

Alberta Ecological Goods and Services Program Scan and Recommendations For Alberta NAWMP Partnership

January 2009

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MIISTAKIS
INSTITUTE



Prepared for: Alberta North American Waterfowl Management Plan Management Committee

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ALBERTA ECOLOGICAL GOODS AND SERVICES PROGRAM SCAN AND RECOMMENDATIONS FOR ALBERTA NORTH AMERICAN WATERFOWL MANAGEMENT PLAN

INTRODUCTION

The purpose of this paper is to define ecological goods and services (EGS), to provide a review of current conservation programming by the Alberta North American Waterfowl Management Plan (NAWMP) partnership and its member organizations in the context of EGS and to provide direction to the partnership with respect to integrating current and future programming with possible provincial EGS strategies and initiatives.

NAWMP is a partnership between the American, Canadian and Mexican governments. Its goal is to return waterfowl populations to their average 1970's levels by restoring and protecting wetland and upland habitat (AB NAWMP, 2007). The Prairie Habitat Joint Venture (PHJV) plans and manages NAWMP on the Canadian Prairies, and the Alberta NAWMP partnership is responsible for the PHJV activities in the Alberta Prairie, Aspen Parkland, Peace Parkland (including BC) and Western Boreal Forest Biomes. Alberta NAWMP uses conservation programs to protect, restore, and enhance waterfowl habitat.

The core members of the Alberta NAWMP partnership are Agriculture and Agri-Food Canada, Alberta Agriculture and Rural Development, Alberta Environment, Alberta Sustainable Resource Development, Ducks Unlimited Canada (DUC), Environment Canada, and the Nature Conservancy of Canada (NCC).

WHAT ARE ECOLOGICAL GOODS AND SERVICES?

Ecological Goods and Services (EGS) are inextricably linked to Natural Capital. Natural Capital is the "stock" of ecological assets and ecosystem resources such as the land and water that surrounds us (e.g. raw materials and natural cycles) that yield EGS on a continuous basis (Ducks Unlimited, 2007; Global Footprint Network, 2008; Olewiler, 2004).

Ecological Goods and Services (EGS) are the economic and social benefits humans derive, directly and indirectly, from the natural environment or Natural Capital, such as clean air, healthy soil, biodiversity, and water quality and quantity (Constanza et al, 1997; Agriculture and Agri-Food Canada, 2006; Millennium Ecosystem Assessment, 2005).

KEY ELEMENTS OF EGS

Ecological Goods and Services as a concept is complex; the number of goods and services is high and their interactions are extensive. One of the main purposes for the discussion around EGS is to cross disciplinary boundaries and to establish a way to

include the natural environment and its interaction with human well being in everyday decisions. In an effort to simplify the concept researchers have categorized EGS (Norberg, 1999; Moberg and Folke, 1999; de Groot et al, 2002). As a result of a four-year global initiative to provide a standardized framework for assessing and valuing EGS, called the Millennium Ecosystem Assessment (2005), the following classification system is the most commonly used system today:

1. **Supporting** goods and services are those that are required for the production of all other ecosystem services.
 - a. Primary production
 - b. Soil formation
 - c. Nutrient cycling
 - d. Habitat
2. **Regulating** goods and services are the benefits obtained from the regulations of ecosystem processes.
 - a. Climate regulation
 - b. Water and air purification
 - c. Disease regulation
 - d. Erosion control
 - e. Pollination
 - f. Flood regulation
3. **Provisioning** goods and services are those products derived directly from the environment
 - a. Food and fibre
 - b. Fuel
 - c. Genetic resources
 - d. Biochemicals, natural medicines and pharmaceuticals
 - e. Ornamental resources
 - f. Water
4. **Cultural** goods and services are those non-material benefits people obtain from nature.
 - a. Education
 - b. Aesthetic
 - c. Spiritual
 - d. Recreation

THE IMPORTANCE OF EGS

The fact that our economic and social well being is intrinsically linked to the health of the ecological goods and services provided by the environment is becoming more widely realized. Unfortunately, the loss of EGS is not often included in the valuation of land use and management decisions and therefore EGS are undervalued in our current market economy. The need to more accurately value EGS is high as their loss has substantial

impacts – threatening health, food production, climate stability, and clean water (Wilson, 2008).

New York City provides the best known example of how understanding the importance of EGS provided significant economic benefit. When faced with the possibility of requiring an \$8 billion water filtration plant, New York City decided to invest \$1.8 billion in private land protection and stewardship in 80,000 acres of watershed that provide the city's water source, saving the capital costs of building a plant as well as an estimated \$300 million annually to operate the otherwise needed plant (Olewiler, 2004).

More and more attention is being paid to understanding the value of EGS to human well-being and environmental health. Over the past decade the body of literature on ecological goods services has grown enormously with researchers valuing EGS (Costanza, 1997; Wilson, 2008; Integrated Environments Inc. and O2 Planning Design, 2007b), classifying EGS (Norberg, 1999; Moberg and Folke, 1999; de Groot, 2002) and documenting EGS programs (Mayrand and Paquin 2004; Integrated Environments Inc. and O2 Planning Design, 2007a).

Large scale cooperative initiatives regarding EGS programming are happening at all levels of society. For example:

1. GLOBALLY the Millennium Ecosystem Assessment (www.maweb.org), launched in 2000, was a four-year global initiative, called for by the United Nations and designed to assess the consequences of ecosystem change for human well-being and has provided a standard for ecological assessments around the world.
2. NATIONALLY the Canadian agricultural ministers came together in 2005 to form a working group to study EGS policy for the Canadian agricultural landscape. In February 2006 a national symposium was held to investigate a national EGS framework. Subsequently eight pilot projects were funded to test different approaches to EGS programming in order to better understand policy effectiveness. A cost-benefit analysis of potential EGS programming is currently underway and a variety of policy research papers and presentations have been completed. (www.agr.gc.ca/pol/egs-bse/index_e.php?page=process)
3. PROVINCIALY the Ag Summit and Agrivantage Strategic Initiatives Committee published a document in 2005 that was the culmination of nearly four years of work related to EGS on agricultural landscapes in Alberta. More recently the government released the Land Use Framework (Alberta Government, 2008) document that identifies the need to conserve and steward private and public lands to maintain EGS. The formation of the Institute of Agriculture, Forestry and Environment to investigate the role of market based instruments (MBI) in

promoting EGS from Alberta's natural capital is further evidence of the prominence this subject is gaining.

EGS PROGRAM MODELS

EGS programming seeks to maintain or improve the production of EGS by influencing or rewarding current land management decisions.

A review of the literature (Wilson 2008; Maynard and Paquin, 2004; Barret, 2007; Integrated Environments and O2 Planning, 2007a; Institute for Agriculture, Forestry and the Environment, 2008a; Australian Government, 2008) shows two main streams of EGS program work occurring. The first stream, "Assessment" is the measure of what exists, what changes may be occurring and how much EGS are worth. The second stream, "Incentive¹", is the programs that attempt to reward or change land management decisions and behaviour. These programs may be thought of on a "stick to carrot" continuum, ranging from regulations to rewards which can include education services, recognition programs, certification programs, and a variety of financial instruments.

The following table briefly describes each program type and its potential to influence land management decisions.

¹ Something, such as the fear of punishment or the expectation of reward, which induces action or motivates effort (dictionary.com).

Table 1 Descriptions of EGS program types.

Research Stream	Program Type	Description	EGS Benefit / Landowner Interest and Influence
Assessment	Inventory	Document current or potential EGS provision by a specific landscape, watershed etc.	The most successful programs are those that have clear, measurable, defensible goals (Maynard and Paquin, 2004). Assessment work is essential to the success of maintaining or improving EGS production.
	Valuation	Attribute a dollar value to various EGS.	
	Monitoring	Document the status, condition or fluctuation of EGS production.	
Incentive	Regulation	Mandatory mechanisms (e.g. legislation, regulations, policy, by-laws) instituted by government that set limits, prevent or prescribe certain activities or practices. Examples - Water Act, Land Use Bylaws	While there may be limited support for more regulation there is recognition that regulation plays a role in influencing land management. There is generally support for more enforcement of current regulations (Agriculture and Food Council, 2008).
	Education	Information provided to land managers through workshops, one-on-one discussions, customized management plans, manuals, brochures, mail outs, news articles, etc. to increase their skills and knowledge about environmental management / stewardship. Examples – Alberta Environmental Farm Plans, Cows and Fish Program, Natural Advantage Program	72% of land managers agreed or strongly agreed that they would try various stewardship strategies if they knew more about them. Land managers want more detailed information on the cost-effectiveness of stewardship practices (Agriculture and Food Council, 2008).
	Recognition	Public or broad acknowledgement of land managers' stewardship activities often through signage, recognition ceremonies, media coverage, etc. Examples – Farmer of the Year Awards, Habitat Stewards Program, Environmental Stewardship Award	These programs can build positive public relations, local involvement and awareness towards environmental efforts (Barrett, 2007)
	Financial Instrument	A value or price is assigned to a desired environmental state or management activity; this may be done in the form of direct payments, tax incentives or tax relief. Most of these programs are funded by government or non government organizations (NGO's). Examples – payments to implement beneficial management practices; payment or tax receipt for conservation agreements; tax relief or credits encouraging environmentally sensitive practices.	There is generally support for publicly funded instruments in programs that support environmental stewardship. These programs should have clear goals, methods and approaches at their outset. (Agriculture and Food Council, 2008)

Market-based Instruments (MBI)	<p>1. Market prices (Price Based)* – Market prices can be positively or negatively changed by modifying or discovering prices for environmental goods and services.</p> <p>Examples – taxes, user charges, conservation tenders / auctions, subsidies</p>	<p>Landowners generally find these approaches attractive. (Agriculture and Food Council, 2008)</p> <p>Producers that voluntarily participate in such programs generally seek a premium price for their product. Ensuring there are consistent and defensible definitions and standards is noted as important (Agriculture and Food Council, 2008)</p>
	<p>2. Market Rights (Quantity Based)* – A market is created by setting a limit or adjusting the quantity of a product or emission. This generally increases the cost of having a negative impact on the environment. Those who are under the set limit can trade with those who are over the limit.</p> <p>Examples – carbon offset markets; cap and trade markets</p>	
	<p>3. Market Advantage (Market Friction Reductions)* – Mechanisms that influence how markets function or help create new markets. This is a broad group of MBIs that may include risk management techniques; private investment in conservation; consumer related market development.</p> <p>Examples – Transfer of development credits; eco-certification or labeling (TLC 2008, Dumont, 2008); revolving fund programs</p>	

* Two category names are given for each MBI, the first is from the Institute of Agriculture, Forestry and the Environment; the one in brackets is the name given to equivalent definitions by the Australian Government.

ALBERTA NORTH AMERICAN WATERFOWL MANAGEMENT PLAN AND ECOLOGICAL GOODS AND SERVICES

VALUING NAWMP CONSERVATION ACTIVITY

NAWMP's goal is to return waterfowl populations to their average 1970's levels by restoring and protecting wetland and upland habitat. The EGS that are produced by protecting this natural capital are significant. Constanza et al. (1997) suggests in general terms that when wetland and upland environments are in a natural, functioning state the production of the following EGS are maintained or improved:

- gas regulation,
- disturbance regulation,
- water regulation,
- water supply,
- erosion control,
- soil formation,
- waste treatment,
- pollination,
- biological control,
- habitat/refuge,
- food production,
- raw materials,
- recreation, and
- cultural resources.

The benefit to society and economic value of ensuring these EGS continue to function is also significant. Using Canada's Soil Organic Carbon Database, Wilson (2008) determined that the wetlands of the Lake Simcoe Watershed in Ontario store 5.2 million tonnes of carbon annually at a value of \$524 - \$1,302 / ha / yr. She also determined that the Lake Simcoe watershed grassland soils store 836,306 tonnes at a value of \$438 / ha / yr, over 20 years. The Lake Simcoe Watershed is 3,370 square kilometers; the wetlands cover 38,974 ha and the grasslands cover 8,353 ha. This is only a fraction of the total upland and wetland acres and the associated EGS conserved by AB NAWMP partnership. Total hectares conserved by March 31, 2007 were 676,706. In the next 25 year plan AB NAWMP is targeting another 1,048,895 ha for conservation. The societal and economic value of this conservation work is significant.

CURRENT AB NAWMP CONSERVATION PROGRAMMING AND THE RELATIONSHIP TO EGS PRODUCTION

While the production of EGS is generally not stated as a specific goal in these programs, they do achieve the protection of the EGS associated with the Natural Capital (e.g., wetland and upland habitat) being conserved. This section will describe some of the AB NAWMP programs, identifying the EGS program type and the EGS it may be influencing. It should be recognized that these programs evolve over time based on landowner feedback, uptake and available resources and therefore this is not an exhaustive list.

AB NAWMP Identified Programs

There are a variety of programs focused on Alberta NAWMP target areas.

Nine of these programs are specific to patented / privately held land and four are implemented on public land. They are each delivered using AB NAWMP funds by one or more AB NAWMP partners. Each program is described briefly below. Tables 2 and 3 identify the program type and consider the potential impact of the program on EGS production based on the conservation target (uplands, wetlands, and / or permanent cover). The list of EGS attributed to each program was compiled using the ecosystem services identified for each biome by Costanza et al. (1997) and not by any locally-specific scientific research. This exercise was simply done to illustrate the variety of potential EGS protected and promoted by each program, and is not based on specific research in the AB NAWMP target areas.

1. Patented Land Securement Options

- a. Land Purchase – Purchases are predominantly used on land where there is “at-risk” high quality wetland habitat or where wetland restoration opportunities exist. Purchase prices are determined according to an independent fair market value (FMV) appraisal based on “highest and best use” (e.g. agricultural, development potential, etc.) of the land. DUC and NCC will purchase land individually or in partnership.
- b. Conservation Easements – Perpetual conservation easements (CE) are applied in all target areas. Opportunities outside target areas are considered depending on wetland habitat, restoration opportunities and other mitigating circumstances. CE’s may be donated, paid or a combination (split receipt). The value is determined using a valuation technique called “before and after” where the CE value is equal to the difference between the value assigned to the “highest and best use” before the CE restrictions are placed on the property (e.g. development potential) and value assigned to the “highest and best use” after the restrictions are placed on the land (e.g. agricultural value). DUC and NCC will issue tax receipts for CE’s or will pay 20% of FMV on jointly delivered “no break, no drain” CE’s. On wetland restoration CE’s DUC may pay up to 100% of the CE FMV.
- c. Land Use Exchange Program – In exchange for a landowner restoring wetlands or agreeing to retain wetland habitat on his or her property, DUC will provide the landowner with upland acres at a minimum acreage ratio of 1:1. The landowner is required to enter into a conservation agreement of not less than 10 years on his or her property and follow a management plan on the upland acres.
- d. Revolving Land Purchase – This evolving approach involves the purchase of targeted properties with the intention of then selling the property with a conservation easement in place or with the condition a conservation easement will be placed on the property. DUC is currently piloting this land conservation approach. To date NCC – AB has only used this option on non-NAWMP landscapes.
- e. Wetland Conservation Agreement – DUC will provide in-kind contributions such as water systems, fencing and/or grass seed in exchange for a 10 – 30 year agreement to restore large marshes or to rebuild DUC projects.
- f. Rangeland/Pastureland Retention Program – Working with landowners who are improving their existing grazing systems DUC will cost share improvements such as fencing and

- water developments. Producers can receive \$3/acre for securing existing native upland and \$10 / acre for converting annual crop land to pasture land. Landowners commit to a 10-year conservation management agreement.
- g. Upland Forage Conversion – A landowner enters into a 10-year management agreement where DUC provides \$20 / acre of tame forage conversion and \$40 / acre of native forage conversion when wetland restoration is also occurring. When there is no wetland restoration DUC will provide \$10 / acre for tame forage conservation. Land managers participating in an Upland Forage Conversion are also eligible for the Proven Seeds Forage Incentive Program.
 - h. Proven Seeds Forage Incentive Program – DUC in partnership with Proven Seeds offers a 25% discount on Ecovars, native and tame grass seed. DUC offers agronomic technical support as required. Proven Seeds offers a guarantee which covers 100% of the seed cost of re-planting proprietary varieties that fail to establish due to extreme conditions such as weather thus reducing the risk of establishment.
 - i. Winter Cereals Extension Program – DUC will provide agronomic support, marketing information and in some cases economic assistance to agricultural producers in support of increasing winter wheat acres across the prairies. Winter wheat provides nesting habitat to waterfowl in the spring and early summer when spring seeded cropland is being worked.

Table 2 Classification of AB NAWMP private land programs

Program	EGS Program Type*	Potential EGS promoted**
Land Purchase	FI	GR, DR, WR, WS, EC, SF, WT, P, BC, H/R, FP, RM, R, CR
Conservation Easements	FI; could also be MBI – PB with some adjustment	GR, DR, WR, WS, EC, SF, WT, P, BC, H/R, FP, RM, R, CR
Land Use Exchange	FI	GR, DR, WR, WS, WT, H/R, FP, RM, R, CR
Revolving Land Purchase	MBI – MA	GR, DR, WR, WS, EC, SF, WT, P, BC, H/R, FP, RM, R, CR
Wetland Conservation Agreement	1. Education 2. FI	GR, DR, WR, WS, WT, H/R, FP, RM, R, CR
Rangeland/Pastureland Retention Program	1. Education 2. FI	GR, WR, EC, SF, WT, P, BC, FP, R
Upland Forage Conversion	1. Education 2. FI	GR, SF, H/R, EC
Proven Seed Forage Incentive Program	1. Education 2. FI	GR, SF, H/R, EC
Winter Cereals Extension Program	1. Education	GR, WR, EC, FP

* FI – Financial Instruments; MBI – PB – Market-based Instrument – Price-based; MBI – MA – Market-based Instrument – Market Advantage

**GR - gas regulation; DR - disturbance regulation; WR - water regulation; WS - water supply; EC - erosion control; SF - soil formation; WT - waste treatment; P – pollination; BC - biological control; H/R - habitat/refuge; FP - food production; RM - raw materials; R – recreation; CR - cultural resources (Extrapolated from Table 2 in Costanza et al. 1997)

2. Public Land Securement Options

- a. NAWMP Protective Notations (PNT) – On public land identified as important to achieve NAWMP goals, Alberta Fish and Wildlife Division of Alberta Sustainable Resource Development (SRD) places a PNT that is recorded in the public lands registry. Once the PNT is in place, Alberta Fish and Wildlife must be notified and provide prior consent to any development or land use change request.
- b. License of Occupation (LOC) – LOC’s grant DUC specific occupation privileges when DUC has invested in certain land management infrastructure (e.g. water control structures, fencing) on public lands. LOC’s are registered in the public lands registry by SRD.
- c. Public Land Grazing Program – DUC will provide technical and financial support to SRD to develop rangeland inventories, management plans and rangeland enhancements in exchange for a minimum 10 year Conservation / Management Agreement with the lessee and the Public Lands Rangeland Agrologist, an LOC or NAWMP PNT on wetlands, and a 10 year NAWMP PNT on all uplands.
- d. Alberta Key Wetland Retention Program – DUC / AB NAWMP have identified key wetlands for breeding, staging and molting in Alberta on Crown land. Using the above tools DUC is targeting the protection of these wetlands and the enhancement of shorelines as required and in combination with other tools.

Table 3 Classification of AB NAWMP public land programs

Program	EGS Program Type*	Potential EGS promoted**
NAWMP PNT	Regulation	GR, DR, WR, WS, EC, SF, WT, P, BC, H/R, FP, RM, R, CR
LOC	Regulation	GR, DR, WR, WS, EC, SF, WT, P, BC, H/R, FP, RM, R, CR
Public Land Grazing Program	1. Education 2. FI	GR, WR, EC, SF, WT, P, BC, FP, R
Alberta Key Wetland Retention Program	Inventory	GR, DR, WR, WS, WT, H/R, FP, RM, R, CR

* * FI – Financial Instruments

**GR - gas regulation; DR - disturbance regulation; WR - water regulation; WS - water supply; EC - erosion control; SF - soil formation; WT - waste treatment; P – pollination; BC - biological control; H/R - habitat/refuge; FP - food production; RM - raw materials; R – recreation; CR - cultural resources (Extrapolated from Table 2 in Costanza et al. 1997)

AB NAWMP Partner Programs and Activities

Each AB NAWMP partner organization is also involved in various programming that aims to conserve, protect or improve Alberta’s Natural Capital (and therefore associated EGS) that are not identified as AB NAWMP projects and are not funded by AB NAWMP. Below is a list of some program examples delivered by some of the AB NAWMP partners that are identified as EGS programs or highlight EGS elements in their descriptions. Table 3 provides a classification of the EGS program type as well as the potential EGS promoted by the program. It should be recognized that these programs may change over time and therefore this is not an exhaustive list.

1. Agriculture and Agri-Food Canada (both programs are in transition to the new Growing Forward policy replacement for the Agricultural Policy Framework; some details may change.)
 - a. National Farm Stewardship Program (with the Agricultural Policy Framework) provided funding for Environmental Farm Plans to improve the environmental performance of Canadian Farm Operations (Rae, 2007).
 - b. Greencover Canada offers assistance in grassland management, water quality protection, greenhouse gas emission reduction, and biodiversity and habitat enhancement efforts to agricultural producers.
2. Alberta Environment
 - a. EGS Assessment Framework – The Government of Alberta is developing and implementing a system to manage the cumulative effects of development. Cumulative effects management will include an Ecosystem Goods and Services Assessment Framework² to assess the benefits we derive, directly or indirectly, from the functions of our ecosystem. The Government of Alberta, lead by Alberta Environment, is currently drafting this framework to help identify the priority ecosystem goods and services on a regional basis. Subsequent steps in the framework are: 1) evaluate the condition of the natural assets (ie: forests) that are providing services, 2) determine if an economic value of the services is required, and 3) identify alternative future scenarios to help evaluate tradeoffs between different services. The resulting EGS assessment serves as an input into decision making as it builds linkages between ecosystems goods and services and Albertans' quality of life. (Meghan Ellis, pers. comm.)
 - b. Environmental Tools Guide website – This is a website that is designed to introduce, and help in the choice of the most appropriate tool(s) to achieve specific environmental outcome(s) in Alberta. It is expected to be used as a resource for policy makers and to encourage a greater understanding of the range of tools available. The guide is scheduled to be updated semi-annually (Alberta Environment, 2008).
3. Alberta Environment / Alberta Agriculture and Rural Development
 - a. Carbon Offset Market – Through the *Climate Change and Emissions Management Amendment Act*, Alberta is the first jurisdiction in North America with legislation to reduce Greenhouse Gas (GHG) emissions through the regulation of large final emitters (i.e., facilities that produce greater than 100,000 tonnes of carbon dioxide equivalence (CO₂e) per year). As a result regulated facilities must reduce their emission intensity by 12% annually until the end of 2014, based on an average of the facility's 2003 to 2005 emissions intensity baseline (Alberta Agriculture and Rural Development, 2008). There are three methods of reduction listed under the legislation:
 - i. Emission Performance Credits – through facility upgrades, new technology etc.;
 - ii. Pay \$15/tonne CO₂e into a Climate Change and Emission Management Fund – to develop or invest in technologies, programs and other priority areas; or

² Alberta Environment's Ecosystem Goods and Services assessment framework is based on the work of the World Resources Institute. 2008. Ecosystem Services: A Guideline for Decision Makers.

- iii. Purchase Alberta-made carbon offset credits.

Carbon offset transactions in Alberta must meet the standards outlined in the Alberta quantification protocols and must be registered on the Alberta Emission Offset Registry (Alberta Government and Climate Change Central, 2008).

Currently there are 23 protocols approved in Alberta, with 17 more potential protocols being investigated. These protocols are intended to provide quality assurance for the market and standardization for an intangible commodity. Each protocol is designed and reviewed against the International Standards Organization (ISO) 14064-2 GHG quantifying, monitoring and reporting emission reductions and removals standard.

4. Ducks Unlimited Canada

- a. Natural Advantage Program - *Natural Advantage: the On-Farm Wildlife and Biodiversity Planning Service* is a program to help producers build a comprehensive plan for their habitat resources where trained DUC biologists identify, map and classify wildlife habitat on a farm or ranch. Producers receive a personalized plan for conservation and improvement on their property. The goal of the program is that producers gain a broader understanding of the connection between effective habitat management and successful, sustainable farming and quality of life benefits. (Ducks Unlimited Canada, 2008)
- b. Wetland Carbon Credit protocol drafting – Working with Climate Change Central, DUC has successfully completed Phase 1 which involved assessing the scientific body of wetland carbon research to determine if sufficient information exists to develop a carbon protocol. In Phase 2, Climate Change Central and AB NAWMP Policy Subcommittee will use this information and follow ISO 14064-2 GHG standards to draft a carbon protocol for wetland protection and restoration for exchange through the Alberta Carbon Offset Market.

5. Nature Conservancy of Canada

- a. Natural Area Conservation Plans – Natural Area Conservation Plans (NACP) identify specific areas where NCC will focus its work and the key actions (e.g. land securement, extension work, partnerships) necessary to conserve the biodiversity targets found within the natural area. A recently completed NACP, Berry Creek Plain, has considerable overlap with AB NAWMP landscapes in the east-central portion of the province.
- b. Beneficial Management Practices – NCC in Alberta works on a variety of landscapes. Some of these landscapes evolved under grazing and many of these landscapes currently have oil and gas exploration occurring on them. In response to these activities NCC has developed Beneficial Management Practices to ensure range management on NCC lands is complementary to the biodiversity targets identified for those lands and that the impact of oil and gas activities on biodiversity targets is minimized wherever possible.

Table 3 Classification of partner programs

Program	EGS Program Type*	Potential EGS promoted**
National Farm Stewardship Program	1. Education 2. FI	Variable - depending on landscape and activity
Greencover Canada	1. Education 2. FI	Variable - depending on landscape and activity
EGS Assessment Tool	1. Inventory 2. Valuation	Variable - depending on landscape and activity
Environmental Tools Guide	Education	Variable - depending on landscape and activity
Carbon Offset Market ***	MBI – QB	GR, CLR, SF, EC
Natural Advantage Program	Education	GR, DR, WR, WS, EC, SF, WT, P, BC, H/R, FP, RM, R, CR
Wetland Carbon Credit protocol drafting	Assessment	GR, CLR, DR, WR, WS, WT, H/R, FP, RM, R, CR
Natural Area Conservation Plans	Inventory	GR, DR, WR, WS, EC, SF, WT, P, BC, H/R, FP, RM, R, CR
Beneficial Management Practices	Education	GR, WR, EC, SF, WT, P, BC, FP, R

* FI – Financial Instruments ; MBI – QB – Market Based Instruments – Quantity Based

**GR - gas regulation; CLR – Climate regulation; DR - disturbance regulation; WR - water regulation; WS - water supply; EC - erosion control; SF - soil formation; WT - waste treatment; P – pollination; BC - biological control; H/R - habitat/refuge; FP - food production; RM - raw materials; R – recreation; CR - cultural resources (Extrapolated from Table 2 in Costanza et al. 1997)

***No biome identifiable to assess potential EGS against; potential EGS assumed based on agricultural protocols (e.g. direct seeding)

OTHER EXAMPLES OF EGS IDENTIFIED PROGRAMMING AND ACTIVITIES

Below are two Alberta examples of EGS inventory work that has taken place or is planned that is not related to NAWMP. While there may be some AB NAWMP partners involved in the projects they are not the main organization.

1. Ecosystem Goods and Services Assessment – Southern Alberta Landscapes (SAL) was carried out on behalf of Alberta Environment. The assessment area included the Alberta portions of the South Saskatchewan River Basin, the Grassland Natural Region and the Cypress Hills. Phase 1 was a survey and report on EGS initiatives in Southern Alberta. Phase 2 provided an assessment and ranking of their relative importance for 20 ecosystem services in southern Alberta. A series of models were created to illustrate changes in ecosystem services based on changes in land use and recommendations made about further work required (Integrated Environments and O2 Planning and Design, 2007a, 2007b).
2. Prairie / Parkland Ecosystem Goods and Services Valuation Project is a project initiated by The Prairie Conservation Forum (PCF). Phase 1 of the project has been completed and included the design of a strategic approach to conduct a small-scale ecosystem goods and services valuation project. The project enables an integrated understanding of economic, social and ecological values on the landscape. Stakeholder input, insights and considerations into the design and implementation of the project are incorporated through a stakeholder workshop.

The PCF is in the process of looking for funding and support to complete the subsequent phases of the Prairie/Parkland Ecosystem Goods and Services Valuation Project. The project's purpose is to support the conservation of biodiversity within the prairie and parkland regions of Alberta by increasing the understanding of EGS and their value among local landowners and resource-/land-use decision-makers by developing and testing resource-/land-use decision- support tools that help account for these goods and services. The project will identify and describe EGS at local scales relative to their contribution to social, cultural and economic values, as well as the factors that contribute to the provision of these EGS. The project will also increase awareness and understanding among local stakeholders of EGS, their value and factors of influence on the prairie and parkland landscapes (Harriot, pers. comm.).

MARKET FACTORS AFFECTING EGS

Most EGS are not recognized or are undervalued by traditional markets (Wilson, 2008; Olewiler, 2004). Landowners, particularly agricultural landowners, for practical reasons tend to focus land management decisions on activities that provide an economic return; unfortunately these decisions may not always provide the best environmental return (Jack et al, 2008). Financial incentives and market-based instruments are designed to allow landowners a business choice for EGS producing decisions by allowing them the ability to realize an economic return when maintaining or improving natural capital and the associated EGS.

While there are certainly positive results from MBI programs, MBIs are not the silver bullet to ensure all EGS production is increased or even maintained. According to Australian research (Department of Sustainability and Environment, 2008), MBI's are more likely to be successful when:

- there is variability in the ability of participants to provide the desired outcomes
- there is flexibility in how the desired outcomes can be delivered
- regulatory approaches are difficult to design, implement and administer

Incentive programs that support positive land use management in favour of EGS production are most likely to be supported by multiple stakeholders and therefore be successful, particularly in the case of MBI programs, when:

- 1) EGS targets have been inventoried and valued and the payments are reflective of that value,
- 2) Specific targets have been identified and goals can be monitored and evaluated,
- 3) There is a temporal requirement / commitment on the part of the land owner,
- 4) Contracts and payments are flexible, on-going and open ended,
- 5) The programs are flexible enough that they allow for improvements as more information is gathered and conditions change, and
- 6) Transaction costs do not exceed potential benefits.

(Barrett 2007; Maynard and Paquin 2004)

DISCUSSION

POTENTIAL PROGRAMMING GAPS AND OPPORTUNITIES

The main factors of success in EGS programming is a solid understanding that the current EGS being produced including the environmental, economic, social and cultural values of those EGS; the impact of various land use activities on the EGS; actions required to mitigate impacts; and a description of conservation actions required. To gain this understanding a thorough EGS assessment at an ecoregional level is required. EGS assessments should be designed using a standard methodology (e.g., EGS Assessment Tool described in AB NAWMP Partner Programs and Activities) where the results can be used by a variety of stakeholders – e.g., municipal, regional and provincial planners and decision makers, conservation organizations, industry, land developers, landowners and land managers.

This assessment work has started in the southern regions of Alberta through efforts like the Southern Alberta Landscape Ecosystem Goods and Services Assessment and the Prairie / Parkland Ecosystem Goods and Services Valuation Project.

Some Alberta NAWMP partners are currently engaged in some level of assessment programs and activities. AB NAWMP should support the creation of a provincial EGS assessment tool that can be broadly applied. Once EGS assessments are complete, conservation tools that are appropriate to achieve the conservation goals can be applied. In some cases new tools may need to be developed. It should be noted that while current AB NAWMP programs support the conservation of some EGS, the programs are not technically EGS programs. There is a great opportunity for AB NAWMP to pilot the Alberta Environment EGS Assessment Tool. This would provide the ability for AB NAWMP to understand and measure the influence of the programs on EGS production and conservation.

All current AB NAWMP programming and activities related to EGS could be classified as Financial Instruments. The amount currently paid through Financial Instruments are based on either fair market land values (e.g., a land purchase or conservation easement) or the cost of implementing an action (e.g., sharing the cost of a solar pump) not on the actual value of the EGS or using a market to influence decisions. The results of an EGS assessment that assign an appropriate value to the economic, social or cultural benefits of the EGS produced could attributed more realistic values be to the efforts required to produce necessary EGS allowing the application of more MBI tools including Market Prices, Market Rights, and Market Advantage.

Most, if not all of the AB NAWMP programs have an educational component, with two programs being formally identified as such. All of these programs could be enhanced and potentially have greater impact if they were tied into a broader EGS assessment. That assessment should include the goals of protecting upland and wetland waterfowl habitat, and provide information about the costs and benefits of certain land management options.

Non governmental organizations generally have a good reputation with farming and non-farming constituents (Environics Research Group, 2003) and so there could be an opportunity to add

labeling/certification (see MBI, MA example, above) and recognition programming to AB NAWMP programs.

AB NAWMP, particularly the Policy Subcommittee, is in an excellent position to assist Alberta Environment with the semi-annual update of the Environmental Tools Guide. AB NAWMP and its partners are regularly considering, and often applying, different tools to influence environmental management, and Alberta Environment is a partner in AB NAWMP.

INTEGRATING AB NAWMP PROGRAMMING INTO BROADER EGS INITIATIVES

Interest in EGS and related programming to encourage the production of EGS is rapidly increasing; so much so that in January 2008 the Alberta Government created the Institute for Agriculture, Forestry and the Environment (IAFE). The main objective of the IAFE is to adapt or create market based approaches that make environmental stewardship actions by forest companies, farmers and ranchers profitable choices. It is intended that through these efforts Alberta's renewable resource industries would become more innovative and competitive in the market place by being environmentally-friendly (Institute for Agriculture, Forestry and the Environment, 2008b).

While the IAFE is focused on the instruments to help promote and encourage environmentally sound practices, Alberta Environment continues to work on the very complimentary EGS Assessment tool to help identify and value EGS.

Alberta's Natural Capital, and therefore its associated EGS products, are broader than AB NAWMP's goals. However by protecting natural upland and wetland waterfowl habitat the AB NAWMP is concomitantly conserving EGS in the AB NAWMP delivery area. AB NAWMP is a long term and successful example of how specific types of programming can positively influence the production of EGS in Alberta. These successes and future plans should be adopted into a broader EGS vision for the province.

AB NAWMP is in a good position through its partners, and as an entity in its own right, to participate in a broader Alberta environmental vision and how that vision can be accomplished in part using EGS language and programs. AB NAWMP and its partners have provided input into the Alberta EGS conversation at least since the Ag-Summit process and more recently by providing input to the Land Use Framework and the Institute of Agriculture, Forestry and the Environment. AB NAWMP should continue to participate in these initiatives. At the same time it should also be recognized that the EGS topic in Alberta is a dynamic one where more and more interest and activity is occurring. AB NAWMP and its partners contribute to the EGS story through their activities and programs. A more formal involvement in the EGS conversation and activities could be achieved through the formation of an EGS Group within the Policy Subcommittee with participation from the Science Subcommittee of AB NAWMP.

As a direct application of the EGS concept, AB NAWMP could provide support and possibly lead a pilot with guidance from Alberta Environment to apply the EGS Assessment Tool, and in consultation with the Land Use Secretariat (a group in SRD to support the roll out of the Land Use Framework) and IAFE to design and implement specific EGS targeted programming especially those related to NAWMP specific

goals with the North Saskatchewan Watershed Alliance (NSWA). NSWA has already begun the Vermillion River Assessment with support from AB NAWMP.

CONCLUSION

AB NAWMP's primary goal of returning waterfowl to 1970 levels has the added benefit of also protecting and / or improving the EGS produced by the Natural Capital of upland and wetland habitats. There is an opportunity for AB NAWMP to highlight the current contributions to EGS production of their current programs. There is also an opportunity for AB NAWMP to participate more formally in EGS discussions, pilots and implementation of various EGS initiatives. This formal role could occur as a working group created from members of the Policy and Science Subcommittees. This working group would be tasked with supporting the development, testing and implementation of a standard and broad scale EGS assessment method, as well keeping track of EGS initiatives throughout the province, directing AB NAWMP EGS efforts and identifying collaboration opportunities for AB NAWMP and / or individual partners where appropriate.

AB NAWMP is a program that protects and restores the production of EGS through the conservation and restoration of natural capital for which there is a benefit to all. AB NAWMP and its members provide a number of current examples of programs that benefit EGS production. Assessment activities that improve the understanding of the value of EGS can have a significant positive impact on the inclusion of environmental factors in decision making at all levels. AB NAWMP should be at the table to influence a broad scale EGS effort in Alberta and could potentially be a delivery agent for programming specific to upland and wetland habitat.

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