day on brainstorming, ½ day strategizing. The workshop participants worked in three groups exploring the following:

Transboundary Fish and Wildlife

- Maintenance of ecological integrity – esp. connectivity, ecological processes, large carnivores, native grasslands, 5 needle pines
- Science into communication & policy
- Data gaps – standards, sharing
- Tools – indicators, economic valuation

Public Attitudes & Values /TB Management Approaches

- Importance of place-based relationships
- Need for political engagement
- Meta-analysis of mgmt approaches / partnerships
- Communication & education

Human Use and Recreation

- Meeting growing needs & ecological sustainability
- Current inventories and trends
- Understanding public expectations
- Modifying behaviour
- Public consultation models/options
- Managing in the face of uncertainty

A detailed summary of the research workshop has been compiled by Miistakis and is available upon request.

Conference Calls

Since January 15, 2003, Miistakis has coordinated 8 CMP conference calls (February 5,12,18, March 5, 14, 28, April 4 and June 5 and provided meeting minutes to all CMP Steering Committee members for each meeting. Miistakis also facilitated CMP Steering Committee meetings held in Waterton on May 4 and in West Glacier on July 17 and 18.

CMP Annual Forum

Miistakis facilitated the annual CMP Forum in Pincher Creek on April 7th, 8th and 9th, 2003. Twenty nine agency participants gathered to discuss collaborative ecosystem management issues in the Crown of the Continent Ecosystem.

The objectives of the Forum were to build on the objectives established in the first and second Forums:

- build awareness of common interests and issues in the Crown of the Continent Ecosystem,
- build relationships and opportunities for collaboration across mandates and borders,
- identify collaborative work already underway and opportunities for further cooperation, and review progress and direction based on the priorities and action items identified by the Forum and the Steering Committee. Miistakis has prepared a detailed summary of the Forum that will be circulated to all CMP participants.

A detailed summary of the Forum has been prepared by Miistakis and is available upon request.

