

SOUTHERN ALBERTA LAND TRUST SOCIETY & MANNING CENTRE FOR BUILDING DEMOCRACY

The Foothills Project

A MARKET-BASED CONSERVATION EASEMENT OPTION

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The Foothills Market-Based Conservation Project is a proposal to investigate the feasibility of using a market-based variation on an existing mechanism, the conservation easement, to protect the ecological value, and thus watershed value, of privately held land in the foothills area of Alberta.

Executive Summary

In 2007, the Southern Alberta Land Trust Society agreed to partner with the Manning Centre for Building Democracy to examine ways of harnessing the power and ingenuity of the entrepreneur and the free market to the cause of conservation. From this partnership the Foothills Project was born.

The Foothills Project is a proposal to incorporate market-based instruments into a variation of the existing conservation easement mechanism with the purpose of attracting a wider audience and thus potentially protecting a much larger and contiguous habitat and watershed landscape. Essentially, the Foothills Project is exploring innovative market-based methods to create additional effective options for the current conservation easement system.

At the core of this proposal is the intent to overcome what some landowners see as barriers within the current conservation easement system and create an easement option that is attractive to a wider base of potential clients. This proposal is not meant to replace the existing conservation easement, but rather add another dimension or option to its arsenal to broaden conservation efforts. The key modified elements of the proposed conservation easement option are as follows:

1. Rather than a single up-front payment and/or charitable tax receipt, provide annual payments for appropriate management practices which promote environmental stewardship and result in improved production of Ecological Goods and Services (EG&S);
2. Utilize a High Conservation Value analysis, Request for Proposal, and bid system to effectively price these EG&S and management practices; and
3. Modify the current perpetuity-term contract to a fixed-term contract, e.g., 50 to 99 years.

It is believed that such a market-based easement option would have many benefits, for example:

- Brings market discipline into the valuation and provision of EG&S on private land;
- Operates effectively with other planning tools such as Transfer of Development Credits;
- Appeals to a much greater participating audience of landowners;
- Assists in agricultural succession planning; and
- Protects a larger and contiguous habitat and watershed landscape.

In order to examine the feasibility of the proposed market-based conservation easement option and to explore the merit of moving forward with a pilot study, a consultation process was engaged with key stakeholders, e.g., government, researchers, industry, agriculture, economists, academics, non-government organizations and various landowners.

At this stage of the Foothills Project, the preliminary findings are supportive of the proposed market-based conservation easement option. The general feedback to date has indicated that innovative methods are needed to extend current conservation efforts in Alberta, especially in the case of private land, and that the proposed concept has potential and should be further investigated.

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1 Introduction

Water is the life-blood of our world. It defines our health, our economy, and our standard of living. Traditionally, North Americans have had abundant access to clean water from watersheds and aquifers, but often without consideration of how that water is captured and stored. In a watershed, both the quality and quantity of water is a direct function of the quality of the landscape where it is captured and through which it flows. While governments can directly control the factors that affect water supply on public land, this is not always the case on private land. Thus, given ever-increasing demands, our society needs innovative and effective mechanisms to better protect our valuable sources of water – our watersheds – especially in cases where the land may be privately owned.

As a public good, water is a highly valued resource. However, when public goods are held on private land, the best interests of society may not factor into the landowner's land use plans. For example, to a landowner it may be more economically valuable to fill in a wetland to increase agricultural production. Conversely, to society, the wetland has more value in its natural state for the purpose of both holding and filtering water. Unfortunately, this type of situation is relatively common and creates a major barrier to conservation efforts.

To bridge this value gap, many governments are turning to market-based mechanisms as a means to satisfy the interests of both parties (See Section 5: Appendix - Research). Rather than relying on added regulation or direct subsidies, incentives are being employed to influence land use practices. For example, a popular market-based mechanism is to provide landowners with annual payments for protecting the sources of ecological goods and services (EG&S). In this model, landowners are provided fair compensation to preserve key public goods. It is a win-win situation that enables both parties to meet their objectives and, at the same time, share the cost and responsibility of supplying these public goods.

Unfortunately, Alberta is not immune to the aforementioned problem. However, steps are now being taken to ameliorate its effects. The provincial government, in its recently released Draft Land-use Framework (LUF), has recognized both this public/private land use issue and, also, the need "to facilitate new stewardship opportunities and strategies to protect and enhance the environment" (Government of Alberta, 2008, p. 19). Through the LUF, the Government of Alberta plans to "identify and develop new best practices, tools, market-based approaches and incentives to provide ecological goods and services" (p. 19). Furthermore, the LUF has acknowledged that the burden of supplying EG&S on private land should not be the sole responsibility of landowners and that "market-based incentives and tools can provide a way for private landowners to receive some monetary benefits for the ecological goods and services their lands provide" (p. 20). We believe that the Foothills Project is a practical and creative solution that fits within this mandate.

1.1 The Foothills Project

In 2007, the Southern Alberta Land Trust Society agreed to partner with the Manning Centre for Building Democracy in examining ways of harnessing the power and ingenuity of the entrepreneur and the free market to the cause of conservation. A consultation in October of 2007 brought together business people, government representatives, academics, and other stakeholders to discuss the topic and provide ideas for possible strategies and future pilot projects. With the resulting information in hand, the two main proponents, Preston Manning and Alan Gardner, developed two possible pilot concepts: the Athabasca Project and the Foothills Project.

The Athabasca Project is a proposal to incorporate an entity to manage a river system based on the very successful Alberta Gas Trunk Line model. The Athabasca Project proposal is the subject of a separate report.

The Foothills Project is a proposal to incorporate market-based instruments into a variation of the existing conservation easement mechanism with the purpose of attracting a wider audience and thus potentially protecting a much larger and contiguous habitat and watershed landscape.

1.1.1 Overview

The main objective of the Foothills Project is to investigate the feasibility of using a market-based variation on an existing mechanism, the conservation easement, to protect the ecological value, and thus watershed value, of privately held land in the foothills area of Alberta. The Foothills Project recognizes the tension that can exist between public vs. private interests. In an effort to resolve this tension and extend conservation efforts, the project is proposing to harness the power and flexibility of the market to create a win-win situation for society, the landowner, and the environment.

This is not a revolutionary idea, but rather a method of using a set of tested techniques combined in a slightly different way. The elements necessary to make this market-based concept work are either in operation now or have been the subject of experimentation in other jurisdictions (See Section 5: Appendix - Research).

At the heart of this concept is the conservation easement. The conservation easement has been both accepted and practiced in Alberta for over a decade. Enabling legislation exists at the provincial and federal levels, and a federal tax receipt can be issued to a conservation easement donor under the federal ecological gift program. While this system has been successful at protecting hundreds of thousands of acres in total, the scale of individual conservation efforts has usually been limited to smaller key ecological areas such as riparian zones and habitat for specialized species. Furthermore, the current conservation easement system has generally been limited in its ability to pull in large areas of high conservation value due to the difficulty of attracting large numbers of participants.

It is important to point out that this proposal is **not meant to replace the existing uses and protocols of the standard conservation easement**, but rather to provide an additional variation or option in order to attract a larger participating audience. The primary elements of a standard conservation easement are:

- A set of conditions and restrictions placed on the future use of a property based on environmental stewardship, which typically restricts such things as subdivision, draining of wetlands, clear-cut forestry, cultivation of native grass, and building of access roads & infrastructure;
- A long-term agreement (perpetuity) between the landowner and a Land Trust based on the conditions and restrictions of the easement;
- No restriction on landowner's ability to sell the land. If the land is sold, the easement remains on the land;
- Ongoing annual monitoring and responsibility of a Land Trust to ensure the conditions of the easement are maintained; and
- Compensation to the landowner for the easement, i.e., a one-time tax receipt and/or payment.

By comparison, the essential elements of the proposed market-based easement option are as follows:

- A set of conditions and restrictions similar to the standard conservation easement (described above) with the possible addition of further requirements to increase the incentive for improved stewardship;
- A long-term agreement between the landowner and a Land Trust based on the conditions and restrictions of the easement, but not in perpetuity. Such an agreement would likely have a term of 50 to 99 years;
- No restriction on landowner's ability to sell the land. If the land is sold, the easement remains on the land;
- Ongoing annual monitoring and responsibility of a Land Trust to ensure the conditions of the easement are maintained; and
- Compensation to the landowner for maintaining the conditions of the easement, but payment would be made annually based on the results of the monitoring.

This proposal keeps the essential elements of the existing conservation easement but brings it into a market-based structure. We feel that the added elements will produce an effective conservation easement option which overcomes existing barriers and captures new opportunities for environmental stewardship.

1.1.2 Advantages

A significant advantage of this market-based approach is that it avoids rigorous government regulation and direct subsidies. Other advantages of the proposed conservation easement option are as follows:

- Utilizes existing techniques and instruments – easy to implement;
- Brings market discipline into the valuation and provision of EG&S on private land;
- Attracts a larger group of landowners – removes existing barriers;
- Protects key agricultural land;
- Preserves riparian zones and wetlands;
- Ensures wildlife habitat is not fragmented;
- Removes perpetuity barrier;

- Assists in agricultural succession planning;
- Provides an annual income to landowners who properly steward their land;
- Operates effectively with other planning tools such as Transfer of Development Credits; and
- Compensation addresses a multitude of factors, including opportunity costs, rather than simply based on land value, as is currently the case.

1.1.3 Protocol

To achieve its objective, the Foothills Project proposes to implement the following protocol:

1. Determine the conservation value of the land through a process of mapping and High Conservation Value (HCV) analysis. The HCV analysis would use a quarter section cell (QSC) and be based on a structured assessment matrix and a mathematical model that uses a variety of parameters to assign a HCV number to each QSC. The HCV number would be based on not just the value of the parameters for that cell, but also the value of parameters for adjacent QSC's.
2. Develop a Request for Proposal (RFP) document focused on the area of interest. The RFP will outline the expected restrictions, stewardship standards and allowed activities on the property. The agreement will also state the length of contract term (e.g., 50 to 99 years) and specify penalties for non-compliance. Furthermore, term agreements may require a mechanism to adjust payments on a regular basis to account for inflation and changing EG&S values;
3. Gain the cooperation and approval of government for the RFP process and result;
4. Communicate with the community both collectively and individually to explain the RFP and the bidding rules;
5. Create a realistic funding model;
6. Set up a bid process – solicit bids for the RFP from all landowners in the target area;
7. Process bids and determine how many (if any) accepted. The Land Trust will be empowered to accept only those bids which meet RFP requirements and are cost-effective;
8. Ensure that funding is in place;
9. Sign contract with successful landowner(s);
10. Monitor the easement on an annual basis. The monitoring reports will form the basis for the payments to the landowner(s);
11. Arrange for annual payment; and
12. Deal with any contract violations.

Essentially, the proposed protocol aims to set a fair value for the conservation easement based on the HCV analysis, RFP, and bid process. The true merit of such a system is that it actively involves landowners in the valuation process. Furthermore, the system is designed to value the contract based on a variety of 'real' factors rather than simply the current land value. These 'real' factors should include all the elements, i.e., any EG&S and/or management practices, that the landowner believes require compensation for signing the proposed conservation easement agreement. The strength of such a system is that it is able to satisfy a diverse range of conservation/easement goals while, at the same time, setting a fair market value for those services.

It is believed that the proposed protocol will be appealing to a greater range of landowners as it provides an annual income and also removes the perpetuity barrier. As well as providing a dependable

income which will aid in succession planning, the annual payments will also make the potential future sale of the land more attractive to buyers, as the payments stay with the land. Moreover, a perpetuity term is often a major barrier since it is exceedingly difficult for the landowner to assess the future lost opportunity value when considering such an easement. Removing these barriers opens up opportunity for further conservation.

1.1.4 Funding

In terms of funding, the Foothills Project expects that money for market-based conservation easements would be available from:

- Government as a replacement for a charitable tax receipt and the forgiving of capital gains. Also, the annual payment to the landowner would be taxable so that an investment by government would result in increased tax revenue;
- Private donors and foundations interested in conservation and watershed protection, on a matching dollar basis; and
- Users of water resources such as towns, cities and irrigation projects that have an interest in promoting good watershed management, as well as possible other future river management entities (See the Athabasca Project proposal).

Finally, the Foothills Project is a market-based easement option which aims to benefit society, the landowner, and the environment. It is an evolutionary idea that, we believe, will be attractive to landowners, government, and other stakeholders in land use planning.

2 Stakeholder Consultation

In order to examine the feasibility of the proposed market-based conservation easement option and to explore the merit of moving forward with a pilot study, a consultation process was engaged with key stakeholders. In October 2007, an initial preliminary consultation was held which brought together a representative sample of these key stakeholders. Since that time, numerous presentations and meetings have been held to discuss the concept and gather feedback. On September 17, 2008, the information gathered through the consultation process will be presented at the Consultation on Market-based Conservation. This consultation will include the initial participants plus a wider group as determined by the presentations and meetings.

2.1 Preliminary Concept Consultation Participants

During the spring and summer of 2008, the essential elements of the Foothills Project proposal were presented to more than 60 people from various government departments (provincial and federal), conservation organizations, businesses, academia, municipalities, and other stakeholders. These participants generally did not speak formally for their organization, but provided excellent personal feedback based on their knowledge and experience.

2.2 Feedback

The overall response to the Foothills Project was very positive. The stakeholders were both supportive and encouraged by the market-based approach. Conceptually, the proposed conservation easement option was accepted as a valid method to enhance the current easement system and improve conservation efforts. Further, the stakeholders communicated that the concept has a lot of potential and value as it provides a means to effectively price EG&S.

In terms of moving forward with a pilot study, the stakeholders were likewise supportive. The notion of a pilot study generated much interest, so much so that a number of organizations offered their support to bring the pilot to fruition. Moreover, the general sentiment was the time is ripe for market-based approaches to conservation and that pilot studies are the necessary next step to test and operationalize the concept.

The following is a sample of the feedback that was received during the consultation:

- The proposed concept should greatly assist in getting people who are currently reluctant to sign-up for an easement to consider this new option;
- It is both positive and a great opportunity that the project falls within the proposed structure of the Draft Land-use Framework;
- The proposed concepts are air-tight;
- The incorporation of a bidding system into the proposed easement has a lot of merit;
- It is positive that the bidding system focuses on conservation elements and value as this will likely set a fair value on the EG&S;
- A market-based system would be potentially beneficial to municipal/regional planning as it inherently sets land use restrictions and conditions;
- The proposed concept appears to be a good fit with other land use planning tools;
- Environmental or land-based payments are not considered commodities or commodity-based payments; therefore, the proposed project will not violate World Trade Organization rules;
- To achieve successful conservation, Alberta needs to adopt alternative approaches to environmental protection;
- Market-based conservation and payments for EG&S are currently gaining a lot of traction with society and governments;
- The proposed concept offers a means to keep people with a good stewardship ethic on the land; and
- The proposed concept is worth pursuing and should be valuable in protecting the foothills landscapes.

Below is a sample of questions that were generated from the consultation process (*N.B.: Responses to stakeholder questions are in Italics*):

- Does the standard conservation easement have to be altered to achieve the proposed easement? *No, current legislation does not demand a perpetuity term. Furthermore, the*

proposed easement will follow the existing governing elements of the standard easement with the intent to add an additional dimension to the existing system;

- Will the proposed system be more expensive to administer than the standard conservation easement system? *In theory, no;*
- How will we deal with the equity issue between lands? *The High Conservation Value (HCV) will be made public knowledge;*
- Is it possible to stack different EG&S for payment, e.g., wildlife habitat, riparian zones, etc.? *The aim is for the landowner to account for the full value of all their EG&S through the RFP and bid system;*
- Will the annual payments be inflation indexed? *Likely. The plan is to have a possible re-negotiation term, e.g., every 5 to 10 years. A re-negotiation term will depend on a number of factors but the goal will be to ensure fair market value of the EG&S. Also, there may be a penalty/reward system for good stewardship which will affect payments, i.e., reward strong conservation efforts and penalize poor conservation efforts;* and
- Land values typically decrease ~30-40% when a conservation easement is placed on the land. Is this a major reason for developing a market-based conservation easement option? *No. Some people are satisfied with the current conservation easement system and happy to receive a tax receipt for their donation. This will not change. We are simply adding another possible option for those people for which a single tax receipt is not suitable.*

2.3 Barriers/Concerns

During the consultation process the stakeholders identified a number of barriers/concerns that may affect the proposed market-based conservation easement option. The following are a sample of identified potential obstacles for the proposed project (*N.B.: Responses to stakeholder comments are in Italics*):

- Expect to get push-back from conservation organizations regarding the proposed 'term-period' concept because these organizations philosophically want land protected in perpetuity;
- High Conservation Value (HCV) evaluations are relatively expensive. *Yes, but it is necessary that a HCV assessment is completed because it is essential for establishing fair market value;*
- It is difficult to place a value on EG&S. How do we propose to overcome this barrier? *We believe that a combination of a HCV analysis, strong communication with community/landowners, a RFP, and a bid system will accurately value the EG&S;*
- A potential barrier is the length of time between re-assessment of the EG&S payments. If the re-assessment period is too long, a pricing disparity may result. Therefore, it will be important to re-evaluate the value of the EG&S payments on a set re-negotiation timetable to ensure a fair valuation of the EG&S;
- Good conservation practices often result in more damages to the landowner because their land becomes the most valued on the landscape to wildlife, i.e., the land attracts a larger proportion of wildlife which results in more grass/crops being consumed and more fence damage. This problem reinforces the need for a re-assessment process to revalue the EG&S in the proposed easement contract;

- It is important that our type of program is not seen as a production subsidy. The program must be trade neutral. The only way to accomplish a trade neutral program is through an environmental vehicle;
- What happens if a landowner in an area that has been selected for the proposed project does not want to enter the program? *It is the landowner's right not to enter the program, so there is nothing we can do. However, to overcome this potential problem, we plan to educate the landowners about the merit and value of entering the program;*
- Different communities may have different preferred program outcomes for the same EG&S;
- Often there is a problem with the monitoring of the stated goals of a program, i.e., the wrong parameters are measured to determine if the desired outcome has been met. Therefore, it is very important to accurately measure the correct parameters to ensure the program goals are achieved;
- As you approach the end of the term of the proposed easement contract, the market value of the land will likely increase as the land could be potentially developed when the contract runs out. For example, a land developer could purchase the land and then wait out the remaining years on the term;
- There is an issue with funding and what Albertans see as priorities. Funding generally goes to areas of highest priority. Currently, health care and education are the top priorities for Albertans which may make it difficult to get funding for environmentally based projects; and
- Society may find it difficult to pay for EG&S which traditionally have been produced at no cost. Therefore, it will be very important to reinforce the need for EG&S and the value to society of the EG&S.

2.4 Suggestions

While the overall response to the Foothills Project was positive, the stakeholders provided a number of suggestions to potentially strengthen the proposed concept. The following is a list of the most relevant suggestions:

- In order to get better access to funding, it will be important to frame our concept from the perspective that society is the recipient of the EG&S rather than government;
- It will be important to get community buy in for the program outcome;
- It will be important to have an inflation index component built into the system so landowners do not opt out of the program or break the contract;
- The value of the EG&S may change with time, especially since this is a new market. Thus, it may be worthwhile to consider how to make regular adjustments to the contract based on the current market value, i.e., an increase or decrease;
- It is very important to have a highly developed verification/monitoring system. If needed, crop insurance agencies can be pulled in to conduct verification/monitoring;
- Goals and outcome preferences will change over both time and generations; therefore, we must factor this into the design of the program;
- It is important to frame the project from the perspective that EG&S are a benefit to society and, therefore, government has a responsibility to be proactive in the protection and preservation of EG&S;
- We may want to consider the idea of penalizing landowners who are performing poorly and rewarding landowners that are performing well in terms of meeting the conditions of the proposed easement contract. In other words, there may be merit in a payment system that is based on performance outcome;

- When a landowner enters into the proposed easement it will be important not to inadvertently penalize those landowners who already maintain their land in a healthy environmental state;
- In terms of government funding priorities, the top are health care and education with environment much lower on the list. However, it is important to note that health care and environment are directly related. The state of the environment directly affects health care; therefore, an argument can be made that funding to the environment will be a direct investment in health care;
- It is important to change farmers' perspectives regarding EG&S, e.g., a slough is not something that is bad and needs to be drained rather it has immense value in its natural state; and
- It is best to do a pilot project on a county or MD scale rather than, e.g., a watershed. This is very important in achieving success because it creates political buy in.

3 Suggested Path Forward: Next Steps

At the completion of the Consultation on Market-based Conservation, to be held on September 17, 2008, the consultation findings will be examined to determine if it is feasible to move forward with a pilot study. If so, then the proposed next steps will most likely be:

1. Secure funding for a High Conservation Value (HCV) analysis which will serve as a basis for the pilot study;
2. Secure a funding source(s) to finance the pilot study;
3. Gain cooperation and approval of government;
4. Determine a suitable study area for the pilot;
5. Get community and landowner buy in;
6. Design and set-up a pilot study based on the outlined protocol (See Section 1.1.3: Protocol);
7. Determine the conservation value of the land for the selected study area through a HCV analysis; and
8. Run pilot, test concept, and examine results.

4 Conclusion

At this stage of the Foothills Project the preliminary findings are encouraging. A major trend that was identified is ecological goods and services are of immense value to society and Alberta must become proficient at protecting these valuable resources for both our present welfare and future generations. Furthermore, based on the responses from stakeholders, moving forward with a pilot study is a warranted next step. The general sentiment was that the incorporation of market-based instruments into conservation is an emerging methodology with great potential. Moreover, to bring this methodology into practical application, it is necessary and worthwhile to engage in field testing. Finally, the Foothills Project would like to extend sincere gratitude to all those individuals and organizations who have contributed to the consultation process. Their feedback and insight has been invaluable.

5 Appendix: Research

While there are many examples of market-based conservation from around the world, the primary focus here will be to examine the precedents set for auction-based/bid systems. In addition, a few examples of other relevant market-based systems will also be highlighted.

5.1 Canadian Examples of Market-based Conservation

5.1.1 Alternative Land Use Services (ALUS)

Alternative Land Use Services (ALUS) is a voluntary, incentive-based method of recognizing and rewarding farmers for maintaining, creating or enhancing environmental benefits. The ALUS concept is a farmer-led initiative that was originally designed by Delta Waterfowl and Manitoba's Keystone Agricultural Producers (Delta Waterfowl, 2008).

ALUS aims to link the environmental demands of Canadians to the farmers who provide the ecological goods and services. It recognizes the value of conserving and restoring Canada's natural capital while respecting and rewarding the important role that farmers play in environmental management (Alternative Land Use Services, 2006a).

The program uses a 'fee-for-service' concept where the landowner is paid a fair price for the environmental benefits that he or she creates and maintains through a variety of land management tools, e.g., preservation of natural or ecologically sensitive lands, riparian areas, or wetlands. Furthermore, ALUS is a trade-neutral program and not production or price distorting for traditional agricultural products (Alternative Land Use Services, 2006b).

ALUS is a national program with a local focus and proposes integration with existing agricultural institutions to minimize costs to taxpayers and maximize measurable environmental results. Moreover, ALUS complements the current suite of agricultural and environmental programs already on the landscape that are managed by government and the private sector (Alternative Land Use Services, 2006b).

On April 24, 2008, the government of Prince Edward Island (PEI) adopted ALUS as provincial farm policy. The current PEI provincial budget has allocated \$750,000 to the program. A broad-based committee of stakeholders will be set up to design the PEI ALUS program (Government of Prince Edward Island, 2008). In addition, there are currently two ongoing ALUS demonstration projects in the Rural Municipality of Blanshard, Manitoba and Norfolk County, Ontario. Future pilot projects are planned for Vermilion River, Alberta and the Rural Municipality of Lakeside, Saskatchewan (Alternative Land Use Services, 2006a).

5.2 American Examples of Market-based Conservation

5.2.1 New York City's Watershed Management Plan

In response to the 1989 Surface Water Treatment Rule (SWTR) issued by the United States Environmental Protection Agency, the city of New York developed a comprehensive watershed management plan to avoid filtration of its two primary drinking water sources. "The rule, in essence, requires all municipalities to filter public water obtained from surface sources unless stringent public health criteria are met and an approved watershed management strategy that minimizes risks to the water supply is in place" (Tyrchniewicz & Tyrchniewicz, 2007, p.23).

The cost to develop a filtration system for the Catskill and Delaware watersheds to comply with the SWTR was estimated to be ~ \$6 billion with an additional \$200 - \$300 million per year for operation and maintenance. Alternatively, it was estimated that the implementation of a watershed management plan would cost ~\$1 - \$1.5 billion. The city of New York opted for the route of economic savings and environmental protection. As a result, New York City has the largest unfiltered water supply system in the United States (Wakiral, 2004).

One of the two-fold primary objectives of New York City's Watershed Management Plan is (Tyrchniewicz & Tyrchniewicz, 2007):

1. To improve the economic viability of agriculture in the Catskill and Delaware watersheds; and
2. To implement environmentally sound practices on watershed farms.

To achieve these objectives the city of New York has committed to a long-term strategy that relies on the following elements (Wakiral, 2004; Tyrchniewicz & Tyrchniewicz, 2007):

1. Land Acquisition and Stewardship Programs;
2. Watershed Rules and Regulations;
3. Financial Assistance – to watershed communities to promote both environmental quality and the local economy;
4. Partnership Programs;
5. Wastewater Management; and
6. Storm water Management Measures.

A key component of the Watershed Management Plan is a partnership program entitled the Watershed Agricultural Program (WAP). The WAP is a voluntary program with the aim to standardize and improve environmental practices on watershed farms (Tyrchniewicz & Tyrchniewicz, 2007). The program is financed by New York City through a water consumption tax (Gagnon, 2005). Funding is then delivered to a number of areas, such as (Gagnon, 2005; Tyrchniewicz & Tyrchniewicz, 2007):

1. Annual rental payments to farmers (with assistance from the U.S. federal government);
2. Structural improvements to the farm;
3. Purchasing of farm equipment; and

4. Operational and management assistance.

The New York City Watershed Management Plan has been operating successfully since 1997. In July of 2007, after an extensive review, the U.S. Environmental Protection Agency determined that New York City has an adequate long-term watershed protection plan and, as a result, granted a 10 year waiver to continue utilizing unfiltered drinking water from the Catskill/Delaware system (United States Environmental Protection Agency, 2007). Other American cities which have been granted waivers to utilize unfiltered drinking water include San Francisco, Seattle, Boston and Portland, Oregon (The New York Times, 2007).

Close examination of the New York City Watershed Management Plan:

demonstrates that it is possible to meet both downstream water quality goals as well as upstream economic objectives through voluntary partnerships of upstream and downstream users, and implementation of community based watershed protection. The initiative also showed that by protecting reservoirs and areas surrounding source waters it is possible to supply water for a massive urban population without the need for expensive filtration or chemical treatment (Wakiral, 2004).

5.2.2 Conservation Reserve Program

Established in 1985, the Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners aimed at retiring environmentally sensitive land from agricultural production and implementing the restoration of a permanent vegetative cover (Gagnon, 2005). Within this basic objective, the CRP aims to (Latacz-Lohmann & Schilizzi, 2005):

1. Reduce water and wind erosion;
2. Improve water quality;
3. Reduce sedimentation;
4. Preserve soil productivity;
5. Improve habitat for fish and wildlife;
6. Curb production of surplus commodities; and
7. Provide income support for farmers.

Through the CRP, farmers are eligible to receive annual rental payments and cost-share assistance to establish long-term, resource-conserving covers. Farmers who desire to enter the CRP must first meet set criteria, e.g., land must be cropland that is planted or considered planted to an agricultural commodity 4 of the previous 6 crop years, and which is physically and legally capable of being planted in a normal manner to an agricultural commodity (United States Department of Agriculture, 2007).

Eligible farmers submit bids for individual parcels of land to the United States Department of Agriculture (USDA) indicating the payment required to take the land out of agricultural production and convert it to conservation use (Latacz-Lohmann & Schilizzi, 2005). Bids for CRP contracts are ranked according to the

Environmental Benefits Index. Successful farmers receive federal funding and enter into CRP contracts for 10 to 15 years.

As of 2005, approximately 33.5 million acres were enrolled in the CRP. Each contract covered an average of 74 acres with an average rental rate of \$45.95 per acre (Latacz-Lohmann & Schilizzi, 2005).

5.2.3 Conservation Security Program

Initiated in 2002, the Conservation Security Program (CSP) is a watershed-based approach to conservation which aims to compensate agricultural producers who excel in environmental performance (Gagnon, 2005). It is a federal program, funded through the Natural Resources Conservation Service, which encourages the implementation of sound environmental practices, such as, crop rotation, watercourse enhancement, and nutrient management. Essentially, the program was set up to purchase ecological goods and services from agricultural producers.

The CSP has four forms of payment including annual rental payments for the provision of ecological goods and services and one-time cost-sharing payments for either the adoption of new beneficial practices or exceptional improvements in practices. In addition, the program has incorporated a three-tier payment system to reward environmental performance (Gagnon, 2005). The overall CSP system was designed to reward farmers who are using good conservation practices and create an incentive for other farmers to use better conservation practices (Lundgren, Biergiel, Donovan, Lee, & Merrigan, 2006). As of 2006, ~20,000 farms were enrolled in the CSP totalling 16 million acres and 280 watersheds (Gieseke, 2007).

Finally, the CSP is the USDA's first comprehensive 'green payment' program – a support program intended to reward stewardship. As a result, the CSP is not considered trade distorting under current World Trade Organization rules (Lundgren et al., 2006).

5.3 Australian Examples of Market-based Conservation

5.3.1 Auctions for Conservation Contracts – Australian Trials

The Australian government has recently funded numerous auction-based projects with the aim to increase cost-effectiveness for the delivery of ecological goods and services on private lands. Essentially, these trials have been developed to test the value and effectiveness of utilizing market-based instruments for environmental conservation.

Over the past few years, a number of auction-based initiatives have been piloted, for example (Latacz-Lohmann & Schilizzi, 2005):

1. RiverTender – aimed at riparian vegetation conservation;
2. PlainsTender – aimed at grassland conservation;
3. BushIncentives – aimed at coastal vegetation conservation;
4. EcoTender – aimed at multiple conservation outcomes, e.g., salinity control, biodiversity enhancement, and water quality; and
5. BushTender – aimed at bush land conservation.

Since there is much overlap between the aforementioned projects' design, the BushTender will be highlighted below as it was initiated in 2001 and has produced the most conclusive results.

5.3.1.1 BushTender Trial

The BushTender Trial was originally designed to examine the following question: 'how much would need to be paid to conserve habitat?' In other words, can the problem of ineffective environmental conservation be resolved through the market (Stoneham, Chaudhri, Ha, & Strappazzon, 2002)? The main objective of the BushTender Trial was to utilize an auction system to purchase public environmental goods from private landowners. The environmental good in this case was biodiversity as a product of improved bush management (Latacz-Lohmann & Schilizzi, 2005).

To achieve this aim a sealed-bid discriminatory price auction was used to sell contracts to farmers and buy their pre-negotiated ecological goods and services. Bids were ranked according to a Biodiversity Benefits Index (BBI) which was derived from the following factors: conservation value score, habitat amelioration score, and landowner bid. Essentially, the BBI establishes a benefit to cost ratio. Contracts were awarded based on BBI rank until the project budget was exhausted (Latacz-Lohmann & Schilizzi, 2005).

The following are some of the positive results and findings of the BushTender Trial (Stoneham et al., 2002; Latacz-Lohmann & Schilizzi, 2005; Rae, 2007):

1. Auctions work – prices are discovered and contracts allocated;
2. Improved cost-effectiveness over fixed price schemes, i.e., a benefit of 700%;
3. Auctions are flexible for landowners – easy to adapt to local circumstances;
4. Auctions are popular with landowners – more attractive than regulation;
5. High rate of compliance – only 1 defaulting contract out of 300;
6. Open and comprehensive communication between program officers and landowners regarding project process and implementation was essential to secure sufficient levels of participation and competition;
7. Collusion was a non-issue;
8. Effective use of public expenditures; and
9. Provides a means to value for public goods in land use decisions.

5.4 European Examples of Market-based Conservation

5.4.1 Challenge Funds – Scotland

Challenge Funds were initiated in Scotland in 1997. As a part of Scottish forestry policy, the main objective of the Funds was to extend woodland area in specific geographical regions. Within this mandate, a number of discrete Challenge Funds were developed to achieve specific aims. For example (Latacz-Lohmann & Schilizzi, 2005):

1. Grampian Challenge Fund – goal to plant 1500 ha of new forest;

2. Central Scotland Challenge Fund – goal to produce marketable timber, diversify land use, and provide opportunities for countryside access and recreation; and
3. Woodlands In and Around Towns Challenge Fund – goal to stimulate sustainable management of woodlands near towns and, thereby, contribute to the regeneration of the urban environment and improve the quality of urban life.

All three aforementioned Challenge Funds employed a bid/auction system. However, the Grampian and Central Scotland Challenge Funds used a project design most relevant to the Foothills Project and thus will be highlighted.

To be eligible for the Grampian and Central Scotland Challenge Funds, applicants had to pass a set of criteria in relation to size, location and suitability of planting to deliver timber output. Eligible landowners then prepared and submitted planting plans (bids). Contracts were awarded based on the bids which best met the aims of the Challenge Funds and offered the best value for money (Latacz-Lohmann & Schilizzi, 2005).

Based on the results, both the Grampian and Central Scotland Challenge Funds were deemed a success. The following are an example of the results (Latacz-Lohmann & Schilizzi, 2005):

1. Woodland area in both Funds increased by at least ~10%;
2. Over 3000 ha were planted for the Grampian Challenge Fund – more than twice the target;
3. Rapid expansion of land area under forestry for both Funds;
4. Successful increase in harvestable timber output for both Funds; and
5. Challenge Fund bid system appears to be more cost-effective than a flat-rate scheme.

5.4.2 Grassland Conservation Pilot Tender – Germany

As compared to the previously discussed examples of market-based conservation, the Grassland Conservation Pilot Tender was initiated in response to a failed fixed-rate payment program. Due to the low participation in the original program, an auction was designed to determine the excess payment required, above the fixed-rate, to achieve greater participation. As a result, government funding was allocated to the pilot auction with the goal of attaining low-intensity grazing systems in the state of North Rhine-Westphalia, Germany (Latacz-Lohmann & Schilizzi, 2005).

Farmers interested in entering the pilot were asked to specify in a sealed-bid process the amount of compensation they expected to receive in excess of the fixed payment. A concealed reserve price was set and all bids under the reserve price were accepted (Latacz-Lohmann & Schilizzi, 2005).

Unfortunately, the results from the pilot indicated that participation was lower than expected (~15 landowners), but, at the same time, much greater than the original program. Regardless, the auction was deemed not effective in encouraging broader participation. Some of the reasons for this result are as follows (Latacz-Lohmann & Schilizzi, 2005):

1. Amount of compensation too low;
2. Due to the scarcity of land, farmers could not afford to lower grazing intensity;

3. Uncertainty regarding the yield and energy losses from de-intensification;
4. Uncertainty over a newly introduced agricultural reform policy and how it would impact operations; and
5. A few farmers felt competitive bidding was an unfair mechanism.

5.4.3 Auction Trial with Outcome-based Payment Scheme – Germany

This outcome-based project was initiated in 2004 and conducted in Lower Saxony, Germany. It was a government funded project that aimed to reward landowners for the provision of environmental services in the form of intensive cultivation crop retirement and replacement with grassland of high ecological and floral biodiversity quality (Latacz-Lohmann & Schilizzi, 2005).

As compared to the majority of the other presented examples of market-based conservation, this project focused not on the conservation inputs but rather the outputs or the quality of grassland achieved. As a result, grassland quality was categorised into three classes and payments were made according to the level of quality achieved. The trial was designed as a budget-constrained (€30,000), sealed-bid, discriminatory price auction with a one year contract duration. A total of 28 out of 38 farmers were successfully awarded contracts (Latacz-Lohmann & Schilizzi, 2005).

The preliminary findings of the Auction Trial with Outcome-based Payment Scheme are as follows (Latacz-Lohmann & Schilizzi, 2005):

1. Price range and average per class:
 - a. Grassland I (lowest quality): 40 - 145€ and 85€/ha average;
 - b. Grassland II: 55 - 300€ and 142€/ha average; and
 - c. Grassland III (highest quality): 100 - 350€ and 203€/ha average.
2. Grassland I is cost-effective as compared to a fixed price scheme – average cost is 53% lower;
3. Outcome-based auction was popular with farmers and policy administrators; and
4. Outcome-based auction generated a wide range of bid prices which enabled policy administrators to select the most cost-effective producers.

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