Scan of Ecosystem Services Programming in the Crown of the Continent

Oct 2013

Prepared by Tracy Lee and Kim Good

MIISTAKIS INSTITUTE

Prepared for:

Roundtable on the Crown of the Continent

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ACKNOWLEDGEMENTS

The Miistakis Institute would like to thank the Roundtable Leadership team for their support of this project. Thanks you to Todd Gartner, World Resource Institute (WRI), for providing guidance on most aspects of the process, including survey design, report editing, general insights and guidance. We would also like to extend thanks to the following for reviewing and commenting on survey design: Gary Tabor, Center for Large Landscape Conservation; Melly Reuling, Center for Large Landscape Conservation; Shawn Johnson, Center for Natural Resource Conservation & Environmental Policy, University of Montana; Nancy Newhouse, Nature Conservancy of Canada; Dave Hillary, East Kootenay Conservation Program; Anne Carlson, Wildlife Conservation Fund and Danah Duke, Miistakis Institute. We are grateful to the respondents who agreed to be interviewed regarding their ecosystem service programmes in the Crown of the Continent Ecosystem (CCE). Finally, we would also like to thank the Center for Large Landscape Conservation for their administration of the Crown Roundtable Adaptive Management Initiative Grants Program and the Kresge Foundation for their generous financial support.

Miistakis Institute for the Rockies

The Miistakis Institute brings people and ideas together to promote healthy communities and landscapes. Miistakis studies the landscape, in order to help people maintain it; and celebrates innovative solutions by making that information accessible to communities and decision-makers. Miistakis Institute partners are leading-edge scientists, like-minded organizations, industry, government agencies and inspiring community leaders. Affiliated with Mount Royal University, the Miistakis Institute is an independent, non-profit charitable organization. Miistakis is a relatively compact organization with a staff of seven people whose expertise range from computer programming and geographic information systems, to wildlife and landscape ecology, to economics and land-use planning. Its projects are diverse both in scope and content.

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The Roundtable on the Crown of the Continent

The Roundtable on the Crown of the Continent is an ongoing forum to bring together people who care about this special place. It is based on the observation that the future of the Crown of the Continent is being shaped by over 100 government agencies, non-government organizations, and place-based partnerships. While these various initiatives operate somewhat independently of each other, the Roundtable provides a unique opportunity to connect people that share a common commitment to the region.

Through workshops, forums, policy dialogues, and conferences, the Roundtable provides an opportunity to exchange ideas, build relationships and explore opportunities to work together to sustain the natural and cultural heritage of this remarkable landscape.

To learn more, please visit www.crownroundtable.org.

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EXECUTIVE SUMMARY

Natural ecosystems, like the Crown of the Continent Ecosystem (CCE), provide essential services for human communities. Forests and wetlands, for example, filter the water we drink, protect neighborhoods from floods and droughts, and shade aquatic habitat for fish populations. Native grasslands feed the food we eat (such as cattle and sheep), support insects that pollinate our crops and provide important habitat for wildlife. Programs that aim to better understand the link between nature's benefits (e.g., rivers, wetlands, grasslands, biodiversity, etc.) and human well-being can be placed under the umbrella of ecosystem services or ecosystem services programming.

The Roundtable on the Crown of the Continent (the Roundtable) requested the Miistakis Institute to undertake an assessment on the current state of programming related to ecosystem services in the CCE. The Roundtable wanted to better understand the types of ecosystem services programming that are occurring within the CCE and to better understand what stakeholders are interested in related to ecosystem services. Miistakis developed an on-line survey on behalf of the Roundtable advisory committee as the basis for this ecosystem service assessment. The on-line survey was distributed to the Roundtable email distribution list of 416 people.

Key findings from the survey include:

- Most respondents are aware of the term ecosystem services (87%) and most think there is potential for an ecosystem services approach to help maintain a healthy CCE. However, a number of respondents (22%) did not know if an ecosystem services approach has potential to help maintain a healthy CCE, highlighting the need for education on ecosystem services and ecosystem services approaches in general.

- Respondents identified an ecosystem services approach within the CCE as having the following benefits:
    - Can work to maintain nature's benefits: such as healthy water, air, wildlife and forests, as well as the more intangible benefits such as aesthetics and emotional well-being
    - Can provide education and awareness opportunities: by focusing on the link between nature's benefits and human well-being which helps people understand the benefits of natural systems in their daily lives. This in turn may lead to broader support for maintaining healthy natural systems.
    - Can assist with decision making: by including an assessment of all impacts on a natural system and considering the trade-offs between different land use decisions over the long-term. With competing land use scenarios in the CCE, an ecosystem services approach can lead to more informed decisions.

- Respondents identified the following barriers and limitations to an ecosystem services approach in the CCE:

- There is a need for education and awareness to improve general understanding and literacy about ecosystem services, specifically on quantifying ecosystem services and highlighting case studies where an ecosystem services approach has been used successfully.
- There are challenges in quantifying ecosystem services (i.e., what are appropriate thresholds in terms of maintaining natural capital) limiting use in decision making and planning initiatives.
- There is a lack of capacity, leadership, policies, staffing and funding to fully understand and implement this approach.

- Respondents were most interested in water (87%) as an ecosystem service, with recreational experience (56%) and cultural, intellectual and spiritual inspiration (36%) rounding out the top three.

- There are a handful of ecosystem services programs occurring within the CCE. Eight ecosystem services programs have been implemented by seven organizations.

- The majority of respondents (65%) highlighted the following opportunities for the Roundtable to further the dialogue around ecosystem services and their role in the CCE by:
  - improving general literacy around an ecosystem services approach;
  - information dissemination (e.g., sharing case studies); and
  - facilitating collaboration between stakeholders.

The survey results clearly depict a role for the Roundtable to help advance the dialogue around ecosystem services in the CCE. We propose the following goal for Roundtable: By 2015 the Roundtable supports an ecosystem services literacy and dialogue workshop and demonstration project on ecosystem services with a focus on water.

INTRODUCTION

The Roundtable on the Crown of the Continent (the Roundtable) requested the Miistakis Institute undertake an assessment on the current state of programming related to ecosystem services in the Crown of the Continent Ecosystem. The Roundtable wanted to understand what type of ecosystem services programming is occurring within the CCE and to better understand what stakeholders are interested in related to ecosystem services. Miistakis developed an on-line survey on behalf of the Roundtable advisory committee as the basis for this ecosystem services assessment.

An ecosystem services approach allows for an examination of the connection between human well-being and services the ecosystem provides. An ecosystem services approach offers a framework for considering the health of an ecosystem through a service-oriented lens and allows for the development of integrated solutions and strategies to maintain and restore natural ecosystems (Costanza 1997).

The objectives of this report are to inform Roundtable stakeholders of:

- the level of awareness and interest of using an ecosystem services approach to maintain a healthy CCE;
- examples of ecosystem services programming occurring in the CCE;
- opportunities for the Roundtable to further the conversation within the CCE about using an ecosystem services approach; and
- areas where the Roundtable may be able to add value to an ecosystem services approach.

BACKGROUND

Natural ecosystems, like the Crown of the Continent Ecosystem (CCE), provide essential services for human communities. Forests and wetlands, for example, filter the water we drink, protect neighborhoods from floods and droughts, and shade aquatic habitat for fish populations. Native grasslands feed the food we eat (such as cattle and sheep), support insects that pollinate our crops and provide important habitat for wildlife. Although there is not a universally accepted definition and typology of ecosystem services, in this assessment we use the widely accepted list of ecosystem services developed by the Millennium Ecosystem Assessment (Appendix A) (Hainos and Potschin 2009, Millennium Assessment 2005).

Projects that aim to better understand the link between nature's benefits (e.g., rivers, wetlands, grasslands, biodiversity, etc.) and human well-being can be placed under the umbrella of ecosystem services or ecosystem services programming. There are different types of ecosystem services programming, for example:

- **Scientific assessments** of an ecosystem service, such as carbon sequestration through monitoring change in percent of native grassland.
- **Economic valuation** of the service provided, such as establishing a dollar value for water quality from each hectare of intact, natural forest.
- **Educating stakeholders and influencing policy** through raising awareness, supporting an education or recognition program and/or informing a regulatory mechanism.

- Developing an **incentive program** to protect or maintain ecosystem service by creating financial instruments and/or market-based instruments.

There is some complexity in accurately documenting ecosystem services programs occurring in the CCE because many organizations working on programs aimed at managing or protecting biodiversity identified their projects as an ecosystem services approach. However, biodiversity is not an ecosystem service but is a foundation component to enhancing ecosystem services. Research has shown that changes in biodiversity, such as a decline in number of species or a keystone species, can influence the supply of ecosystem services (Schwartz et al. 2000, Hooper et al. 2005). Although biodiversity is not an ecosystem service it is fundamental to the enhancement of an ecosystem and is therefore an important provision of ecosystem services (Hainos and Potschin 2009). For this process we do not include programs aimed explicitly at conserving biodiversity as an ecosystem service program.

One of the objectives of this survey is to understand who is undertaking programming using an ecosystem services approach within the CCE. Ecosystem services terminology is quite fluid and, although research into quantifying, valuing and assessing ecosystem services is occurring at an increased rate, in-depth knowledge and information about ecosystem services by many conservation practitioners is still quite limited. For this assessment we focused on programs that:

- are explicitly developed using an ecosystem services approach;
- focus on the integration of biophysical, social and economic systems; and
- focus on one of the ecosystem services listed in the MEA.

Although projects that aim to protect biodiversity for the sake of biodiversity have merit and likely inform or benefit an ecosystem services approach to programs or projects, we aim to identify projects that are oriented toward the direct links between natural systems and human well-being.

METHODOLOGY

An on-line survey (Appendix B) was developed and delivered by Survey Monkey as the basis for this assessment. The survey was tested by five people from the Roundtable leadership team and/or individuals identified on the Roundtable distribution list who were known to be working on, or have worked on, ecosystem services programs within the CCE. The on-line survey was distributed to the Roundtable email distribution list of 416 people. Participants were asked to respond within one month and one reminder message was emailed to the distribution list prior to survey closure. In addition, the survey was advertised in relevant Crown newsletters (Roundtable monthly digital newsletter, Y2Y newsletter) and promoted by the leadership team.

The survey was closed at the end of June 2013, and results were exported into Excel software. All open-ended questions were imported into HyperRESEARCH 2.8.3, a qualitative research software, and were coded by Miistakis staff to identify key themes. While developing themes, Miistakis considered recommendations in the literature on how to communicate an ecosystem services approach to resonate with a broader audience (Mertz and Weigel 2010). Respondents often expressed more than one theme within an open-ended response.

A table was developed to highlight respondents who identified working on an ecosystem services program that were intentionally developed using an ecosystem services approach. These programs were assessed against the following questions:

- Has the program been developed specifically using an ecosystem services approach?
- Does the program focus on the link between human well-being and natural systems?
- Is the program focused on one of the ecosystem services outlined by the MEA?

Organizations that identified themselves as working on ecosystem services programs and seemed to fit the criteria above were contacted by email to set up an interview. The interviewees were asked for the following information:

- Program name
- Contact information
- Do you specifically identify your program as "ecosystem services" internally and externally?
- Was this your intention from the start? Why or why not?
- Does it target ecosystem services?
- Description of the program

In some cases the interviewees provided further information by email or directed the authors to resources on-line.

RESULTS AND DISCUSSION

Who participated in the survey?

A total of fifty-two people responded to the survey from a distribution list of 416, representing a 13% response rate. Results are not statistically representative of the Roundtable distribution list. The majority of responses were from Montana (67%), and the lowest representation was from British Columbia (7%). The distribution of responses (Table 1) reflects the provincial/state breakdown of the Roundtable distribution list.

Table 1: Distribution of responses based on jurisdictions at state/provincial level

Location	**% Survey Responses**	**Dist. List breakdown**
Alberta	31%	27%
British Columbia	12%	11%
Montana	67%	48%
Transboundary	6%	0
Other states	0	5%
Unknown	0	8%

The top three affiliations to respond were non-governmental organizations, university/college and federal government (Figure 1). The top three sectors represented in the responses included forestry, environment and agriculture (Figure 2). In Figure 1, the "other" category represents individual citizens with no affiliation or specific sector representation. In Figure 2, "other" represents individuals whom identified their sector as water, economics and corridors.

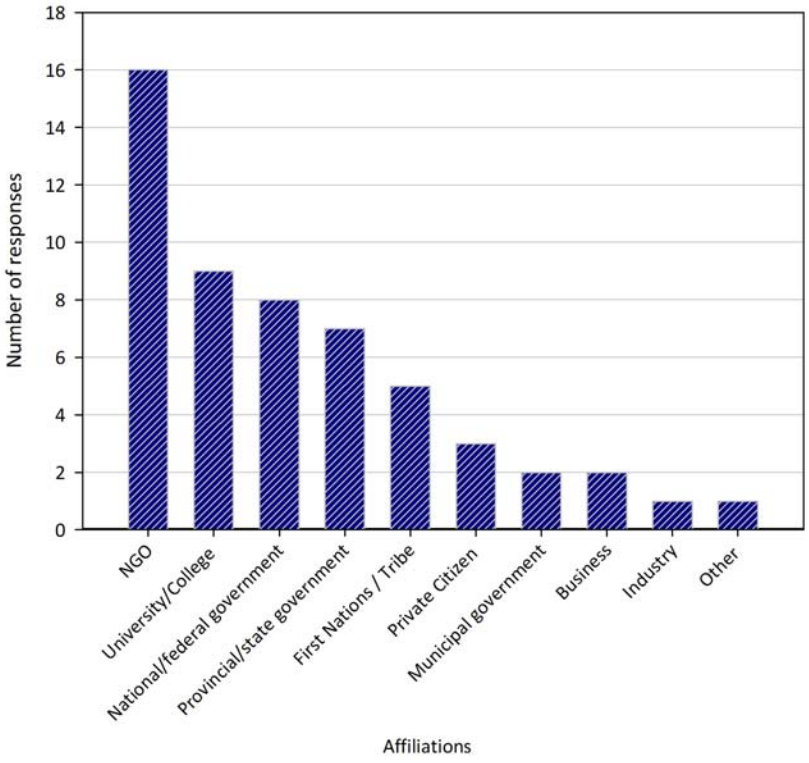

Figure 1: Affiliation of respondents

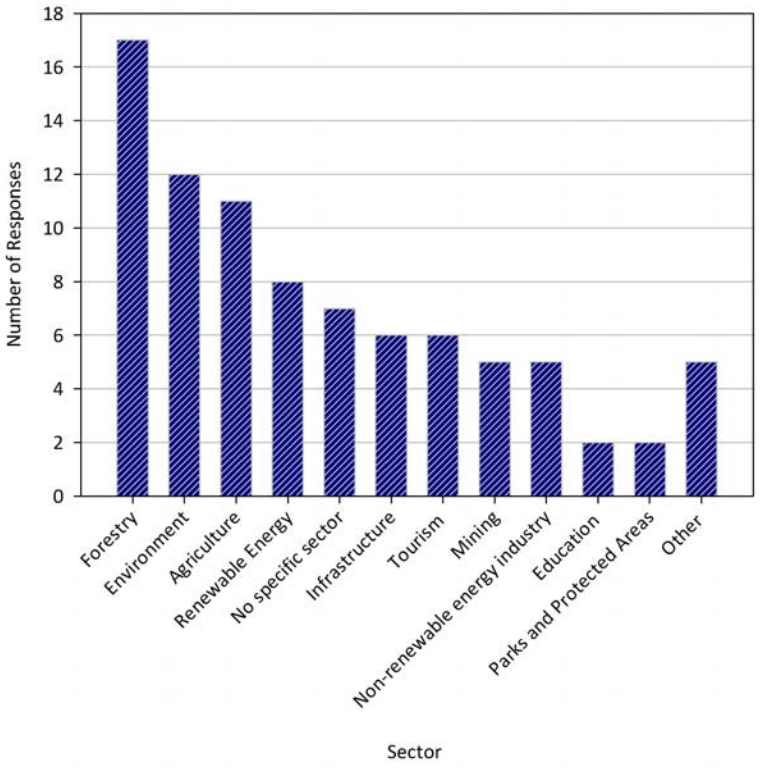

Figure 2: Sectors representation of respondents

Level of Awareness/Interest in an ES Approach in CCE

The majority of respondents (87%) identified themselves as being familiar with the concept of ecosystem services prior to taking this survey. Seventy-four percent identified an ecosystem services approach as having potential to help maintain a healthy CCE; six percent did not agree with this notion and twenty-two percent did not know if an ecosystem services approach had potential for maintaining a healthy CCE.

The respondents who identified an ecosystem services approach as having potential to help maintain a healthy CCE were asked to provide an explanation. The responses were grouped into six themes (Figure 3), which are described in more detail below.

THEME DEFINITIONS

Maintain nature's benefits: An ecosystem services approach has potential to be the driving force to maintain the CCE's natural capital including air, water, forests and other tangible benefits provided by nature such as wildlife and recreation, as well as intangible benefits such as cultural and spiritual values.

Re-frame approach: An ecosystem services approach allows for a reframing of key environmental issues to focus on the link between human well-being and nature's benefits. This reframing will resonate with a broader audience by increasing the relevance of key environmental challenges to the public and may lead to more political support to address environmental challenges.

Education and awareness: An ecosystem services approach has potential to increase public awareness of the importance of maintaining nature's benefits to human well-being.

Decision-making: An ecosystem service approach can lead to better informed decisions when there are competing demands on the ecosystem because true costs to the ecosystem can be considered.

Foundation of environmental sustainability: An ecosystem service approach is the foundation of achieving sustainable ecosystem health within the CCE as it promotes consideration of the entire system and the wise and compatible use of natural resources (such as wood products, ground and surface water, wildlife).

Economic value: It can be helpful to place an economic value (e.g., dollar value on nature's benefits, number of jobs created, green infrastructure cost savings compared to grey infrastructure) on ecosystem services to help the public and decision-makers better understand the value of maintaining nature's benefit.

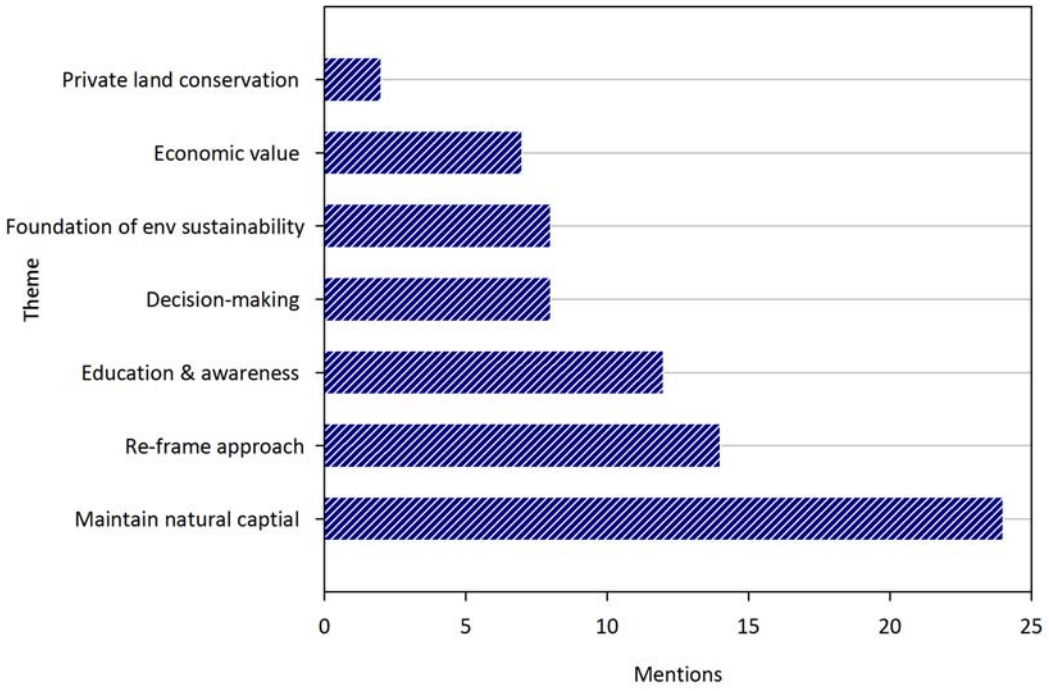

Figure 3: Frequency of themes reported for how an ES approach has potential to help maintain a healthy CCE.

The themes identified in Figure 3 are not mutually exclusive, as many participants expressed multiple themes within a single response. For example, one respondent expressed concern about the rapid and continued growth of competing land uses within the CCE and stated "in order to have a sustainable resource base and justification for decisions where there are competing demands for ecosystem uses a strong understanding of ecosystem services and its values (natural, social, economic...) is vital." This statement reflects several themes: the need for *education and awareness* about ecosystem services; the importance of an ecosystem services approach in maintaining *nature's benefits*; and the possibility of an ecosystem service approach leading to better informed and balanced land use *decisions* because information is provided in the context of biophysical, social and economic systems.

The interconnectedness of the themes, as expressed by the respondents and summarized by the authors, reflects the overall positive sentiment for the potential of an ecosystem services approach in the CCE. Respondents generally described nature's benefits as healthy water, air, wildlife and forests, as well as the more intangible benefits such as aesthetics and emotional well-being. They identified nature's benefits provided by the CCE as essential components of human well-being and that an ecosystem services approach could be used to *maintain nature's benefits*. They described *education and awareness* about ecosystem services as important for helping people understand the link between nature's benefits and a healthy ecosystem, while recognizing that within the CCE human modifications continue to grow in magnitude and extent each year. These changes continue to have an impact on nature's benefits and therefore human well-being. Striking a balance between development and conservation and protecting *nature's benefits* is the *foundation to sustaining a healthy environment*. *Re-framing conservation challenges* through an ecosystem services approach has potential to develop a broader constituency for conservation because it may resonate with more people than those already interested in conservation. It also expands the possibility for influencing *decision-making*. In some instances, placing an *economic* value on natural assets may help to promote more informed decisions around competing land use demands.

As a follow-up question, participants were asked to highlight the barriers to using an ecosystem services approach for conservation in the CCE. Only 57% of participants responded to this question. Figure 4 highlights six repeating themes extracted from the opened-ended responses.

THEME DEFINITIONS

Concept not well understood: There is a need for general ecosystem services literacy because knowledge and awareness of ecosystem services is lacking in public and decision-making spheres.

Lack of funding: In general, funds are needed to implement an ecosystem services approach including staff time to reframe programs and funds to quantify ecosystem services. In addition, barriers were explicitly identified for payment of ecosystem services programming with regard to sustainability of payment schemes, identification of who pays to maintain ecosystem services and problems calculating the value of ecosystem services.

Lack of information: There are essential data gaps in our understanding of an ecosystem services approach including accuracy and reliability of ecosystem services models, quantifying ecosystem services and understanding of thresholds where ecosystem services are degraded.

Policy: There are no known policies (i.e., regulations, planning requirements) to support implementation of an ecosystem services approach within the CCE.

Lack of capacity: Barriers to implementation of an ecosystem services approach include capacity in terms of leadership (at all levels of government), staff (in terms of understanding and numbers of people) and time.

Lack of acceptance: General acceptance of the term ecosystem services could be an issue for a broader audience. Some may find the idea of nature serving humans to be off-putting, therefore using language that resonates with people is an important consideration.

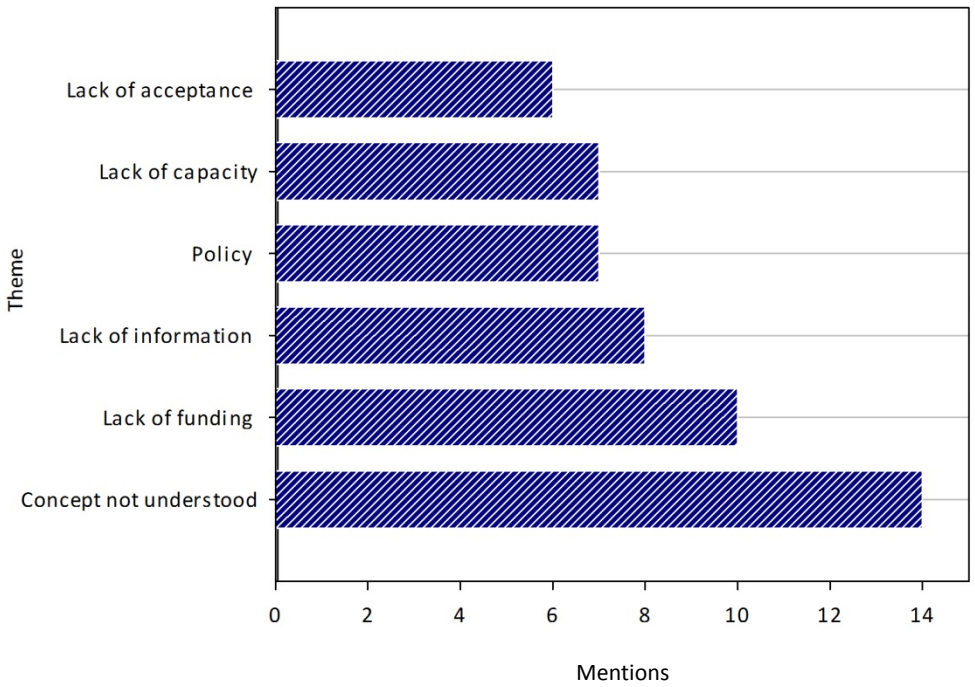

Figure 4: Frequency of themes reported for barriers to an ecosystem services approach in CCE

One of the key barriers to an ecosystem services approach identified by respondents and synthesized by the authors is that the *concept is not well understood*. A number of respondents felt ecosystem services literacy is needed within organizations operating in the CCE to better understand its potential in maintaining a healthy CCE. Some respondents also expressed the notion of a *lack of acceptance* of an ecosystem services approach: "How do you value something that is priceless?" and "Are there examples to show credibility of an ecosystem services approach in achieving conservation goals or desired outcomes?"

Furthermore, basic *information* about an ecosystem services approach is needed if they are to be integrated effectively into *policy* and decision-making. Generating the appropriate information for many ecosystem services is difficult to quantify. For example, what level (threshold) of nature's benefits is required to sustain the benefits that the CCE provides to humans? Organizational *capacity* in terms of leadership, staff, time and *funding* is also often lacking. This may result in continued use of existing data for decision-making and not the development of new data specific to ecosystem services.

Respondents felt current *policy* and regulations are not sufficient to support an ES approach, leading to insufficient incentives or viable markets. Lastly, an identified barrier is the multi-jurisdictional landscape of the CCE where there is no mandate to coordinate across political jurisdictions thus increasing complexity of an ecosystem services approach.

Respondents were also asked which ecosystem services their organizations were most interested in; seventy-five percent of participants responded to the question. Table 2 displays which ecosystem services respondents were most interested in - water (87%), recreational experiences (56%) and cultural, intellectual and spiritual inspiration (36%) were the top three.

Table 2: Ecosystem services of interest to survey respondents

Ecosystem Service (MEA)	Percent
water	87.2%
recreational experiences (including ecotourism)	56.4%
cultural, intellectual and spiritual inspiration	35.9%
energy (hydropower, biomass fuels)	30.8%
food (including game), crops and wild foods	25.6%
nutrient dispersal and cycling	23.1%
carbon sequestration and climate regulation	23.1%
pest and disease control	23.1%
scientific discovery	23.1%
primary production (bases of food chain)	17.9%
purification of water and air	17.9%
seed dispersal	7.7%
waste decomposition and detoxification	7.7%
minerals	5.1%
pharmaceuticals, bio-chemicals, and industrial products	2.6%
crop pollination	0.0%

Examples of ES Programming within the CCE

While many programs identified by respondents support or complement ecosystem services, the authors were looking for programs/projects that were considered, designed and implemented using an ecosystem services approach. This means that the purpose or objective of the program was designed to promote/understand/consider environmental activities/conservation through a human well-being lens.

Fifty-two percent of respondents reported their organizations are involved in ES programming/projects. The report authors selected 18 programs (from eleven respondents) that match the following criteria:

- the program was developed specifically using an ES approach/framework;
- the program focused on the link between human well-being and natural capital; and
- the program focused on one of the ES outlined by the MEA.

Nine of the 11 respondents (representing 15 of the programs) responded to a request to be interviewed by phone.

There were some limitations to our criteria, in particular language/definition related issues. Not everyone considers programs/projects in the same way. For some a program/project is a targeted activity with a specific start and end date. For others, it refers to all the activities they do day-to-day (e.g., delivering on their work plan or business plan).

Also related to language, some may have used ecosystem services terminology internally but not externally, or used the language around an ecosystem services approach but not explicitly identified "we

are following an ecosystem services approach." In other cases, people may not have used the language around ecosystem services at all, but fundamentally the conservation work they do is promoted as a way to benefit humans.

Based upon our criteria and interview process we summarized eight ecosystem service programs. These are described in Table 3. Two other programs/projects were investigated that were not specifically identified as using an ecosystem services approach but we believe there is a clear link between nature's benefit and human well-being. These include:

1. Crown of the Continent Book: Steve Gnam is using an artistic approach to highlight the importance of the CCE to the people who live in the area. The socio-economic benefits of the CCE's natural amenities are featured through photographs and essays. This is an education type of program/project that targets multiple ecosystem services.

2. Trails Program: Debo Powers, North Fork Landowners Association, provided a summary of an educational trails program that targets recreation. The committee provides information and resources about the trails in the area and carries out trail maintenance as a way to highlight the conservation values and increase people's appreciation of what nature provides and foster a commitment to maintaining it.

Many of the programs included in Table 3 were developed and implemented by partnering organizations. The contact person identified is the person who responded to the survey or who was named by the person who responded to the survey. There may be other people who are equally involved or informed about the program or project.

Table 3: Ecosystem services programming occurring within the CCE

Program Name	Contact Person	Identified as ecosystem service approach?	Program Type	Target Ecosystem Services	Program Description
County Payment Reform Proposal	Ray Rasker, Headwaters Economics	Yes	Economic valuation	Multiple - Measured the benefits that come from ES improvement; for example, if roads are removed, what is the value in restored wetlands and increased recreational opportunities	Federal lands in the US are tax exempt so the federal government compensates counties for this. Historically these payments have often been made for commodities, which encourage high resource use. This is one of seven proposals put forward to Congress that would see proportionally higher payments to counties with higher levels of ES on federal lands.
Darkwoods Carbon Project (on fringe of CCE area)	Nancy Newhouse, Nature Conservancy of Canada	Yes	Scientific assessment, economic valuation	Carbon sequestration	Carbon credits are sold into a voluntary market. They are accredited and validated annually through Verified Carbon Standard and Rainforest Alliance. They are currently working on another level of certification with Climate Community Biodiversity Alliance.
Whitefish Range Partnership	Michael Jamison, National Parks Conservation Association	Yes	Economic valuation, incentive based	Primary – water quality and water filtration, secondary – recreation and timber	Working with a local company whose activities complement source water protection to keep them on the landscape through conservation easement purchases.
Blackfeet Headwater Alliance	Michael Jamison, NPCA	Yes, internally	Education/ Policy	Water quantity and quality	Water protection in the area is essential as rainfall is very low. Working with local decision-makers and businesses to protect important headwaters land by increasing understanding of the impact of different land use decisions.

Program Name	Contact Person	Identified as Ecosystem Service approach?	Program Type	Target Ecosystem Services	Program Description
Forest Stewardship	Roger Marshall, Swan Ecosystem Center	Yes, internally only	Incentive based, education/ policy	Wildlife habitat, economics of region by reducing wildfire potential	Provide cost sharing opportunities for private landowners to manage their properties as healthy forests.
Wetland Restoration Program	Scott Geggeman, Swan Ecosystem Center	Yes, internally only	Incentive based, education/ policy	Wildlife habitat, water quality, water quantity	Provide matching funds to private landowners to restore wetlands.
Biomass Incentives Program	Rich Kehr, U.S. Forest Service	In some discussions but not all	Incentive based, education/ policy	Biomass utilization, wildlife habitat	Created a business opportunity for landowners to remove the fuel sources while still making use of the material. Create products like wood pellets while creating a healthier ecosystem with better fire cycles, habitat, etc.
Ecological Services Initiative	David Zehnder, Ecological Services Initiative	Yes	Incentive based	Water quality and quantity, carbon sequestration, species at risk and biodiversity	Initially developed to test a payment for ecosystem services incentive concept. Goal to broaden the conversation and expand program to have more landowners implementing or continuing practices that maintain or enhance target ecosystem services. Initial funding from all levels of government, foundations, private donors and granting agencies.
Reforming forest management on Alberta's Eastern Slopes	Katie Morrison, CPAWS, Southern Alberta	Yes	Education/ policy	Headwaters protection (water quality, quantity and natural flow regulation)	Conduct research and provide recommendations to government, industry and the public on best forest management practices for the Southern Eastern Slopes to meet economic, ecological and social objectives.

Opportunities for Roundtable to further the dialogue on ecosystem services

Survey respondents were asked if they felt the Roundtable had a role to play in advancing the ecosystem services agenda. Sixty-five percent of respondents answered the question. Figure 5 highlights five repeating themes extracted from the opened-ended responses. Many respondents identified more than one theme in their responses.

THEME DEFINITIONS

Education and awareness: The Roundtable could help increase the understanding of ecosystem services for the public, agencies and decision-makers to help build support for this approach.

Forum: The Roundtable could play a leadership role as a venue for facilitating education on the ecosystem services approach and dialogue exchange between stakeholders.

Ecosystem services information dissemination: The Roundtable could support stakeholders by distributing information relevant to ecosystem services programming in the CCE, including identifying ecosystem services tools and sharing of successful case studies.

Collaboration: The Roundtable could be an advocate for encouraging discussion, networking and coordinating programs around ecosystem services programs with all stakeholders in the CCE.

Don't know: A small number of individuals expressed that they were unsure of the role the Roundtable could play in furthering an ecosystem services approach.

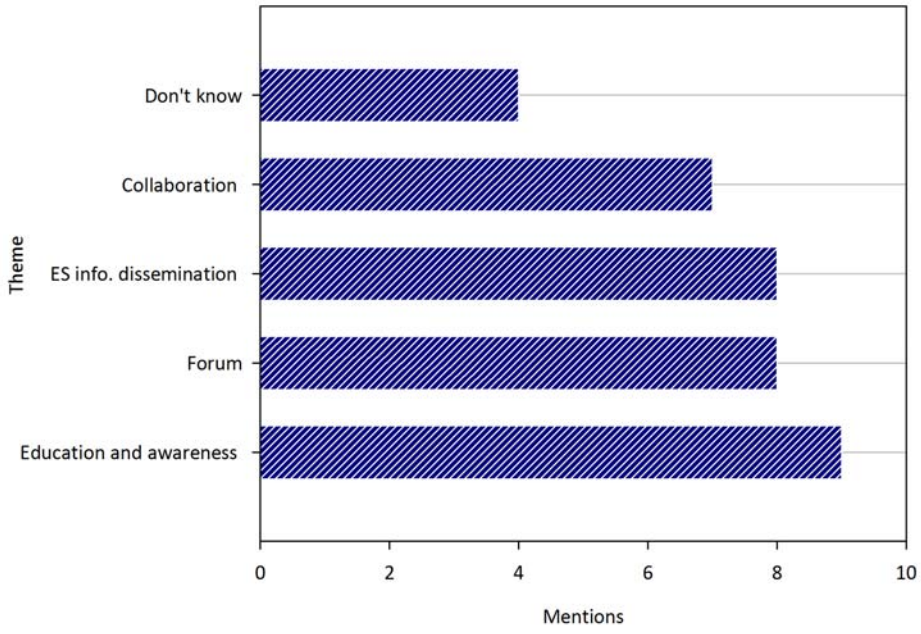

Figure 5: Frequency of themes reported as role of Roundtable in advancing the ecosystem services approach within CCE

The number one role respondents felt the Roundtable could play in advancing an ecosystem services approach in the CCE is to provide *education and awareness* aimed at the general public, agencies and decision-makers. Respondents noted the lack of awareness limits the potential of implementing an ecosystem services approach and the Roundtable could play a role in building awareness. More specifically, respondents noted *information dissemination* is needed on ecosystem services research methods and tools for understanding the link between nature's benefits and human well-being. In addition, respondents felt the Roundtable could help share successful ecosystem services case studies.

Respondents suggested the Roundtable's role in increasing *education and awareness*, *information dissemination* and sharing of success stories could occur through a *forum* setting. Through a forum setting the Roundtable could also facilitate discussion on the ecosystem services approach and ensure the conversation on ecosystem services continues.

A number of respondents felt the Roundtable would play a natural role in encouraging, facilitating and advocating for *collaboration* within the CCE around ecosystem services. As a network of networks, the Roundtable could also play a role in attracting a broader audience. A few respondents mentioned that the Roundtable could act as an enabler by facilitating research, collaboration, training and funding opportunities.

Despite the number of responses suggesting a role for the Roundtable, a few respondents *didn't know* if the Roundtable should have a role in promoting ecosystem services, because they did not understand the concept well themselves or they did not understand the Roundtable well enough to make a judgement. In addition, one individual felt strongly that there was no role for the Roundtable because they questioned the success of outcomes for an ES approach to conservation in general and the ability of this approach to enable better decisions.

KEY FINDINGS

- Most respondents are aware of the term ecosystem services (87%) and most think there is potential for an ecosystem services approach to help maintain a healthy CCE. However, a number of respondents (22%) did not know if an ecosystem services approach has potential to help maintain a healthy CCE highlighting the need for education on ecosystem services and ecosystem services approaches in general.

- Respondents identified an ecosystem services approach within the CCE as having the following benefits:
    - Maintain nature's benefits: healthy water, air, wildlife and forests as well as the more intangible benefits such as aesthetics and emotional well-being, all contribute to overall human well-being.
    - Provide education and awareness: an ecosystem services approach focuses on the link between nature's benefits and human well-being. This emphasis helps people understand the benefits of the natural systems in their daily lives, which may lead to a broader constituency of support for maintaining healthy natural systems.

- Assist in decision-making: an ecosystem services approach tends to include an assessment of all impacts on a natural system and assesses the trade-offs between different land use decisions over the long-term. An ecosystem service approach can help lead to more informed decisions regarding competing land use scenarios in the CCE.

- Respondents identified the following barriers and limitations to an ecosystem services approach in the CCE:
  - There is a need for education and awareness to improve general understanding and literacy about ecosystem services, specifically on quantifying ecosystem services and highlighting case studies where an ecosystem services approach has been used successfully.
  - There are challenges in quantifying ecosystem services (i.e., what are appropriate thresholds in terms of maintaining natural capital) which limits the use of an ES approach in decision-making and planning initiatives.
  - There are limitations around capacity, leadership, policies, staffing and funding.

- Respondents were most interested in water (87%) as an ecosystem service, with recreational experience (56%) and cultural, intellectual and spiritual inspiration (36%) rounding out the top three.

- There are a handful of ecosystem services programs occurring within the CCE. Eight ecosystem services programs implemented by seven organizations were summarized within the CCE.

- The types of ecosystem services programs within the CCE included education (general awareness and to inform policy), incentive based programs and economic valuation.

- The majority of respondents (65%) highlighted the following opportunities for the Roundtable in furthering the dialogue around ecosystem services and their role in CCE by:
  - improving general literacy around an ES approach,
  - information dissemination (sharing successful case studies), and
  - facilitating collaboration between stakeholders.

NEXT STEPS

The survey results clearly depict a role for the Roundtable to help advance the dialogue around ecosystem services in the CCE. The majority of survey respondents highlighted the value of an ecosystem services approach to enhance ecological integrity throughout the CCE but also identified the need for enhancing ecosystem services literacy. Respondents to the survey were most interested in water as an ecosystem service. We therefore suggest initially focusing ecosystem services dialogue on water-related issues in the CCE

A FOCUS ON WATER

The ecosystem services related to water include:

- Water for drinking – ground or surface
- Waste waters – storm water management, water quality
- Flood control and water supply
- Environmental flow – for recreation, fish and wildlife

The Roundtable is an ideal platform to foster dialogue and literacy around ecosystem services, as highlighted by its mission statement, "The Roundtable is an ongoing forum to connect people that care about the Crown. It is not an official commission authorized by any government agency, nor is it any single group of people. Rather, it is place where *Friends of the Crown* and others can exchange ideas, build relationships, explore opportunities to work together, and jointly shape the future of this shared landscape[i]. In addition, enhancing the dialogue on ecosystems services approaches supports the vision statement, values and principles supported by the Friends of the Crown.

We propose the following goal for the Roundtable:

The Roundtable support an ecosystem service literacy and dialogue workshop and demonstration project on ecosystem services with a focus on water by 2015.

1. Fostering Ecosystem Services Literacy and Dialogue:
   Host a workshop as a component of, or in association with, the next Roundtable annual forum with sessions focused on:
   - Education and outreach - basic literacy around ecosystem services approaches, develop common language and highlight case studies from around the globe.

   - Practice in the CCE – highlight case studies from around the CCE addressing water-related concerns that used an ecosystem services approach. In addition, map and collect details about water-related projects occurring within the CCE, discuss how they are linked and support each other and identify information gaps. Identify mechanisms to address concerns relating to information gaps around framing water concerns in an ecosystems services approach.

- Policy – highlight current laws, regulations, by-laws, policies, statements, etc. that exist to support the conservation and use of water throughout the CCE and tie into an ecosystem services approach.

2. Demonstration project – consider providing financial support for existing or new projects/programs that address concerns around water using an ecosystem services approach within the CCE. Demonstration projects can provide important knowledge to help future projects succeed.

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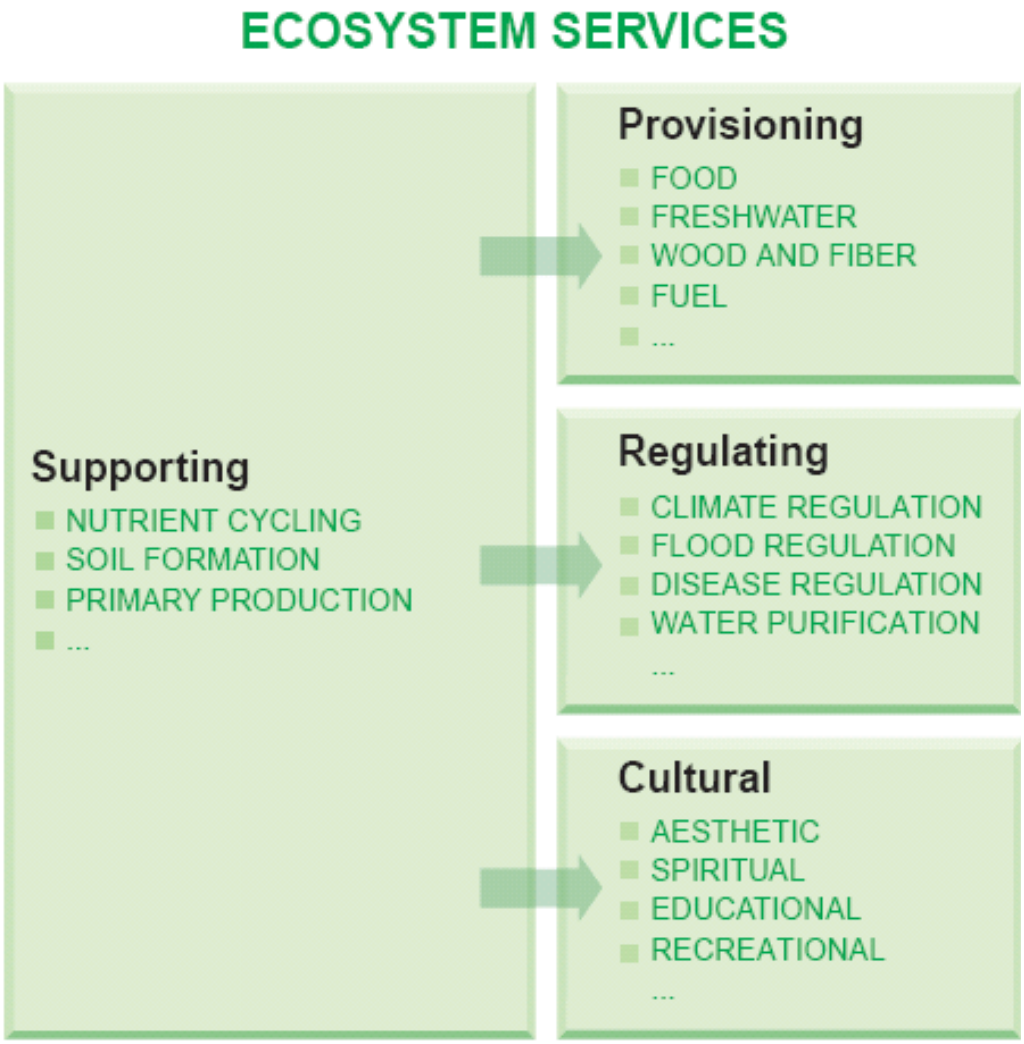
Appendix A: Millennium Ecosystem Assessment Ecosystem Services



Appendix B: Survey

Survey Introduction

The Roundtable on the Crown of the Continent (Roundtable) asked the Miistakis Institute to undertake an assessment of the current state of programs (including concepts, pilots and/or projects) relating to ecosystem services (ES) in the Crown of the Continent Ecosystem (CCE).

An ES approach allows for an examination of the connection between human well-being and services the ecosystem provides. ES is increasingly being utilized for considering the health of an ecosystem through a service oriented lens and allows for the development of integrated solutions and strategies to maintain and restore natural ecosystems for the benefit of people and nature.

The following survey begins with a short description of ecosystem services and ecosystem services-based programs, followed by a 10-15 minute survey. If you want to exit the survey and continue later, make sure you select the "next" button at bottom of the of page you are working on. This will save your responses to date. If you have any questions about the survey or how the information will be used, please contact Tracy Lee at the Miistakis Institute at tracy@rockies.ca or 403-440-8444.

Survey Context

Problem Statement: The Roundtable on the Crown of the Continent is interested in understanding what type of ecosystem services (ES) pilots, projects and/or programming is occurring within the CCE and to better understand what questions or needs people and organizations have with respect to ES.

Context Description: Natural ecosystems, like the Crown of the Continent Ecosystem (CCE), provide essential services for our communities. Forests and wetlands, for example, filter the water we drink, protect neighborhoods from floods and droughts, and shade aquatic habitat for fish populations. Native grasslands feed the food we eat (such as cattle and sheep), support insects that pollinate our crops and provide important habitat for wildlife. Projects that aim to better understand the link between natural capital (rivers, wetlands, grasslands, biodiversity, etc.) and human well-being can be placed under the umbrella of ecosystem services or be referred to as an ES program.

There are different types of ES programs, for example:

- You may be undertaking a scientific assessment of an ecosystem service, such as monitoring changes in carbon sequestration resulting from loss of native grassland.
- You may be carrying out an economic evaluation of the service provided, such as establishing a dollar value for water quality from each hectare of intact, natural forest
- You may be working to educate stakeholders and influence policy by raising awareness; supporting an education or recognition program; and/or informing a policy mechanism.

- You may be developing an incentive program to protect or maintain ES by way of creating financial instruments and/or creating market-based instruments.

Survey Questions

Demographic Questions

1. What is your affiliation?

- ☐ Municipal government
- ☐ First Nations / Tribe
- ☐ Provincial/state government
- ☐ National/federal government
- ☐ Environmental non-governmental organization
- ☐ Industry
- ☐ Business
- ☐ Academic researcher
- ☐ Other (please specify)

2. Which sectors are you most involved with?

- ☐ Agriculture
- ☐ Forestry
- ☐ Mining
- ☐ Non-renewable energy industry (e.g. oil, gas)
- ☐ Renewable Energy (e.g. wind, hydro)
- ☐ Infrastructure
- ☐ No specific sector
- ☐ Other (please specify)

3. Where do you work?

- ☐ Alberta
- ☐ British Columbia
- ☐ Montana
- ☐ Other (please specify)

4. Please share your organizations name and website link

Stakeholder Survey Questions

5. Prior to receiving this surveys were you familiar with the concept of ecosystem services?

- ☐ Yes
- ☐ No

6. Do you think there is potential for ES programming to help maintain a healthy CCE?

- ☐ Yes
- ☐ No
- ☐ Don't know

7. If yes, please explain your response.

8. Is your organization involved in any ES programs?

- ☐ Yes
- ☐ No

9. What ES does the program address?

10. What type of ES program(s) are you involved in?

- ☐ scientific assessment
- ☐ economic valuation
- ☐ education/policy
- ☐ incentive based
- ☐ Other (please specify)

11. Please briefly describe your ES program, include program title, brief description of program, if your program uses a market or incentive based programming please describe.

Ex. 1

Ex. 2

Ex. 3

Ex. 4

12. What percentage of your budget do you spend on ES programming?

- ☐ 0-24%
- ☐ 25-49%
- ☐ 50-74%
- ☐ 75-100%

13. How many years has your organization been involved in ES programming?

- ☐ 0-1 years
- ☐ 1-5 years
- ☐ 5-10 years
- ☐ >10 years

14. What is your organization's role or level of involvement in each project

- ☐ Lead
- ☐ Collaborator
- ☐ Supporter
- ☐ Other (please specify)

15. If you are ok with us following up with you, please enter your email address below.

16. Please list any ES Programs you are aware of within the CCE by other organizations (please include name of organization implementing the program and contact if possible).

Ex. 1

Ex. 2

Ex. 3

Ex. 4

17. Are there any barriers to the wider use of an ES approach to conservation in CCE? What are they?

18. Within the CCE which ecosystem services are you/your organization most interested in? (please pick top three from list below (Millennium Ecosystem Assessment, 2005)).

- ☐ nutrient dispersal and cycling
- ☐ seed dispersal
- ☐ Primary production (bases of food chain)

- ☐ food (including game), crops and wild foods
- ☐ water
- ☐ minerals
- ☐ pharmaceuticals, biochemicals, and industrial products
- ☐ energy (hydropower, biomass fuels)
- ☐ carbon sequestration and climate regulation
- ☐ waste decomposition and detoxification
- ☐ purification of water and air
- ☐ crop pollination
- ☐ pest and disease control
- ☐ cultural, intellectual and spiritual inspiration
- ☐ recreational experiences (including ecotourism)
- ☐ scientific discovery

19. What value / role should the Roundtable on the Crown of the Continent play with respect to an ecosystems approach?

Thank you, Survey completed

20. Thank you for participating in this survey, we appreciate your time. If you would like to be entered into the prize draw to win a registration at the next Roundtable on the Crown of the Continent Forum please enter your email address below.

[i] http://www.crownroundtable.org/friends-of-the-crown.html accessed September 2013.