Application of an Ecological Goods and Services Model in the Whitewater Lake Sub-Watershed: An Analysis of Options and Landowner Attitudes

by

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Abstract

The policy framework for ecological goods and services (EGS) programming continues to evolve across Canada. In the context of the Whitewater Lake sub-watershed, the role of EGS programming has emerged as a response to rising water levels. While conservation programming has been delivered in the area to manage the effects of agricultural production, traditional approaches have not alleviated the loss of water retention.

The purpose of this research was to obtain from the public, their views on EGS programming, their land management decisions and their perception on current programming in the area. Participants also described their experiences of a changing watershed, including the human and regional dynamic that have shifted as a result.

The study highlighted a number of constraints associated with programming implementation. However, a recognizable interest in EGS programming over traditional conservation programming was presented.

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Chapter One: Introduction

1.1 Problem statement

As with any terminal basin, Whitewater Lake has significant episodes of drought and flooding and can fluctuate significantly (Lindgren, 2001). As a result, water levels on Whitewater Lake rise during climatic wet cycles and decrease during climatic dry cycles.

Over the past 15 to 20 years, watersheds in Manitoba, including the Whitewater Lake sub-watershed, have been experiencing a wet cycle. In 2011, water levels on Whitewater Lake hit historic records due to extremely wet conditions. Since 2011, water levels have remained high and have continued to exceed historic records. In addition to the climatic wet cycle, water retention capacity has declined in the Whitewater Lake sub-watershed due to increasing demands on agricultural production.

While conservation programming has been delivered in the area to manage the persistence of agricultural encroachment and farming of marginal areas, current regulatory mechanisms and programming has not alleviated the loss of water retention in the area. In 2011, the Turtle Mountain Conservation District (TMCD) recognized the need to alleviate the stress on local lake landowners by proposing the development of an Ecological Goods and Services (EGS) program for Whitewater Lake.

EGS programs aim to provide environmental protection in agricultural landscapes and promote a healthy ecosystem approach to managing human altered ecosystems (Pasupalati et al, 2017). However, because the production of ecosystem services predominantly occurs on privately owned land, agricultural producers are exposed to the high costs, or foregone opportunity costs, associated with producing these public ecosystem services. EGS programming

has been developed to compensate agricultural producers for producing these public goods which can result in positive externalities, such as flood abatement, that benefit the greater public (Government of Quebec, 2005).

This study will provide support to the TMCD and its partners as they design a community supported EGS program that is tailored to the TMCD and Whitewater Lake sub-watershed. Understanding landowner preferences and land use concerns will be important for developing place-based, and relevant, EGS programming.

1.2 Objectives

The purpose of this study was to review and summarize EGS programming across Canada and to conduct public opinion research to gain an understanding of the attitudes of Whitewater Lake sub-watershed residents with respect to EGS programming. The first objective included a comprehensive literature review examining EGS programs to facilitate a greater understanding in feasible programming options. The purpose of the comprehensive literature review was to identify key program options, administrative structures, landowner reactions to these programs, and the barriers associated with implementation of programming. This analysis was taken into consideration when developing survey and interview material.

The second component of the study was a public opinion survey which took place in three phases. First, the formulation of research questions were developed and tested on a small sample population outside the Whitewater Lake sub-watershed. Second, structured open ended interviews were conducted to determine issues related to EGS programs for agricultural drainage and flooding. The structured interviews focused on three geographic areas; landowners immediately surrounding the lake, landowners in the uplands and landowners in the Turtle Mountains. And finally, the interview process helped to refine the components of a questionnaire

which were distributed across the Whitewater Lake sub-watershed to determine attitudes of all residents towards EGS programs. The questionnaire was more structured than the interview, directing specific questions rather than aiding in conversation. The resulting recommendations and conclusions of this research will be provided to TMCD to assist with their development of EGS programming.

1.3 Thesis organization

The thesis is organized into six chapters. Chapter One covers the general introduction, problem statement and objectives of the research, a general description of the TMCD and the link to EGS research, and a general overview of flooding in the area. Chapter Two includes a review of the literature on the structure of EGS programs and a review of programming in Canada. Chapter Three provides a description of methods used to conduct the research. Chapter Four presents the results and analysis. Chapter Fiver discusses these results. Chapter Six presents recommendations, conclusions and areas for future research based on the study results.

1.4 Background

Established under authority of The Conservation Districts Act, Manitoba Conservation Districts are a formed partnership between local municipalities and the province, committed to the protection, restoration and management of land and water (Carlyle, 1980). The formation of conservation districts in Manitoba included the merger of land and water programming, two previously distinct entities in the rural agricultural landscape (Carlyle, 1980). EGS are the positive environmental outcomes resulting for proper land and water management in agricultural landscapes which are valued by humans for the processes or functions that they can produce (Farley & Costanza, 2010). Conservation districts have a mandate to deliver programming such as: riparian area management, water retention structures, grassed waterways, wetland reclamation, forage buffer strips, constructed wetlands, among others (Manitoba Water

Stewardship, 2015). As a result, conservation districts play a fundamental role in the delivery of EGS programming throughout agro-Manitoba.

The Whitewater Lake sub-watershed study area is located in the Turtle Mountain Conservation District (TMCD). TMCD is located in the southwestern part of Manitoba on the Canadian and United States border (see Figures 1 and 2). The district covers 4,518 km^2 (1,744 miles^2) and the population was estimated to be 8,513 in 2014 (TMCD, 2014).

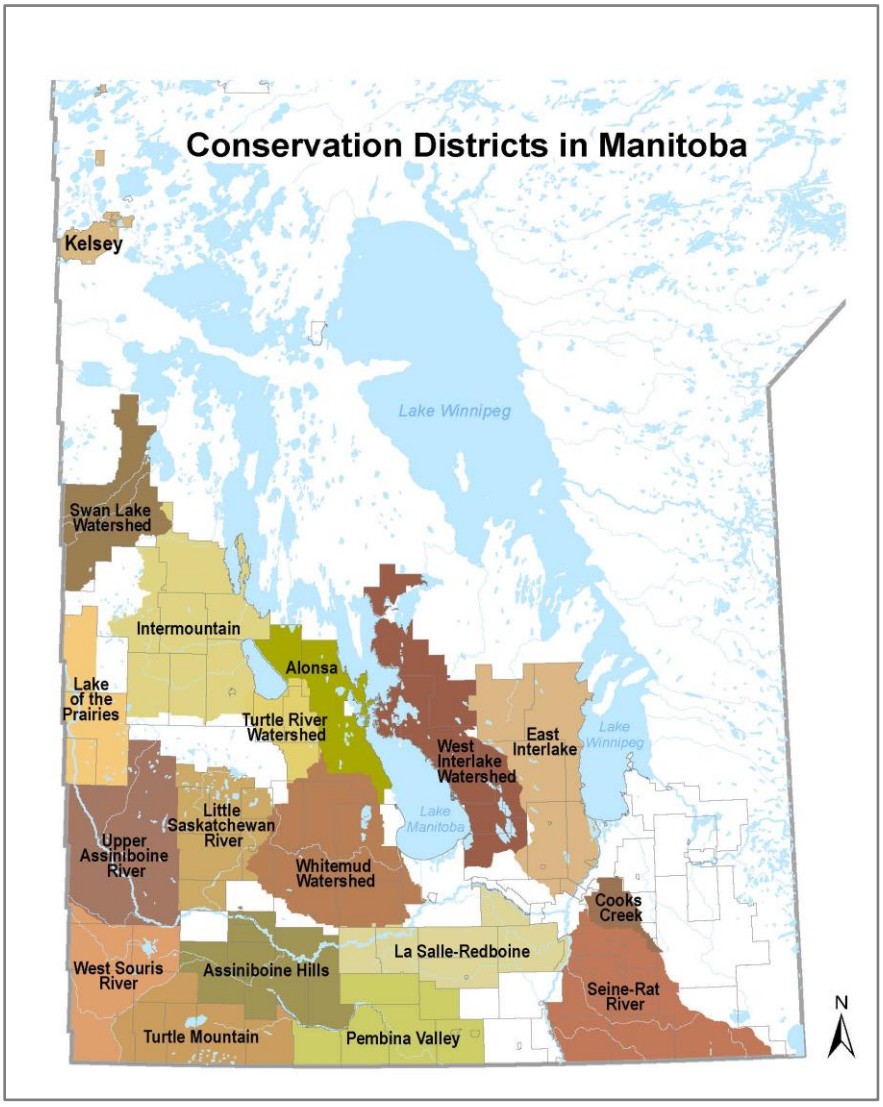

Figure 1: Map showing Manitoba conservation districts
Figure Source: Manitoba Sustainable Development (2017) – Used with permission

The TMCD was formed in 1973 under The Resource Conservation District Act and later established under The Conservation District Act in 1978. The main focus of the TMCD is land and water management on a watershed-basis, with programs including public education, small dam construction, wildlife habitat preservation, abandoned well sealing, remote watering system installation and salinity seed assistance (TMCD, 2014). The TMCD is divided into six sub-districts based on sub-watersheds, including, Eglin Creek-Whitewater Lake, Wakopa Creek, Upper Pembina River, Waskada Creek, Medora Creek and Chain Lakes (see Figure 2).

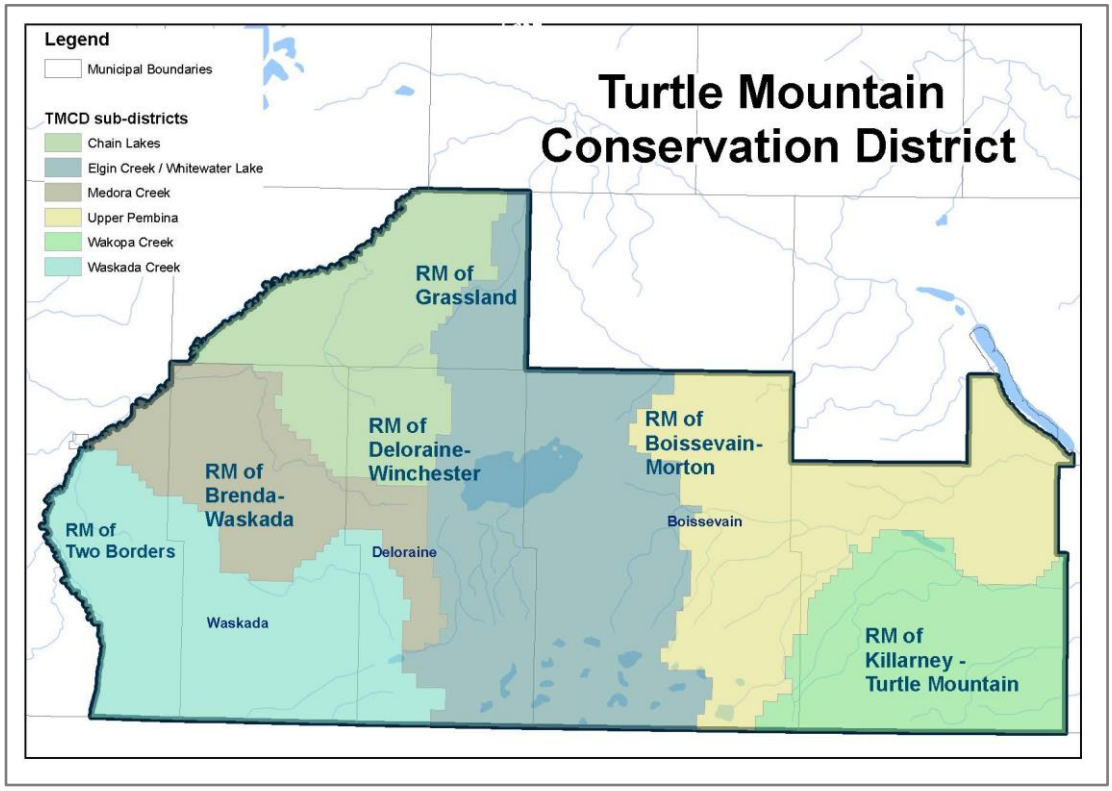

Figure 2: Map showing of the Turtle Mountain Conservation District
Figure Source: Manitoba Sustainable Development (2017) – Used with permission

In Manitoba, watershed planning is governed by The Water Protection Act. TMCD is part of two watersheds, the East Souris River and the Pembina River. Currently conservation districts lead development of all integrated watershed management planning (IWMP)

programming in Manitoba because of their close ties to watershed programming. TMCD is the designated water planning authority under The Water Protection Act (2006) and is designated as the delivery agent of the East Souris River IWMP. In 2006, the East Souris River IWMP was the first IWMP to be provincially approved under The Water Protection Act in the province. This plan summarizes watershed priorities and recommends priority actions to improve watershed health and sustainability within the TMCD region (TMCD, 2014).

1.5 TMCD and ecological goods and services

In 2006, TMCD completed the East Souris River IWMP. The plan outlined a "road map" for future watershed incentive programming to be completed in the watershed over the next 10 years. Surface water management was identified as one of the main goals within the plan with specific actions related to flooding and water levels around Whitewater Lake. Since 2006, the district has implemented projects under this plan to address issues around Whitewater Lake, including the implementation of conservation agreements, grassed waterways, windbreaks, and back-flood projects. The conservation district has also partnered with a number of non-governmental organizations, including Ducks Unlimited Canada (DUC) and the Manitoba Habitat Heritage Corporation (MHHC), to deliver conservation programming.

In 2013, TMCD commenced a pilot EGS conservation auction program for the Whitewater Lake watershed (TMCD, 2014). Landowners were required to submit bids to either sell their land, sign a conservation agreements with the TMCD and MHHC or DUC, sign a 10-year agreement to complete and maintain best management practises (BMPs) that work towards improving water quality throughout the Lake Winnipeg watershed. Various BMPs eligible under the program, included water retention structures, wetland restoration and construction of wetlands, riparian area enhancement, natural area maintenance and enhancement, buffer and

grassed waterway establishment, perennial cover for sensitive lands and shelterbelt or tree establishment.

In 2011, the TMCD hosted a public consultation meeting which presented an opportunity for residents to voice their opinions on engineering solutions for reducing flooding around Whitewater Lake. Manitoba Infrastructure (MI) presented a cost-benefit analysis of constructing an outlet to reduce water levels on Whitewater Lake. Due to high costs and incremental water management problems downstream, MI recommended against construction of an outlet from Whitewater Lake. In response to public consultation feedback, the TMCD Board developed a list of potential actions to address the issue rather than increase drainage by constructing an outlet, including a recommendation to develop an EGS program around Whitewater Lake to help alleviate some of the stress on local lake landowners between the elevation of 1628 and 1633 feet (Press Release: TMCD Recommendation for Whitewater Lake, 2012). This study will provide support to the TMCD and its partners as they design a community supported EGS program that is tailored to the TMCD and Whitewater Lake sub-watershed.

EGS programming could be used to alleviate flooding concerns in the Whitewater Lake sub-watershed by providing incentives for landowners to retain water in the watershed. As discussed previously, record high water levels and flooding of adjacent agricultural land resulted in the RM of Deloraine-Winchester investigating the construction of an outlet on Whitewater Lake. The construction of an outlet would treat only the symptom of this broad watershed issue whereas EGS programming offers an opportunity to treat the one main cause of the problem, increased drainage in the watershed.

The policy framework for EGS programming is continuing to evolve across Canada. In the context of the Whitewater Lake sub-watershed, the ecological benefits that wetland retention and increased headwater storage could play in flood abatement is emerging as an important component of the response to the rising water levels around Whitewater Lake. Following the Whitewater Lake Public consultation in 2011, the TMCD is exploring how EGS programming could restore and conserve water storage capacity in the watershed while reducing the impacts of land use and agricultural encroachment surrounding the lake.

EGS policies aim to attribute a market value to goods and services produced by private landowners, who in the absence of incentive payments bear the cost of producing EGS without capturing an economic benefit. EGS policies could correct the externality gap and create a healthy balance between ecosystems and agriculture on the landscape.

EGS programs generally work through incentives, compensating farmers for undertaking efforts or making changes to their land use that generate EGS through establishment and conservation of grasslands and wetlands. For example, Roy et al. (2011) discussed that within Manitoba, multiple EGS programs have been tested, including: Alternative Land Use Services (ALUS), The Wetland Restoration Incentive Program, The Riparian Tax Credit, The Environmental Farm Action Program and most recently Growing Forward 2 – Ecological Goods and Services Program, yet the province is still in the pilot stage of programming. Successful EGS programs across the world have been facilitated from their former pilot stage through federal support.

TMCD has undertaken multiple EGS programs in the past and with the assistance of Growing Forward 2, the conservation district was able to undertake conservation auctions to

accrue land and implement BMPs for conservation purposes. TMCD is looking for an innovative EGS program that will address the particular issues faced by TMCD and be supported by its residents.

1.6 Location

Whitewater Lake is situated between the communities of Deloraine and Boissevain. Due to the presence of the Turtle Mountains, the range in elevation throughout the East Souris River watershed is quite large. Elevation characteristics are shown in Figure 3 (Genivar, 2009).

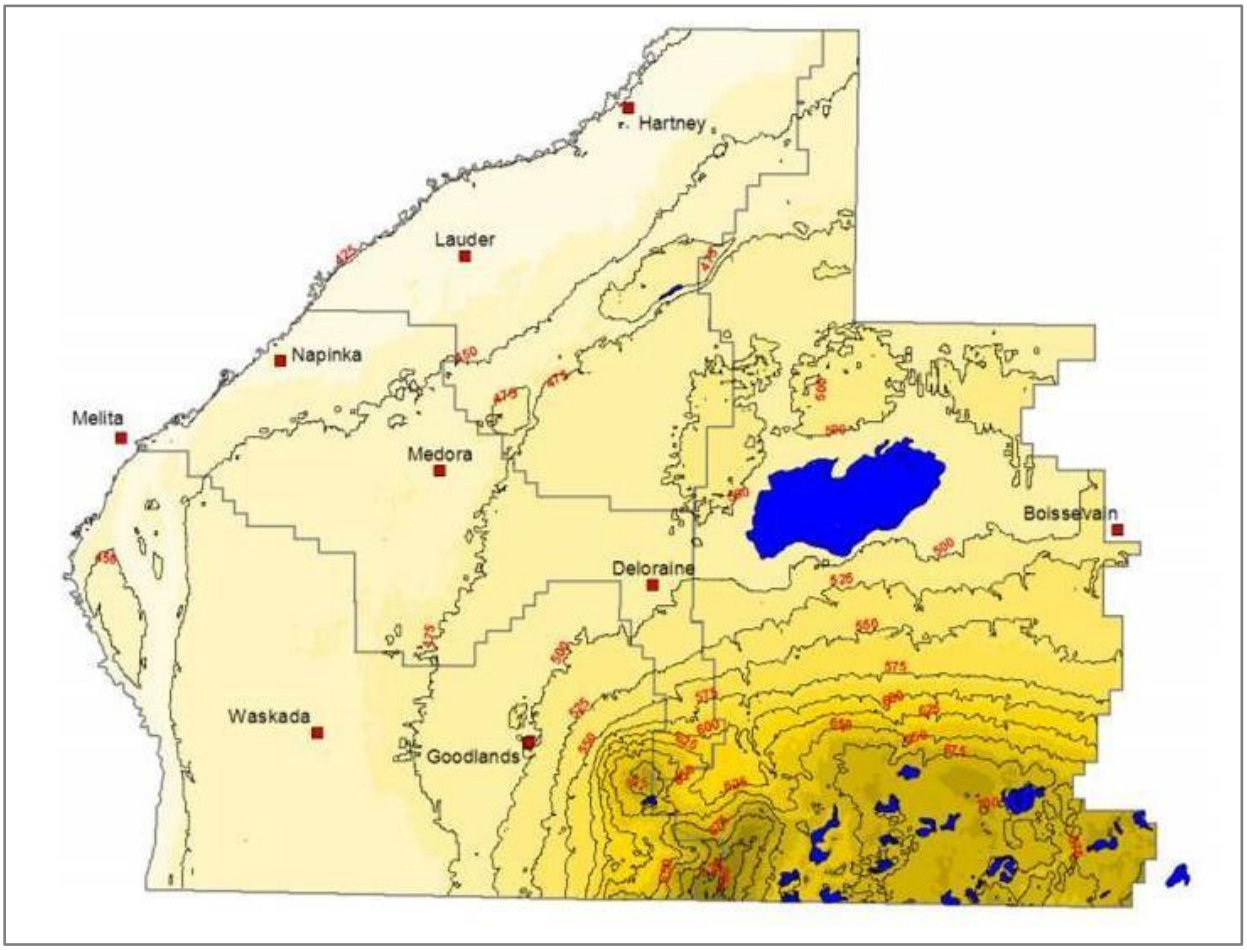

Figure 3: Elevation map demonstrating a large elevation change between the Turtle Mountains (yellow colouring) and Whitewater Lake (blue colouring in the middle)
Figure Source: Genivar (2009)

The flat prairie topography around Whitewater Lake is at an approximate elevation of 500 metres (1,640 feet) and rises to around 700 metres (2,296 feet) in the Turtle Mountains. This 200 metre (656 feet) elevation difference affects the hydrology of the East Souris River watershed in a variety of ways (Ransom, 1972). Spring snowmelt and summer precipitation runoff flows quickly out of the high relief areas in the Turtle Mountains, through small incised valleys with a number of streams until it reaches Whitewater Lake (Genivar, 2009; Ransom, 1972). Whitewater Lake is a 9,000 hectares (22,239 acres) saline terminal basin on the east side of the East Souris River watershed situated in TMCD (IBA, 2001). Flooding of agricultural land around the lakes periphery has posed significant problems for surrounding landowners for the last three to five years. The lake is fed from eight major creeks and streams from the south with no natural outlet.

1.7 Habitat

Whitewater Lake is designated as an Important Bird Area[1] that provides habitat for over 110 species of birds as well as over forty species of wildlife (TMCD, 2014). Whitewater Lake is located in the mixed-grass prairie biome (TMCD, 2014). In 1989, DUC implemented a Habitat Restoration Program. The $2 million dollar project was funded through the North American Waterfowl Management Plan (NAWMP) and DUC, with a land donation from the Government of Manitoba. Construction of the marsh enhancement project was completed in 1997 and included two wetland cells and twelve kilometres (eight miles) of dikes. The dikes were constructed for two purposes, holding fresh runoff water in the marsh and restricting saline water from entering the marsh from the lake. Runoff water is held back temporarily by the dikes and

[1] Important Bird Areas (IBAs) are discrete sites that support specific groups of birds: threatened birds, large groups of birds, and birds restricted by range or by habitat. IBAs range in size from very tiny patches of habitat to large tracts of land or water. They may encompass private or public land, and they may or may not overlap partially or entirely with legally protected sites (IBA Canada, 2014).

released into the lake through eleven water control structures (Lindgren, 2001). This management technique restricts the release of saline water into the lake while stimulating the growth of native whitetop grasses. These grasses provide feeding areas, nesting habitat, and a hay crop for landowners in the late summer (IBA, 2001). Much of the two million dollar project has since been affected by high water levels on the lake and as of 2014, most of the project has been severely affected by erosion caused by high water levels. The lake also offers a wildlife observation area and is a candidate for the Manitoba Heritage Marsh[2] nomination (Lindgren, 2001) as the lake provides habitat for Sandhill Cranes, Snow Geese, Tundra Swans, Shorebirds, White-fronted Geese, White-tailed Deer and Muskrat (Ransom, 1972). Whitewater Lake is also designated as a Manitoba Wildlife Management Area[3].

1.8 Drought and flooding

As with any terminal basin, Whitewater Lake has significant episodes of drought and flooding and can fluctuate significantly (Lindgren, 2001). Rising water volumes on terminal lakes are influenced by the amount of precipitation received over the lake, surface inflows and groundwater seepage (Williams, 1996; Todhunter & Rundquist, 2004). Whereas decreasing water volumes are influenced by seepage and the amount of evaporation over the lake (Williams, 1996; Todhunter & Rundquist, 2004). While evaporation is the predominant method to lower water levels on Whitewater Lake, seepage does have a minor effect. Given these two processes

[2] Manitoba's Heritage Marsh Program was set up in 1985 to designate, conserve, manage, and develop some of the province's most significant marshes (Manitoba Wildlands, 2011).

[3] The Manitoba Wildlife Act provides for the designation of Crown lands as wildlife Management Areas (WMA's) for the "better management, conservation and enhancement of the wildlife resource of the province" (Wildlife Management Areas, 2014).

of water elimination, climate plays a large role in water surface elevations on closed basin lakes (Genivar, 2009).

Water levels on Whitewater Lake rise during climatic wet cycles and decrease during climatic dry periods. Prior to Water Survey of Canada water level records, it was identified that the lake was completely dry from 1913 to 1915 and between 1932 to 1934 (Lindgren, 2001).

In the mid-1970's, Water Survey of Canada began recording water level data on the lake. The annual maximum water elevations described above are illustrated in Figure 4. Some periods of data were missing from the Water Survey of Canada website and have been omitted from the chart.

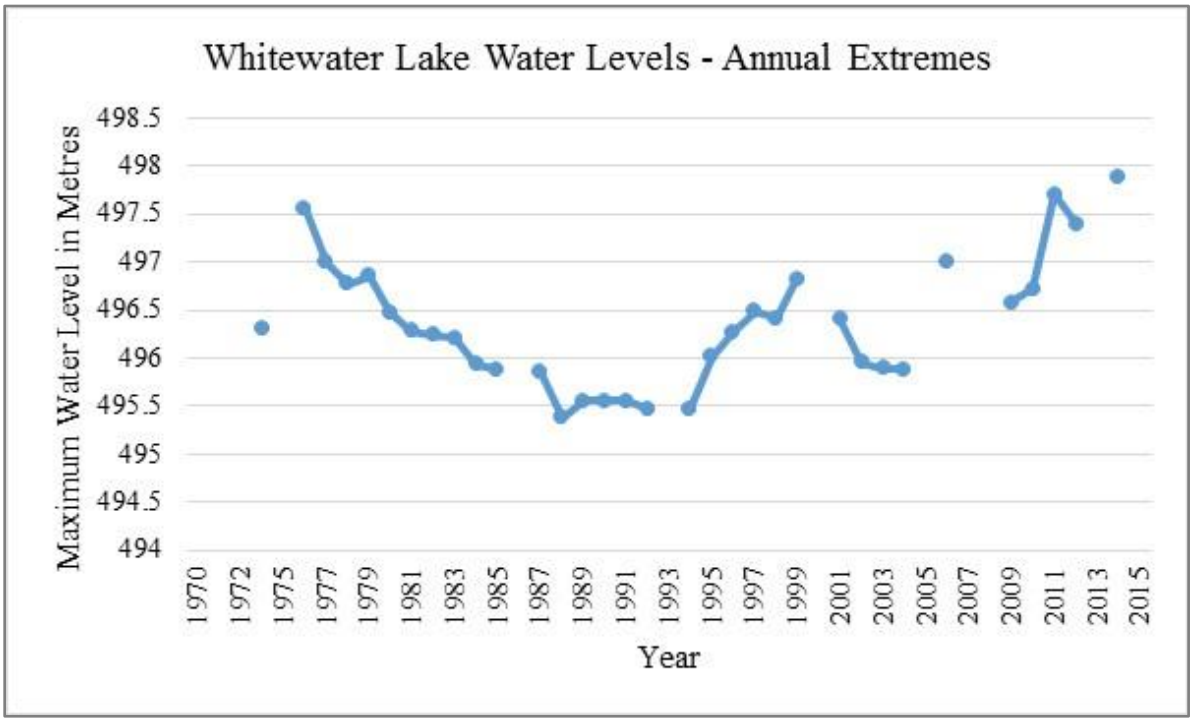

Figure 4: Water levels on Whitewater Lake (1970 – 2017)
Data source: Water Survey of Canada (2017)

In 1976, water levels on the lake rose to 497.6 metres (1632.87 feet). Shortly after that, the 1980's brought drought conditions that caused the lake to drop below the elevation of the

hydrometric gauging station. This drier period in the hydrologic cycle continued into the 1990's, with the lake reportedly going dry in this period (Van der Kamp et al, 2008).

Water levels on the lake rose again in the late 1990's and peaked at 496.8 metres (1629.9 feet) in 1999. Water levels began to decline in the early 2000's; however, an increase in water levels were experienced after an extreme rainfall event in 2005.

Due to the flat prairie topography surrounding the lake, levels can change dramatically. In 2005, June and July experienced an extreme 360 mm (14.2 inches) of rainfall event, causing the lake to rise 66 cm (26 inches) and severely impacted the town of Deloraine (Genivar, 2009).

In 2011, southwest Manitoba, including the Whitewater Lake sub-watershed, experienced extreme precipitation and a severe spring flood event. Unprecedented water levels caused Whitewater Lake to spill out and run into through Medora Creek, the first occurrence in recorded history. Since then lake levels have continued to remain high. In 2014, water levels rose to a new historic high of 498 metres (1,633.73 feet). Wet conditions in the spring of 2017 caused water levels to rise again. Water levels rose close to the record high levels recorded in 2014.

Chapter Two: Literature Review

2.1 Ecological goods and services concept

Our landscape contain both natural and human altered ecosystems. Natural ecosystems are the biological environments found in nature and include a number of environments such as forests, grasslands and freshwater areas (Pasupalati et al, 2017). Human altered ecosystems result from the disruption of natural areas. Agricultural land is an example of a human altered ecosystem (Pasupalati et al, 2017).

A number of definitions have been developed to define ecosystem services; however, the concept is fundamentally based on the idea that these services are valued by humans for the processes or functions that they can produce (Farley & Costanza, 2010). Ecosystem services are represented by the natural assets or natural capital that exist in our environment (Government of Quebec, 2005). The provision or protection of ecosystem services can occur through EGS programming. EGS programs provide environmental protection in agricultural landscapes and promote a sustainable approach to managing human altered ecosystems (Pasupalati et al, 2017). However, because the production of ecosystem services predominantly occurs on privately owned land, agricultural producers are exposed to the high costs, or foregone opportunity costs, associated with producing these public ecosystem services. EGS programming has been developed to compensate agricultural producers for generating these public goods which can result in positive externalities, such as flood abatement or water purification, that benefit the greater public (Government of Quebec, 2005).

EGS programs focus on the multifunctionality of land use; incorporating environmental, social and economic aspects of agriculture. EGS programs compensate for the negative impacts that can result from agricultural production. The natural areas and BMPs conserved or produced

on agricultural land as a result of EGS programming provide a number of functions useful for the general public. As discussed above, these natural functions can include soil erosion protection, climate regulation, water purification, maintenance of biodiversity, and flood and drought protection (Government of Quebec, 2005).

A variety of programs have been developed to recognize to the mutualistic relationship of environmental benefits and agricultural production. Governmental policies also play a large factor in how programs can be successfully implemented, so we see a range of different programs that span across the country.

Monetary benefits are provided by the production of ecosystem services; however, the value of natural capital is difficult to define and evaluate (Rees, 1995; Pasupalati et al, 2017). As a result, there has been a growing increase in the number of engineered structures rather than managing our landscapes naturally with the assistance of functional ecosystems components. As an example in the Whitewater Lake sub-watershed, TMCD had a substantial uptake of small dam construction over wetland conservation or restoration.

While there has been a demand from agricultural organizations to create agricultural policy that implements payment based programming at the federal and provincial level, Canada is currently the only industrialized country that lacks a national incentive based program to increase public EGS benefits (Wishart, 2009).

2.2 Market failure and the effect on EGS programs

Goods and services provided by our ecosystems were once an abundant resource to our world. As the world's population began to increase, subsequent demands were places on agricultural systems across the world (Goldman & Tallis, 2009). As a result of these growing

demands, land alteration and degradation began to occur and the stocks of prevalent ecosystem services began to deplete (Goldman & Tallis, 2009; Turner & Daily, 2007). Ecosystem services are termed classic public goods and their use has not historically been controlled. As a result, no efficient price mechanism exists to signal scarcity of deterioration in the stocks of ecosystem services (Whitten et al, 2003).

Jack, Kousky & Sims (2007) identify that the benefits of providing an ecosystem service are accrued by the individual making the management decision. The provision of ecosystem services for private individuals, such as crop or livestock production, benefit the producer and are consistent in contemporary markets as there is a measurable willingness to pay. The provision of ecosystem services for the public, such as flood abatement or water purification, can result in market failure (Jack, Kousky & Sims, 2007). Markets failure is defined as, "the failure of a more or less idealized system of price market institutions to sustain desirable activities or to stop "undesirable" activities" (Bator, 1958, p.351).

The market failure that is faced when allocating payments for ecosystem services is identified by environmental externalities and the transaction costs that are associated with implementing programs, such as development, monitoring and enforcement of the program (Mauerhofer et al, 2013). Voluntary contracts that are encouraged through effective legal structures and enforceable property rights are an effective means to implements EGS programs that decrease the costs associated with them (Mauerhofer et al, 2013).

Environmental issues are generally associated with two market failures; the externalities and the public goods. Externalities are defined as the costs that are imposed on a third party instead of being placed on the participating entities in the market transaction (Nusdeo, 2008).

Negative externalities, such as agricultural pollution, can create incremental costs for a third parties water treatment facility. Positive externalities, such as benefits from environmental protection, provide a positive outcome for an entity that may not be paying for that service. Public goods are another form of positive externalities and can be categorized as non-rivalry public goods or non-exclusive public goods (Whitten et al, 2003). Non-rivalry public goods are defined as positive externalities that do not diminish (in net capacity) as one entity has access. Therefore any individual will be able to access this type of good without the concern of its diminishment. Nonexclusive public goods are defined as positive externalities which face the challenge or complexities of excluding anyone from the good or service. It is generally unfeasible or too exorbitant to exclude one from the public good (Brown et al, 2006). Due to the defining characteristics of public goods, no market is effectively able to produce them as such, and the burden is placed on government entities to provide the public goods (Whitten et al, 2003).

As discussed above, some natural capital produced through the benefits of ecological goods and services, such as food and fiber, have a measurable willingness to pay in our contemporary markets. Alternatively, natural capital such as water purification, habitat creation, nutrient retention and aesthetic appearances, face an undesirable position in a market failure situation. The above noted ecological goods and services are suspected to have market failure because of their unique characteristics (Daly and Farley, 2004). First, ecological goods and services are viewed as public goods that are produced by private costs and on private land. This dynamic creates a difficult mechanism for markets to evaluate a willingness to pay by consumers (Whitten et al, 2003). Secondly, the ecological services outcome produced by the landowner may not be a tangible or visible asset like food and fibre. However, the incorporation of

environmental monitoring systems can provide an assessment of the services provided. The ecological goods and services benefits that society experience is an unintended result from another land use or management decision.

Rees (1995) discusses an issue surrounding assigning a price to an ecological good. For ecological goods and services provided on agricultural land, it is not the money value associated with them, but rather the physical quantity of natural capital stocks and flows that is fundamental to sustainability (Rees, 1995). Economists and society find it hard to quantify a price to these services because they are not familiar in dealing with them. The ecosphere provides four categories of ecological goods and services, including provisioning services (e.g., food production, extraction of raw materials, etc.), regulating services (e.g., air purification, water regulation, etc.), cultural services (e.g., aesthetic value, recreation, etc.) and supporting services (e.g., pollination, habitat production, etc.) (Pasupalati et al, 2017).

Our markets presently deal well with assigning an economic value to provisioning services and have not commonly assigned values to the other three categories (Rees, 1995; Pasupalati et al, 2017). As a result, there has historically been difficulties in making societal changes towards paying for ecological goods and services (Rees, 1995).

One way governments can alleviate market failure in positive externalities for EGS, is the provision of a subsidy or payment to the producer to offer an incentive to continue the production of the ecological good or services that are creating the positive externality. A number of other policy mechanism examples are provided in Section 2.4.

2.3 Property rights and ecosystem services

Property rights are characterized by, "the individual's ability to consume the good or the services of the asset, directly or to consume it indirectly through exchange" (Whitten et al, 2003, pg. 6). This means an individual landowner with a strong property right would have a greater ability to access and utilize the benefits produced on the land (Whitten et al, 2003). Property rights can be affected positively or negatively by government action.

Negative impacts to private property rights can occur through the implementation of environmental legislation, such as the requirement to maintain a forested or wetland area on private property. A regulatory taking, a limitation on an individual's private property rights, may be imposed when a government regulation limits the uses of private property to an extent that the landowner is evaded of an economic opportunity (Schwartz & Bueckert, 2006). Under The Water Rights Act and associated regulations, all drainage projects must require a licence. This legislation in Manitoba currently protects Class 4 and Class 5 wetlands, classified through the Stewart and Kantrud Wetland Classification System, from drainage activities. While an environmentally sound decision, this regulatory decision could impose a restriction on current property rights (Schwartz & Bueckert, 2006).

Positive impacts to private property rights can occur if governments create markets suitable for the sale of ecosystem service. For EGS, the conservation of natural resources is transformed into a perceived good, such as healthy soil and water landscapes. Entitlement to the ecosystem services is then given to the private property which would allow them to sell the service in the developed market (Nusdeo, 2008). For example, the good, protection of soil and water health, will be sold for the improvements it provides, such as soil erosion protection, water supply enhancement, water quality improvements, fish and wildlife habitat increases, and a

reduction in damages caused by floods and other natural disasters. Therefore, the building of a market for EGS programs can be facilitated through the attribution of property rights to non-market goods (Whitten et al, 2003).

2.4 Description of policy instruments to deliver EGS

2.4.1 Regulatory avenues

Regulatory frameworks for EGS protection and creation are diverse, but for the purposes of this research will be described in two categories: regulations that prohibit certain activities, such as wetland drainage, without providing any compensation or incentives, and regulations that support incentive payments to encourage conservation activities, such as carbon sequestration activities.

Some government regulations require landowners to adhere to a minimum standard to protect certain environmental resources (Government of Quebec, 2005) and practising techniques that do not harm society as a whole. Regulatory prohibitions of this kind are in effect, protecting public goods and services while restricting the private production of economic goods.

Manitoba has implemented regulations that may affect how landowners utilize their land. For example, The Water Protection Act, The Water Rights Act and The Planning Act all restrict certain activities on land, without offering any compensation to the landowners whose property rights are restricted as a result.

2.4.2 Cross-compliance

Cross-compliance or eco-conditionality requires landowners to adhere to certain environmental requirements. This can be based off of environmental guidelines or governmental regulations. In some cases, governments may choose to restrict access to government funding if

the identified environmental requirements are not implemented. Additionally, governments can use EGS programming to bring landowners into compliance of environmental regulations.

The 1985 U.S. Farm Bill created a number provisions to reduce the production of highly erodible land and to encourage the protection of soil and water resources (Stubbs, 2016). While the implementation of the 1985 Farm Bill was not intended to impose restrictions on private property rights, it restricted landowner access to federal subsidizes on land that was being utilised against their provisions. For example, land which converted highly erodible land into cropland or landowners who chose to drain wetland were not eligible to receive crop insurance benefits (Stubbs, 2016).

In Canada, the approach to exclude landowners from federal benefits has not yet occurred. However, in some provinces, EGS programming has been used to bring landowners into regulatory compliance. The Prince Edward Island (PEI) Federation of Agriculture developed a pilot project that provided an incentive to landowners that complied with regulations. A 1999 regulation increased the width of riparian strips to ten metres and the pilot project aimed to provide a lump-sum compensation to landowners who adhered to this regulation (Government of Quebec, 2005).

2.4.3 Voluntary approaches

Voluntary approaches are initiatives that do not provide financial compensation for landowners. The approach may involve educational training for participants or consultation through workshops, one-on-one participation or mail-out brochures. Such programs help landowners acquire technical assistance for environmental benefits they already wish to pursue on their land without the requirement of a financial payment.

The Environmental Farm Plan (EFP) is a national program across Canada which is implemented individually by each province (Atari et al, 2009). Through risk-assessment questions, the EFP program assists landowners in filling out an awareness document that helps to identify the environmental risks that landowners have on their farm (Atari et al, 2009). While this is a voluntary system that helps guide producers through BMP's and the options they can implement on their land, completion of an EFP is tied to funding availability of some Manitoba programs. For example, landowners must receive an EFP Statement of Completion to be eligible to receive funding for BMP adoption under the Growing Assurance-Environment (Manitoba Agriculture, 2017). Due to the voluntary nature of the program, the level of participation is highly influenced by operation type and the satisfaction of the program. As a result, there has been a higher involvement of livestock producers in the EFP process participants (Atari et al, 2009).

2.4.4 Environmental marketing

Environmental marketing systems add a value to a certain product or service by certifying it. This type of commodity would preferably be in more demand by consumers and the price point would increase (Government of Quebec, 2005). Such examples of environmental marketing systems can be seen in Manitoba with the eco-certification of sustainable fisheries (Freshwater Fish, 2010).

While eco-certification of products creates a mechanism for environmental marketing, such systems can also exist without the development of a certification program. Landowners participating in the PEI ALUS program have been able to recognize a competitive advantage of their products in the marketplace. Landowners have identified that the public has recognized

their sustainably produced products over and above regular industry products (Commission on the Future of Agriculture and Agri-Food on Prince Edward Island, 2009).

2.4.5 Market based approaches

Payments for services can also be achieved through market-based programs. As earlier discussed, market failure makes for a challenging situation when trying to quantify EGS services for payments. The artificial creation of a market for these services can be implemented through granting tradable rights to landowners. The negative effects agriculture imposes on the environment can be offset though a system of purchasing offset credits and trading or selling offset credits when appropriate. This type of system expresses a signal to market stakeholders to modify their negative behaviour (Government of Quebec, 2005).

Economic instruments, such as Green House Gas (GHG) offset credits, tax credits and nutrient reduction credits are commonly used in European countries and the United States but have been slow to pick up in Canada (Schmidt et al, 2012). The implementation of the following economic instruments is delivered in a non-traditional market, created on the basis of granting landowners property rights for these ecosystem services (Nusdeo, 2008).

Water Quality Trading: Water quality trading programs are evaluated based on an overall limit that is set for water pollution levels and is based on the cap-and-trade system. Sources of pollution, or pollutants, are allocated a portion of the total limit and are restricted from exceeding that amount. This produces a market where pollutants can partake in water effluent trades, creating a cost effective solution for water pollution reduction (Fed-Prov EGS Working Group, 2011). In Canada, Water Quality Trading has been used in Eastern Ontario through the South Nation River Total Phosphorus Management Program. Beginning in 2000, a partial cap was placed on phosphorus discharges. The program monitored and allowed phosphorus discharges

with reductions in other nonpoint source areas; and was done at a four to one trade ratio (Fed-Prov EGS Working Group, 2011).

Transferable Development Credits: Transferable development credits programs aim to remove at risk landscapes out of intensive development by relocating the service to better suited landscapes. Current programming in Canada is not vastly developed; however, the Alberta's Land Stewardship Act allows the creation of programs like this (Fed-Prov EGS Working Group, 2011). The Alberta Wetland Policy allows for continued growth and development in the province by implementing an avoidance, minimization and replacement approach. The combination of approaches facilitates development by minimizing or replacing the wetland's value in another area and protects the benefits of high value wetlands (Alberta Government, 2013).

GHG Offset Systems: GHG offset systems are commonly referred to as cap-and-trade programs, which place a market value on GHG emissions while creating a market for polluters to trade and incentives to reduce their emissions. Cap-and-trade programs offer pollutants the option to sell carbon offset credits if they have assumed practices that reduce emissions (Fed-Prov EGS Working Group, 2011). Alberta has been a front-runner in Canada for implementing a cap-and-trade system with the introduction of the Alberta Offset System in 2007. Economically and geographically, Alberta became the leader in cap-and-trade systems in Canada, with other regions becoming more involved through the following programs: Pacific Carbon Trust, Midwestern Accord, Western Climate Initiative and the Regional GHG Initiative (Fed-Prov EGS Working Group, 2011). A study by the David Suzuki foundation shows that Canada's economy could grow over 20% in the next decade while the country reduces greenhouse gas emissions by approximately 50% (David Suzuki Foundation, 2009).

Wetland and stream mitigation banking: Wetland mitigation banking and stream banking are two concepts that have been utilized by the U.S. Army Corps of Engineers. This concept follows the no-net-loss of wetlands policy that states if a wetland must be drained, there must be mitigation that compensates for more than the loss of wetland benefits (Government of Manitoba, 2014).

Reverse Auction: The reverse auction system is another form of market-based approaches that effectively creates a viable market for EGS to be provided. Whitewater Lake Conservation Auction Incentive Program had landowners submit bids based on how much they were willing to accept/willing to sell their good or service for (TMCD, 2014). The landowners can sell their land directly to the conservation district, put their land into conservation easements or implement BMP's on their land (TMCD, 2014).

Tax Offsetting: Payments for EGS services may also be implemented in programs through the form of a tax credit. Programs utilize either provincial tax systems (ex. Manitoba Department of Finance) or municipal tax systems. Remuneration is provided based on a dollar amount/acre/year for implementation of BMP's that create EGS benefits. Although generally, funding for EGS programs comes from public money (provincial taxes), funding for payments can also arise from a local level.

In 2005, a Riparian Tax Credit program was implemented by the Manitoba Department of Finance which provided a 100% property tax credit for the preservation and re-establishment of riparian area. The riparian strip had to have a minimum width of 100 feet and had to be maintained for five years (Cross, 2010). The program was extended in 2010; however, due to the

credits ineffectiveness, the credit was eliminated in the 2017 Budget Address on April 11, 2017 (Cross, 2010; Manitoba Tax Assistance Office, 2016).

Local funding can be derived from fees for a service or from the taxation of a negative externality (Government of Quebec, 2005). These types of programs can utilize the municipal tax system to impose a levy on all members of the land for a fee for service, whether it is for water purification or conservation purposes etc. This money can then be solely devout for that purpose and can be managed locally.

A local British Columbia example has been demonstrated by levying all area landowners to create a designated fund for conservation activities. The Kootenay Conservation Program was set up to provide local support for conservation projects. The program raises an annual amount of funding through a specified parcel tax that is then dedicated to conservation activities (KCP, 2017).

Manitoba conservation districts also provide an example of utilizing local levies to fund conservation programming. Manitoba conservation districts are funded through municipal governments, provincial grants and other funding sources such as, non-governmental organizations and industry (Manitoba Water Stewardship, 2015). Municipal funding is based on a three to one ratio; requiring a municipal contribution of $1 for every $3 contributed by the province (Manitoba Water Stewardship, 2015). This unfortunately could be identified as a volatile revenue source as political appetite and policies can very across administrations. As an example, in 2014 provincial cuts to Manitoba's conservation districts ignited some municipalities to reassess their financial involvement in the program (Stevenson, 2014).

2.4.6 Financial incentives

Payments for EGS can come from a number of sources. Funding can arise from two sources, either payments from the users or payments from a third party and/or public. We see demonstrations of user-pay systems where the landowners themselves (rate payers) pay for the services (Mauerhofer et al, 2013). As discussed above, municipal levies are taken from rate payers to contribute funding towards Manitoba conservation districts (Manitoba Water Stewardship, 2015). Third party payments can arise from non-governmental organizations and federal and provincial governments.

Payments for EGS generally do not directly pay for quantifiable environmental services; alternatively they pay for inputs that provide these goods and services. For example, the costs associated with restoring a wetland. However, in some cases more sophisticated models have been developed to assess the value of the benefit provided.

Payments for EGS can either come in a one-time payment, annual payments or mixed one-time and annual payments (Mauerhofer et al, 2013).

2.4.6.1 One-time payments

One-time payments are implemented with the goal of offsetting the initial net losses landowners will incur for implementing programs. Conservation agencies and governments generally determine a one-time payment level by assessing the market value of the land; however, the landowner's opportunity costs or value of investment may be included in this figure as well. For example, this refund can be directed to refunding capital investments for implementing beneficial management practises (Agriculture and Agri-Food Canada, 2008). One-time payments may also be devoted towards land purchases.

Programs such as Canada's national farm stewardship program (NFSP) and Quebec's Prime-Vert Program provided one time payments for landowners. The United States has implemented an Environmental Quality Incentives Program that helps landowners implement conservation practises with funding support (NRCS, 2014).

2.4.6.2 Annual payments

Annual payments are payments granted to a landowner for their net annual expenses they incur for maintaining or adopting new BMP's on their land. Annual payments correspond with contract periods. Contract length varies for annual payments. Some programs offer shorter term contracts such as three years and others offer longer term contracts (Agriculture and Agri-Food Canada, 2008). For example, Alternate Land Use Service (ALUS) and the Conservation Replacement Program (CRP) are two programs that provide landowners with annual payments for conservation practises. In 2006, an ALUS pilot project was delivered in the Rural Municipality of Blanchard in Manitoba. The pilot project was deemed successful and received high reports of program participant satisfaction. Payments were provided to landowners for existing features on their land which provided different levels of alternative land use (Grant & Mann, 2007). One criticism of this pilot project was the lack of additionality, the implementation of new practises to generate additional ecological goods and services. A program review was undertaken in 2007 in which the researchers identified that all similar programs moving forward should include an additionality aspect (Grant & Mann, 2007).

Annual incentive based programs have also been successful in utilizing previously existing agricultural agencies to deliver and administer the program. This can reduce high administration costs associated with delivering conservation programming. Entities such as, Manitoba conservation districts, Keystone Agricultural Producers (KAP), The Manitoba

Agricultural Services Corporation (MASC), Manitoba Agriculture, Agriculture and Agri-Food Canada and Prairie Farm Rehabilitation Administration (PFRA) are some of the delivery options that have been recognized in Manitoba (Wishart, 2009). For example, ALUS projects across Canada have been successful in utilizing a number organizations to optimize on their existing functions and mandates.

2.4.6.3 Acquisition of property rights

EGS programs can also be executed through the acquisition or purchase of property rights. Programs aimed at obtaining property rights effectively limit the control of the landowner in an effort to implement conservation efforts. Land ownership comes with the right to occupy, sell, lease, farm, develop, construct buildings, harvest timber and restrict access (The Nature Conservancy, 2014). Programming for the acquisition or purchase of property rights is available through partnerships with the North American Waterfowl Management Plan, Nature Conservancy of Canada, DUC and many other land trust organizations. The landowner can release sole or multiple rights to the land trust organization in an effort to maintain a specific conservation effort and generally landowners received a payment in turn.

2.5 Negative implications of EGS programming

Negative implications have been cited by landowners from the implementation of EGS programming. Understanding these implications will help to clearly define suitable programming for landowners and will help policy makers understand the pressures placed on landowners. Negative effects include: loss of opportunity costs, impact to land values, impacts to neighbouring areas and wildlife implications.

For example, conservation easements are voluntary agreements entered into by landowners and conservation agencies. Conservation easements protect land, generally in

perpetuity, by restricting the conversion of the existing habitat (Lawley & Towe, 2012). By restricting the conversion of the existing habitat, a landowner foregoes the possible value associated with that action, and ultimately reduces the value of the parcel signed in the conservation agreement (Lawley & Towe, 2012; Brown et al, 2011).

Buckley & Crone (2008) discuss the negative impacts which can occur to surrounding landowners as a result of restoration projects. As ecological processes occur across land-use boundaries, both positive and negative impacts can be felt by surrounding landowners. While positive impacts are more commonly experienced, conflicts between landowners may result from spillover effects from the project, such as alkaline soils near large waterbodies or animal disturbance (Buckley & Crone, 2008).

Programs which aim to maintain or improve wildlife habitat can result in an abundance of wildlife. With this, landowners may experience both negative cost implications and positive benefits (Conover, 1998). Conover (1998) indicates that landowners who undertook wildlife habitat maintenance/improvement activities experienced negative cost implications, such as wildlife damage to property and crops, allowing hunter access to their property, lost opportunity costs associated with the management of wildlife (e.g., cover crops, water sources, crop residue, salt licks, etc.), and the lost opportunity costs associated with preventing damages (Conover, 1998).

2.6 Stacking, bundling and additionally

Many ecosystem functions in the natural and altered landscape are interconnected. Some conservation programs place great significance on enhancing or management one service which can result in limiting or recognizing the production of other services (Ingram, 2012). As discussed above, payments for providing ecosystem services can be delivered through a number

of systems or markets. However, most commonly landowners received financial payments (e.g. annual, one time, etc.) and incentives or offset credits (e.g., tax relief, mitigation credits, etc.) (Cooley & Olander, 2011). The following concepts: stacking, bundling and additionally, can help to facilitate a connection between ecosystem functions and the payments received by landowners (Ingram, 2012). Successful implementation of these concepts in EGS programming can impact the effectiveness of program participation and satisfaction, environmental outcomes and public perception. Allowing landowners the opportunity to participate in multiple markets for the provision of multiple services can provide both private and public advantages (Cooley & Olander, 2011).

Stacking is defined as a process that allows a landowner the ability to receive more than one payment for a conservation action on their land (Schmidt et al, 2012). For example, a landowner conserves a wetland and receives a tax incentive payment from their government. In addition, the landowner also receives an annual payment from a private conservation organization.

Bundling is defined as a landowner receiving one single payment for multiple EGS services (Schmidt et al, 2012). For example, restoring a buffer strip along a river could provide multiple benefits, such as erosion control and water quality improvements; however, the landowner will receive only one payment for these multiple benefits.

Additionality is defined as a change in agricultural practice made in direct response to a payment. Changes to agricultural practices are often seen as an onerous expense at the outset, which can deter landowners from participating in a program (Bennett, 2010). For example, a program that attempts to recognize the water quality benefits a buffer strip may provide, would

not constitute as additionality or an incremental change. Under the concept of EGS programs, a payment should act as an incentive to influence change in land management practises on the participants land.

2.7 Agricultural policy and the impact on EGS programs

Agricultural policy, both federally and provincially, provide a considerable sweep of programming options for producers. The management of agricultural products differ from province to province, as provincial marketing boards are affected by varying provincial legislation and regulations. As a result of wide spread agricultural policy across Canada, federal and provincial governments are both involved in, agricultural research, food inspection and food regulation, extension and education services, farm input and capital assistance and support for Best Management Practices (Schmidt et al, 2012).

In particular, federal spending in much of agricultural policy is focused on Business Risk Management (BRM) tools rather than innovative programs to encourage the production of EGS. BRM tools help producers to manage risks associated with the management of a farm operation by providing support for income declines due to market forces and natural disasters (Government of Canada, 2017). While negative land use behaviour, such as the production of marginal lands, on an individual farm may not directly impact their reliance on BRM programming, the cumulative impact of negative land use behaviour in a watershed may increase the quantity of BRM programs required for landowners.

BRM tools do not provide adaptive programming options to mitigate the producers overall farm viability from these risks. In contract, EGS programs aim to reward positive land use behaviour and the implementation of EGS programming may reduce a landowner's reliance on BRM tools, reducing overall federal costs associated with delivering BRM programs.

Campbell (2012) discusses the pitfalls of EGS programming and recommends against using EGS programming as a method to support farm income, as seen with BRM tools. Using funds for this method of support is inefficient for program finances and environmental objectives (Campbell, 2012).

BRM programs, such as income support and stabilization payments have historically been much greater than payments for environmental services and programming; albeit diversified landscapes with environmental programming tend to be more risk tolerant and require less support during disasters (Task Force Report, 2015). In addition to on-farm benefits, research from Indiana points towards the community benefits of diversified agro-landscapes, with a finding that a wetland coverage of 1.5% on a landscape could reduce peak floods by 29%, thereby reducing reliance on BRM programming (Task Force Report, 2015). Figure 5 shows federal, provincial and territorial expenditures in BRM tools from 2004 through 2011 (Schmidt et al, 2012).

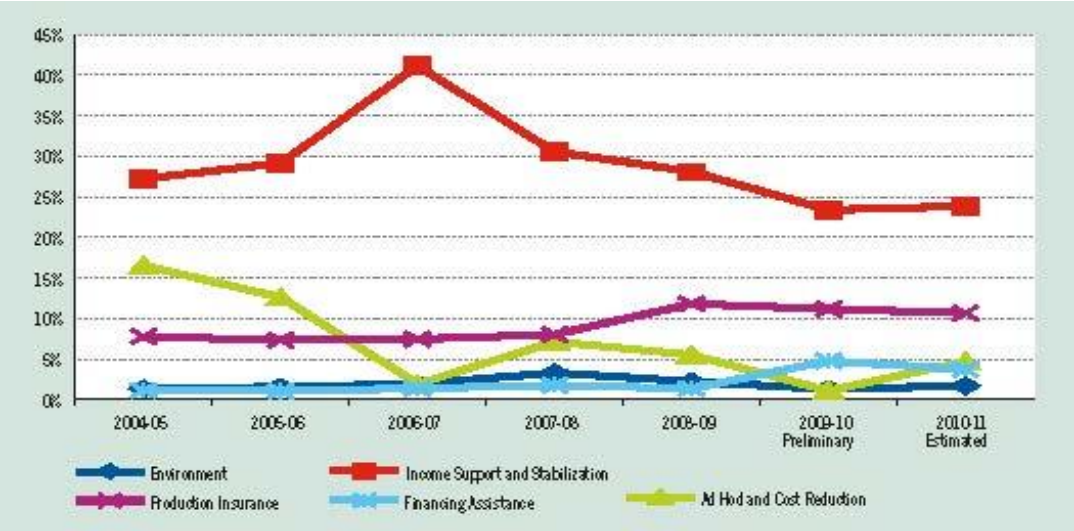

Figure 5: Agri-food programs of the combined federal/provincial/territorial expenditures

Figure Source: The Macdonald-Laurier Institute (Schmidt et al, 2012) originally taken from AAFC, Farm Income, Conditions and Government Assistance Data book, 2010.

As discussed above, business risk management programs are created to assist producers during periods of income decline caused by flooding, drought, or market conditions that result in lower commodity prices and rising input costs (MAFRD, 2016). In Manitoba, producers are able to access a variety of BRM programs through Growing Forward 2, as detailed in the Table 1 below. However, as the description of each program clearly defines, these programs provide landowners with a mechanism to respond to issues instead of proactively mitigating for risks.

Table 1: Business Risk Management Programs in Manitoba

Program	Description	Frequency of occurrence	Source of Risk
AgriInvest	A self-managed producer savings account that helps cover small margin declines. It provides coverage for small income declines and allows for investments that help mitigate risks or improve market income	Frequent and small events	Other
AgriStability	Provides support when a producer experiences large decline in the farm's operating margin. A payment is triggered when the margin (allowable revenue less allowable expenses) falls below 70% of the producer's historical reference margin.	Frequent and small events through rare and large events	Markets/Other
AgriRecovery	Is a disaster relief framework that provides a co-ordinated process for federal, provincial and territorial governments to respond rapidly when disasters affecting several producers occur. It is designed to help producers with extraordinary costs incurred to resume operations after a disaster.	Rare and large events	Nature/Markets
AgriInsurance	Provides insurance products for production losses caused by natural perils (weather, pests, or disease) for	Rare and large events	Nature

	most crops grown in Manitoba, including cereals, oilseeds, special crops and forages.		
Western Livestock Price Insurance	Offers livestock producers protection against unexpected market price declines.	N/A	Markets

Table Source: Information in the table taken from Government of Manitoba (2016)

In 2005, Agriculture and Agri-Food Canada announced the National Farm Stewardship Program. The National Farm Stewardship Program operated on at $40 million dollar budget, and funded a number of projects which implemented on farm BMP (Basset, 2014). In 2008, the National Farm Stewardship Program expired and the federal government announced Growing Forward, a slightly re-adjusted framework; an agricultural policy approach that aims to create a profitable and innovative, agriculture, agri-food and agri-based products industry across Canada (Basset, 2014). The Growing Forward framework provided national outcomes to provinces and territories, while allowing greater flexibility with the design of provincial programming (Schmidt et al, 2012). Growing Forward was in effect until 2013, which at that point a new framework, Growing Forward 2, was implemented by the federal government. Growing Forward 2 was a five year agreement that provided funding to provinces and territories for strategic initiatives and BRM programming. Strategic initiatives for the agricultural sector included innovative approaches that respond to changing market conditions and consumer demand (MAFRD, 2016). This aspect of Growing Forward 2 allows provinces and territories the opportunity to explore EGS programming. Federal, provincial and territorial governments are currently working on the next agricultural policy framework to replace Growing Forward 2 (McCormick, 2017). Six key priorities were identified as the guiding framework for the development of the next agricultural policy and include: markets and trade; science, research and innovation; risk management;

environmental sustainability and climate change; value-added agriculture and agri-food processing; and public trust (McCormick, 2017).

2.8 Provincial legislative avenues and effective incentive based programs

Natural resources in Canada are held in trust on behalf of citizens by provincial and federal governments. Due to the changing dimensions of land ownership across a landscape, a variety of legislation and regulations have been implemented to protect certain species that rely on natural resources for their habitat as well as protecting natural areas for the greater good. Programs such as the federal Species at Risk Act (SARA), the federal Migratory Birds Convention Act (MBCA) and the Ontario Endangered Species Act, all protect migratory birds whose transient characteristics take them across a variety of landscapes. In addition to Canada-wide movement of wildlife, the North American Waterfowl Management Plan was implemented in 1986 in an effort to help Canada and the United States collaborate to protect wetlands and upland waterfowl habitat (NAWMP, 2015).

2.8.1 Manitoba water policies

In 1990, the Government of Manitoba developed the Manitoba Water Policies which focused on a number of objectives, including flooding, drainage, water quality, conservation, use and allocation and education. These policies were updated and further developed in The Manitoba Water Strategy, which was announced in 2003. The policy on conservation states,

> "To conserve and manage the lakes, rivers, and wetlands of Manitoba so as to protect the ability of the environment to sustain life and provide environmental, economic, and aesthetic benefits to existing and future generations" (Manitoba Water Strategy, 2003, pg. 27).

In the strategy, a number of policies were identified, which were implemented through the use of incentives, education, watershed-based integrated management and regulations (Manitoba Water Strategy, 2003). The identified policies and their subsequent actions identified a clear vision for the Manitoba Government and their partners to move toward integrating the conservation of wetland habitat across the province. In 2014, in response to a significant flood coupled with nitrification of Lake Winnipeg, the Manitoba Government announced Manitoba's first comprehensive Surface Water Management Strategy and multi-year surface water management investments to protect Lake Winnipeg and mitigate flood and drought damage (Manitoba News Release, 2014). The report, a commitment identified in TomorrowNow – Manitoba's Green Plan, highlights policy and program actions and was organized around three key pillars: preparing for extreme events, improving and protecting water quality and co-ordination and awareness. Manitoba's Surface Water Management Strategy identified actions that fall in the above identified pillars. These actions still maintain the original intent identified in the two previous policy documents. Within the Manitoba Surface Water Management Strategy, the province identifies two key areas that will aid the province in protecting and conserving wetlands into the future. Additionally, proposed legislation, the Surface Water Management Act, was announced on November 24, 2015 by the former department of Conservation and Water Stewardship. The proposed bill was also introduced into legislature for the first reading but did not proceed in the legislature.

More recently, Manitoba Sustainable Development announced public consultation on three initiatives focused on water management and watershed planning. These initiatives stem from the policy commitments identified by government in the mandate letters. The Manitoba government will be pursing consultation on the following initiatives: a program based on the

ALUS model, watershed-based planning for drainage and water resource management with a goal of no net loss of water retention capacity and a made-in Manitoba climate action plan (Government of Manitoba, 2017).

In Manitoba, semi-permanent and permanent wetlands (classes 4 and 5) are protected through regulation under The Water Rights Act. At this time, Manitoba does not have any policies to protect ephemeral and temporary wetlands (classes 1 and 2), which fluctuate greatly in duration and saturation of water.

2.8.2 Manitoba legislation

The following Manitoba pieces of legislature provide a legal avenue for the protection, conservation, administration and restoration of wetlands: The Environment Act, The Manitoba Habitat Heritage Act, The Conservation Agreements Act, The Water Rights Act, and The Municipal Act.

However, current regulatory policies result in high administrative costs. Furthermore, regulatory measures imposed on private lands have been ineffective and tend to cause fractures in trust between the rural community and provincial decision makers. An EGS pilot project based in Prince Edward Island demonstrated that landowners were more inclined to implement beneficial management practises on their land for an incentive versus a regulatory approach through a government (PEI Wildlife Federation, 2009). In addition to the policies and legislation discussed above, the Manitoba Government has assisted landowners to better understand environmental management systems through the use of EFPs and has provided funding for the delivery of EGS programming through Manitoba conservation districts.

Mauerhofer et al (2013) discussed the evolution of the polluter pay principle to the concept of payments for ecosystem services. Researchers suggested that regulation of a program, beyond the distribution of property rights, may cease if transaction costs of a program are non-existent or remain lower than the resulting benefit. EGS programs are suggested to be privately managed systems, in accordance to the programs being self-organized (Mauerhofer et al, 2013).

Incentive based programs offer advantages when governmental regulations are ineffective or when no regulations framework exist (Paulich 2010). Paulich (2010) explains that government regulations can play an important role in effective resource management if developed properly to avoid the command and control structures most commonly experienced with government regulations. Incentive-based systems, as delivered through EGS programming can act as an efficiently managed system which involves landowners in program development rather than working against them (Paulich, 2010). As stated earlier in the report, a regulatory taking is imposed on an individual when a government regulation limits the uses of private property to an extent that the landowner is evaded of an economic opportunity. EGS programs may offer a method of compensation, in lieu of a regulatory taking, which incentivises landowners to meet an acceptable level of environmental conservation.

2.9 EGS programming – Canadian context

The term EGS is comparatively new in the context of Canadian agricultural and environmental policy. Although an emerging term, the actions and subsequent rewards have been evident in the agriculture section for years as proper stewardship of land and water resources (EGS Technical Meeting, 2009). EGS programs have emerged from past agri-environmental stewardship programs such as, Permanent Cover Program, the National Soil Conservation Program and the Agricultural Policy Framework. As agri-environmental stewardship programs

evolved, the federal government recognized a need for maintaining funding for activities across the country. Programs such as, Greencover Canada, Environmental Farm Planning and the National Farm Stewardship Program, emerged in the early 2000's to provide producers an avenue for recognizing water quality and quantity beneficial practises (EGS Technical Meeting, 2009). The Greencover Canada Program was developed to deliver beneficial management practises with a focus on grassland management. Activities such as planting shelter belts and converting sensitive land to perennial cover were included in the program (Klimas & Weersink, 2013). Environmental Farm Planning was a federal-provincial endeavour that provided landowners a voluntary and confidential process to identifying environmental risks on their farm. The federal government provided funding for the program, while the provincial governments provided guidance and technical support to landowners. The Environmental Farm Plan was additionally a requirement for entry into the federal-provincial National Farm Stewardship Program. Similar to the Greencover Canada program, the National Farm Stewardship Program provided funding for the implementation of beneficial management practises such as runoff control, irrigation management, water well management and nutrient recovery; however, practises were focused more on water management rather than grassland management (Klimas & Weersink, 2013). All three of these federal programs ended in 2008/2009 when the introduction of Growing Forward occurred. Under Growing Forward, and subsequently Growing Forward 2, federal-provincial-territorial partnerships were identified to build upon the success of the programs discussed above. The emergence of these programs in 2009 solidified the shift to provincial and territorial program administration. The federal government plays a key role in supporting EGS programs through continued funding arrangements. As discussed above, federal, provincial and territorial governments are currently working on the next agricultural policy

framework, Growing Forward 3, to replace Growing Forward 2 (McCormick, 2017). Six key priorities were identified as the guiding framework for the development of the next agricultural policy and include: markets and trade; science, research and innovation; risk management; environmental sustainability and climate change; value-added agriculture and agri-food processing; and public trust (McCormick, 2017).

2.9.1 Summary of programs

Federal, provincial and local governments across Canada are beginning to offer a number of EGS type programs. Some of these programs are relatively old, while the conception of some is more recent. The production of EGS benefits has now begun to emerge into the deliverables of federal conservation funding. Table 2 provides a glance at some EGS programming available in Canada. While extensive, this is not an exhaustive list of programming. Federal support of EGS programming is generally through the provision of grant funding to provincial and local program delivery agents; however, tax credits have also been provided to landowners for donating land. Provincial support of EGS programming ranges from province to province. PEI is on the only province implementing a province-wide EGS program under the ALUS Concept. Additional provincial support has included tax exemptions, annual payments and technical assistance. Municipal support of EGS programming has occurred through tax exemptions, funding of ALUS based programming and funding of water quality programming. Private support of EGS programming has occurred through a number of eNGOs and is generally delivered on the local level.

Table 2: Overview of programs across Canada that provide inceptives for EGS production

Program Name		Description of Program	Incentive/ Cost Share Payment	Funding
Geographic Level: Federal	Habitat Stewardship Program (HSP) for species at risk	Contribute to the recovery of endangered, threatened, and other species at risk, and to prevent other species from becoming a conservation concern, through engaging in activities that protect or conserve habitats.	HSP funds activities promoting habitat protection and recovery of species at risk.	Federal (Environment Canada, Fisheries and Oceans Canada, and Parks Canada, Interdepartmental Recovery Fund, and the Aboriginal Fund for Species at Risk.)
	Ecological gifts program	Program encourages landowners to protect valuable pieces of nature by donating ecologically sensitive lands.	Tax credit or deduction to donors and a reduction in the taxable capital gain.	Federal (Environment Canada), other provincial and municipal governments, and environmental non-government organizations.
	Agriculture Stewardship Program	Some components support production of EGS, examples include: wetland restoration; buffer zone tree and shrub planting.	Example: cost share: 66% tree planting; 75% wetland restoration.	Federal (Growing Forward)
Geographic Level: Provincial	Conservation Land Tax Incentive Program (Ontario)	Program encourages the protection of Ontario's provincially significant conservation lands by encouraging landowners to carry out specified activities to conserve the natural heritage values of their properties.	A 100% tax exemption on the eligible portion of the property.	Provincial (Ontario Ministry of Natural Resources)
	Alternative Land Use Services (Prince Edward Island)	Provide incentives to agricultural producers to produce EGS.	Annual payment: buffer zone tree planting and sensitive land retirement, ($100-185/ha/yr), land under soil conservation structures ($250/ha/yr), and	Provincial (Government of Prince Edward Island and Fisheries and Oceans Canada)

			maintaining livestock fences adjacent to watercourses or wetlands ($0.30/m/yr).	
	Recreational Access Management Program (RAMP)	3-year (2009-11) private lands hunting and fishing access and habitat stewardship program to encourage "recreational hunting and fishing access opportunities".	Technical assistance and incentive payments.	Provincial (Alberta Sustainable Resource Development)
	Strategic Transition and Agricultural Revitalization for Tomorrow (START)	Remuneration for EGS in order to better protect the environment and diversify farmers' sources of income.	Annual payment: $124/ha/yr .	Provincial - Federal and Provincial Governments
	Environmental Service Initiative	Project intended to compensate farmers for the loss of cropland under a 1999 regulation increasing the length of riparian strips.	Payments: extension of buffer zones ($296/ha/yr), high slope land retirement ($247-296/ha/yr), shelterbelt establishment ($296/ha/yr).	Provincial - Waiting for federal funding
	Water Management Program	Program provides technical assistance and incentive for the creation of a Long Term Water Management Plan at the farm level.	Program payment: maximum of $5000. Cost sharing: 50/50 for certain items also available.	Federal (Growing Forward)
	Nature Conservancy Canada (NCC)	NCC works with landowners to secure ecologically significant land identified as priorities for conservation. Land is protected through purchase of land, donation of land, or agreement in which a landowner agrees to the imposition of restrictions on activities.		Provincial - Private (NCC)
Geog	Environmental Water Quality Program (Ontario,	Pays farmers in this area for 3 years to plant trees on their property.	$250/acre for 3 years, $100/ acre for 4 more years	Provincial/Grand River Conser-vation Authority

	Waterloo/Wellington County)			
	Reverse Auction Program Saskatchewan	Set up of a reverse auction to pay landowners for restoring wetlands in their fields	Determined by reverse auction	Private (DUC)
	Alternative Land Use Services "ALUS" (Alberta)	Provide incentives to agricultural producers to produce EGS.	Establishment costs shared (50/50), annual payment based on local rental rates, quality of soil, use, etc. ($2-$50/acre).	Municipal/Regional, private organizations (County of Vermilion River, Delta Waterfowl, Wildlife Habitat Canada, etc.)
	Habitat Conservation (Ducks Unlimited Canada)	This program focuses on threatened wetlands including i) wetland rehabilitation and ii) wetland protection through conservation easements, donation, or purchase.	Direct payment or tax reduction.	Private (Ducks Unlimited Canada)
	Wetland auctions program (Ducks Unlimited) Saskatchewan	Reverse auction in efforts to conserve, restore, and manage wetlands and associated habitats for North America's waterfowl. Habitat land is sold through an online auction to provide opportunities to conserve an area of land.	Participants provide estimates of restoration costs, payment is provided to the lowest estimate.	Private (Ducks Unlimited Canada)
	ALUS Norfolk County Ontario	Program aiming to conserve the environment on farmlands in Norfolk County, Ontario.	Establishment costs covered by ALUS with in-kind contributed by producer. Annual payment based on rental rates, soil quality, use, etc. (Up to $150/acre).	George Cedric Metcalf Charitable Foundation and W. Garfield Weston Foundation
	Rural Water Quality Program	Program designed to improve and protect water quality of the Grand River watershed.	Cost sharing: 30 – 100%.	Municipal, provincial and federal governments.

Table Source: Verbatim table taken from The Greening of Canadian Agriculture Report (Schmidt et al, 2012)

To provide a more in-depth look at programming, two pilot projects were reviewed in further detail provided in the next section.

2.9.2 Prince Edward Island Ecological Goods & Services Pilot Project

The potato industry in PEI is a historical agricultural practise of which PEI has been recognized for both nationally and internationally. As seen in PEI, there has been a steady shift from small, family farms to large, industrial farms Canada-wide. The PEI Ecological Goods and Services pilot program was developed in response to a paradigm shift seen in the potato industry on the island. Changing markets and improved technology have increased the average farm size from 44 hectares to 119 hectares over the last half century and has resulted in the number of farms decreasing by 78%. This shift in PEI agriculture has led to the maximization of production at the cost of decreasing the environmental health of PEI (EGS Technical Meeting, 2009). In response to this and additional land management concerns, the Souris and Area Branch of the PEI Wildlife Federation initiated an EGS program, administered by Agriculture and Agri-Food Canada. The objective of the pilot project was to provide producers with an incentive to produce EGS to address environmental concerns on the island (EGS Technical Meeting, 2009). The Souris and Area Branch of the PEI Wildlife Federation was responsible for administering and delivering the program, which cost $551,500 over a two year period. As discussed in the EGS Technical Meeting report (2009), the following key points about the program are important to highlight:

- Involvement: A number of partners were involved; all had various technical, administration and funding rolls to fill (e.g., The Souris and Area Branch of the PEI Wildlife Federation; the Trout River Environmental Committee; the PEI Federation of Agriculture; the PEI Department of Environment, Energy and Forestry; the University of

New Brunswick; Agriculture and Agri-Food Canada; DUC; Syngenta; and Cavendish Agri-Services).

- Communication: Program managers recognized education and information as a key factor to influence uptake in the program. Due to this early on understanding, an effort was made to meet with landowners to build trust.
- Performance Measures: EGS services were measured and quantified. For example, an agrology specialist measured the effect of a variety of land management techniques on their ability to produce EGS services. Additionally, a socio-economist determined the social benefits of the environmental improvements produced from the program.
- Outcomes: Already environmentally responsible farmers were encouraged by the program to try new practises and the payments acted as an encouragement to expand older practices. Update was slow in the first year, but as landowners became comfortable with the program, uptake began to increase. A cost-benefit analysis will be prepared to quantify the payments versus the environmental outcomes. Producers appreciated the "carrot vs. stick" approach of the project and many maintained their commitment to EGS programs as the PEI Alternative Land Use Services (ALUS) program emerged as a development from this pilot.
- Lessons learned: Two years was too short for a pilot project; uptake was slow and performance measures would be difficult to gauge in this time period. Furthermore, signing the contribution agreement before the growing season is critical to ensure projects occur within the same year.

Results of the PEI Ecological Goods and Services Pilot Project motivated the province to implement an ALUS program provincially.

2.9.3 Alternative Land Use Services (ALUS)

As evidenced in the PEI pilot project, modern farming technologies have placed mounting pressures on the environment and a need for stewardship activities has become front and centre for some grounds. In 1999, Keystone Agricultural Producers (KAP), the largest producer group in Manitoba, released an EGS concept paper. The concept was accepted by many across the province, including the Government of Manitoba, and a pilot project was encouraged. The Alternative Land Use Services (ALUS) pilot project was developed in Blanshard, a highly agriculturally dependent municipality, situated in western Manitoba. The ALUS pilot project was developed in response to a changing agricultural climate resulting in an increase in the regulation of agricultural practises and the deficiency of available environmental stewardship programs (EGS Technical Meeting, 2009). The pilot project had three objectives:

1. Test the feasibility of ALUS at the local level to see if producers would be interested
2. Trail agricultural agencies in the administration arm of conservation programming
3. Test the enrollment rate of producers in the program

During the three year period (2005 through 2008) the ALUS project provided Manitoba with a look into the delivery of EGS programming at a local scale and as outlined in the EGS Technical Meeting document (2009), the pilot program provided a number of key points that are important to highlight:

- Involvement: A number of partners were involved; all had various technical, administration and funding rolls to fill (e.g., Keystone Agricultural Producers; Manitoba Agriculture, Food, and Rural Initiatives (MAFRI); the Manitoba Rural Adaptation Council (MRAC); the Delta Waterfowl Foundation; the Rural Municipality of Blanshard;

the Manitoba Agricultural Services Corporation (MASC); the Little Saskatchewan River Conservation District (LSRCD); Manitoba Habitat Heritage Corporation; George Morris Centre – University of Guelph; University of Manitoba; and Agriculture and Agri-Food Canada). The various organizations also formed the Management Committee, the Technical Committee and the Local Advisory Committee.

- Communication: The ALUS program was designed with the producer in mind. The large buy-in from the municipality demonstrated the local support from producers. Additionally, 70% of landowners within the municipality participated in the pilot project. Such a large success rate showed the commitment of the community in this project and the success of the project to effectively communicate the program advantages.
- Performance Measures: The joint administration of the LSRCD and Manitoba's crop insurance agency, MASC proved to be economically advantageous. Utilizing existing agricultural agencies reduced administration fees, which are generally quite high for conservation programs.
- Outcomes: A significant amount of land was enrolled in the ALUS pilot project, in part due to the design of the program. The programming model was engrained in the "culture of agriculture" which was receptive to producers. The pilot project demonstrated the simplicity and ease of implementation which effectively lied in the administration with LSRCD and compliance monitoring through MASC. ALUS was able to harness the relationship producers already had with crop insurance staff. Additionally, the success of having program managers as technical and scientific staff played an important role in a productive EGS program.

- Lessons Learned: Projects work ideally under political boundaries over watershed boundaries as human affairs and municipal accountability are dealt with at an individual level, as opposed to the involvement of multiple municipalities with diverging priorities. The management of EGS land, at a controlled level, is advantageous and this flexibility was seen in the administration of the ALUS program. It is important to highlight that the ALUS program supported the idea that compensation should be provided to all services of EGS, whether they are currently existing or newly created.

2.10 EGS Programs at a larger scale

A shift away from EGS programs being driven project-by-project and towards a socially fair distribution of ecological sustainability is important for future EGS policy (Costanza et al, 1997). Ecological sustainability works to sustain environmental limits in conjunction with critical natural capital. EGS programs, if sustainably run, would maintain viable stocks of natural capital that provide ecosystem services. Once conservation needs are determined and met, then the remaining ecosystem services can be placed in a structured market. This theory recognizes that conservation should determine the price of ecosystem services, not be price determined (Mauerhofer et al, 2013).

In 2006, the Lower Souris Watershed Committee in Saskatchewan submitted a proposal to begin a policy/research project to study how EGS activities could be used to achieve desirable environmental endpoints in a working agricultural landscape. The goal of the pilot was to determine if EGS programs could be successfully scaled up to a national level (EGS Technical Meeting, 2009). In addition, the Rural Municipality of Blanshard's ALUS pilot program was used to determine if programming could be expanded to further provincial and federal levels (Grant & Mann, 2007).

While the most discernable factor is funding limitations, an increased level of public understanding is required on the concept of stewardship and the production of ecological services. Understanding the loss of opportunity costs and other associated risks is a concept not fully recognized by the public.

The discussion of where conservation funding is allocated is also an important topic to consider. If EGS programs are scaled up to the provincial or federal level, contradictory policies will have to be identified and policy coherence should be encouraged. Cases have been presented where some policies encourage the cultivation of marginal lands, whereas many EGS programs aim for the conservation of marginal lands (Mayrand et al. 2003). Identifying the mechanisms that we have within our governmental systems to regulate these types of discrepancies is an important concept to consider when scaling up EGS programming in this policy context.

Chapter 3: Research Methods

3.1 Introduction of research design

The purpose of this research was to obtain from the public, their views on EGS programming, their land management decisions and their perception on conservation programming in the area. Thus, the research design was qualitative in nature. Qualitative research is generally collected though one or more of the following methods: direct observation, participation in the setting, in-depth interviews and analysis of documents and materials (Limb & Dwyer, 2001). While all forms of qualitative research were utilized to some degree, the largest form of research was undertaken using the analysis of documents and the in-depth interview process. First, secondary data were collected by reviewing documents from a variety of sources, including academic journals, thesis dissertations, government reports and a vast number of other documents from conservation organizations across the nation. Second, primary data was collected from interviews with select individuals, and from questionnaire responses from residents within the Whitewater Lake sub-watershed. Both methods were initiated during the same time-frame and the individuals for both processes were from the same study area. This type of research can be categorized as cross-sectional research (Hall, 2011).

This qualitative approach included content analysis of the data using Dedoose, a qualitative data analysis software. Common themes were identified during the analysis to provide conclusions and recommendations within this report.

3.2 Literature review

A comprehensive literature review was completed to understand the landscape of EGS programming across Canada. This entailed looking through academic thesis dissertations,

academic journals, news media accounts, eNGO records and government agency reports and files.

To supplement the literature review analysis, discussions were held with multiple representatives from across organizations to identify the key documents to use as resources. Conversations were held with representatives from Delta Waterfowl Organization; MHHC; Manitoba Agriculture; Manitoba Sustainable Development; Kootenay Conservation Program and the North Dakota State University.

The purpose of the comprehensive literature review was to identify key program options, administrative structures, landowner reactions to these programs, and the barriers behind implementation.

3.3 Selection of study area

The chosen study site of Whitewater Lake resides in the boundaries of two rural municipalities; Deloarine-Winchester and Boissevain-Morton. Prior to 2015, there were four municipalities in the local area; however, on January 1, 2015, the municipalities of Deloraine and Winchester amalgamated and the municipalities of Boissevain and Morton amalgamated. This occurred as part of the larger provincially mandated amalgamation. The study area ranges from the town of Boissevain, situated on the east side of the lake, to the town of Deloarine, situated on the west side of the lake. DUC and MHHC have an established partnership with the TMCD for securing sensitive areas and wetland habitat through conservation easements. DUC has maintained a partnership within the TMCD area to work with landowners to secure wetland conservation agreements. Their effort is focused on private lands surrounding Whitewater Lake, however their efforts aren't limited to this area (TMCD, 2014). MHHC has maintained established partnerships with TMCD, resulting in twenty-five MHHC conservation agreements

signed in the district to date. These conservation agreements have resulted in over 4,064 acres being protected within the area (Annual Report MHHC, 2016). The district itself also signs conservation agreements and as of 2014 a total of 92 agreements had been signed in the study area.

Three specific regions were identified within the study area; landowners adjacent to the lake (up to a distance of two miles away from the lake), landowners in the uplands (two to four miles away from the lake) and landowners in the Turtle Mountain area (six or more miles away from the lake). These regions were clarified and discussed with local landowners on the TMCD Board. The distinction between these three spatial areas is important to understand the varying responses between landowners in the upstream area and landowners in the downstream area. The study area included both rural and urban landowners, critical for understanding and identifying all possible issues with the development of an EGS program in the area.

The focus of the project was to study options for EGS programming within the Whitewater Lake sub-watershed and as such; consultations were not held with landowners in other portions of the East Souris River Watershed. It is important to note that downstream landowners along the Souris River may benefit from the introduction of a successful EGS program in the Whitewater Lake watershed. Successful EGS programming that results in increased water storage on the landscape would likely reduce the pressure to construct an outlet. The construction of an outlet would result in an inter-basin water transfer, increasing water levels on the Souris River (Figure 6).

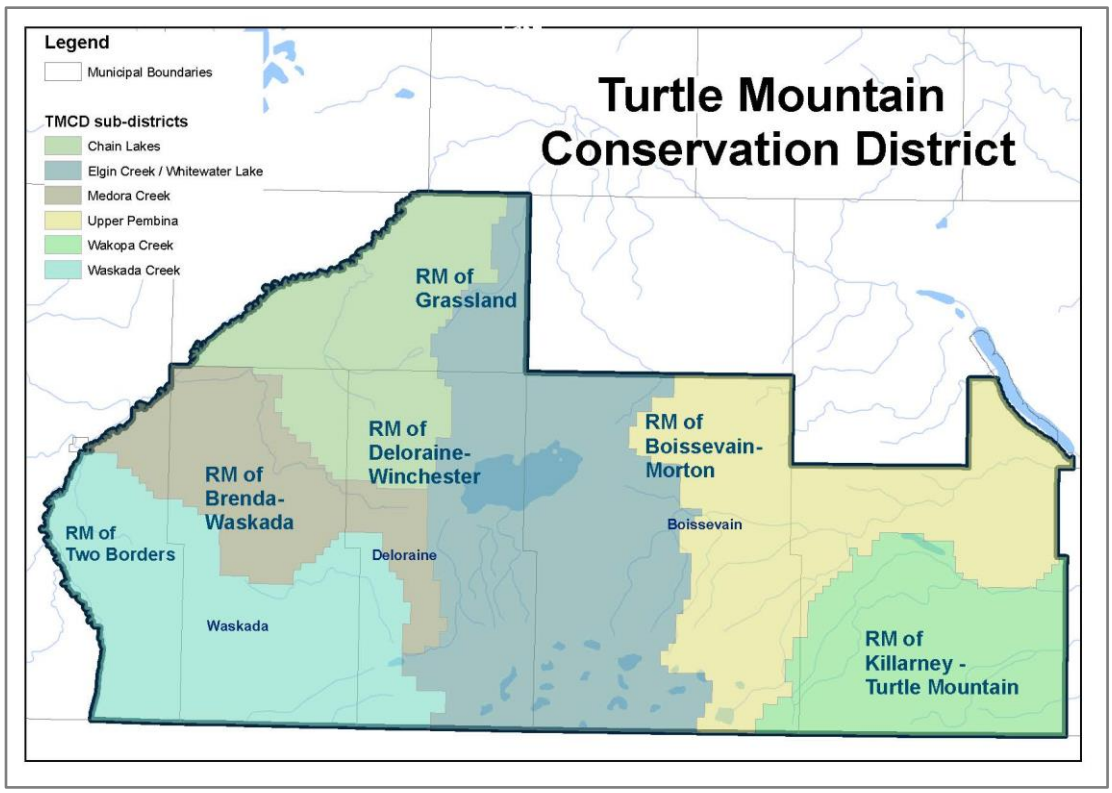

Figure 6: Map showing of the Turtle Mountain Conservation District
Figure Source: Manitoba Sustainable Development (2017) – Used with permission

3.4 Personal interviews

3.4.1 Identification of interviewees

In late-November 2014, the researcher distributed posters (Appendix A) in various locations around Boissevain and Deloraine. Posters were placed in local coffee shops; restaurants; public amenity areas, including libraries, hockey rinks and community halls; grocery stores; banking institutions; drug stores and post-offices. The information poster provided brief information about the project and provided the researcher's telephone number, as well her email for scheduling interviews. During these visits, the researcher held casual conversations with many town members identifying her research and explaining the need to interview landowners. Many specific landowners were identified in these conversations as key stakeholders to have discussions with. These names were recorded and their contact information was identified.

In addition to the contacts identified from local residents, the researcher listed landowner names identified on the Regional Municipality (R.M.) maps for the R.M. of Deloraine-Winchester, formerly Winchester and the R.M. of Boissevain-Morton, formerly Morton. Landowners were divided into three main special zones, those adjacent to the lake, those in the uplands and those in the Turtle Mountain area.

Purposive sampling was utilized in some aspects of the research to ensure that distribution of responses were consistent to the regional landscape of the watershed. This method of sampling was utilized as a way of identifying key interview participants. This was done to ensure they had the background and experience to represent the requirements of the research (Frankel & Devers, 2000). The TMCD board was asked to compile a list of candidates who would be suitable for involvement in the structured interview process. The board determined 16 candidates to contact and landowners included on the list were distributed across the three spatial zones indicated above. Letters were sent out to these 16 candidates in addition to 34 randomly selected landowners. Thus, a total of 50 recruitment letters were sent out during the month of January 2015. All interview participants were residents of the study area and either owned a residential home, a piece of property or operated a farm in the area. Eighteen landowners, representing a response rate of 36%, responded to the letter of request and I subsequently scheduled interviews between February 17, 2015 and February 20, 2015 and between March 9, 2015 and March 13, 2015. Of the 16 landowners recommended by the conservation district, 8 subsequently scheduled interviews. Additional landowners were identified as possible interviewees throughout the course of the other interviews. Such snowball sampling provided the researcher with the option of contacting key stakeholders who may have otherwise been missed during the random selection process (Atkinson & Flint, 2011).

3.4.2 Development of interview guide

The development of an interview guide was completed through a variety of steps. An initial conversation was held with Dr. Cheryl Wachenheim, a professor from the North Dakota State University. At that time, Dr. Cheryl Wachenheim was completing research to develop an understanding of Conservation Reserve Program (CRP) and the impact of the program on landowners in the United States. Dr. Cheryl Wachenheim provided the researcher with an interview template that acted as basis for development of the questions.

Once developed, the interview questionnaire was reviewed by the thesis committee and was additionally reviewed by the Whitewater Lake Futures Group. The Whitewater Lake Futures Group consisted of representatives from the local area, MHHC, Delta Waterfowl Foundation, Sustainable Development and TMCD.

Through this process, interview and survey questions were reviewed for inaccuracies and were also amended to reflect the inquiries of local stakeholders.

3.4.3 The interview process

The interviews began by presenting each participant with a package on the research project (Appendix C). This package also acted as the interviewee's informed consent to participating in the research, and the researchers copy was signed by the landowner. After the interviews concluded, the researcher left one copy of the package with the interviewee as it detailed their ability to ask questions and request removal from the research after the conclusion of the interview. The package provided to each participant outlined the objectives of the research, the structure of the interview process, the interaction expected by the researcher, the benefits of being an interviewee, the ability of the interviewee to remove themselves from the research process at any point in the process (for example, during the interview or after the

interview has been completed) and it provided the interviewee the confirmation of autonomy and the destruction of any personal information at the completion of the research. The package also stated that the researcher had received Ethics Board Approval from the University of Manitoba for her research (J2014:145). The letter also included the researcher's email and telephone number, as well as the number of the research advisor, if the participant had any questions or concerns regarding the structure and/or conduction of the interview.

The researcher offered to hold the structured interviews in the participant's home or at a public location, such as a coffee shop, a restaurant or the library. All interviews were conducted in-person at the participant's home, excluding one participant who met the researcher at restaurant for convenience. The interviews were guided by pre-determined interview questions (Appendix D).

The structured interview process involved landowners in the R.M.s of Winchester and Morton. The interview process provided access to landowners across the watershed as the problem of flooding is not isolated to land surrounding Whitewater Lake. The personal interviews highlighted on how landowners make decisions on their land, what their opinions are towards EGS programs, and what would allow them to accept a specific EGS program. The conversations held, focused on the needs of the landowners and were completed to provide an understanding of the attitudes and the environmental awareness of landowners. Attitudes towards the risk of BMP's and environmental awareness have been demonstrated as positive influences on the adoption of BMP's for landowners (Baumgart-Getz et al, 2011).

The researcher took interview participants through a structured interview process. Follow up questions and discussions between the researcher and the participants also occurred when necessary.

3.4.4 Data analysis

Twenty-one interviews were scheduled with the researcher during the months of February and March 2015 and nineteen interviews were carried out. One interviewee travelled out of town during the scheduled interview time and one interviewee forgot about the scheduled interview time; both were unable to rebook in person or by phone. The number of interviewees selected was to ensure that the scope of interviewees spanned across the three identified regions and to provide a manageable amount of information to analyze.

The purpose of interviewing landowners within the region was to identify a clear understanding of the views towards conservation programming in the area and to understand the needs of landowners and provided the interviewees with the opportunity to be involved in the bottom level of community conservation planning.

The length of the interviews ranged from shortest duration of 14 minutes to the longest duration of 81 minutes, lasting an average of 42 minutes. The interviews were recorded with the primary researcher's iPhone, and downloaded onto a computer hard drive. Verbatim transcripts of the interviews were made.

Interviews were transcribed in the entirety into a Word document. Transcription of the interviews was completed during April, May and June 2015. As the researcher transcribed the audio, close attention was paid to common discussion points throughout the research and common themes were highlighted to include in the analysis. Interview participants were also

provided a participant code during the transcription and analysis process. Participant codes are indicated beside each quote throughout the document.

Data analysis was completed using Dedoose software, a tool which helped to identify common themes and assess the correlation between landowner responses. Once transcribed, the media was imported into Dedoose (http://www.dedoose.com/). The researcher also created a coding structure to group and analyze the data. Common themes and coding were identified by the researcher based on the outcomes of the project and were imported into Dedoose. Codes were organized into a hierarchical structure to help to define and narrow down responses within themes.

The researcher then proceeded to analyze the data by examining the responses and identifying related codes. Dedoose allowed the researcher to assess the occurrence of these themes and helped to compare similar responses. The researcher also imported descriptors to Dedoose. Descriptors were used to identify varying characteristics of the interview participants. All interview participants were attached to a descriptor set including location in the watershed, and the type of agricultural producer. Interview participants who were also cross-referenced as survey participants were attached to a more detailed descriptor set, including a number of characteristics about their land and personal demographics.

3.5 Mailed questionnaire

3.5.1 Pre-survey preparation

In July and August 2014, the researcher conducted preliminary testing of potential survey questions. Pilot testing is a recommended approach in qualitative research to help determine any flaws or weaknesses of the study (Turner, 2010). Members of the TMCD board, who were outside of the study area, volunteered to take part in a "mock-interview" to help determine the

scope and depth of the questions. Three telephone interviews were completed with TMCD board members not living in the Whitewater Lake sub-watershed. This eliminated any possibility of using the sample population for future research. All three interviews took approximately 40 minutes long and were conducted over the phone.

During the telephone interview, the mailed questionnaire was surveyed in its entirety. Following the questionnaire, the researcher asked the preliminary interview participants to gauge their opinions on the questions being asked and determine if there were any discrepancies or suggestions for improvement. It was noted that participants elaborated with good detail on many of the questions where the researcher did not specifically ask. This feedback was used to create adjustments and to tailor the question moving forward.

3.5.2 Survey development and distribution

A list of participant mailing addresses were provided to the researcher by the TMCD. The list of mailing addresses had been previously compiled for public consultation which was undertaken by TMCD in 2011. The questionnaire was distributed by mail in March 2015 but also included an option to complete the survey online. The questionnaire focused on landowner demographics, general attitude towards the environment, values around farming, values towards ENGOs, values towards ecological services and what they envision for the future of rural communities. The questionnaire included a brief description of the most suitable EGS programs determined during the literature review and required participants to relatively rank their preferred method of EGS programs. Questions were aimed to draw conclusions on landowner perceptions of program administration, development and delivery. The questionnaire provided opportunities for both quantitative and qualitative feedback. Additional incentives to return surveys were used if the questionnaire is returned within a certain time frame. As well, the researcher followed up

with prompting phone calls to survey recipients to explain and encourage completion of the survey.

3.5.3 Data analysis

The survey was mailed to 325 residents in the Whitewater Lake sub-watershed. Responses were returned to the researcher for data entry and analysis or the survey was completed online through Survey Monkey. Of the 325 surveys mailed out, 23 were returned to the researcher unopened. Of these surveys, 48 surveys were returned to the researcher with completed responses. This provided a response rate of 15.9%.

Survey responses received by mail were collected and recorded by the researcher in Microsoft Excel. Survey responses collected online were also incorporated into the same spreadsheet. Descriptor data was also created from the survey responses. Both the survey responses and descriptor data were imported into Dedoose.

As with the interview participants, survey participants were also provided a participant code during the transcription and analysis process. Participant codes are indicated beside each quote throughout the document.

Descriptor data helped to identify themes and consistencies between groups of landowners. Response characteristics were calculated in Dedoose and information graphics were produced in Excel to demonstrate the data.

3.6 Limitations to research

The primary focus of this study was to determine how EGS programming could be implemented and the effectiveness of such a type of programming in the study area. The research was not intended to quantitatively evaluate or assess the success of EGS programs across Canada, but was to provide a fulsome understanding of the programs available across the

landscape. Additionally, this research provided the preliminary information for making an informed decision on program implementation. Therefore, there was no attempt made to quantify any of the economic, social or biological impacts of an EGS program for the area. Manitoba's provincial EGS working group and researches, such as Chad Lowely at the University of Manitoba, have extensively studied the quantification of EGS for the services provided.

General trends and patterns were noted in the types of responses and landowner discussions. These were then used to obtain certain conclusions from the lessons learned and to make policy recommendations.

Another potential threat to validity was my presumed affiliation with Delta Waterfowl, MHHC and the TMCD. Delta Waterfowl is one of the founding organizations to conceptualize ALUS, a program delivered on the EGS platform (Schmidt et al, 2012). Participants may have felt inclined to give a favourable review of ALUS or favour the program in their responses. In addition, participants may have felt inclined to favourably discuss their experiences with MHHC and the TMCD. While conducting my fieldwork, I stressed that my affiliation with the organizations would not affect the results, that my opinion was unbiased, and that all responses were confidential. As some participants provided critical feedback about programming offered by both MHHC and the TMCD, my impression was that there was a minimal or absent impact to landowner responses.

Chapter 4: Results and Analysis

4.1 Introduction

The purpose of this chapter is to analyze the results obtained from the public regarding their views on EGS programming, their land management decisions and their perception on conservation programming in the study area. Results from the personal interviews and mail-out questionnaires will be analyzed separately, and then cross-referenced in combination with each other.

It should be highlighted that attitudes and responses to the questions within the study represent only one period of time. Economic pressures as a result of flooding were identified prevalently in a number of the answers from the respondents. This underlying pressure may have had an impact on how respondents engaged with the researcher about water storage and EGS programming. This will be discussed further throughout this chapter. However, it is important to note that water levels on Whitewater Lake continue to remain high. As of May 2017, water levels were close to record high levels. It could be expected that attitudes and responses of the respondents should remain relatively static from the time of survey to the time of publishing this work. This should be taken into account when assessing the validity and relevance of the information presented below.

4.2 Mailed questionnaire

Of the distributed surveys, 48 were returned to the researcher with completed responses. This provided a response rate of 15.9%. This type of response rate is comparable to other types of research, with sub-10 percent response rates to similar questionnaires are standard when conducted in rural regions (Grant & Mann, 2007). While higher response rates have been experienced in some program review surveys, it could be expected that participating landowners have an interest and value in the environmental outcome/results of the survey. Reasons for

nonresponse can generally be grouped into three categories: refusals, noncontact and other reasons (Brick & Williams, 2013). While noncontact was an identified issue, refusal and failing to remember the survey were also identified reasons. This was expressed to the researcher in follow-up telephone calls with the participants.

Participants were presented with three options for participating in the survey. Participants were provided with the option of returning the hardcopy survey to the TMCD or by mail to the researcher. Additionally, participants were provided with the option of completing the survey online. Surveys returned by mail were the most popular option (62.5%), while some surveys were returned in person to the conservation district (22.9%). The least popular option was online, with only seven participants utilizing this option (14.6%) (Figure 7).

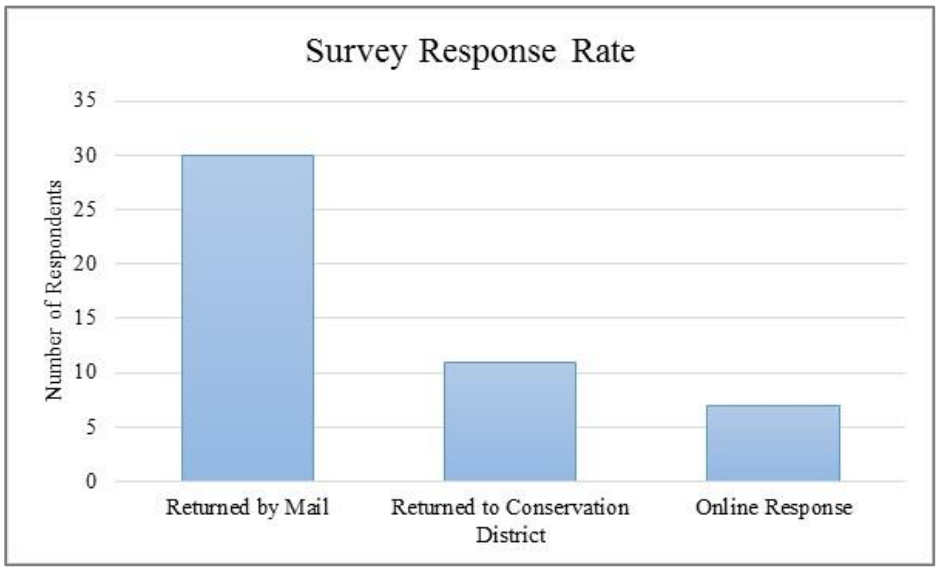

Figure 7: Distribution of survey response rate

4.2.1 Land characteristics

The survey included a number of questions which provided information on the characteristics of the landowners operation.

Survey participants were asked to provide their current place of residency (Figure 8). This question was completed by 100% of survey respondents. Of the respondents, 57% identified their residency as a farm, 10% identified their residency as an acreage in the country and 33% identified their residency as a city or small town.

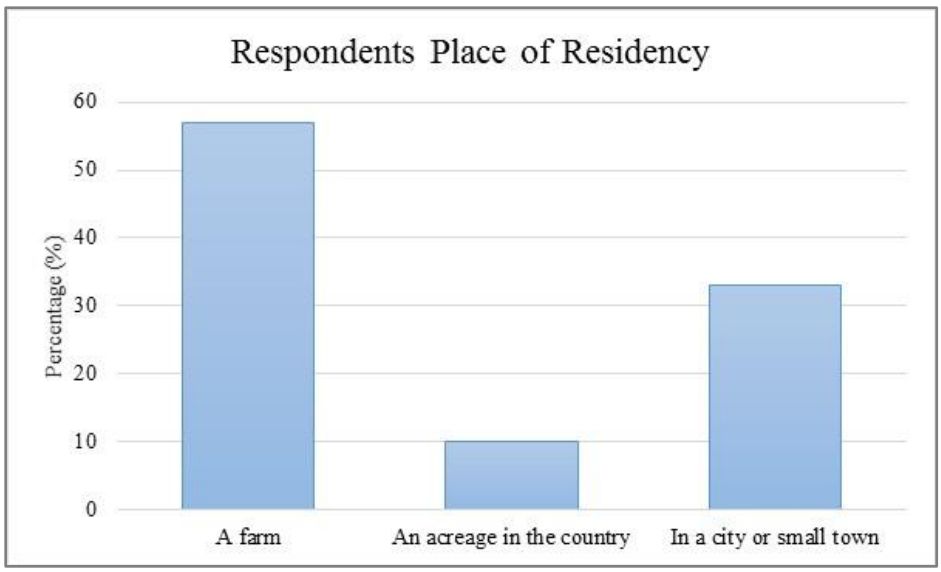

Figure 8: Respondents Place of Residency

Survey participants were also asked to identify their total acres of land and its approximate location to Whitewater Lake (Figure 9). This question was completed by 100% of survey respondents. Of the survey respondents, 36% of rural respondents identified as having land zero to two miles away from Whitewater Lake (identified as the Whitewater Lake area), 40% of rural respondents identified as having land two to four miles away from Whitewater Lake (identified as the upland area) and 24% of rural respondents identified as having land 6 miles or more away from Whitewater Lake (identified as the Turtle Mountain area).

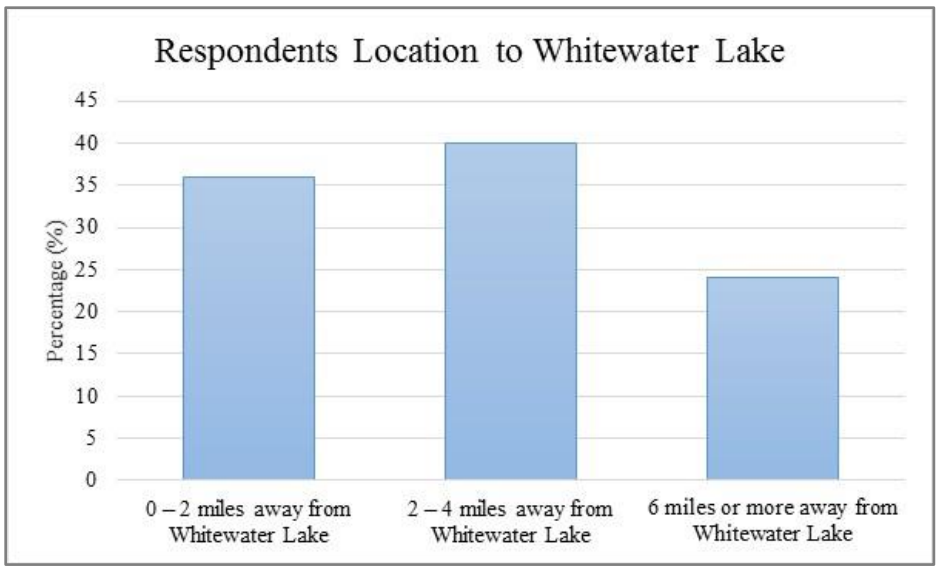

Figure 9: Respondents location to Whitewater Lake

Survey participants were also asked to identify how many acres of their land were directly affected by the current water levels of Whitewater Lake (Figure 10). When this question was posed in 2015, water levels on Whitewater Lake were approximately 497.7 metres (1,632.9 feet) above sea level (Water Survey of Canada, 2016). This question was completed by 100% of survey respondents. Of those respondents, 36% had no land affected by Whitewater Lake flooding whereas 64% had acres affected by Whitewater Lake flooding. Affected acres ranged from the smallest area of 12 hectares (30 acres) to the largest area with 971 hectares (2,400 acres).

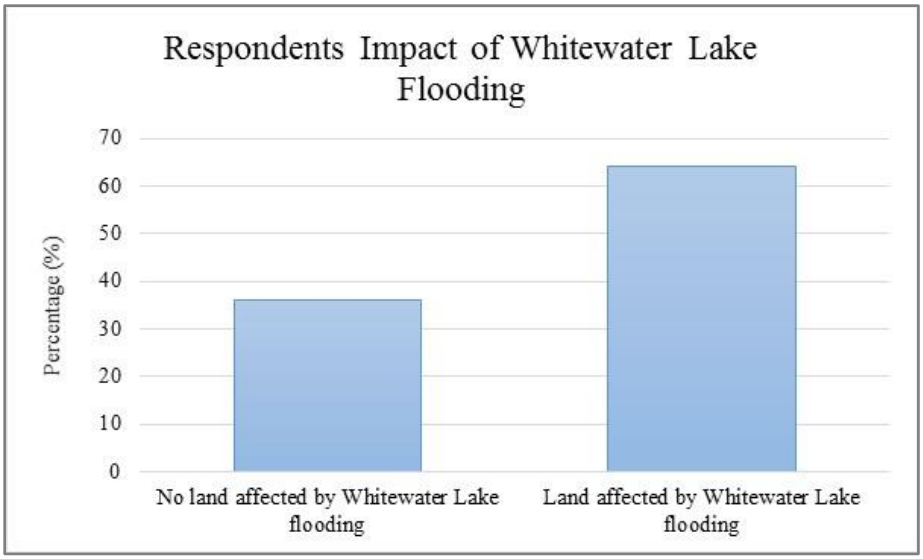

Figure 10: Respondents Impact from Whitewater Lake flooding

Survey participants were also asked to identify the type of farming operation that they undertook on their land (Figure 11). This question was completed by 100% of survey respondents. Of those respondents, 36.4% of respondents identified as a grain producer, 12.1% of the respondents identified as a livestock producer, 24.2% of the respondents identified as a mixed (grain and livestock) producer and 27.3% of the respondents identified as “other”. A number of survey respondents provided a description of their operation if they classified themselves as “other”. A majority of survey respondents specified that their land is currently rented out to other producers.

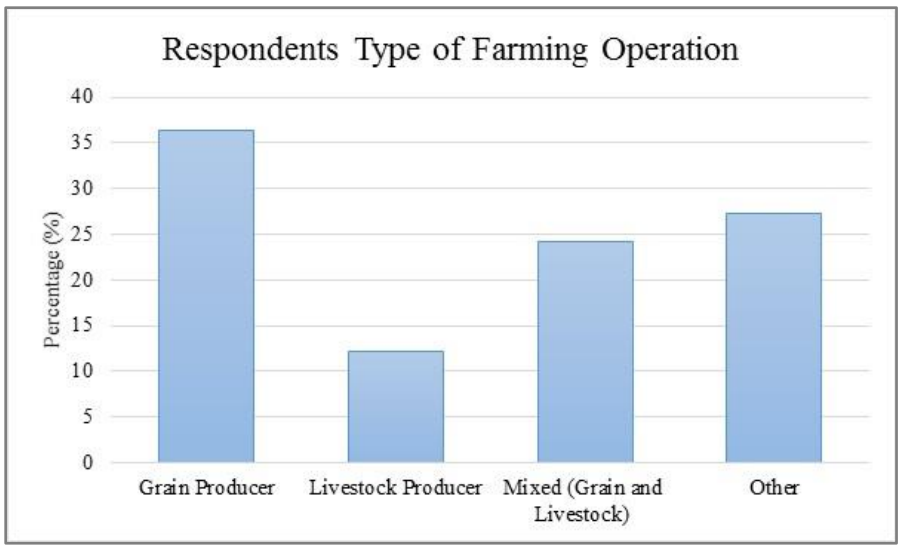

Figure 11: Respondents Type of Farming Operation

Survey participants were asked to identify the approximate percentage of land that was farmed and/or ranched as opposed to in conservation, such as bush or slough (Figure 12). This question was completed by 97.9% of survey respondents. Of those respondents, the average amount of land in production (farmed/ranched) was 68% and the average amount of land in bush or slough was 32%, with the lowest acreage amount being 0% and the largest acreage amount being 100%.

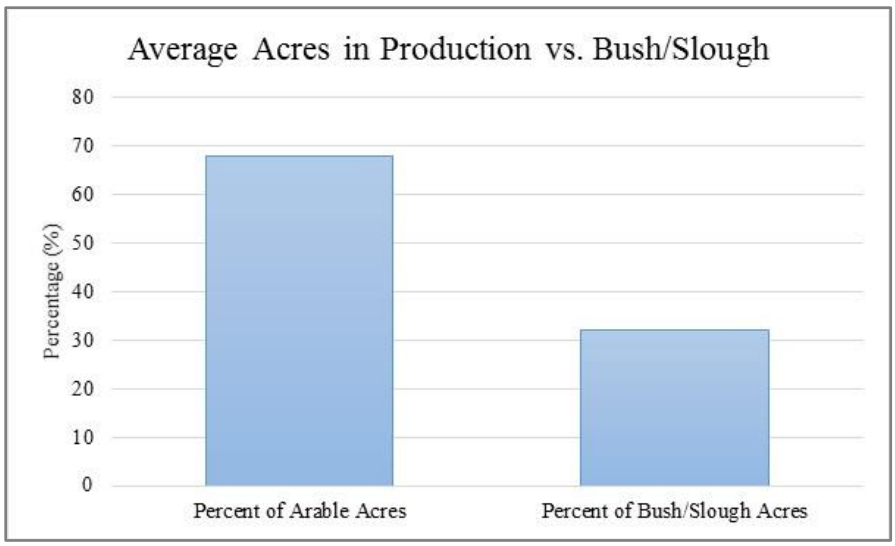

Figure 12: Percent of Land in Bush/Slough vs. Arable Acres

Survey participants were also asked if they were intending to make any changes to their land in the next year (Figure 13). Changes included alterations to the proportion of cropland, pasture and conservation areas, including bush and slough. This question was completed by 93.8% of survey respondents. Of those respondents, 93.9% of respondents identified that they had no intention of changing their proportion of land use and 6.1% indicated that they intended to change their proportion of land use.

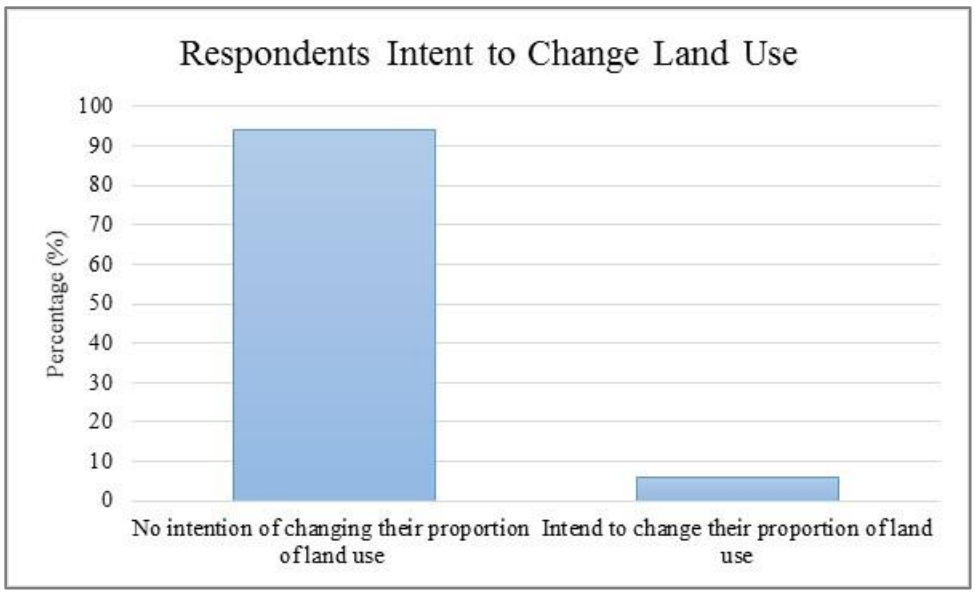

Figure 13: Respondents Intent to Change Land Use

Survey participants were asked a number of questions about their grass and pasture land. This question was completed by 93.75 % of survey respondents. An additional 8.2% stated that their grass and pasture land was flooded and did not provide a response to the subsequent questions. Of those respondents, 2.7% identified as having no grass and pasture land. Of the respondents that did have a portion of grass and pasture land, 5.4% of respondents have had their land in that state for 0 to 15 years, 18.9% of respondents have had their land in that state for 15 to 30 years, 10.8% of respondents have had their land in that state for 30 to 100 years, 48.6% of respondents have had their land in that state forever and 5.4% of respondents were unsure how long their land was in that state. Survey participants were also asked how they used their grass and pasture land. Of the respondents that did have a portion of grass and pasture land, 5.8% indicated their land was flooded, 41.1% indicated their land was used for pasture and/or hay production, 11.7% indicated their land was rented out, 26.4% indicated their land was used for grazing, 8.8% indicated that they use it for recreational purposes and 5.8% indicated that they do not use the land. Survey participants were also asked if they would ever consider converting this

land to crop land. Of the participants that did respond, 92.9% of respondents indicated that they would not consider conversion and 7.1% indicated that they would consider conversion. Survey participants were finally asked how this grass and pasture land differs from their cropped fields. Of the participants that did respond, many indicated that the land was low, less productive land, commonly situated in a ravine or on hilly land. Some of the factors that led to the land being less productive were components of the soil, such as salinity and stones.

4.2.2 Conservation programming

Survey participants were asked a number of questions on their opinions of conservation programming, current program availability and their involvement in conservation programs on their land.

Survey participants were asked to rank a variety of conservation approaches from one to nine, according to their preference (Table 3). Survey participants were instructed to identify their first choice of programming with the number one and their last choice of programming with the number nine. Programs were ranked between these numbers based on their preference. This question was completed by 77.4 % of survey respondents. Of those respondents, the most preferred program was recognition programs with 25% of respondents selecting this option. Of the respondents who selected recognition programs as their most preferred program, 66.6% identified purchases of land by conservation agencies as their least preferred program option and 33.3% identified regulatory programs as their least preferred program option. It is interesting to highlight that recognition programs were chosen as a preferred program type by a number of landowners. This contrasts the research of Trenholm et al. (2017) which recommends that program development dissuade the use of public recognition, as a number of individuals were

reluctant to participate or indicated a requirement of additional funding if recognition was a factor of participating in the program (Trenholm et al, 2017).

Of those respondents, the second most preferred program was the municipal watershed fund with 20.8% of respondents selecting this option. Of the respondents who selected the municipal watershed fund as their most preferred program, 60% identified purchases of land by conservation agencies as their least preferred program option, 20% identified reverse auctions as their least preferred program option and 20% identified financial incentive programs (one time payments) as their least preferred program option.

Of the respondents, the least preferred program was purchases of land by conservation agencies with 57.1% of respondents selecting this option. Of the respondents who selected this as their least preferred program, 33.3% identified recognition programs as their most preferred program option, 25% identified the municipal watershed fund as their most preferred program option, 16.6% identified financial incentive programs (one time payments) as their most preferred program option, 8.3 % identified financial incentive programs (annual time payments) as their most preferred program option, 8.3 % identified educational programs as their most preferred program option, and 8.3 % identified regulatory programs as their most preferred program option.

Table 3: Conservation Programming – Participant Response

Conservation Programming – Participant Response		
Program Type	**Most Preferred Program**	**Least Preferred Program**
Recognition Programs (Acknowledgement of land stewardship activities – signage, conservation awards)	25%	9.5%

Municipal watershed fund	20.8%	0%
Educational Programs (Workshops, manuals, mail outs, one-on-one discussion)	16.7%	0%
Financial Incentive Programs – Annual Payments	12.5%	0%
Financial Incentive Programs – One Time Payments	12.5%	4.8%
Regulatory Programs (Bylaws, regulations, legislation)	8.3%	0%
Purchases of land by conservation agencies	4.2%	57.1%
Market-Based Programs (Tradable Permit System)	0%	9.5%
Reverse Auction System	0%	19.1%

Survey participants were also asked to identify their acreage currently enrolled in conservation programs (Table 4). This question was completed by 95.2% of survey respondents. Of those respondents, the majority (67.5%) identified as currently having no land enrolled in conservation programming. Of the respondents who identified having no land enrolled, 46.2% were located in the Whitewater Lake area, 34.6% were located in the upland area and 19.2% were located in the Turtle Mountain area. This also correlates with land use type in the three spatial regions. Grain production was the predominant land use type in the Whitewater Lake area (>50% of respondents). The lack of conservation programming on grain land was expected going into this research. Additionally, as expected, the percent of enrollment decreased as total acreage increased. Only one respondent, located in the Turtle Mountain area, identified as having close to all of their land enrolled in conservation programming with the MHHC.

Table 4: Conservation Programming – Current Enrollment (Total Acres)

Conservation Programming – Current Enrollment (Total Acres)	
Total Acres	**Percent of Responses**
0 acres	67.5%
1 to 99 acres	10 %
100 to 199 acres	7.5 %
200 to 299 acres	7.5 %
Over 300 acres	5 %
All land	2.5 %

Survey participants were also asked if there were any programs currently available to them to assist them in maintaining wetlands on their property. They were asked to list any programs that apply and the reasoning behind why they would be interested in partnering. This question was completed by 88.1% of survey respondents. Of those respondents, 54.1% were not aware of any programming, 16.2% were aware of programming but were not interested in participating, 21.6% were aware of programming and provided examples on their questionnaires, and 8.1% identified that they were already participating in programming and had no additional land available for this purpose. Table 5 details some of the examples provided by the respondents who were aware of programming. Participants identified water related programming such as wetland restoration, remote watering, small dam construction and backflood programming. Participants who were aware of programming identified the following organizations as delivery agents: TMCD, MHHC and DUC.

Table 5: Survey Respondents Aware of Conservation Programming - Examples Provided

Survey respondents aware of conservation programming - Examples provided
– Conservation agreement keeps areas for wildlife and creeks intact, so they might not erode
– I am aware of programming that would maintain wetlands but not available in my area. I would definitely be interested in partnering.
– MHHC wetland program, TMCD backflood program
– Reverse auction, remote watering
– DUC wetland restoration, reverse auction
– Part of ravine on my property is dammed, used by waterfowl, muskrats, and birds. MHHC programs
– Yes, the CD paid for the repair of my dam last year

As discussed above, 67.5% of respondents (46.2% Whitewater Lake/34.6% uplands/19.2% TM) identified as currently having no land enrolled in conservation programming. Of those respondents, 77.8% identified as not being aware of programming or aware of programming but were not interested in participating.

Survey participants were also asked to identify the extent that conservation programming had an effect on their land management decisions. This question was completed by 80.1% of survey respondents. Of those respondents, 58.8% identified that conservation programming does not affect their land management decisions. A number of survey respondents expressed concern over outside involvement on their land. The remaining 41.2% indicated that conservation programming did have an affect on their land management decisions. Of those respondents, 30.8% indicated a negative or minimal effect, whereas 69.2% indicated a positive effect on their land management decisions. Some examples are included in Table 6 below. Generally, participants did not describe any beneficial financial impact with implementing conservation

programming on their land. However, landowners did identify water retention, flood protection and habitat restoration as positive benefits resulting from conservation programming. It was apparent that conservation agreements were the prevalent programming option discussed. While one landowner did discus the benefit of conservation easements, they also mentioned their negative opinion towards the lifetime caveat and permanency of the project.

Table 6: Survey Respondents – Positive Impacts from Conservation Programming on Land Management Decisions

Survey respondents aware of conservation programming - Examples provided
– In 1990 with help from TMCD a dam was built in the ravine running through our neighbours and our land. This water supply helps farmers for spraying etc. The dam was funded by federal, provincial and local governments. It has controlled runoff. – Purchase of grass seed, remote watering program, dams for water retention. – It is always taken into consideration. – We maintain wetlands as per our conservation agreement. – All of our land is under conservation agreements or in natural habitat. Affects all of our decisions on our land. – They help manage the extreme water that we have. – We do not drain, tear down trees or push bush. – Signed on with MHHC. There will be some trees left standing on private land in some of the TM. Only drawback is with signing on with them and a one-time payment, the land value is inflating like crazy, I feel that we have shot ourselves in the foot as far as getting fair market value when we decide to sell. If it is to compensate for others, they should take a serious look at those that have signed on and what they have to loose.

Of the landowners who indicated a positive effect of conservation programming on their land management decisions, 50% of respondents currently had no land enrolled in conservation programming and 50% had some land enrolled in conservation programming (ranging from 40

acres to 220 acres). It is interesting to note that the landowners with a greater area of property (amounts greater than 220 acres) enrolled in conservation programming indicated that conservation programming did not have an effect on their land management decisions.

Survey participants were also asked if they had ever completed an Environmental Farm Plan (EFP) (Figure 14). They were additionally asked if there should be alternatives to an EFP for qualifying for some conservation programming. This question was completed by 80.1% of survey respondents. Of those respondents, 41.2% indicated that they had completed an EFP, with 63.6% expressing interest in an alternative to the EFP and 36.4% expressing their satisfaction with the EFP process. An additional 58.8% of respondents indicated that they had never completed an EFP. Of those respondents, 70% did not answer the second part of the question, 20% indicated that there should be an alternative and 10% indicated that no alternative was needed.

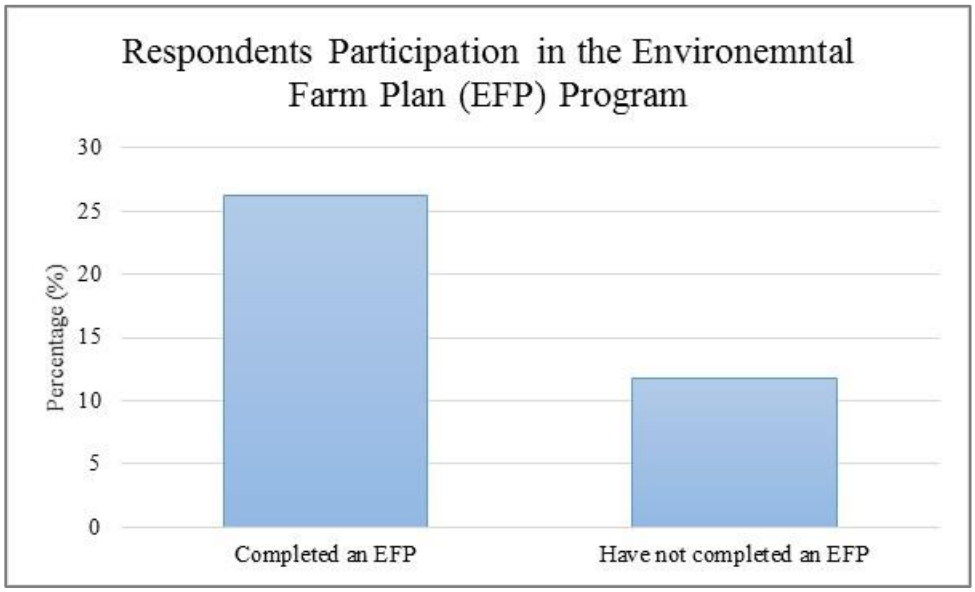

Figure 14: Respondents Participation in the Environmental Farm Plan (EFP) Program

Of the respondents who indicated that they had completed an EFP, only 28.6% of landowners had their land enrolled in some type of conservation programming and 71.4% of landowners had no land enrolled in some type of conservation programming.

Survey participants also asked their opinion on why they thought flooding was occurring around Whitewater Lake. They were asked to indicate a percentage for the following options: an extended wet cycle, agricultural drainage into Whitewater Lake and deforestation of the Turtle Mountains. This question was completed by 97.6% of survey respondents. Of those respondents, 7.7% indicted that flooding was caused completely (100%) by an extended wet cycle and 2.6% indicted that flooding was caused completely (100%) by agricultural drainage into Whitewater Lake whereas no participants indicted that flooding was caused completely (100%) by deforestation of the Turtle Mountains. Table 7 summarizes the survey responses to this question.

Table 7: Respondents Identification of the cause of Whitewater Lake flooding

Cause of Whitewater Lake Flooding			
Value	**Extended wet cycle**	**Agricultural drainage into Whitewater Lake**	**Deforestation of the Turtle Mountains**
No Cause (0%)	2.5%	7.5%	20%
Minimal Cause (1 – 25%)	27.5%	32.5%	55%
Minor Cause (26 – 50%)	30 %	45%	22.5%
Significant Cause (51 – 75%)	20%	7.5%	2.5%
Major Cause (76-99%)	12.5%	5%	0%
Complete Cause (100%)	7.5%	2.5%	0%

Of the respondents who indicated an extended wet cycle as a major cause, 60% identified agricultural drainage as the other defining factor and 40% indicated both agricultural drainage and deforestation as a factor. Of the respondents who indicated agricultural drainage as a major cause, 100% identified an extended wet cycle as the other defining factor. No respondents identified deforestation as a major or complete cause of flooding on Whitewater Lake.

There is a growing recognition across Canada of the need to provide funding for conservation activities. Survey participants were also asked to identify their support or opposition behind the creation of a dedicated watershed conservation fund for the Whitewater Lake sub-watershed. Funds from the conservation fund would support environmental conservation initiatives and water storage projects on private land. This question was completed by 71.4% of survey respondents. Of those respondents, 67.9% identified that they supported the creation of a dedicated watershed conservation fund for the Whitewater Lake sub-watershed while 25% identified that they did not support the idea. An additional 7.1% misunderstood the question, identifying concerns that they would not support the concept if it resulted in more drainage into Whitewater Lake, concerns over neighbouring landowners having a decision in their land management choices as well as identifying themselves as resident of the Turtle Mountain area, with no control over programming close to Whitewater Lake. Table 8 details some of the examples provided by the respondents who were in agreement of creating a dedicated watershed conservation fund. As identified by the 67.9% rate of support from landowners, participants provided positive feedback about the concept. In particular, landowners confirmed that landowners who drain should be paying the landowners who store the water. This idea was connected further to the ineffectiveness of drainage regulations.

Table 8: Survey respondents in support of creating a dedicated watershed conservation fund – Examples provided

Survey respondents in support of creating a dedicated watershed conservation fund - Examples provided
– Payment to the mountains which is partially deforested over all the other places in the area. – Those draining every slough and clearing shelter belts are causing problems downstream and should pay. Those holding water back should be compensated. Also drainage by-laws are not being enforced. – It doesn't seem fair for those that farm in this area to be dumped on by others water. Land bought with soughs should remain on the property if not a natural runoff area. – I support such an idea. Those who drain should pay. And those who conserve should be rewarded. – If funding is available then maybe some producers would look at storing water rather than drainage. – Government (provincial) must take responsibility for collective drainage which affects many people. Land no longer capable of supporting agriculture should be purchased by a government and used for water storage and/or conservation initiatives. – Perhaps some of the land farmed around the lake could hold some water.

Of the respondents who were in support of a dedicated watershed conservation fund, 30% of the respondents were located in the Turtle Mountain area, 55% of the respondents were located in the uplands area and 15% of the respondents were located in the Whitewater Lake area. While water retention capacity should be restored across the watershed, this is a positive outcome as implementation from landowners in the Turtle Mountain and uplands areas will be fundamental to influencing acceptance from landowners in the Whitewater Lake area.

As discussed, there was some disagreement over the implementation of such a fund. One landowner, who was from Uplands area, indicated that they would not support creating a

dedicated watershed conservation fund due to their disagreement over the natural state of the lake,

> *Participant 12:* No, I would not support this type of program. Much of the water coming in is natural. The 1930's drifted some closed off the outlets, trapping water in the lake itself causing it to grow and now flood its natural banks.

Another landowner, from the Whitewater Lake area, reiterated this sentiment and their disagreement of this idea by stating,

> *Participant 21:* No I don't think so. Almost all dams that have been placed in the high water flows at peak times. They also come with a huge cost. Whitewater Lake is the biggest water storage unit you can ask for at no cost, it just needs a level control put into place.

Additionally, survey participants were introduced to the concept of "Ecologically Sustainable Products". To generate more financial benefit for landowners who participate in conservation programming, one method would be to create a product designation that would certify products from enrolled lands and allow them to sell at a greater markup in the store. Products can be linked to the "Fair Trade" and "Organic" concept; however, with an "Ecologically Sustainable Product" landowners would be certified if a certain percentage of their land was enrolled in conservation programming. Survey participants were asked to provide their opinion on the concept of "Ecologically Sustainable Products". This question was completed by 69% of survey respondents. Of those respondents, 58.6% did not agree with this concept, 20.7% were unsure and 20.7% were in support of this concept. One survey respondent misunderstood the question and expressed concerns that this type of concept would not provide conservation for animals and wildlife. Table 9 details some of the examples provided by the respondents who were not in agreement of this concept. This concept was generally not accepted by landowners on the survey. However, as discussed later in this Chapter, the concept received greater support when explained in person. The details of the program were likely not communicated well enough

during the survey. Landowners discussed possible issues with the program, including administration costs and marketing costs.

Table 9: Survey respondents not in support of implementing an "Ecologically Sustainable Product"

Survey respondents not in support of implementing an "Ecologically Sustainable Product" - Examples provided
– This would be too complicated to implement – I would rather see something that benefits everyone – Not in support. This type of program would be an administrative nightmare, open to misrepresentation by unscrupulous producers – No. How can the amount of production be calculated to make a fair allowance to qualify and how much can be traded in this way. – If it is like the organic I have seen around here, most of the guys have switched back to regular farming because of lack of market for organic. I don't think this would work. – Take the food cops out of the food available to public. Let farm grown produce into the food chain without stupid government laws. – I don't think that would work as marketing would be too costly to keep separate from other produce.

Additionally, survey participants were asked to provide their opinion on whose fiscal responsibility it should be to pay for wetland conservation/restoration. Participants were asked to indicate a percentage for the following options: landowners, municipalities, provincial or federal governments, non-governmental organizations and Conservation Districts. This question was completed by 95.2% of survey respondents. Of those respondents, 5% indicated that programming should be funding completely by landowners, 0% indicated that programming should be funding completely by municipalities, 10% indicated that programming should be funding completely by provincial or federal governments and 0% indicated that programming

should be funding completely by Conservation Districts. A majority of respondents selected a variety of entities. Table 10 summarizes the survey responses to this question.

Table 10: Survey Responses – Financial Responsibility for Programming

Financial Responsibility for Programming – Survey Responses					
Value	**Landowners**	**Municipalities**	**Provincial & Federal Governments**	**Non-governmental Organizations**	**Conservation Districts**
No Involvement (0%)	47.5%	32.5%	5%	32.5%	27.5%
Minimal Involvement (1 – 25%)	40%	67.5%	32.5%	55%	60%
Minor Involvement (26 – 50%)	7.5%	0%	25%	10%	12.5%
Significant Involvement (51 – 75%)	0%	0%	15%	2.5%	0%
Major Involvement (76-99%)	0%	0%	12.5%	0%	0%
Complete Involvement (100%)	5%	0%	10%	0%	0%

Of respondents who indicated that landowners should have no to minimal involvement with financial responsibility of programming, 40% indicated that the provincial and federal governments should have significant to complete involvement with financial responsibility of programming.

Of the total respondents, 15% distributed responsibility equally amongst all options, with 20% identifying entities from all categories.

Additionally, survey participants were asked if they support the use of the property tax system as an effect means of compensating landowners for taking part in conservation programs that support conservation funding. This question was completed by 88.1% of survey respondents. Of those respondents, 43.2% supported the use of the property tax system, 2.7% supported the use of the property tax system to some degree and 54.1% of survey respondents did not support the use of the property tax system. It's interesting to note that only 43.2% of respondents supported the use of the property tax system, whereas 67.9% identified that they supported the creation of a dedicated watershed conservation fund for the Whitewater Lake sub-watershed. While the concept of the watershed conservation fund is based on levying landowners through the property tax system, this may not have been clearly recognized by landowners responding to the survey question.

Some survey respondents included additional information as to why they would not support using the property tax system. One participant identified their resistance to using the property tax system and identified that funds should be allocated towards local infrastructure projects instead. However, some survey respondents included additional information as to why would support using the property tax system. Landowners discussed their disapproval with continued land tax on persistently flooded land and also recognized the importance of crediting landowners with the property tax system for maintaining wetlands.

Survey participants were additionally asked their opinion on the level of tax they would be willing to pay per acre for a watershed conservation fund (Figure 15). Participants were provided with the following options: $10 or less, $30 or less, $50 or less, $70 or less and $90 or less. This question was completed by 71.4% of survey respondents. Of the 54.1% of survey

respondents identified above that did not support the use of the property tax system, 50% responded to this question with the option of $10 or less.

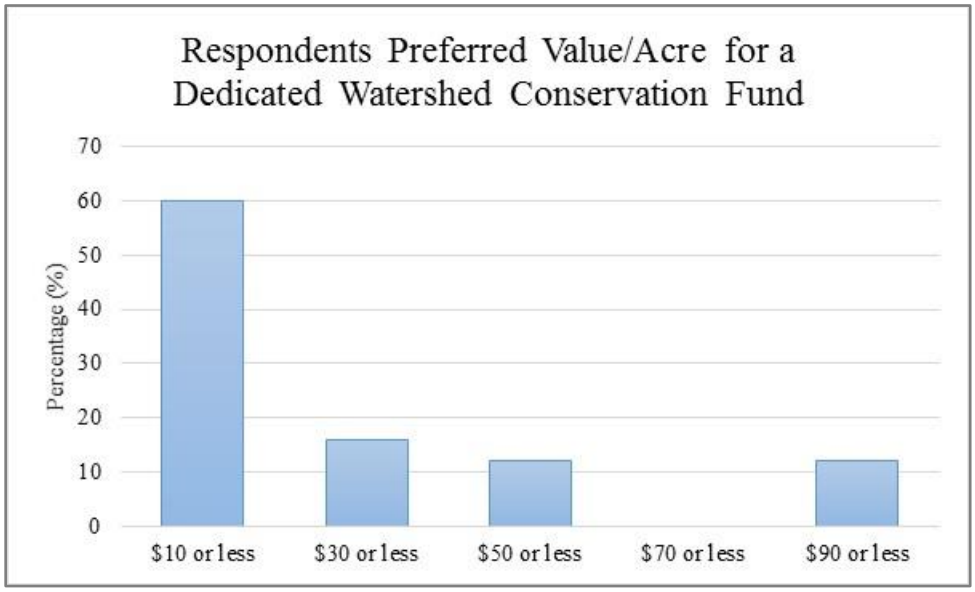

Figure 15: Survey Responses - Value of the Dedicated Watershed Conservation Fund

Survey participants were additionally asked their opinion on who should have the responsibility of delivering conservation programming. Participants were provided with the following options: municipalities, provincial or federal governments, non-governmental organizations, crop insurance (Manitoba Agricultural Services Corporation), local conservation districts, landowner or a combination of all options. This question was completed by 83.3% of survey respondents. Of those respondents, 45.7% indicated that they would like to see programs delivered through a combination of all organizations, 20% indicated that they would like to see programs delivered through the local conservation district, 2.9% indicated that they would like to see programs delivered through MASC, 8.6% indicated that they would like to see programs delivered through provincial or federal governments and 2.9% indicated that they would like to see programs delivered through local municipalities. An additional 19.9% of respondents

checked off a number of responses with the majority (87.5%) indicating a combination of rural municipalities and local conservation districts.

Survey participants were also asked what weaknesses or gaps they saw in current conservation programming that would make entry into the programs unattractive. This question was completed by 73.8% of survey respondents. Table 11 details some of the examples provided by the respondents. Only one landowner indicated satisfaction with their current program being offered through MHHC. Participants discussed a number of gaps in current programming, including the location of implemented projects, the lack of suitable/eligible practises, the lack of marketing and awareness of programming, the inability for programming to reflect true opportunity costs, the lack of funding for programming, high water levels on Whitewater Lake and their resistance to outside involvement on their property.

Table 11: Survey respondents – Weaknesses and gaps in current conservation programming

Weaknesses and gaps in current conservation programming - Examples provided
Program location – The huge fact that over the years almost all projects have been to the south side of the lake. – Too fragmented. Eligible practises – Nothing really applies. – I don't use them at all, none are practical. Marketing and participation – Lack of education on programs. – What is even available? – Everything is for water conservation and not land conservation. – I doubt if there is any, or at best, haphazard planning for conservation districts and watersheds. It needs to be an overall collective effort.

- Not familiar with all programs. What I see is the landowner isn't paid enough, especially with the way land is increasing in value.

Program administration and delivery

- The lack of enforcement on drainage is one of the biggest problems.
- I don't believe in tying up property forever.
- The financial compensation does not reflect the extra effort involved in these projects.
- Remuneration per acre, follow up is lacking from the organization.
- Not strict enough.
- Not managed properly.
- We like the one that we have (MHHC).
- By laws are not enforced, road allowances being broken up for grain farming without the municipality doing anything.
- The dominance of large scale commercial agriculture running all over the municipal councils and conservation leads.
- An inability to enforce drainage regulations.
- Caveats on land.
- A number of years ago water was released from upstream dams. No one came to tell me what was going on. Consequently, 82 bales of hay were flooded, impossible to move and eventually had to be removed after much frost. Poor delivery of programs is worse than no program at all. Communication trumps good intention every time.

Sustainable funding source

- Need more funding so it will involve more landowners. Landowners don't always get funding to do projects when they need it.
- Their funding appears to be eroding.
- Lack of funding or security of budget - can be yanked by Province at will.
- Short of funds.
- Not enough funding, lack of truthful information.

Whitewater Lake water levels

- High lake levels.

- Nothing is really being done to regulate drainage and this Whitewater Lake issue has gone on for years with no concrete results other than families lives affected in the area financially.

Resistance to outside involvement

- I have lived in this area all of my life and I know the land better than anyone else. Our grandparents and our parents spent their lives in this area.
- As a farmer, I am the steward of my land. I should take care of it in a way that retains a value. I bought it and will someday sell it. If not taken care of will not be worth the same as my neighbours

A number of issues were raised over the lack of consistent and sustainable funding sources for programming, administration issues and a lack of awareness and education about the programs.

Survey participants were also asked if they believed that conservation programs that support water storage save money on infrastructure costs in the long run. This question was completed by 85.7% of survey respondents. Of those respondents, 19.4% indicated that they did not agree that water storage projects would result in infrastructure savings in the long run, 8.3% were uncertain or expressed concern over their benefit unless the projects were maintained to a certain standard, and 72.3% indicated they did agree that water storage projects would result in infrastructure savings in the long run.

Survey participants were also asked to indicate the two most important benefits of conservation programming. Participants were provided with the following watershed components as options: land, water, soil and air. This question was completed by 71.4% of survey respondents. Table 12 summarizes the survey responses to this question.

Table 12: Survey Responses – Watershed Benefits of Conservation Programming

Watershed Benefits of Conservation Programming – Survey Responses		
Watershed Component	**First Choice**	**Second Choice**
Land	63.4%	0%
Water	20%	53.3%
Soil	13.3%	40%
Air	3.3%	3.3%

Of the respondents who indicated land as their first choice, 66.7% indicated water as their second choice while 33.3% indicated soil as their second choice. Of the respondents who indicated water as their first choice, 100% indicated soil as their second choice.

Survey participants were also asked to indicate their opinion on whether wetlands are an impediment to their daily farming activities and the production of their land. This question was completed by 90.5% of survey respondents. Of those respondents, 55.6% indicated that wetlands were not an impediment, 38.8% indicated that wetlands were an impediment and 5.6% were unsure. Table 13 details some of the examples provided by the respondents.

Table 13: Survey respondents – Wetlands as an impediment to farming

Wetlands as an impediment to farming - Examples provided	
Not an Impediment	**Impediment**
– No, wetlands in most situations can be a very small problem. – No, the lake flooding causes more issues for us than the wetlands on our land.	– Certain wet acres cause problems for tillage, spraying, etc. increasing production costs.

– No, I like having the natural land. – No, I have worked around them all my life. I continue to harvest hay when I can.	– Yes, we are in a wet cycle and "unusual wetlands" cause difficulties moving machinery over the land. – Yes, because it floods both productive farmland and also hurts pasture land. – Yes, to work around wetlands takes extra inputs such as fuel, fertilizer, seed, spray, time. They produce no return. – On wet years the sloughs drain from on to another causing the land not being farmed between the sloughs and around them.

Survey participants were also asked if they have areas of their land that they find difficult to farm which would be suitable for conservation programming. This question was completed by 90.5% of survey respondents. Of those respondents, 57.1% indicated that they had land that was difficult to farm and 42.9% indicated that they had no difficult land to farm. Table 14 details some of the examples provided by the respondents.

Table 14: Survey respondents – Indicated they had difficult land to farm

Survey respondents – Indicated they had difficult land to farm
– Yes, but I'm doing it alone because I believe in doing my part.
– Yes. Salinity is a growing problem.
– Yes, but we have converted those acres.
– Yes, hilly land and wetlands.
– Yes, some areas have been wet for so long that cattails have taken over.
– Yes, creeks running across both sections of our land.
– Yes, we do but it's already dedicated to conservation values.

- Yes, we already have our land signed up.
- We have pristine land with trees.
- Yes I do have. They are used for pasture or just left unused. I'm all for conservation but I don't like my hands tied as soon as I commit. I like to have some say still, especially with what small compensation there is.
- Two thirds of our land is bush and pasture.
- Yes, we've reducing erosion by grassing runways.
- Yes, we have sloughs and bush land.

Of the respondents that indicated they had no difficult land to farm, 20% indicated that their land was underwater.

Survey participants were also asked their opinion on crop insurance eligibility. Participants were asked to indicate if they agreed or disagreed with declining crop insurance to landowners who refuse to enroll their marginal acres in conservation programming. This question was completed by 73.8% of survey respondents. Of those respondents, 35.5% indicated that the land should be eligible for crop insurance, 19.3% indicated that they were unsure and 45.2% indicated that they shouldn't be eligible.

Survey participants were additionally asked what would make conservation programming easier for them to access as a producer. They were also asked to comment on how they would like to interact with the people who deliver the programming. This question was completed by 69.0% of survey respondents. Table 15 details some of the examples provided by the respondents. Participants discussed a number of opportunities to increase access and implementation of programming, including the incorporation of local knowledge in program development, accesses to programming which recognizes soil practises as well as past positive

land use practices, options to market programs through information sessions and mailed information and continued program administration through local agencies, such as the conservation district.

Table 15: Survey respondents – Suggestions for easier access and implementation of programming

Suggestions for easier access and implementation of programming - Examples provided
Program development – In my experience this is already well done – Each individual farmer has his own unique problems with water levels. That needs to be taken into account. – I don't like the idea of someone looking at our land and telling me who has been here all my life how I should look after it. They can't look at it and know it as well as someone who lived on it for years. Eligible programming – I am interested in increasing soil organic matter. Driving from one end of the field to the other and controlling soil salinity. When conservation has answers to these questions, which are profitable, then we can talk. – We don't know! We're not producers of agricultural products. We produce environmental goods on our land. – If my practices are conservation minded, I should be entitled to funding, but I don't fit the mold, so I am not eligible. Marketing and participation – First of all for conservation programs to work, the producer has to want to be involved with them – Meetings to discuss program options – Literature sent in the mail and the ability to access the information online. Program administration and delivery – Annual payments, and fines – Get the people who have had success with programs help the entities deliver them

- Have the programming part of the crop insurance package explained and enacted by the local office
- As long as a producer has an EFP the programs are easy to access now. CD people are very approachable
- More power to the CDs
- Access through crop insurance offices
- Deal with local conservation district. People who understand your areas and can relate
- Why in the past number of years have so many of the smaller offices closed? These offices are now sometimes located in towns farmers do no business in and they don't know the representatives
- Our current head is doing a good job of working with producers.
- Having a local conservation district.
- Not interested. Government involvement only as needed.
- I farmed for 50 years and I find that the less I had to do with government the better off I was. I never seemed to benefit from anything.

Survey participants were also asked to list any other ideas that may assist landowners in receiving payments for producing environmental goods and services. This question was completed by 50.0% of survey respondents. Table 16 details some of the examples provided by the respondents. Most participants provided examples for how to improve program development, delivery and administration, but did not provide alternative options for financing projects. One landowner does discuss a carbon sequestration scheme which was presented to the conservation district. However, some landowners did identify possible financing schemes through: the municipal tax system, incentives and government start-up grants. Additionally, it was identified that urban individuals should have a role in financing projects on the rural landscape.

Table 16: Survey respondents – Suggestions for paying landowners to produce ecological goods and services on their land

Suggestions for paying landowners to produce EGS services on their land - Examples provided
Program development – Work closely with other conservation groups (e.g. DUC). – Now that the Manitoba Government has forced smaller municipalities to amalgamate there are fewer of them. Now visit each RM individually and learn the water management concerns of each one. Rate them and then start building a working watershed. Eligible programming – More emphasis on land use planning to minimize soil erosion. – Payments for maintaining wetlands & shelter belts. – I had a very good carbon sequestration program that I presented to TMCD. That program paid farmers real money for pothole, sloughs, trees and good farm practises. From being a joke to being laughed at and ridiculed for the program I realized that even those who claim to be able to deliver programs couldn't recognize what was on the table in front of them. Marketing and participation – Post information at the local conservation districts and municipalities. Program administration and delivery – Municipal watershed fund; carrot, not stick; incentives, not regulations. – Enforcement – Keep contracts to a limited time as well as keep perpetual agreements overall. – I find the sooner farmers get paid a fair price for their product. We need to get away from the government payments which are never fair; the crooks get most of the gravy. – Government grants for start-up farming. – Use the ALUS program like in the RM of Blanchard. If you charge put it on everyone's taxes. City people like to talk the talk but if they had to walk the walk and pay for conservation areas to offset the urban sprawl I think would make it easier to get funding for such programs

- It's hard to accept the idea that any landowner should provide wetlands, etc. at no cost to others. No wonder that very few would not drain, bulldoze etc. small payments would go a long way to help.

Survey participants were also asked about drainage in their watershed. Participants were asked to identify if there were acts of unlicensed drainage occurring near their land (Figure 16) and were also asked to identify if drainage regulations were effective in enforcing man-made drainage (Figure 17). The first question was completed by 80.9% of survey respondents. Of those respondents, 79.5% indicated that there was unlicensed drainage occurring, 2.9% indicated that they were unsure if there was unlicensed drainage occurring and 17.6% indicated that there was no unlicensed drainage occurring. The second part of the question was completed by 71.4% of survey respondents. Of those respondents, 7.5% indicated that drainage regulations were effective in enforcing man-made drainage, 90% indicated that drainage regulations were not effective in enforcing man-made drainage and 2.5% indicated that they were unsure if drainage regulations were effective in enforcing man-made drainage.

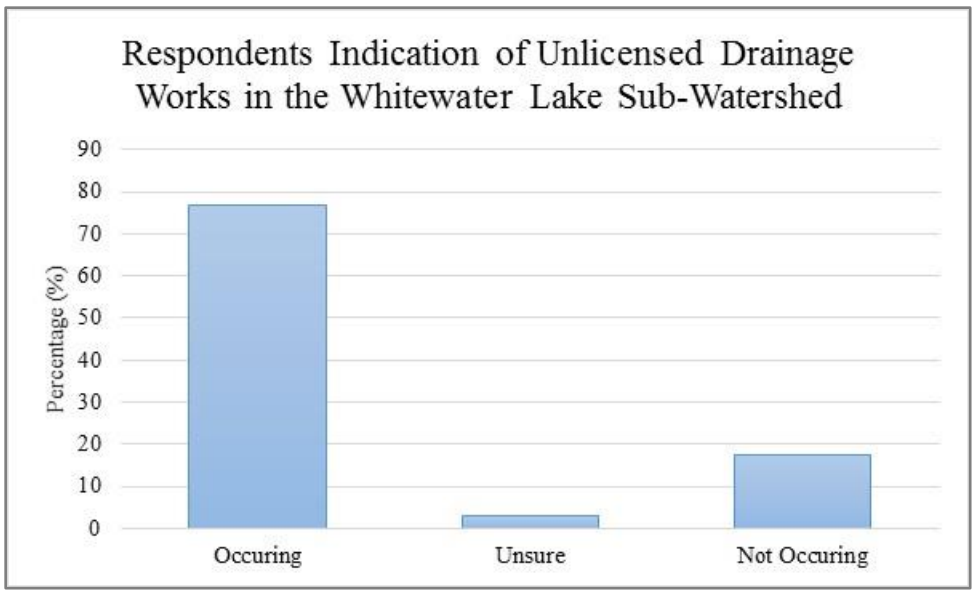

Figure 16: Respondents Indication of Unlicensed Drainage Works in the Whitewater Lake Sub-Watershed

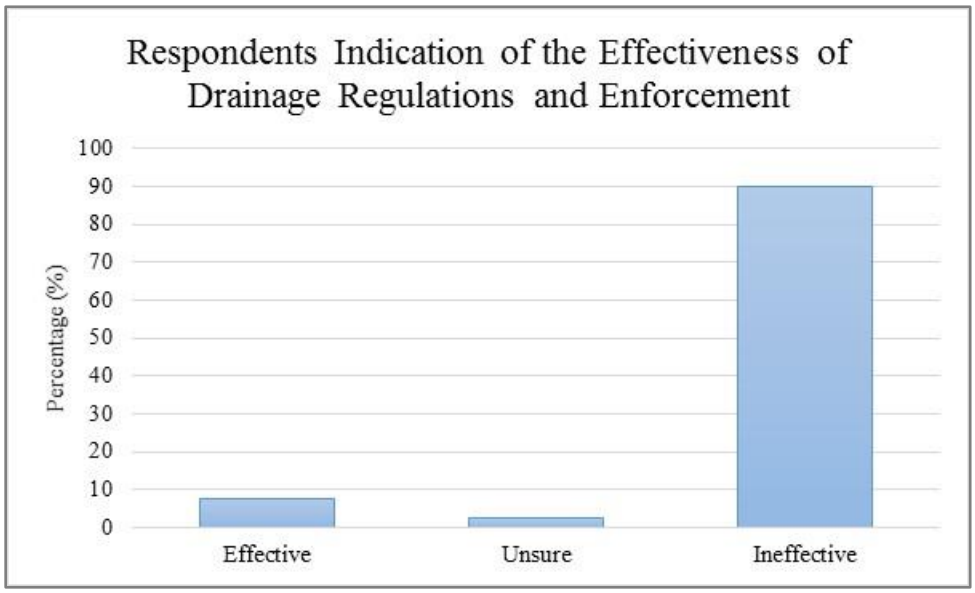

Figure 17: Respondents Indication of the Effectiveness of Drainage Regulations and Enforcement

Survey participants were also asked to identify the changes that they have made to their land as a result of government regulations (Figure 18). Participants were given the following options: no changes to operation as a result of governmental regulations, changed the area of production on your land, reduced the area of production on your land, large monetary

improvements through capital investments and adopted beneficial management practises (BMPs). This question was completed by 83.3% of survey respondents. Of those respondents, 71.4% indicated that they had undertaken no change to their operation as a result of government regulations, 2.9% indicated that they had changed the area of production on their land, 8.6% indicated that they had reduced the area of production on their land, 11.4% indicated that they adopted BMPs and 0% indicated that they had large monetary improvements through capital investments. Some respondents did not answer the question directly and instead provided a written response. For example, one respondent identified that they had reduced their area of production as well as adopted BMPs while another respondent identified that they had changed their area of production, reduced their area of production and adopted BMPs.

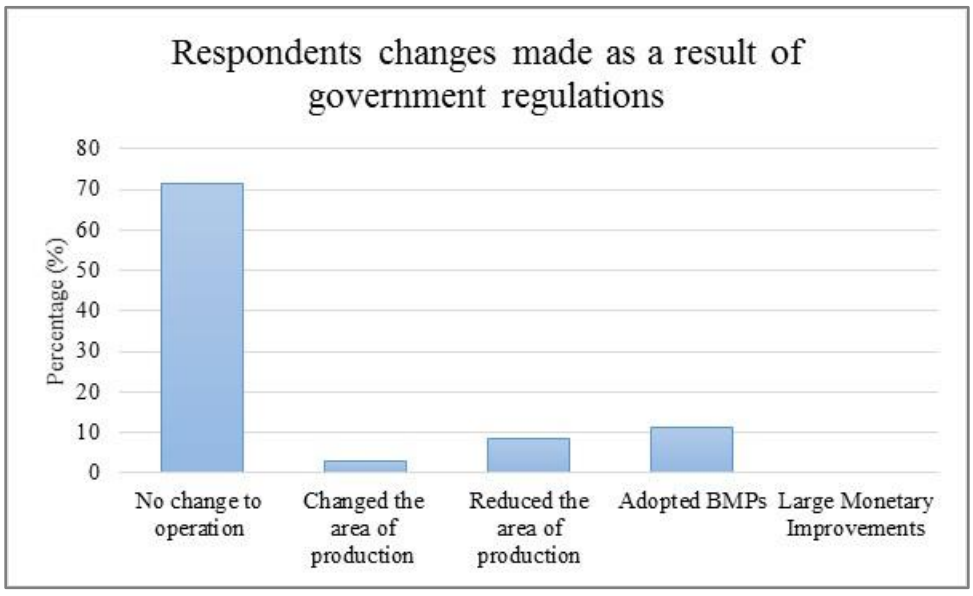

Figure 18: Respondents changes made as a result of government regulations

Survey participants were also asked to provide their opinion on who stands to benefit from the adoption of conservation practies on their land. Participants were asked to rank the following options from one to five, with one being the highest and five being the lowest. This

question was completed by 78.6% of survey respondents. A number of responses to this question were not answered properly. On re-assessment of the question, participants may have misunderstood how to number their responses. This is taken into account in the following analysis. Of the respondents, 27.7% indicated that Manitoba residents stood to benefit the most, 30.3% indicated that farmers stood to benefit the most, 9.1% indicated that rural communities stood to benefit the most, 9.1% indicated that consumers stood to benefit the most, 3.3% indicated that the agricultural industry stood to benefit the most and 12.1% indicated that all options benefited equally. 8.4% of respondents did not directly answer the question but provided additional commentary. As an example, one respondent indicated that tourism benefits in the long run, while one respondent indicated that wildlife benefits in the long run.

Survey participants were also asked to identify if they believed that they had to make changes to their farm through the adoption of conservation practises. If they agreed with that statement, they were asked to rank the following options from one to four, with one being the highest and four being the lowest: to meet public expectations, meeting market expectations, meeting government regulations and an environmentally conscious mind. This question was completed by 76.2% of survey respondents. A number of responses to this question were not answered properly. On re-assessment of the question, participants may have misunderstood how to number their responses. This is taken into account in the following analysis. Of the respondents, 53.1% indicated their first choice as an environmentally conscious mind, 6.25% indicated their first choice as meeting government regulations, 7.1% indicated their first choice as meeting market expectations and 3.1% indicated their first choice as meeting public expectations. 30.45% of respondents did not answer the question but instead included additional

commentary. One respondent indicated that none of the options resonate or pay the bills, while one respondent indicated that most of their land was left the way that nature made it.

Survey participants were also asked if they thought that public expectations of environmental standards in their farming operations were increasing. This question was completed by 80.9% of survey respondents. Of those respondents, 67.6% indicated that public expectations were increasing, 23.5% indicated that public expectations were not increasing and 8.9% indicated that they were unsure if public expectations were increasing.

4.2.3 Survey participant demographics

The survey included a number of questions which provided information on the landowner's demographics, including age, sex, primary source of income and annual net farm income.

Survey participants were asked to identify the year that they were born in. This question was completed by 90.5% of survey respondents. The average age of respondents in the Whitewater Lake sub-watershed is 66 years, with the lowest age being 33 years and the highest age being 87 years.

Survey participants were also asked to identify if they were male or female (Figure 19). This question was completed by 100% of survey respondents. Of those respondents, 92.9% indicated that they were male and 7.1% indicated that they were female.

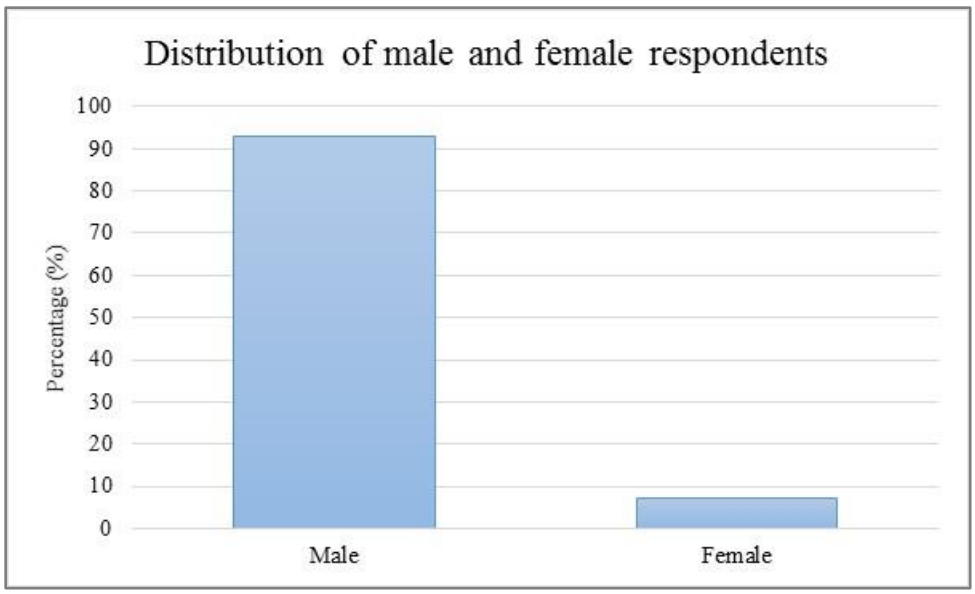

Figure 19: Distribution of male and female respondents

Survey participants were also asked to identify if farming was their primary source of household income (Figure 20). This question was completed by 95.2% of survey respondents. Of those respondents, 50% indicated that farming was their primary source of income, 45% indicated that farming was not their primary source of income and 5% indicated that they were retired.

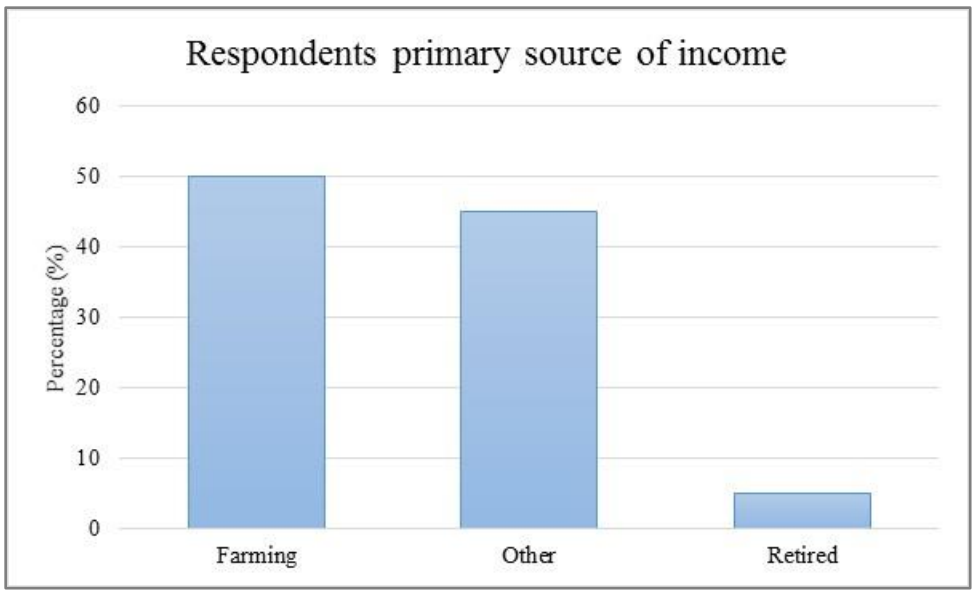

Figure 20: Respondents primary source of income

Survey participants were additionally asked to identify their approximate total net farm income before taxes and deductions for the years 2008 and 2012 (Figure 21). This question was completed by 64.6% of survey respondents. Of those respondents, only 16.1% indicated a change in revenue from 2008 to 2012.

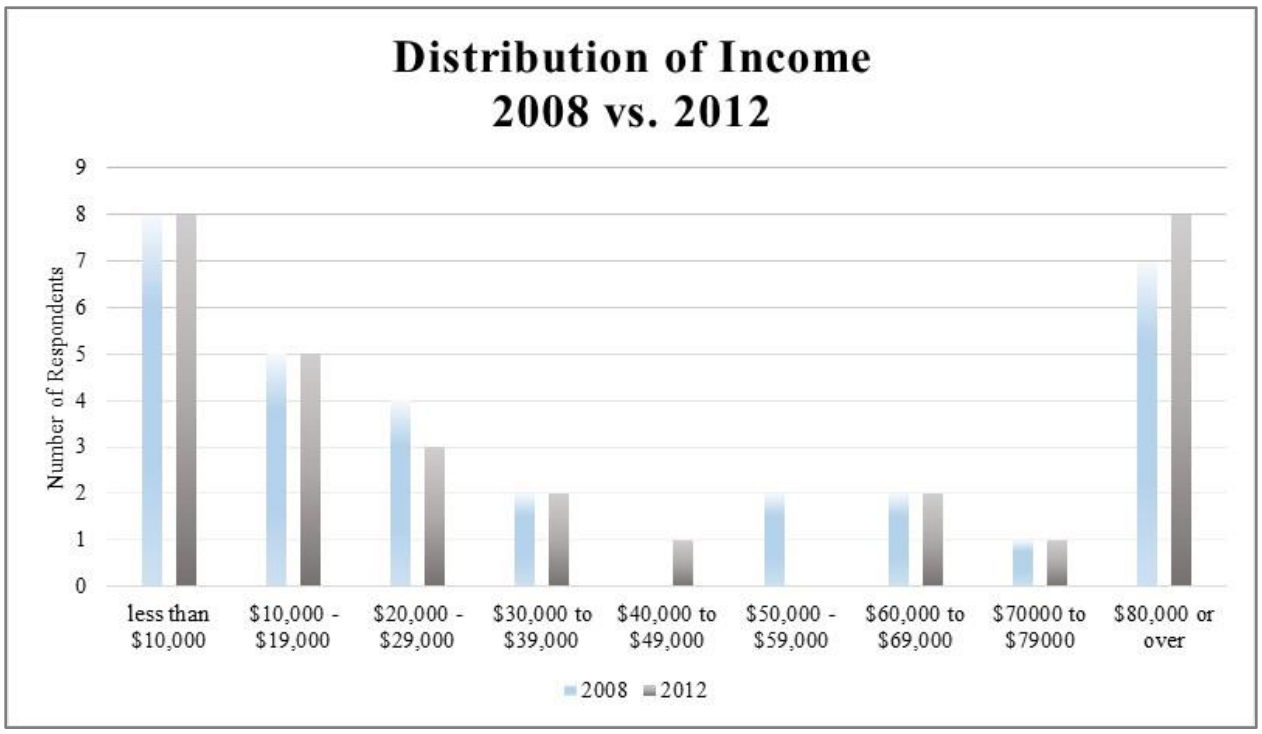

Figure 21: Distribution of Income (2008 vs. 2012)

4.3 Personal interviews

The following results of the personal interviews will be presented based on themes identified throughout participant discussions.

It is important to note that some participant quotes have been amended to protect the confidentiality of the participants. Several landowners commonly referenced other landowners by name; these quotes were adjusted to state the location of the landowner instead.

Interview participants were asked to discuss their normal process of planning on their land, including drainage, bush clearing, and crop that they grow, etc. Participants were also asked to discuss any changes that they had planned for the future.

4.3.1 Local land management issues

Interview participants were asked to discuss what their most important land management consideration is in their farming or ranching operation. Participants were asked to explain why their answer was the most important consideration, as well as list additional factors that they consider when planning on their land.

A prevalent theme that was expressed through discussions with participants was that land and soil management were top priorities in their farming operations. Several participants indicated that taking care of their land in the most appropriate way included management for erosion through tillage practises and management of alkaline soils. When asked to discuss their current land management practises, many participants indicated that they have had to adapt to a number of different conditions, from year to year. One participant stated:

> *Participant 57:* Well I think the most important thing is to look after the land. One thing my grandpa told to me at a very young age, he said, "If you look after the farm, it will look after you". I think land management, how we always farmed, things have evolved over time, the days where they used to plow everything has changed. A lot of it is zero till now, but this past year people have had to get on the land in the fall to do some work. And you'll see a lot of those guys have scratched the surface this fall to open up the soil. You have to adapt to the conditions around you.

Natural landscapes are always changing. Persistent wet conditions may lead to alkaline soils and periods of drought may change a landowner's tillage practise to conserve water. Some landowners identified practises that they have incorporated in an effort to mitigate some residual effects of water being on their property. One landowner indicated frustration over the presence of wetlands on his property but identified the following:

> *Participant 49:* Yeah the wetlands are a pain, but I have nowhere to drain them unless I make a big cut. But I'm in a rotation so every four years I'll sew alfalfa and then crop, it's always a rotation. And I don't want a big cut in my land. Because when you have alfalfa it absorbs all the water in the land, unlike crop land which doesn't.

While some issues identified by participants can be a direct result of excess water of their land, some landowners conceded that land use practises impacts the way water infiltrates or ponds on their soil. Most landowners who identified themselves as ranchers, indicated that planned and rotational grazing was a key factor in improving infiltration and sustaining the health of the soil. One landowner in the Uplands region expressed this sentiment by saying:

> *Participant 53:* Our most important consideration is looking after the soil. So we do that by planned grazing and the plan is not to overgraze. Create as much forage, the more forage is going the more water is being used. The water will penetrate the soil, there will be a litter cover there so the soil won't dry out and we'll be able to grow more.

This sentiment was further reiterated by another landowner in the Whitewater Lake region. He stated:

> *Participant 50:* We don't summer fallow, and haven't for many years. What was a good way to let your land rest and be more productive, turned to be the other way around. We aren't zero till but we farm continuously. I bought a piece of land that was summer fallowed, and it flooded shortly after that. When the water went away, 8 foot tall cattails were left and I worked it down and I worked that land continuously for 37 years until 2011 and it continuously got better and more productive. So it's important that you maintain good farming practises to maintain good ground. Zero till doesn't work for us here because it's too wet; some guys are able to get away with it. You're seeing a lot of black fields this year that you wouldn't normally see.

As highlighted in the statement above, land management characteristics change from one region of the watershed to another. In addition, management for water also varies throughout the watershed. Land characteristics in the Whitewater Lake region are generally flat with minimal depressions or potholes. Management of water is typically dealt with crop and grazing rotations to break and open up the land to allow water to seep in. Land and water management characteristics in the Turtle Mountain region differ and the feasibility of storing water in depressions is greater.

As discussed above, many landowners expressed concern over land use management issues as the main cause of problems instead of water management. It was apparent that concerns were present over the current programming offered to resolve flooding issues in the area. Landowners indicated that wetland drainage was certainly a concern; but identified the mismanagement of soil and land as a defining factor in why flooding issues were occurring. One landowner from the Whitewater Lake region stated:

> *Participant 43:* Our perspective in why we are in the situation we are today (with the lake) has everything to do with land and not a lot to do with water. The greatest problem we face now across the Great Plains of America is almost the complete destruction of the water cycle. And all the other cycles have been totally disrupted (energy and nutrient) but you can frame it in the water cycle. Modern agriculture has totally changed the landscape and the result of that change is a completely debunked water cycle….
>
> And the most important stage is the infiltration of the water into the ground to get the water down and it's no longer functioning. We've got hard pan, we've got compact soils. And it's not compacted soils because of heavy equipment but I believe it's what the equipment does. 200 years ago, huge populations of bunch grasses (e.g., switch grass, wheat grass and big blue stem) had deep perennial roots. The livestock and buffalo would graze that and the nutrients would go into the soils. And all of that is gone now. Now the precipitation that falls rests in the top 16 inches where all the activity takes place. And that has a really difficult time to pass the hardpan and all the channels from old roots have now been filled in with quarts and fine materials and that's where the compaction comes from, not the tractors being too big, although that attributes…
>
> The water assimilates on the surface and it has nowhere to go so the water just ponds. And as the soil gets worse, the situation gets worse. It has nowhere to go and out of frustration these guys drain it. And they have such an immaculate set of drainage tools now, the water goes so fast. And that happened when the first plow went into the ground. The only way to resolve this issue is to resolve the water cycle and get it back in place. If the water cycle is fluctuating properly the water will go into the soil 90% of the years.

Undertaking land management practises that restore the soil structure to allow proper infiltration has been successful for some landowners in the region. The implementation of a planned grazing system on one farm led to a measurable increase of infiltration to the soil. The planned grazing system involved an ecological assessment of individual paddocks to help determine the necessary grazing plan for the farms determined conservation outcomes.

Rotational grazing was then practised on all areas of the farm using the paddocks to encourage the growth of natural grasses. He indicated:

> *Participant 43:* But we've managed this way and our production has turned right around and it's on its back up again. And we see a high productivity in our desirable species which is native grasses. We've seen a return of our water cycle. We see almost no runoff. The years where they saw all the rains, we have a dug out at the end of our property and it was only half full. When it was in grain land we dug it in a slough because we said there will always be water, but it's dry half the year…
>
> We don't let any water go, we actually guard our water quite jealously. This land uses so much water. And now we have areas that we're trying to get our willow encroachments so we're trying to get more natural shrubbery.

In addition to being unhappy with permanent caveats on their land, many participants expressed dissatisfaction with the land use restrictions. One landowner identified his hesitancy of enrolling in programming as a result of the land use restrictions. He stated:

> *Participant 54:* No I don't have any land in programming. We looked into it. But the way they had it I wasn't interested. There was sloughs (3 classes) native grass, native pasture, hay ground and I know there was a program a few years ago where you could cut your hay a little later to let the nesting birds finish nesting. The programs are all the way in or you're not doing anything.

Overall, in discussion with participants it became apparent that landowners may be more inclined to participate in EGS programming if soil and land improvements were included in the list of eligible practises. A number of landowners indicated that they would not be willing to participate in water storage programming. It's interesting to highlight that many of the landowners who indicated this were already undertaking conservation practises on their own land. It was identified that programs have been lately been skewed too much towards water management and less on soil and land management. The same participant continued by saying:

> *Participant 43:* No, I don't see Alternate Land Use Services (ALUS) being implemented here. In order to save Whitewater Lake basin issue we need to deal with the cultivated land. The perspective of ALUS is pretty good. To do nothing with land is doing

> something, idle land goes backwards. Desertification of Texas is from idle land not from grazing. If you see succession stalling out or if it's advancing to a point you need to halt it…
>
> We need agricultural systems that understand water is fundamental to production. They need cropping systems, programs and things that target water cycles and water use on their land. Education needs to start in kindergarten because the people at my age wouldn't agree even if it was slapping them in the face (which it is). They are so deep seated in what they are doing now.

4.3.2 Participant assessment of wetland and small dam flood protection benefits

While local flood protection benefits can be an outcome of EGS programming, expectations will have to be set transparently while working with landowners. There is a general frustration in the area about the lack of flood protection provided by the small dams in the Turtle Mountains, as well as the risk associated with the dams. When discussing the effectiveness of water storage programming in the Turtle Mountain area, it was common for landowners to express their frustration over the inability of dams or wetlands to store water in large floods. Two landowners indicated the following:

> *Participant 49:* I think programming would retain some water in the Turtle Mountains. The Conservation District put a bunch of dams in the mountains but once they're full, they're full. Unless you have some way to release the water, that's an issue.
>
> *Participant 10:* They've done water storage before with the dams. They get filled up in the first year and then they're full when a big rain comes and then I get twice as much water in a bad year as I would get in a normal year. They should always be emptied in the fall, last thing before freeze up, so in the spring you have a reservoir. So floods in 2009 they all busted out and we got three times as much water as we were supposed to.

When marketing programs to landowners, it will be important to incorporate discussions on the effectiveness of wetland conservation and restoration for mitigating higher frequency floods. There is a general agreement in the area that increased wetland acres will help with some flooding but there is a general disconnect over the effectiveness of mitigation. For example, two landowners discuss their experience with large floods, such as 2011:

> *Participant 51:* How much good will it really do to have wetlands holding water. It's only going to be a short little time that the water is going to be there for. 2011 was exceptional, I did see a map from 2010 to 2011 to now and how much land it has taken, and it was quite astonishing.
>
> *Participant 18:* Higher than normal rainfall, but excess draining is way overdone. The Turtle Mountains here are drained to the max. I think both an outlet and water storage would help. I think on extreme wet years there would still be flooding even with water storage.

4.3.3 Participant awareness of local programming

Interview participants were also asked to discuss EGS programming. Participants were asked if they were familiar with the concept and were asked to discuss any programs that would be successful in their area of Manitoba.

When discussing awareness of programming, one participant stated, "I've heard of the programs offered by MHHC. I imagine there are some programs out there, we just haven't heard of them. You just have to go looking for them, but most people don't go and look". This sentiment was reiterated by a number of landowners. Generally participants were aware of MHHC's programming but were hesitant to look further into the program. In addition to MHHC's programming, multiple landowners indicated that they were aware of a new "Revolving Land Conservation Program" being offered by DUC. There was a general positive consensus in the region about this programming; however, no programming had actually been fully implemented on any of the participant's lands. For example, two landowners describe their perception of the DUC program as:

> *Participant 56:* Our neighbour is interested in doing stuff with Ducks. So he actually found out what the program was. You can still farm it, but they actually said that if it's dry enough, they don't care if you sew it. If you can farm it, farm it. If it's too wet, it's too wet. So they have this half up here, and I think it's for rent in the spring. It will be for tenure to rent (for a year or two) and then they will sell it. You can do what you want; you just can't open up the drains…

> I certainly would, I believe in the concept. I don't know if you've heard about Ducks Unlimited approach. I think that's really good. To be quite honest I'm quite interested in that program. I think it's new, land was up for tender out near here and they did purchase it. They think they're taking the land away from the young guy, but it's a tender process so if I really want the land I can bid a little higher. And they're just flipping the land, so people will be able to work it later. And some of those sloughs shouldn't have been drained originally. It's a way for them to get their program out there. And there has been an uptake.

This demonstrates the power of word of mouth and positive reinforcement of programming through community members. One participant further reiterated this about the DUC program by stating, "Programs are spread by word of mouth, and now that they've tendered on some then people start to know about it".

It is important to note that landowners also adapt and learn from one another outside of conservation programming decisions. Farming techniques and efficiencies are commonly recognized and adapted by others. One landowner describes:

> *Participant 60:* As the environment changes temporarily or permanently there will be changes but how quick I don't know. I think farmers learn from each other. Back in the 1980's air seeders were just coming out, everyone was seeding with a disc drill and it was dry in the 1980's. So it was too dry to sew and everyone was waiting for it to rain. And there was one farmer, he used an air seeder and had everything worked. He waited and waited and in June we got a rain and he seeded everything and grew a little bit of a crop that year. And in a couple years everyone had an air seeder. Everyone watches their neighbours.

A lack of program awareness in the area appears to have a significant effect on participation in programming. A number of other considerations for non-participation were identified in discussions with landowners. These are discussed in the next section.

4.3.4 Participation in programming – obstacles and rationale

Interview participants were also asked to identify if they are participating or would be willing to participate in programming that provides incentives for creating ecological goods and services on their land.

Hesitation to participate in programming could be grouped into the following themes: personal land management concerns and local land management concerns. One area of concern that could be grouped under personal land management concerns was landowner hesitancy to enrol acres because of currently flooded land. A number of participants expressed their inability to participate in programming because they had no available acres or felt as though their available land was maxed out due to flooding. An additional area of concern that could be grouped under personal land management concerns was landowner hesitancy to enrol acres because they felt they lacked marginal lands. This was common amongst landowners and a fundamental issue of ongoing conservation programming. The enrollment of marginal lands reduces the efficiency of the programs value for money and future environmental outcomes. Independency was also raised as a concern from many landowners. Landowners were hesitant to allow an outside agency to have control over their land and reaffirmed that they knew their land better than anyone else. One landowner states:

> *Participant 53:* I have not been involved in any of those programs. I'm not that keen on them. The concept is good, but I'd rather do it myself and not have any strings attached. I am comfortable and capable of managing my land that I'm not interested in going into programs.

One area of concern that could be grouped under local land management concerns was landowner hesitancy to enrol acres until an outlet was constructed. This is discussed in greater detail below but appears to have a causal link to a landowner's willingness to participate in programming. One landowner describes his thoughts on this topic:

> *Participant 52:* Participate in programming? Something like this ravine, I'd be game to do that, but I'd be probably more so against it if they're not going to look at the issues in Whitewater Lake.

4.3.4.1 Environmental values of participants

Participants expressed a number of environmentally conscious sentiments which may have an affect on their participation in programming, including: responsibility to future generations, aesthetic values, responsibility to self and responsibility to their land. Predominately, landowners expressed an overall responsibility to their land. Some responses from interview participants are included below. They provide a glimpse into the environmentally conscious mindset of some landowners in the study area. They stated:

> *Participant 8*: I am a firm believer of with leaving the bush where it is. I grew up with it and my son is under the same mind set. We never have been people to drain. Probably you'll find the people up in the Turtle Mountains, the original ones, they don't drain. It's the guys who come from the prairies and rent land up in the Turtle Mountains and they are the ones that drain. They are also the ones that are complaining. That we're causing the problem down by the lake but we're holding water.
>
> *Participant 60:* We have three quarters of our land in programming. There was piece that we never farmed and my dad tried to farm it and we would try to get grass on it. But it would hurt me if someone tried to tear it up. It grows good grass, has lots of production.
>
> *Participant 2:* Some people like to drive down and see crops corner to corner, keep it nice and tidy. Personally I like to see a little bit of habitat, so therefore I guess I'm an oddity. Delta has the ALUS program which is wonderful, and it's nice to say you're feeding the hungry world, and our youth coming up I think they have a right to see a wetland with a duck on it. So any program, I don't care who it's with, that's keeping natural habitat on your land is good in my eyes. When I entered my agreement, I wasn't going in it to make money.

Some landowners went on to state their rationale behind participating in programming as their responsibility to give back for some of the potential harm that they've caused to the environment. One landowner states:

> *Participant 52:* We sold a half section of pasture, but now when we went to sell it and there was a caveat on the land that hurt us. The guy who was going to buy it was going to break it up, and didn't end up buying it. That was kind of our give back to the environment because we can give back for some other stuff that we've done.

A number of landowners expressed their frustration over the misidentification of landowners as unhealthy stewards of their land. Interview participants described a number of

environmental conscious practises that they undertook on their farms and expressed a general rural-urban disconnect as the reasoning behind many of these assumptions.

4.3.4.2 Lack of an outlet as an inhibiting factor to participation

Some participants reported hesitation to enrolling in conservation programming while high water levels on Whitewater Lake remain an issue. Two landowners expressed the following concerns:

> *Participant 3:* There is no point doing a program until you get the water levels under control and then at that point it won't affect me anymore. They have the water moving so fast now, every acre they clear now and the water comes out of the hills 100 miles an hour and doesn't sit in the dams. It doesn't look like much of a hill, but water runs down fast.
>
> *Participant 51:* Getting the water out in the fall and not having landowners dealing with it in the summer is the right thing. I can't see another way out about it. Building wetlands will help the situation, once this situation is dealt with.

A majority of landowners expressed frustration with the high water levels and lack of water level management in the area. A number of landowners discussed the idea of there once being an outlet to the lake and it since filling in during dry years. The same participant expressed his thoughts by stating:

> *Participant 51:* I've suggested to the Conservation District that Whitewater Lake should be looked at like any other water retention system. If you want to hold water, make a dam. It's just a water storage area, it's gotten overfull and it will run out on its own. It will just get bigger and worse, not bigger and better. It loses its value, because the marsh is no longer marsh, what used to be fringe area is now under three feet of water and the fringe area is now in ag land so when that recedes people are going to be farming right up to the lake.

While high water levels were the main focus of discussion, many landowners made reference to the risk of a drought situation on the lake. Landowners commonly discussed the use of an outlet as one component of their preferred solution, to both high and low water levels. The

hardship of drought was still prevalent in the back of some landowner's minds. One landowner states:

> *Participant 50:* Any solution that doesn't take in the whole picture of moving water is short sighted and won't work. Any project that doesn't look at the big picture, and that includes outlets and maintaining levels. The only thing worse than that lake too full, is that lake empty. It is white silty sandy stuff and it blew all over the lands and choked it. So pick a normal and you never let the lake go below it, that's good maintenance.

Some landowners did recognize consequences of an outlet and discussed their concerns with passing water through to a different system. Two landowners discuss this idea in the following quotes:

> *Participant 50:* It's unfortunate that the only outlet that was coming out of Whitewater Lake has been filled in. Naturally the water comes in to the lake and it has been detrimental to a lot of people. If you put a controlled drain on it, then you're just putting it in a different water system. It's hard to look at it in that respect. If holding the water is not helping flooding downstream then it's helping the natural ecosystems in the dry years. We have to have water or else we'll become the Sierra Desert. You have to have water for wildlife; you have to have water for your animals in your house. Nature needs water.

> *Participant 53:* I think an outlet would just cause problems downstream. The poor people at Lake Manitoba, that's where it's going to end up. An outlet is more of a band aid. It's not treating the cause, its treating a symptom. Not utilizing the water when it hits the land is the problem.

4.3.5 Perspectives on identifying a sustainable funding source

Interview participants were also asked to identify if there were any partnerships that they could see being feasible in creating funds for EGS programming. Participants were provided with the following options as an example for discussion: eco-tourism, municipal watershed fund and eco-certification of crops. In addition to the themes discussed below, a number of landowners also discussed their dissatisfaction over continued taxes on their land assessed for conservation. While discussing this, one participant stated:

> *Participant 55:* Yeah, like everyone said we should have done this when Whitewater Lake was dry, but where does the money come from. They haven't even paid for the

> disaster at Lake Manitoba. It's easy to talk about, but until there is money there is nothing you can do. All the towns are struggling to survive. Populations are declining. Boissevain and Morton are in a good place, we're going ahead, but most communities are going backwards. The people in the communities had some foresight and saw the communities grow.

Another participant describes his frustration over the lack of incentives in the area. He states:

> *Participant 2:* On the north side of the lake, one neighbour had a half section and his neighbour had the other half section and the land that was broken up had cheaper taxes then the land that was left in sloughs. So he still hasn't broken up his sloughs, but he's still not happy that his tax base is higher. His uncle had land near Elgin and he said he personally never paid the taxes on that land because the federal government had a program that compensated landowners who were maintaining sloughs. Which he now left and some of them are still there and he got enough money from the federal government to pay for his taxes.

4.3.5.1 Eco-tourism

There was significant discussion on the prospects of increasing eco-tourism in the area. Opinions were mixed between landowners; some recognized the possibility of generating profit off their land while others questioned the feasibility of such a program in the area. A number of landowners detailed the disturbance and destruction of natural habitat that has occurred as a result of high water levels and flooding. Some landowners indicated a dramatic decline in the number of American hunters, while others still recognized the viability of the industry. Three landowners discussed this during their interviews by stating:

> *Participant 2:* I kind of have an ecotourism going on. I have American farmers come and stay at the farm. I had two different groups. I think Whitewater Lake history revolved around hunting, and in the late 1800's they were going to have a marine on the lake, but they had showed pictures to buyers in England as that. We've had hunters to come to the farm. The unfortunate part of Whitewater Lake is Sextons Island. It was the best undisclosed ecosystem in Canada. Not so much now, the snow geese have passed on. In the late 70's American hunters stayed at farms all along Whitewater Lake. I would think if a guy had some sloughy areas, he could get something out of it. I have a trailer on the land, and they pay for the accommodations and they pay for that and then get to hunt on the land. Accessibility to the land, guys like, a man from Michigan phoned me two weeks ago about coming up.

Participant 8: We have lots of hunters as it is right now, and they don't pay anything. I could see it as an income source. If they paid to come on your land I think they would respect things a little more. And there is a lot of guys hunting, and they know where you are, you don't see them year round but just at hunting season.

Participant 3: In the 1980s and 1990s they farmed it corner to corner. Whitewater Lake used to be huge game hunting. The water is too rough now, the waves are three feet high. We had a lot of Americans come. As an area, we never capitalized on that. The guys that came up were really considerate. He was having a drink with an American and he said why you guys don't charge to hunt on your land. And he said there's no place in America that you go to and you're not charged. A group of hunters came and paid $100 and he said was it worth it? So I guess I made a little bit of money, but then the geese stopped coming and people haven't been hunting.

One landowner discussed the benefit of having wetlands and wildlife on their own property. Views like this were not commonly discussed throughout the interview process but highlight the value that wetland conservation and restoration can have on a landowner's income. Understanding the benefits that lie within these ecosystems will be an important concept to highlight to other landowners moving forward. He states:

Participant 2: A couple years ago, there was a section of land and one year we trapped $300 worth of beaver, same of muskrat, and it was probably wasn't even two acres of land. I know there was always ducks on that slough, I know you could of rented out that land for a couple of hundred dollars, so you have $1000 dollars right there that came in off the land without doing anything to it.

As discussed above, there were a portion of landowners who did not recognize the feasibility behind ecotourism. Two landowners confirm this view by stating:

Participant 51: There is no way you'll get someone to pay in hunting. We have seen a dramatic decline in American hunters in the fall. You could hardly turn around without having another hunter coming. I haven't had a hunter cross our doors in three years.

Participant 55: We have a small bison herd and we used to bring people in and let them tour and as soon as we started to charge them a little bit it totally stopped. They would just park on the road and then use binoculars to look. They wouldn't pay a small fee to come in and let me talk about them. And hunters, there aren't that many hunters anymore.
Participant 55: Maybe it's become cost prohibitive or getting across the border is harder. We have a few friends that have been there for 20 years, but we can't bear to charge them anything. They usually end up paying us a little but it's nothing that would ever sustain a

> process. So I don't see that being lucrative enough. And as soon as you start doing that, you're considered a business so you're paying extra taxes on your land. So then you have to try to cover that, and advertising is just huge and expensive. Marketing has never been my strong hold. I've just learnt to be a producer.

As the second landowner highlights, undertaking an ecotourism venture falls significantly on the landowner themselves as well as the resources that they have available to them. If pursued, ecotourism can benefit as a stacked financial incentive combined with EGS programming. However, the input requirements may be a deterrent to many landowners.

4.3.5.2 Municipal watershed fund

The municipal watershed fund was developed on the concept of a user-pay system. Therefore, a municipal watershed fund would collect levies from landowners who undertake drainage activities on their land, while the funds would be redistributed to landowners who undertake water storage projects or wetlands on their land. The excess monies remaining in the levy would be used to fund ecological goods and services projects throughout the Whitewater Lake sub-watershed. One of the main advantages behind the implementation of a local watershed fund is the generation of sustainable funding in the local area. One landowner discussed the concept during his interview. He states:

> *Participant 50:* A local watershed fund isn't a totally bad idea and if people are moving water onto someone else's property they should be paying for that. They should know who's doing it by looking at the drainage licenses and they will have an idea on how much they're draining based on the license and they will say its x-amount of dollars per acre and that's just the cost of doing business. It would be hard to sell, but it's a good idea.

Some landowners also recognized the difficulties associated with administering a municipal watershed fund. Two landowners discussed this issue during their interviews by stating:

> *Participant 52:* The watershed fund would be very hard to manage. How they would come to terms with retaining. The Conservation District is money struck and it can't do

what it wants to do because there is no money there. Sometimes I think, us as a landowner, why do we have to turn around and put more money into it, when we're paying our taxes.

Participant 54: Yeah the economics of it is I guess the big thing. The program that I looked at they were paying a very nice price but you're locked in it. I think there would be a lot of opposition. The big grain farmers would be totally against it. Because it's against their whole brand, they're trying to get every acre into production. And then they have to pay a levy so another guy can have a wetland right beside them? I think there would be a lot of issues with that.

4.3.5.3 Eco-certification of crops

The concept of an ecologically sustainable product was also discussed with landowners in both the personal interviews and the questionnaires. Again, opinions were mixed between landowners. However, a number of landowners supported the concept when it was explained to them in person with more detail. One landowner discusses this concept:

Participant 60: Yeah I agree with all that stuff. We're not certified organic, but we'd be close to organic, we're more natural here. I believe the whole organic system is so bastardized that it's not even real. So the consumer that buys it, you might be thinking you're buying organic but it also has other detrimental environmental effects down the line. But this, if you have so much of your land, or you have a pothole agreement or you have conservation agreement, and say that this ranch produced this product, and there is a paper trail to follow then yes, I would say it has a place.

As demonstrated in the quote above, many concerns were raised over the morality of other producers attempting to deceive the system. A few landowners raised concerns of over-regulation with that type of program, citing past experiences with natural free range grass products and organic products. For example, one producer states:

Participant 43: We've participated in meetings with natural free range grass products, but in the meetings that I've been to, administered by Manitoba Agriculture, they went to great lengths on how to bastardise the product. We grow grass finish beef here, but we're not a part of any of those systems. I've sat in meetings and listened to them saying how much grain can we feed them and when to have it certified. The idea definitely has merit, but the people administering it have to understand what they are administering and that the program that they are targeting, is shifting agriculture and returning the system back to a healthy cycle.

Another landowner cites his experience with programming and touches upon the consumer's willingness to pay for certified products. He states:

> *Participant 51:* Where we moved from it was so heavily programmed that we were basically farming for programs. Our crop decisions, what we grew were all defined by a payment from the government. It was basically a make-work program. It kept your land in production and healthy. I think all that stuff, to generate value on any crop you have to grow something that someone wants to buy. It's just complete human nature to buy something cheaper – until the end user of the project has a complete reversal of where they are right now, it won't work.

A number of landowners recognized a possible market for this type of programming. Two landowners discuss this further:

> *Participant 18:* Yes I think that type of certification program could work, I think people in the city are aware of that. And farmers are aware of it too, because it's all money. I would be all for it. I think you would find quite a few people interested in it.

> *Participant 50:* The eco certification of crops idea sounds really good. They are hard to implement and when it gets down to the grassroots level it's a fairly vague return but it's fairly indirect. If the market is prepared to pay with $20 more for the wheat coming from an area that has conservation programming and when you go to the grain elevator and they're prepared to pay 20 cents more per bushel then people would sit up and take notice. But it would be hard to monitor and hard to set up. You're selling people the concept and you hope that you don't end up with more red tape and more bureaucracy then the farmer originally was dealing with. It would be a nice sell politically, but you would have to be careful. But that's not to say that fair trade goods and organic goods aren't working elsewhere.

It is important to highlight that the concept of an ecologically sustainable product was more widely accepted during the interview process than in the survey results, which only saw 20.7% in support of the concept.

4.3.6 Participant perspectives on program administration

There was a general negativity when discussing administration of current conservation programming with landowners. There were five general themes that emerged from these conversations: cost effectiveness of programming, dissatisfaction with easements/purchases of land, contract length, land devaluation and lack of enforcement.

4.3.6.1 Cost effectiveness of programming

It was widely discussed by landowners that most of their land currently enrolled in conservation programming was marginal or not suitable for their current farming practices. One landowner stated the following:

> *Participant 49:* This land is not broken up for a reason; it's all bush, stones and sloughs, so why would I break it up now. If it was farmable it should have been broken up years ago. It's too costly to break it up now. We have a quarter that is all bush that we signed up with MHHC. Bovine spongiform encephalopathy (BSE) was on at the time that we signed the agreement, so any cash flow that came in was welcome. And like I said before, we weren't going to break up the land anyways, why not get paid for it.

Another landowner discussed his decision making process when choosing to not follow through with a conservation easement. He stated:

> *Participant 18:* I did the paperwork for an easement but then backed off because it being forever scared my wife. My opinion was that the land that it was on was saline and wouldn't grow crops well anyways, so it wouldn't value being broken up anyways.

When discussing future EGS programming, another landowner reiterated this thought. This highlights the importance of including a benefit-cost index as a component of project evaluation moving forward. He stated:

> *Participant 51:* If someone could give me $20 an acre to keep the water there, the land will just be spoiled anyways, so I would be all over that. And whether that stuff was actually supposed to be cultivated, the answer is probably no. But yes, I would be interested in programs if the money was there.

One landowner discussed this by saying:

> *Participant 56:* They should have CRP type programs here but for the poorer stuff. Cause people try to farm it and it would be better if you could sew it down to something. I know some guys that bought land and they made enough off it to have the land there.

This landowner further identified that funds are targeted in the wrong area. He explained:

> *Participant 43:* The conservation easement program used to pay a little bit for permanent cover but most of the programming targets mistakes. At least 90% of their funding is targeted at problems where things have gone wrong, instead of things that are right.

4.3.6.2 Landowner dissatisfaction with easements and land purchases

Landowners expressed regret in tying their land up in a permanent agreement because of a number of factors, including: changing land use practises as a result of retiring their cattle operation, restrictions on land management, a reduction in the value of their land and limitations for selling their land in the future. One landowner indicated that they were frustrated with the lack of programming available. He explained:

> *Participant 3:* The only thing really offered here is signed through the conservation district and then you can't change anything. If you sell an acre, you reduce the value of your sale. And farmers look at that. No I would never be interested in a program like that. And that's all that has been offered. The conservation district has a program, and anyone that I talked to that I went to the meeting just walked out. You were going to get 10 cents on the dollar.

Another landowner discussed how their opinion had changed over their decision to enroll land in a conservation easement. He stated:

> *Participant 49:* Hindsight's always better, being locked in now; we have a caveat on our land. That's the only downfall; at the time we thought it was a good idea. Now we have to live with it.

While discussing conservation easements, one landowner expressed his concerns over the potential devaluation of land, which was commonly discussed amongst landowners. He stated:

> *Participant 18:* Paying people to keep wetlands, I think that's a really good thing because land is very expensive. It's a money thing, if they pay enough. I think they have to pay more than they are paying people right now. I think a lot of people are scared to go into programming because they're scared it will decrease the value on their land, it shouldn't, but they think it might.

While environmental values were identified by some landowners as the motivating factor behind enrollment, financial compensation was highlighted most commonly. However, one

landowner did indicate some satisfaction behind their decision to enroll their land. He did express concern over the risk associated with selling the land in the future but stated:

> *Participant 52:* We sold a half section of pasture, but now when we went to sell it and there was a caveat on the land that hurt us. The guy who was going to buy it was going to break it up, and didn't end up buying it. That was kind of our give back to the environment because we can give back for some other stuff that we've done.

A number of landowners showed hesitancy over programming that retired land completely. Some landowners discussed programming that permitted landowners to undertake maintenance work on the land. One landowner discussed this opinion during the interview. He stated:

> *Participant 54:* I went to go buy some pasture and it was locked into the caveat. And the guy that had it before these people, he had some nice alfalfa fields. They put it into pasture and then they signed it to a conservation agreement on it. When they went to sell it they wanted top dollar for it. An alfalfa field in 10 years is just going to be filled with holes and turn into grass. And they won't even let you go back in and let you sew it back down to grass or maintain the habitat that it is. If it was a 5 year contract I would be more interested in that. If I could go in and cut hay I would be interested in that. I do not want to convert to crops, just something like that that is a little more flexible.

In discussions with another landowner, he reiterated similar thoughts when discussing his decision making process when he was assessing DUC's revolving land program. He stated:

> *Participant 50:* Putting an easement on the property, will work in some cases, but not all because then it limits the buyer in the future. Any program that doesn't lock your land up is worth looking at. The dollar and cents, the exit clause and the contract period are all important. Ducks came out and looked at a piece of land and it was tying my lands for too little money. If you can touch anything buyers will stay away from it.

Additionally, market pressures and livestock diseases, such as BSE, have resulted in unforeseen land use changes. One landowner discussed this in the interview:

> *Participant 52:* The life time caveat, we never thought we were going to do anything with it and then we got rid of the cattle (it was pasture land) and now we're thinking we may

have been able to do something with it. But who knows, we never really intended to do something.

Additionally, landowners also identified frustration with land purchases by conservation organizations. As discussed in the previous section, the Revolving Land Program administered by DUC involves the purchase of land by the organization. The organization will then restore the wetland and upland habitat on the property, place a conservation easement on the land title and return the land to market to be sold (Ducks Unlimited Canada, 2017). As previously indicated, a number of landowners were interested in this program; however, some landowners have raised concerns over the organization purchasing land in their area. One landowner states:

> *Participant 3:* What is Ducks Unlimited doing in our farm land? The problem with those entities is that they have huge amounts of money and they're buying up huge amounts of land. That's just hearsay that I hear. My friend is selling some land to Ducks and he said well I'm getting paid and I can still farm it.

Overall, landowners generally appear opposed to easements and land purchases by conservation organizations. This was expected going into the interview process and was confirmed by most participants.

4.3.6.3 Participant perspectives on program contract length

A number of landowners discuss the attractiveness of short-term contractual programming available in other areas of Canada and the United States, including the CRP program and ALUS. One landowner discusses this by stating:

> *Participant 43:* Right now it may seem like a good idea to sign up in a program. But we can't say in 10 years that will be the right decision. Possibly due to the unknown or our son may need to do something, but we've made a commitment now. That's where the long term commitment on your land is threatening. So possibly, more of a 5 year period, would be friendlier to the landowner. And chances are, if you believe in it, you won't change your mind. But it would just be a comfort to not be so long term and if EGS programs are delivered on an annual basis instead of a lump sum. After a certain amount of time, they went under the plow. And if it changed hands then, it's totally gone back to what it once was, even if there is something on the title. An annual payment, they receive

it every year and they'll treat it as a reminder saying oh yeah, it's probably worthwhile to keep it there versus busting up.

A number of landowners discuss their belief that short-term ALUS type programming would influence a higher participation rate among community members. Landowners cite a number of factors, including shorter contract lengths, greater flexibility in land use decision making and greater security in land management as they approach retirement.

> *Participant 60:* Yeah, I think you'd see a little more uptake so it's not so infinite. My friends in their 50's and 60's if they can tie it up for a few years before they sell it, they can say oh well it worked fine for me. So I'd say you might get more uptake.

> *Participant 59:* I was looking at signing up a piece of my land with MHHC a few years ago. It's along the creek towards Whitewater Lake and it was them who approached me to put it into a program. The main reason that I didn't was because it wasn't economical enough. There was a 10 year plan and a longer contract, but they wanted me to do the longer program. Yeah I can see myself interested in ALUS programs if the wet cycle persists. I like the idea of not being locked up forever.

Another factor that was brought up during discussions of program contract length was the age of interview and survey participants and their hesitation to enroll in longer term contracts while near retirement. One landowner states:

> *Participant 11:* I don't think I would be willing to participate in any long term programming. I am getting to old to do these programs.

Another landowner sites a number of factors influencing his reservations behind participating in programming, including his intention to retire. He states:

> *Participant 55:* I don't ever plan on selling any of my land, I plan on handing it down to my family. I haven't really given many of these programs much thought because I'm at the end of my farming career. I thought I would just rent my land out because there is all kind of renters and that would impact that possibility. But everything is kind of on hold right now, until the wet cycle straightens itself out.

4.3.6.4 Participant perspectives on impacts conservation easements/land purchases

Land devaluation as a result of conservation easements was identified as a concern in some survey results and was more broadly discussed throughout the interview process. A number

of participants were hesitant to enroll in conservation programming due to the current state of their land. Many participants interviewed were currently flooded as a result of high water levels on Whitewater Lake. During discussions, some landowners made reference to some parcels of land being purchased by the TMCD and other conservation organizations at a lower rate. There was a general agreement that landowners would we unwilling to sell land at this point in time because their land value had decreased due to the flooding. Some participants identified that they weren't going to make any move until the water receded. One participant discussed this in his interview. He stated:

> *Participant 2:* I plan to hang on to my land, I don't want to sell it right now. They've devalued the land in comparison to 5 years ago. I think they did that so if they decide to buy it they don't have to pay as much.

There appeared to be a general sense of concern about the unknown with participants. Persistent flooding has changed or altered plans for many landowners. The hesitation to commit to conservation programming was prevalent amongst many landowners.

4.3.6.5 Lack of enforcement

A number of landowners brought up the theme of enforcement. This topic was discussed under two different concepts. The first being the suspicion that many older conservation easements were no longer being followed. And the second being the belief that many conservation programs do not lack the necessary enforcement to maintain compliance. Permanency and compliance with caveats becomes increasingly difficult as land switches hands (Paulich, 2010). Miscommunication over contract obligations was evident in conversations with landowners. For example, one participant discussed potential contract that can occur. He stated:

> *Participant 8:* Shorter term program would be better but I wouldn't be interested in anything like that because I still don't want to be tied down. I heard of my cousin, he

passed away, and his wife is wishing he hadn't done that. Because she's selling resources on her land but I'm not sure if that's dipping into the agreement.

A few landowners expressed their concern that conservation organizations and conservation districts do not have enough resources to enforce contracts and undertake compliance monitoring of programming. While discussing his awareness of conservation programming he expressed his concerns with compliance. He stated:

> *Participant 2:* Well I guess the one we hear about is the Ducks Unlimited projects. Down in the states where we pheasant hunt, they have a lot more teeth in their projects, up here the projects disappear a lot quicker. Other than that I don't hear about the programs much around here.

4.3.7 Evident relationship between special regions

Many participants clearly identified residents close to Whitewater Lake as the primary beneficiaries and inferred that upstream landowners in the Turtle Mountains should be compensated if there is a request for them to hold water. When asked to discuss the municipal watershed fund concept, one participant from the upland area describes his thoughts on the concept and clearly identifies land users and beneficiaries. He explains:

> *Participant 49:* For the people in the Turtle Mountain area won't see any benefits, it's the people around Whitewater Lake that will see the benefits. If people are storing water they should be compensated for it. In 1988 when we built this dam, Whitewater Lake was dry, it was a dust bowl. We were running out of water for our livestock, we filled the dam up in 12 hours. It sounds like a school tax, some people have never had kids, but they still pay a school tax.

The municipal watershed fund will be discussed in detail later in this section; however, it is important to highlight that identification of beneficiaries were distinguished often when discussing this concept with participants. In an effort to generate sustainable funding, a municipal watershed fund would collect levies from lands that have been drained. Funds collected through the levy would be used to administer an EGS program which finances projects

for preservation and/or construction of wetlands. When discussing this concept with a Whitewater Lake landowner, he explains:

> *Participant 50:* A local watershed fund isn't a totally bad idea and if people are moving water onto someone else's property they should be paying for that. They should know who's doing it by looking at the drainage licenses and they will have an idea on how much they're draining based on the license and they will say its x-amount of dollars per acre and that's just the cost of doing business.

One distinguishing point that was raised in a number of participant interviews was a disconnect between landowners around Whitewater Lake and landowners in the Turtle Mountains. Several participants provided examples of hostility and misunderstandings in the perspectives of landowners in different areas of the watershed. Additionally, some landowners felt like they were being blamed for actions that they had not undertaken. For example, several participants from the Turtle Mountain area expressed feelings of being blamed for the flooding around Whitewater Lake. This group of participants routinely reported that much of the drainage in the Turtle Mountains was completed by prairie farmers purchasing land in the area and would not be completed by the original landowners in the mountains. One landowner expressed his thoughts by saying:

> *Participant 8:* We in the Turtle Mountains are getting a big blame. They say a lot of the guys up in the mountains are draining up here but it's not happening nearly as much as it is happening down near Whitewater Lake. The draining that is happening is the valley farmers that come up to the mountains and they're used to draining and they think the farming practises are the same on the hill. The guys around the lake they aren't to blame, the water just came around them.

Another farmer indicated that most of the land being purchased and broken up at the base of the Turtle Mountains is marginal land. He stated:

> *Participant 49:* My most important land management consideration is erosion. Because we are living in a hilly landscape, some land that is broken up shouldn't be because it just erodes. And this is just marginal land anyways; the base of the Turtle Mountains is

> marginal. This is cattle country, but some people are coming in and buying the land, bulldozing the land and breaking it up, but it's all marginal.

In addition, several participants highlighted a disassociation from the Whitewater Lake issue and potential solutions through an EGS program. This sentiment came from both participants in the Whitewater Lake area and the Turtle Mountain area. Participants from the Whitewater Lake area commonly expressed that they would not be available or willing to participate in EGS programming because their land was already flooded. When discussing programming options, one participant stated, "I don't think it even applies to me. That's my livelihood that's under water". Whereas some participants from the Turtle Mountain area felt like they should not have a say in programming because the issue was not directly affecting them.

This conflict was also expressed by landowners in the upland region. One participant describes his experience as the following:

> *Participant 52:* The whole mentality of the lake is that I've seen it go dry, and having the lake go way over on its boundaries isn't to say it will go dry again. The drainage isn't only on the south side, there is a ton of drainage around the whole lake but it's a cosmetic issue when you see all the water running down. We have lots of land where there is no drainage, it's all naturally drained. I went to a meeting to show support for my neighbours who are flooded out and us in the south got sandblasted. And the government guys says you know, 7 or 8% maybe is caused by drainage, there is just too much water. The roads that washed out were in Winchester, there is no farmland behind it. So I don't see a lot of it changing.

Discussions with some landowners identified a prevalence of hostility amongst regions. One landowner expressed his concern over this by stating, "Water in my mind has caused huge differences between people. And I hope for small communities somehow we can all reason and get along. I think our area needs a big learning curve because it's all been distorted here. When everyone is fighting no one is going to do anything".

Chapter 5: Discussion

5.1 Introduction

The purpose of this chapter is to discuss key themes which emerged through the analysis of the surveys and personal interviews. These themes are based on discussions and responses from landowners in the Whitewater Lake sub-watershed and demonstrate the opportunity and prospective challenges of implementing an EGS program in the region.

The following discussion will be presented in four sections to address the findings identified in Chapter 4: program location, program administration, program development and program delivery.

5.2 Program location

5.2.1 Identification of beneficiaries and land users

The spring of 2011 produced extremely wet conditions across southern Manitoba. The Whitewater Lake area was alike, with water levels rising high enough to spill into Medora Creek. In the winter of 2011, TMCD investigated possible solutions to flooding around Whitewater Lake. The need for developing EGS programming was identified as a result of these discussions.

One component of successful EGS programs is the ability to provide a supporting institutional infrastructure, including the flow of compensation from beneficiaries to land users (Pagiola and Platais, 2002). Figure 22 illustrates the flow of compensation from the beneficiary to the land user through the recommended institutional infrastructure (Pagiola and Platais, 2002).

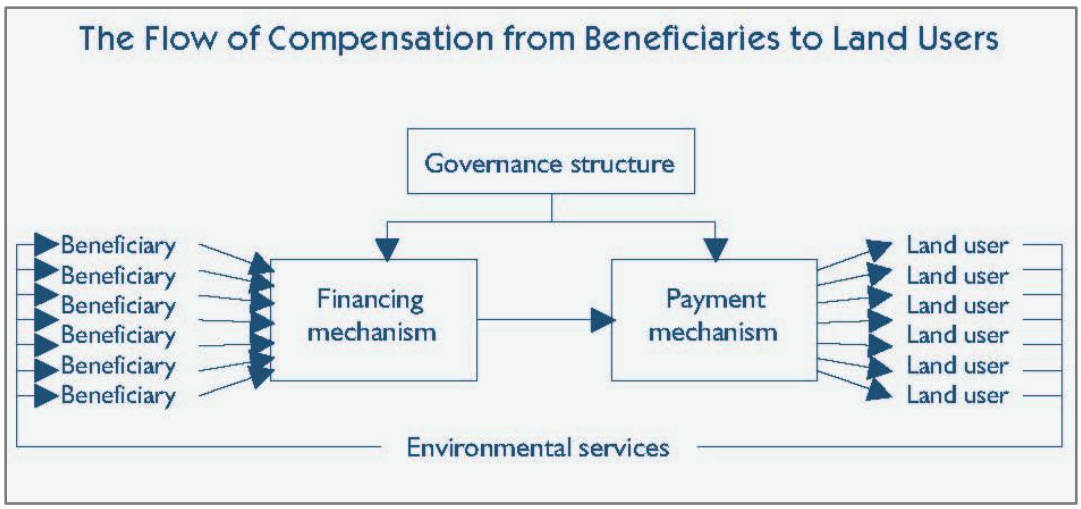

Figure 22: The Flow of Compensation from Beneficiaries to Land Users
Figure Source: Pagiola and Platais, 2002

Identifying beneficiaries of ecological services can be difficult when programming is spread over a large geographic region such as a large watershed or province. Identification of EGS programming beneficiaries in the Whitewater Lake sub-watershed is likely more possible due to the smaller size and nature of the closed basin watershed. This was identified as a common theme throughout discussions with landowners.

Although identification of land users and beneficiaries may be easier to define in a closed based watershed, there appears to still be some remaining hostility amongst regions as discussed in Chapter 4.

5.2.2 Local land management considerations

Landowners in the Whitewater Lake sub-watershed generally identified a lack of suitable conservation programming. Upon further analysis, it is possible that landowners were aware of conservation programming; however, did not find program objectives suitable to their local conditions and land use considerations. For example, in the survey results 70.3% of respondents indicated that they were not aware of any programming or were aware but not interested in

participating. Some landowners contented that they were not aware of any suitable programming and provided a follow up response that conservation easements were the only programming available to them. Place-based program development takes into account local conditions, increases flexibility and provides greater public support of the program (Campbell, 2012). Bennett & Dearden (2014) additionally identify that the success of conservation programming is largely reliant on local support. In addition to influencing local support, place-based programming can create a sense of stewardship amongst participating landowners (Hartig, 2015). This can be achieved by harnessing local social, environmental and economic considerations (Hartig, 2015).

In addition, Cattaneo et al. (2008) identify that program development which incorporates local land management considerations results in an easier assessment of environmental outcomes using a benefit-cost targeting approach. This has been demonstrated in the delivery of the Environmental Quality Incentives Program (EQIP). As identified during both surveys and interviews, participants expressed land and soil management as top priorities in their farming operations. Several participants indicated that taking care of their land in the most appropriate way included management for erosion through tillage practises and management of alkaline soils

The United States Department of Agriculture (USDA) offers assistance to producers to undertake conservation crop rotation through the EQIP. Producers can receive an annual payment of $40/acre for the conversion of up to 80 acres of continuously grown annual crops (Minnesota Department of Agriculture, 2017). The annual crops must be converted into a resource-conserving crop for at least two years. Resource-conserving crops include: grasses, green manure, legumes and cover crops (Minnesota Department of Agriculture, 2017). Manitoba Agriculture identifies using forages within a producer's crop rotation as a positive solution to

erosion and water infiltration problems. Legume forages, such as alfalfa, also increase soil quality. As identified in the participants statement above, soil quality in the Great Plains of America, including Manitoba, have been degraded severely in the last century. The deep roots associated with forage crops can also help to alleviate salinity issues by lowering the water table. In addition, alfalfa has been shown to lower salinity issues in the subsequent cash crop.

One participant discusses the effect of our current day cropping system on our root zone. He states:

> *Participant 43:* And the most important stage is the infiltration of the water into the ground to get the water down .And it's no longer functioning, we've got hard pan, we've got compact soils. And it's not compacted soils because of heavy equipment but I believe it's what the equipment does. Two hundred years ago, huge populations of bunch grasses (e.g., switch grass, wheat grass and big blue stem) had deep perennial roots, it's a perfect situation.

His statement further reiterates the benefit of introducing forages into crop rotations. Although special equipment may be required to harvest forage crops, forages require less cash inputs than typical grain crops and equipment sharing can be arranged between land users.

A number of other local concerns were identified in discussions with landowners, including the continued use of highly erodible land on the slopes of the Turtle Mountains and the conversion of sensitive lands to agricultural production. Taking these local considerations into account when developing eligible program practises will help to define a sustainable program (Campbell, 2012). The absence of recognizing local land use and management considerations has led to the demise of program enrollment in some past programs. The national Greencover Canada Land Conservation Program was unsuccessful in securing enrollment of landowners outside of the Prairie Provinces (Knight, 2010). This was a result of the large acreage requirements for conservation, which did not take into account local considerations across the

country. Knight (2010) identified that program failure like this highlights the need to incorporate local considerations into program design.

5.2.3 Environmental values of participants

As discussed previously, survey participants were also asked to identify if they believed that they had to make changes to their farm through the adoption of conservation practises. They were also asked to identify the rationale behind the adoption of these practises. Fifty-three per cent of survey respondents indicated their first choice as an environmentally conscious mind. MacLean (2014) identifies a number of studies that have indicated that landowners feel a significant responsibility to undertake environmental stewardship activities. MacLean (2014) identifies three evident responsibilities, including responsibility to the land, social/personal responsibility and responsibility to future generations. Landowners in the Whitewater Lake sub-watershed identify with all three responsibilities.

Environmental stewardship is defined by the human responsibility to protect nature and be accountable to the earth (Romolini et al, 2012; MacLean, 2014). Some landowners in the Whitewater Lake sub-watershed indicated a responsibility to protect the land and the services that it provides.

Landowners in the area also indicated a responsibility to future generations. Providing habitat for ducks was indicated as an importance to one landowner as they recognized the significance of allowing their children and grandchildren the opportunity to experience natural wetland habitats. Foster (2005) includes accountability to figure generations as a defining factor of environmental stewardship.

Additionally, 67.6% of survey respondents indicated that public expectations were increasing. Romolini et al (2012) also identify environmental stewardship on the social scale. Landowners in the study area recognized the growing trend of public opinion. While some indicated this as a reason for implementing change, a responsibility to the land and future generations outweighed.

The environmental values of a landowner can also have an impact on they identify and place a competitive bid during a program application process (Vukina et al, 2008). While environmental values may influence the competitive bidding process, landowners appear to identify value in environmental benefits that directly affect their land's productivity instead of public producing benefits (Vukina et al, 2008). This idea was similarly reflected in discussions with landowners of the Whitewater Lake sub-watershed. While a majority of survey participants indicated environmental values as a motivator on the questionnaire, very few interview participants identified environmental values as their motive behind placing an easement on their land. It appeared that most participants were instead interested in the financial aspect that could be gained on land which presently gave them none.

5.3 Program administration

As discussed above, there was a general negativity when discussing administration of current conservation programming with landowners. There were four general themes that emerged from these conversations: cost effectiveness of programming, dissatisfaction with easements/purchases of land, land devaluation and lack of enforcement.

5.3.1 Cost effectiveness of programming

The importance of benefit-cost indexing was highlighted in discussions as one of the fundamental components required for an effective EGS program in the area. Hansen &

Hellerstein (2006) recognize that not all lands have the same productive capacity nor the same environmental benefits. Benefit-cost indexing assists program managers by identifying projects that are cost effective, beneficial and reduce negative impacts to the environment and human health and safety (NRCS, 2009). The lack of benefit-cost indexing can lead to the excess purchase of marginal lands and can result in environmental outcomes not being reached. It was widely discussed by landowners that most of their land currently enrolled in conservation programming was marginal or not suitable for their current farming practices. While the argument can be made that any land is at risk of being put into production, purchasing land that has been difficult to farm may result in the misuse of conservation program funding and consequently reducing the net production of ecosystem services based on a value for money assessment.

A benefit-cost index would help to identify critical lands, such as marginal crop land that has been converted from pasture/forage land. It could be argued that taking this category of land out of production should be ranked higher on a benefit-cost index than signing agreements on pasture/forage land currently out of production. The CRP has implemented an Environmental Benefits Index (EBI), based on a cost-benefit analysis approach, to rank program applicants (Hansen & Hellerstein, 2006). The projects ability to fulfill program outcomes are compared against the contract cost of the program (Hansen & Hellerstein, 2006). However, program managers should be critical when assessing program outcomes and received project applications. Investment in high cost areas can deplete program budgets quickly and constrain overall investment in the production of environmental outcomes (Ando & Chen, 2011).

The distribution of conservation program funding should be looked at critically. One landowner from the Whitewater Lake region highlighted this by stating, “We need to protect

Class 1 land, because Class 10 land will protect itself because it won't actually grow anything. There are very few programs out there available for people who are doing the right thing". This landowner further identified that funds are targeted in the wrong area. He explained:

> *Participant 43:* The conservation easement program used to pay a little bit for permanent cover but most of the programming targets mistakes. At least 90% of their funding is targeted at problems where things have gone wrong, instead of things that are right.

While this idea is true, it is a fundamental question that needs to be asked by program managers. Some EGS programs have chosen to reward past good behaviour by compensating landowners if they agree to increase their area of conservation or add additional ecological services to their land. This concept is discussed later in this chapter in the additionality section.

5.3.2 Landowner dissatisfaction with easements and land purchases

In the past, conservation easements have been an attractive method to secure land for stewardship activities. Conservation easements have been viewed more favourably than land purchases by conservation organizations as the land title remains in private ownership (Nowak, 2012). Conservation easements are often identified as a fiscally safe option for government and non-governmental agencies due to their low administration costs in comparison to other annual based program options (Paulich, 2010). However, there are a number of issues associated with conservation easements. In particular, Paulich (2010) identified difficulties in monitoring and enforcing easement terms. This was similarly identified by landowners in the Whitewater Lake sub-watershed. Landowners identified frustration with the lack of compliance monitoring and identified the concern of easement permanency when land ownership changes. Kabii & Horwitz (2006) identified similar conclusions in their research on landowner decision making process for adopting conservation easements.

A number of landowners additionally indicated that they were not satisfied with their decision to enroll their land in a conservation easement. As discussed in the previous section, a number of landowners showed hesitancy over programming that retired land completely. Some landowners discussed their satisfaction with possible programming that would permit landowners to undertake maintenance work on the land. Nowak (2012) identifies that some conservation easement contracts allow the activity, such as agriculture, to proceed. While occur in some contracts around the world, landowners contest that easements offered in the Whitewater Lake sub-watershed are restrictive of this type of land use.

This was a presented as a problem for landowners enrolled in the Conservation Reserve Program (CRP) in the United States and was also recognized in the RM of Blanshard's ALUS program. The program was able to accommodate market pressures or unforeseen land requirements by allowing landowners to amend their agreements. In the case of cancelling their ALUS contracts, landowners would have been required to return previously received payments (Grant & Mann, 2007). This is not possible with conservation easements which place a caveat on the land.

Overall, landowners generally appear opposed to easements and land purchases by conservation organizations. This was demonstrated in the literature and was expected going into the interview process and was confirmed by most participants. However, a few participants did express an interest in maintaining conservation easement programming options. This could provide option alongside EGS programming for environmentally conscious landowners. The benefit of maintaining conservation easement programming is the ability to secure land for the purposes of continuously protecting natural features such as grasslands, wetlands and forests (Government of Canada, 2011).

5.3.3 Land devaluation and the local impact of conservation easements/land purchases

Conservation easements are voluntary agreements entered into by landowners and conservation agencies. Conservation easements protect land, generally in perpetuity, by restricting the conversion of the existing habitat (Lawley & Towe, 2012). By restricting the conversion of the existing habitat, a landowner foregoes the possible value associated with that action, and ultimately reduces the value of the parcel signed in the conservation agreement (Lawley & Towe, 2012; Brown et al, 2011).

As discussed above, land devaluation as a result of signing a conservation easement was raised as a concerning factor to landowners in the Whitewater Lake sub-watershed. While the sentiment may be correct that conservation easements result in land devaluation, a number of studies have identified that landowners are compensated fairly to offset that difference (MHHC, 2012). Lawley & Towe (2012) researched the effect of conservation easements on agricultural land value in the prairie pothole region of southwestern Manitoba. Their results indicate that land value fell by $0.79/acre for every 1% increase in habitat protected by a conservation easement; however, landowners received adequate compensation to balance any foregone land value at the time of sale (Lawley & Towe, 2012). This was previously confirmed by Anderson & Weinhold (2008) while researching the impact of conservation easements on land value in South Central Wisconsin. Anderson & Weinhold (2008) presumed that a lack of impact on agricultural sale prices would identify that conservation easements were securing land with a low risk of being developed. However, their research did demonstrate that restrictive conservation easements, which don't allow any land use modifications, result in a reduction of land value.

While land devaluation was identified as a concerning factor by participants in the Whitewater Lake sub-watershed, as discussed in the previous section, a number of other issues

were raised about conservation easements. The significant resistance and dissatisfaction with conservation easements is likely to remain as an opinion in the sub-watershed unless easements are addressed to be less restrictive on land use management.

5.3.4 Enforcement of programming and compliance monitoring

A number of landowners highlighted the theme of enforcement and compliance monitoring through their discussions. As Paulich (2010) explains, enforcement of the development restrictions imposed through a conservation easement generally falls on the landowner themselves. This is generally a result of lack of programming resources for enforcement (Paulich, 2010). As noted in Chapter 4, a number of participants identified a lack of programming resources as a concern over the actual permanency of projects. Keane et al. (2008) identify that without compliance, rules are meaningless. While separate from conservation easements, landowner perceptions of drainage regulation enforcement demonstrate an example of this concern in the study area. When asked about drainage regulation enforcement, 90% of landowners in the Whitewater Lake sub-watershed identified that there was a lack of enforcement in drainage regulations and 79.5% indicated that were instances of unlicensed drainage works occurring.

Compliance monitoring of conservation projects varies across entities and programming. In the ALUS pilot project in the RM of Blanchard, the compliance rate was over 90%, with the 10% of non-compliance cases being related to misunderstandings in contract obligations (Knight, 2010). Knight (2010) also looked at compliance monitoring across a number of other programs. Compliance monitoring varied from annual monitoring in the Conservation Reserve Program up to monitoring after a consecutive number of years in the Greencover Land Conversion (5 years) and Wetland Reserve Programs (3 years). Knight (2010) recognizes that contract obligations

must be transparent to landowners and must be monitored by program administrators to ensure adherence.

Chan et al. (2017) recommend two approaches for dealing with the burden of compliance monitoring: peer monitoring and landowner identified activities through competitive bidding. Peer monitoring was already evident in the Whitewater Lake sub-watershed as a number of landowners discussed cases of non-compliancy. Public identification of programming, through project recognition signs, would help to encourage individual motivation to remain compliant to a contract (Chan et al, 2017). Additionally, the competitive bidding or reserve auction process allows landowners to submit applications for projects that they see value in (Hill et al, 2011).

5.4 Program development

5.4.1 Program rationale and measurement of flood protection benefits

While local flood protection benefits can be an outcome of EGS programming, expectations will have to be set transparently while working with landowners. As discussed above, conservation programming success is largely reliant on local support (Bennett & Dearden, 2014). The perceived flood protection benefits provided by water storage or wetland conservation/restoration projects was a subject of contentious debate amongst landowners in the Whitewater Lake sub-watershed. Bennett & Dearden (2014) identify that qualitative perceptions of environmental outcomes can be an indicator for lack of program acceptance in a local area. As discussed above, there is a general frustration in the area about the lack of flood protection provided by the small dams in the Turtle Mountains, as well as the risk associated with the dams.

It is important to note that wetlands do not act like active water control infrastructure, such as the small dams located in the Turtle Mountain; instead, they are passive parts of the

landscape that store and release water based on the hydrologic cycle. Therefore, in response to forecasted high flows, wetlands cannot be emptied to accommodate the higher influx of flows.

Survey participants were also asked to discuss if they believed that conservation programs that support water storage save money on infrastructure costs in the long run. As previously discussed, 72.3% indicated they did agree that water storage projects would result in infrastructure savings in the long run. While this demonstrates wide agreement on the perceived local flood benefit and infrastructure savings, there are still reservations when discussing this subject with landowners.

Opinions demonstrated in the project area are not uncommon across Manitoba and the Prairies. Recent studies, such as the Pomeroy et al. report, Improving and Testing the Prairie Hydrological Model at Smith Creek Research Basin, shows that wetlands do provide some benefit in moderate to low flow years. Pomeroy (2014) states, "This model simulation exercise shows that wetland drainage increases the annual flow volumes and peak daily discharges substantially, with notable increases in the flow volume and the peak discharge of the flood of record due to wetland drainage that has already occurred in Smith Creek. Relative increases in annual flow volumes and peak daily discharge increase with decreasing annual flow volume, showing that the relative hydrological impact of wetland drainage is greatest in moderate to low flow years, but the magnitude of the hydrological impact of wetland drainage is greatest in flood years" (Pomeroy, 2014, pg. 53).

It is interesting to highlight that Pomeroy notes that the relative hydrological impact of wetland drainage is greatest in moderate to low flow years. Moderate to low flows years may impact local municipalities differently across the province and may not produce widespread

provincial damages. As a result, it could also be expected that fewer moderate to low flow years would become eligible under the Government of Canada's Disaster Financial Assistance Arrangements and the Government of Manitoba's Disaster Financial Assistance program. Municipalities bear the greatest costs during smaller flood events, with municipal shares being the highest for flood recovery. As damages increase, which is likely under larger low frequency floods, municipal shares decrease and provincial shares increase.

These foreseeable impacts to local municipalities may encourage further analysis into understanding how wetlands could reduce the infrastructure impacts on floods that are minor to moderate in scale. It is possible that wetland restoration/conservation, while providing a greater impact in moderate to low flow years, could have a positive impact on disaster recovery for municipalities.

In the Whitewater Lake sub-watershed, EGS program rationale has developed from the need to manage the quantity of water and to encourage upstream water storage for flood protection. This differs from a number of other EGS programs who identify water quality as their motivating factor behind implementation. While water quantity if often cited as a consequential benefit, this does not necessarily discredit the substantial benefits programming can have on improved watershed storage.

5.4.2 Local involvement in program development

As indicated above, place-based program development takes into account local conditions, increases flexibility and provides greater public support of the program (Campbell, 2012; Bennett & Dearden, 2014). Creating a place-based and locally developed program will also help to encourage communication of local needs and the identified program plans to achieve environmental outcomes (Galik & Grala, 2017).

Knight (2010) further identified the importance of including local landowners and stakeholders in program developed. Through his analysis, he identified high landowner satisfaction in the Norfolk Country ALUS pilot project which implemented local development support. While landowners in the Whitewater Lake sub-watershed identified resistance to provincial government involvement; however, landowners generally cited satisfaction with conservation districts and rural municipalities in the area. This demonstrates an opportunity to harness program development at the local level.

5.4.3 Program participation through awareness and marketing

Program participation and the level of enrollment is directly impacted by the level of program awareness in the area. As a result, program marketing should play a fundamental role in any EGS program.

Whitewater Lake sub-watershed landowners predominately cited word of mouth as the method of program awareness in the area. During the interviews, participants were asked to discuss their awareness of conservation programming in their area. Participants listed few programs but many highlighted their discovery of programs through their neighbours or other landowners. Overall, the general theme was a lack of program awareness and understanding of program components. A lack of awareness about environmental issues and the conservation programming available to alleviate these impacts has been identified in other areas (Clearfield, 1986). There is a concern that landowners may disregard programming before understanding the program specifics if misinformation or opinions are distributed by others. However, there is also an opportunity to engage landowners for the advertising and marketing of programs to other landowners in their watershed. The Alternative Land Use Services (ALUS) pilot project in the Regional Municipality (RM) of Blanshard was farmer driven and engaged a number of farm

organizations within the community. Uptake into the program was high, with approximately 75% of landowners in the RM enrolling in ALUS contracts (Knight, 2010). Participant satisfaction was also ranked high in the pilot project. Knight (2010) recognizes that meaningful farmer and local stakeholder involvement increases the effectiveness of targeting programs to the specific needs of the community. Although the ALUS pilot project in Blanshard was successful in securing community uptake, other ALUS programs across the country have not experienced similar outcomes. Johnston (2012) indicated that her research highlighted a correlation between a lack of distributed program information and a lack of program uptake. A number of her interviewees discussed the lack of awareness about the program as the main factor in a number of individuals not signing up (Johnston, 2012).

As discussed in Chapter 4, survey participants were asked to identify their preferred program choice. Program recognition through signage was selected as the highest choice amongst 25% of the respondents. This demonstrates that a number of landowners are interested in recognizing the programs that they have on their land and also acts as a mechanism to advertise programming to other landowners in the region. Johnston (2012) also indicates that her research identified program recognition as one of the primary motives for landowner enrollment in the PEI ALUS program.

In addition, some conservation programs have taken the approach to develop farmer led initiatives in response to landowner hesitation to participate in programming due to their adherence to outside involvement. ALUS is one example of such programming in which they describe one of their core principles as implementing farmer-delivered programming to engage agricultural producers in developing unique solutions to conservation issues (ALUS Canada, 2017). A number of other farmer led initiatives have highlighted the residual benefits of

involving landowners in the development stage. Some residual benefits include, an increased understanding for landowners of the benefits associated with conservation practise, outcome based programming which targets areas of concern, as well as increased respect between the landowner and conservation organization (Farmer Led Watershed Council, 2014).

High water levels on Whitewater Lake were also identified as a point of discussion in the interview and survey questions, with a number of participants raising this as a topic of discuss during their interviews. Some participants reported hesitation to enrolling in conservation programming while high water levels on Whitewater Lake remain an issue. While landowners identified a lack of an outlet as an inhibiting factor a number of other participatory mechanisms, as identified above, could be utilized to influence greater enrollment.

5.4.4 Stacking program payments

As discussed earlier, staking, bundling and additionality are three components which can assist EGS programs in reaching environmental outcomes and can provide greater benefits to landowners. Stacking is described as a concept where a landowner can receive multiple payments for services produced on one single parcel of land (Cooly & Olander, 2011). There are ongoing discussions over the positive and negative benefits of stacking. Stacking is generally preferred by landowners as additional resources and can help to make the project cost-effective for them. Additionally, stacking of programs can result in the production of higher quality projects, greater environmental outcomes and a greater range of environmental services (Cooly & Olander, 2011). One concern with the practise of stacking payments for conservation programming is the risk that landowners may receive a payment that goes beyond the required amount to initiate the project (Cooly & Olander, 2011). Due to the limited scope of programs available to landowners in the project area, the issue of over compensating landowners is

unlikely but should be monitored. A number of opportunities are discussed in later sections which may be feasible under the concept of stacking benefits. It is important to recognize the value that additionality can bring to EGS programs which encourage stacking. Implementing a policy to ensure additionality will harmonize between landowner needs (increased fiscal incentives) and program outcomes (environmental targets).

The opportunity to stack program payments will depend on the programming offered in the future. For example, landowners could receive multiple benefits from the following types of programs: payments for ecosystem services through a provincial program, tax reductions on land enrolled in EGS programming and income supplementation through the eco-certification of crops on their land. All three programs are generated from different sources; provincial, municipal and public, but provide an increased opportunity for landowners to recover costs associated with implementing conservation programming on their land. This also provides a mechanism for landowners to generate income off their property. Having different types of programs also offers landowners the option to enroll in programming that fits their needs.

It is important to recognize that many conservation programs do not provide landowners with enough incentive to offset production and retire their land. Stacking provides a mechanism for landowners to recover expenses paid for the project in addition to allowing landowners the opportunity to produce income off of their project. It is also important to note that stacking of programs can interfere, or limit, the additionality aspect of effective EGS programming (Cooly & Olander, 2011). Landowners who receive a credit, such as a tax incentive, for a project which would have occurred without the payment will not generate additional environmental benefits.

5.4.5 Policy coherence

Successful EGS programming must develop coherence with provincial and federal policies. Farley & Costanza (2010) identify policy coherence as one defining factor of efficient EGS programs. Identifying program policies which align with greater provincial and federal policies is required to ensure program direction is not providing opposing incentives. Likewise, provincial and federal policies should be looked at to determine their compatibility to the EGS concept (Farley & Costanza, 2010).

Recent provincial policy direction was expressed by the former department of Conservation and Water Stewardship when proposed legislation, the Surface Water Management Act, was announced on November 24, 2015. While the Surface Water Management Act did not proceed through legislature in 2015, similar provincial policies were reiterated by the new provincial government in 2016. The mandate letter for the Minister of Sustainable Development identifies the following related commitments:

- "Implement a province-wide program based on the Alternative Land Use Services (ALUS) model to help reduce flooding and improve water quality and nutrient management, in partnership with your colleague, the Minister of Agriculture as well as stakeholders including landowners, eNGOs, federal and municipal governments" (Pallister, 2016).
- "Implement watershed-based planning for drainage and water resource management with a goal of no net loss of water retention capacity in watersheds" (Pallister, 2016).

More recently, Manitoba Sustainable Development announced public consultation on three initiatives focused on water management and watershed planning. These initiatives stem from the policy commitments identified by government in the mandate letters above. The Manitoba

government will be pursing consultation on the following initiatives: a program based on the ALUS model, watershed-based planning for drainage and water resource management with a goal of no net loss of water retention capacity and a made-in Manitoba climate action plan (Government of Manitoba, 2017).

It will be important to weigh these policy considerations against the creation of an EGS program. Development of an EGS program which indicates wetland restoration as an eligible practise will have to foresee overlap between the legal protection of seasonal (Class 3) wetlands and the implications that may pose on short-term contract obligations. For example, landowners who participate in a five year term EGS program to restore a seasonal wetland may be bound by regulation to maintain the wetland beyond their contractual obligation. One possible option to remedy this policy conflict is to make landowners participating in EGS programming exempt from the requirements of the legislation. Alternatively, program administrators may instead choose to communicate this policy conflict transparently with landowners and discuss the legal permanency behind their restoration decision. This may deter a number of landowners from restoring wetlands of this classification. Additionally, if regulations to protect Class 3 wetlands proceed, wetland conservation practises should only be eligible under an EGS program if they aim to conserve Class 1 or 2 wetlands.

As well, aligning Manitoba conservation districts to watershed boundaries will help to better define land users and beneficiaries of EGS programs. This was discussed in Chapter 4 and earlier in this section.

While undertaking a case-study analysis on ALUS programming, Campbell (2014) states, “The voluntary nature of the programs, although promoting the production of EGS such as

erosion control and wildlife habitat, may limit the desired environmental goals that are attainable. Farmers who have no desire to participate in ALUS, or consciously farm in a manner that is environmentally damaging can hinder the programs. In such cases, ALUS would have little regional impact, necessitating reliance on legal regulation would become the primary means to stop environmental degradation" (Campbell, 2014, pg. 122). The province of PEI uses its ALUS program as a compliment to regulation. This could set a model for situations where voluntary stewardship is not sufficient enough to ensure baseline acceptance of environmental indicators. While EGS programming should be aimed at rewarding voluntary behaviour, the concept of cross-compliance could be implemented to help landowners meet and exceed regulatory requirements. While regulatory burden falls on the provincial government, it is unlikely that a local authority would attempt to implement cross compliance restrictions. As discussed in Campbell's research, regulations can play an important role in limiting the environmental damage generated by some landowners unwilling, or unaware, of the impact which some land use practises can have on the flow of important environmental outputs. Rae (2007) goes on to say, "When combined with traditional regulatory frameworks, market-based instruments have the potential to achieve positive environmental outcomes at the least cost to the public purse".

The Manitoba government has also indicated their commitment to agriculture in the Manitoba Budget 2017. The budget aims to commit enhanced funding to the Livestock Growth Strategy. Red tape reductions and the continuation of the Livestock Associations Loan Guarantee are two commitments cited by the Minister of Manitoba Agriculture as a method to increase livestock numbers in the province (Stockford, 2017). Including crop conversion as an eligible

EGS program component is one way to assist or cohere to ongoing policy directions in the province. It is possible that converted land could be used by livestock producers in the area.

5.5 Program delivery

5.5.1 Local involvement in program delivery

The local program development and delivery model is a seen as a win-win situation for producers and local communities (Kienlen, 2016). By developing and delivering programs at the local level, local conservation district staff have an understanding of landowner needs and are familiar with local projects and their benefits.

While delivery is best suited for local agencies, landowners in the Whitewater Lake sub-watershed do recognize the importance of multi-stakeholder involvement. A large majority of landowners (45.7%) who responded to the survey, indicated that they would like to see programs delivered through a combination of all organizations. The multi-stakeholder delivery method has been developed within ALUS programming and highlights the success of this collaboration (Mann et al, 2014).

Possible delivery mechanisms for the Whitewater Lake sub-watershed include: conservation districts for program administration and technical support; MASC for compliance monitoring; municipal governments for financial support, including local levying if required; provincial government for financial support as well as baseline data collection and residual monitoring of the project for environmental outcomes.

5.5.2 Sustainable funding source

The topic of sustainable funding can be addressed from two perspectives. First, is will be fundamental that a funding source for the program remains in place and executed throughout the term of the contracts. Recognizing a municipal, provincial or federal commitment to the program

will demonstrate long term sustainability of the program to landowners. Second, it will also be important to recognize sustainable funding mechanisms within the delivery of the program, including the identification of eligible land, eligible practices and the level of payment received by the landowner.

Johnston (2012) recognized the lack of long term secured funding as one of the greatest weaknesses of Prince Edward Island's ALUS program, which was delivered between 2008 and 2011. Her research identified that a number of landowners cited this as a reason behind their adherence to joining the program.

A number of landowners recognized the difficulties that municipalities are faced with. Declining rural populations have led to a declining tax base; however, many landowners still stressed the importance of reduced property taxes for program participants.

Under The Municipal Assessment Act, property taxes are assessed based on the market value of the land. Market value of land is defined as the most probable selling price if it was to be sold to a willing buyer (Indigenous and Municipal Relations, 2017). Property is also classified under ten property classes based on their use. Under the Classification of Property and Portioned Values Regulation (184/98), land classified as farm property is taxed at rate of 26%. Farm property includes both productive agricultural land as well as wetland acres (Manitoba Laws, 2017). There are currently two programs within Manitoba that provide tax credits to landowners who maintain wetland acres. The Dufferin Wetlands Tax Credit Program was introduced in 2010 as a method to preserve and re-establish wetland acres (AMM, 2014). The Dufferin Wetlands Tax Credit Program provides a financial incentive of $40 per acre through a property tax credit with a minimum eligibility of one acre. Wetland acres can be existing or re-established. The

program has been funded by the municipality with additional funding considerations from the La Salle Redboine Conservation District (AMM, 2014). Additionally, the Riparian Tax Credit program was implemented by the Manitoba Department of Finance as a 100% property tax credit for the preservation and re-establishment of riparian area. The riparian strip had to have a minimum width of 100 feet and had to be maintained for five years. Due to the credits ineffectiveness, the credit was eliminated in the 2017 Budget Address on April 11, 2017 (Manitoba Tax Assistance Office, 2016). Providing a tax credit as a stacked financial incentive with EGS programming may facilitate greater program uptake and participant satisfaction.

5.5.2.1 Municipal watershed fund

Survey participants were also asked to rank a variety of conservation approaches from one to nine, according to their preference. The second most preferred program was the municipal watershed fund with 20.8% of respondents selecting this option. Furthermore, survey participants were later asked if they supported the idea of a dedicated municipal watershed fund. 67.9% of respondents identified that they supported the creation of a dedicated watershed conservation fund for the Whitewater Lake sub-watershed. This demonstrates a generally high consensus from landowners they would support this type of programming.

As discussed earlier, one component of a successful EGS programs is the ability to provide a supporting institutional infrastructure, including the flow of compensation from beneficiaries to land users (Pagiola and Platais, 2002). A municipal watershed fund could be utilized as a potential payment mechanism within the Whitewater Lake sub-watershed as beneficiaries and land users can be clearly defined. As no defined outlet from Whitewater Lake currently exists, a marginal number of beneficiaries exist outside of the watershed. This closed basin watershed could also be utilized as a pilot project area for defining a user-pay system for

across Manitoba. It is important to note that expanding this type of project across the province may come with resistance and/or skepticism as identifying beneficiaries becomes more difficult when watershed boundaries and benefits become shared.

The nature of the closed basin, existing in the Whitewater Lake sub-watershed, presents an interesting case study for the development of a supporting financial framework for an EGS programming.

5.5.2.2 Eco-certification of crops

While the above landowner cites an innate need to purchase items at a cheaper price, the organic and fair trade industry have been successful in creating a large, demanding market. As consumers became aware of agriculture's influence on the environment, the demand and production of organic goods rose during the 1990s (Krystallis and Chryssohoidis, 2005). Beyond price, a number of factors influence a consumer's willingness to purchase a product, including environmental, health and food safety concerns. Furthermore, the willingness of consumers to purchase goods at a premium price, greater than the true value of the product, indicates the consumers demand for the product (Krystallis and Chryssohoidis, 2005).

A number of producers in the ALUS Canada program have recognized the potential to market their products in a similar fashion. By marketing their products under the lens of the programs initiative they are able to differentiate themselves from other products, resulting in added value generated from their land (Lovell, 2016). While attracting greater business from consumers through this marketing scheme, Lovell (2016) states, "What's important for farmers to understand is the ecosystem services they produce have potential value to corporations that are increasingly required to prove their corporate social responsibility, to report on the environmental impact of their activities, and to adopt full-cost accounting principles". This

practise is shifting the common thought away from adding potential value only through the increase of crop revenue and towards alternative solutions that can be incorporated into agricultural businesses (Lovell, 2016).

5.5.2.3 Oil and gas exploration in the East-Souris River Watershed

While this topic was not explored in the personal interviews or surveys, identifying a funding source through oil and gas companies may be a possibility worth exploring.

The area of Whitewater Lake, Manitoba is of particular interest because of the oil and gas industry existing in the area. Southwest Manitoba is one of two areas in Manitoba that have potential for producing an oil and gas industry. Currently oil and gas is produced in southwest Manitoba on the northeastern flank of the Williston Basin with the potential of hydrocarbon at depths up to 2,300 meters (Manitoba Mineral Resources, 2014). Of the 50.17 m^3 of oil produced in Manitoba by December 31, 2012, 49% of that was in the management area of Virden, Manitoba (Manitoba Mineral Resources, 2014). Currently in southwest Manitoba there are 178 producing oil pools and 15 designated oil fields. The cost associated with drilling the completion of a well in Manitoba is in the range of $325,000 to $1.8 million; dependent on the depth of the site.

Specifically in the East-Souris River watershed, six oil fields are found in production. These six oil fields are located in Lulu Lake, Mountainside, Regent, Souris-Hartney, Waskada and Whitewater and together produce 157, 017 m^3 of oil. This amount accounts for 24.8% of Manitoba's total oil production (East-Souris River Watershed Management Plan, 2006).

The summer of 2014 brought historic high water levels for Whitewater Lake. From July 3, 2014 until July 11, 2014 Whitewater Lake was at a historic high of 1633.5 feet (Daily Flood

Report, 2014). Impacts to road services, drains and agricultural land were experienced during this period, including impacts to oil production sites. A steady increase in water levels over the past 10 years has flooded oil field sites, decreasing accessibility and making the sites inoperable. An opportunity to partner with oil and gas companies in the area could be a foreseeable option to provide funding for EGS programming; however, TMCD has approached this as an opportunity in the past but has not secured a feasible partnership.

A joint partnership with oil and gas companies is not uncommon in the history of conservation. The use of mitigation techniques are a familiar approach to partnerships between oil and gas industries and the conservation paradigm. In a traditional approach, stakeholders with interests in conservation would engage with oil and gas industries at the time of licensing. Responsibility of impacts is important for industry to recognize and a mitigation plan may be developed in order to keep the industry liable for the negative impacts they may pose to the environment (IUCN, 2013).

Swaying from traditional interactions with industry and conservation is an approach of mutual benefits. The situation posed in Whitewater Lake, Manitoba is one that is concerning to both oil and gas industries and conservation agencies. Impeding high water and flooded land is a situation both groups want to develop out of. If a partnership can be created with funding coming from oil and gas industries to conservation agencies, the ground work can be done to support EGS programs to alleviate flooding. Oil and gas industries should have an interest in providing funding to EGS programming. An increased growth in funding opportunities for EGS programming will lead to more projects on the land which will lead to proper water storage and a reduction in overland flooding that we are currently experiencing. Oil and gas industries such as Tundra Oil and Gas, are main proponents that should be reached in early phases of planning.

5.5.3 Determining program payments (rental rates vs. competitive bidding)

A number of EGS programs utilize local land rental rates as their base price for remuneration within programming. Knight (2010) identifies the following programs in Canada which utilize rental rates to set program payments:

- Payments for Environmental Goods and Services: Huron County – This program was delivered using local land rental rates. Producers received an annual payment of $250 per acre for a five year period.
- Alternative Land Use Services – Blanshard – This program delivered annual payments to landowners which were reflective of local land rental rates. The program defined rental rates as the costs associated with taking their land out of production.

Knight (2010) identifies that the Blanshard program could have been more successful and cost-effective by incorporating competitive bidding into the application process. It was identified through analysis of the Huron County program that program uptake across the agricultural sector may be hindered by the use of rental rates. As an example, the Huron County program only received and enrolled applications for livestock producers. It was acknowledged that local rental rates were not incentive enough to entice grain producers into the program. Lands associated with high opportunity costs (e.g., cash crops) may be inadvertently omitted from program uptake if rental rates are used to set program payments.

Reverse auction systems have more frequently been incorporated into conservation program delivery. Reverse auctions can successfully reduce program costs as competitive bidding requires landowners to submit bids closer to their true costs. This practice discourages landowners from seeking to maximize the payment received for the conservation effort (Eigenraam et al, 2007).

The Conservation Reserve Program in the United States now incorporates competitive bidding by providing an annual rental payment to landowners dependent on the rate that they were willing to accept. This approach has resulted in the program generating high benefits at the lowest cost by revealing the true cost of undertaking program activities (Knight, 2010).

With the implementation of programming in 2014 and 2015, the TMCD already has experience carrying out a reverse auction conservation program. This comes with the benefit of being a knowledgeable administrator for the assessment of competitive bidding applications. If rental rates were used as the basis of program payments, administrators must recognize the associated risk of omitting cash crop agricultural producers. As demonstrated in the survey and interview results, a majority of livestock producers (80%) are already undertaking conservation efforts on their lands without the assistance of programing. It will be necessary to engage all types of producers in order to achieve successful watershed based outcomes in the program area.

5.5.4 Contract components (payment type and length)

There has been a significant shift in the way conservation programming is being delivered in areas across Canada and the United States. Conservation easements have been touted as restrictive and uneconomical by a number of landowners, which has in some cases resulted in reduced enrollment rates, impacting the result of long term program outcomes (Smith et al, 2012). The shift away from permanent easements has opened the discussion on programming with shorter terms and annual payments. Program contract length is a highly debated topic when discussing the creation of EGS programs. As discussed earlier, a range of contract lengths exist for a number of existing programs. Ando & Chen (2011) investigated the optimal contract length for programming, giving weight to both ecological effects as well as enrollment rate. Their research concluded that the optimal contract length depends on the

purpose and objectives of the program. They discussed that long term programs yield higher environmental effects while short term programs yield high enrollment rates (Ando & Chen, 2011). While this is important to highlight, Rae (2007) discusses landowner behaviour in Australia's BushTender conservation program. She notes that regardless of contract length (short-term, medium-term or long-term), many landowners continued with their conservation practises beyond their contract requirement. She attributes this to the demonstrated financial results of the program (Rae, 2007).

Recognizing the cumulative effect of multiple projects on upstream water storage benefits, the most suitable option in the project area may be the implementation of multiple short term contracts. This also aligns with landowner opinion in the area. Drechsler et al. (2017) also recognize the cost-effectiveness of 5-year contracts over 10-year contracts. Their research also recognized that shorter term contracts provide a mechanism for program administrators to correct deficiencies within program payments or program organization (Drechsler et al, 2017). However, it is also recognized that non-compliance occurs more commonly with longer term contracts (Drechsler et al, 2017). This risk could be reduced with the implementation of compliance monitoring and increased enforcement through peer monitoring, recognition signage, and reverse auction/competitive bidding, as discussed above.

As mentioned earlier, a number of landowners cite greater security in their land management decisions as they approach retirement. There was a general agreement among landowners that long-term contracts (10 years or greater) would deter a number of producers close to or nearing retirement. Based on data from Statistics Canada, in 2011 the average age of a farm operator in Manitoba was 53.1 years. In comparison, in 2006 the average age of a farm operator in Manitoba was 51.2 years (Market Intelligence, 2013). With a majority of producers

falling within the baby-boomer era, and retirement being eminent, there should be a focus of discussion on the opportunity to offer short-length program contracts. The average age of respondents in the Whitewater Lake sub-watershed is 66 years. While this age is considerably higher in comparison to the average of farm operators across Manitoba, this may be a result of survey respondents and may not truly be reflective of the average age of farm operators within the watershed. A number of landowners discussed this idea during their interviews.

Additionally, landowners in the Whitewater Lake sub-watershed identified a greater preference towards annual payments for conservation programming versus one-time payments for conservation program. While providing a steady income source, annual payments are seen as risk reducing. Landowners who currently undertake farming practises on their land may experience income uncertainty with crop production (Cattaneo et al, 2008). Annual payments also provide a mechanism for continued contractual reminders.

Chapter 6: Recommendations and Conclusions

6.1 Introduction

As indicated above, the purpose of this research was to identify the feasibility of implementing an EGS program in the Whitewater Lake sub-watershed. After discussing interview and survey participant opinions and attitudes towards EGS programming, a number of recommendations can be drawn from the results.

6.2 Recommendations

6.2.1 Program development should include partners from a number of institutions

While individual program delivery is best suited for local agencies, such as conservation districts, a number of landowners (45.7%) have indicated that they would like to see EGS programming delivered through a combination of all organizations. The bottom up approach has been highly regarded as a successful mechanism in EGS programming across Canada. Landowners in the Whitewater Lake sub-watershed identified their resistance to government intervention, indicating aversion to provincial involvement in programming. Program development in the Whitewater Lake sub-watershed should be modeled on an approach that incorporates representation from farmers, provincial and municipal governments and eNGOs. The use of multi-stakeholder committees also influences open communication between landowners and policy makers. Incorporating a major involvement from landowners in the Whitewater Lake sub-watershed could be one mechanism to incorporate local knowledge into program development. This will be fundamental for the identification of eligible programming components and could improve overall enrollment rates, helping to reach target objectives more feasibly. As discussed in Chapter 5, a number of agencies, including provincial governments, municipal governments, agricultural organizations and eNGOs all can play a valuable role in assisting conservation districts with program development and delivery.

6.2.2 Implement program delivery through a local agency

Due to their general distrust in provincial government involvement, a number of landowners interviewed here indicated their preference for program delivery to be offered through local agencies, including rural municipalities and conservation districts. Program delivery in the Whitewater Lake sub-watershed should be administered through the local conservation district as administrative mechanisms and technical competency already exist. A majority of landowners also indicated a positive sentiment towards current conservation district assistance and responsibilities within the sub-watershed. A local delivery agent would also help to aid landowners in obtaining information on the program and may provide technical assistance with project implementation. Project selection as well as identification of targeted lands will be facilitated significantly easier at a local level.

6.2.3 Identify a sustainable funding source

The identification of a sustainable funding source will be pertinent for local landowner acceptance of an EGS program in the Whitewater Lake sub-watershed. A number of landowners expressed concerns over the lack of funding available for projects implementation and compliance monitoring. A sustainable funding source reduces landowner hesitancy and encourages confidence in the capacity and length of the program. A sizable number of landowners (37.5%) agreed that funding should be a large fiscal (greater than 50%) responsibility of provincial and federal governments, with most landowners (95%) indicating the requirement of some provincial or federal responsibility. If a provincial or federal funding commitment is not recognized, some landowners have indicated their agreement over using the municipal tax system to deliver a local watershed fund. A local watershed fund would help to ensure long term stability of an EGS program but potential issues will have to be worked through before implementation occurs. As discussed in Section 4.2.2, landowners in the upland and

Turtle Mountains are generally more in favour of creating a watershed fund than Whitewater Lake landowners. While this is likely a result of flooding pressures on Whitewater Lake landowners, this is a positive sentiment from upstream landowners and presents an opportunity to pursue this type of funding arrangement. Data collection to identify the changing landscape will have to be precise to ensure accountability within this type of programming. There may be criticisms from landowners who acquired land years after the baseline data were collected (e.g., 1955 to 1958). Criticisms may arise from landowners who are penalized for drainage works completed on their property before they had purchased it.

6.2.4 Implement a targeted marketing campaign

Communication defines the success of many EGS programs. A considerable amount of landowners (54.1%) were generally not aware of conservation programming in the area. The lack of program awareness has been indicated not only as an issue in the Whitewater Lake sub-watershed, but in areas of Canada where successful EGS programming is currently being implemented. As a result, recognizing the social network and how information is relayed amongst community members is important in program design. To influence greater interest among landowners in the Whitewater Lake sub-watershed, the program should be identified as a land and water management program. A number of landowners during the interviews indicated frustration and an apparent hesitancy to enroll in strictly water storage programming. Highlighting land management opportunities may increase interest and uptake in the program. Recommended eligible program components are discussed further in the "Program Delivery" section below. Successful awareness of the program can be encouraged through local information sessions on program components, eligibility and obligations. This will also encourage transparency and contractual awareness once projects are implemented. Program awareness could also be generated through radio ads, farmer led demonstration tours and grant

writing workshops. Social media marketing also serves as a useful technique to encourage awareness amongst younger generation producers.

6.2.5 Encourage the practise of stacking program payments

The practise of stacking program benefits should be encouraged to program participants, if applicable. A number of landowners expressed concerns over the lack of funding available for projects implementation and stacking provides a mechanism for increased financial assistance. Program administration should encourage the use of multiple program resources to help make project implementation cost-effective for landowners. Stacking of programs can result in the production of higher quality projects, greater environmental outcomes and a greater range of environmental services. It is recommended that program administrators encourage landowners to partner with provincial Environmental Farm Plan programming to allow for upfront costs to be taken care of. This will permit EGS programming to cover annual costs and provides a greater financial outcome for the landowner. Rural municipalities are also encouraged to assess the implementation of a wetland tax credit in the Whitewater Lake sub-watershed. Advancing a wetland tax credit through local municipalities will further encourage uptake into EGS programming, while potentially reducing long term costs associated with the program. It is important that all opportunities for stacking program benefits be communicated transparently to landowners.

6.2.6 Deliver programming with transparent objectives

There is a general frustration in the study area about the lack of flood protection provided by the small dams in the Turtle Mountains, as well as the risk associated with the dams. This sentiment was also shared when discussing upstream storage potential through the conservation/restoration of wetlands. When discussing the effectiveness of water storage programming in the Turtle Mountain area, it was common for landowners to express their

frustration over the inability of dams or wetlands to store water in large floods. Identifying objectives transparently throughout program development and delivery will ensure that there are no misconceptions about the impact or effectiveness of the program. The water retention benefits associated with implementing EGS programming may take years to develop. This concept should be discussed and openly conveyed to landowners when marketing the program. Program administrators must be cognisant that negative attention to the effectiveness of programming may occur if a large runoff event results in flooding within the early years of program conception. Program reporting should attempt to quantify the measureable objectives obtained as a result of project implementation. It is recommended that sample project areas be assessed for runoff characteristics by comparing baseline and post project results. Positive results will help to build credibility behind the program. If an outcome monitoring program is unable to be developed, anecdotal information should be collected from participants.

6.2.7 Implement an annual term payment structure

Landowners in the Whitewater Lake sub-watershed identified a greater preference towards annual payments over one-time payments for conservation program. Within the survey results, annual and one-time payments received the same support with 12.5% of landowners identifying both options as their most preferred program. However, annual payments were not chosen by any landowners as their least preferred program, whereas 4.8% identified one-time payments as their least preferred program. Program payments should be delivered on an annual basis to compensate landowners for ecological good and services program participation. The value of program payments should be set by competitive bidding; however, land rental rates may alternatively provide a payment scheme mechanism if program administration costs become a burden. The value expected with the implementation of a competitive bidding process is discussed further below.

Landowners in the area also indicated a general preference to recognition programs, with 25% of respondents identifying recognition programming as their most preferred program option. Landowners identified potential recognition programs as signage indicating their property's enrollment. This should be positively acknowledged throughout the delivery of the program as there are multiple benefits associated with program recognition. At a relatively low implementation cost, marketing and local knowledge of the program will increase. This can also stand as a mechanism to encourage continued contractual obligation for current and future landowners. It is recommended that annual program payments be accompanied by recognition signs, at no cost to the landowner.

6.2.8 Implement competitive bidding into the application process

Participants in the study area have identified concerns with the continued crop production of marginal and sensitive lands. Grain producers are generally not participating in conservation programming, with 76.9% of grain producers indicating that they have no acres enrolled in conservation programming. The practice of competitive bidding can successfully reduce program costs as program participants are positioned to identify the true associated costs to program administrators. Overall program expenditures are reduced by discouraging landowners from artificially maximizing the payment required for their conservation effort. One of the fundamental issues within the Whitewater Lake sub-watershed is the continued agricultural production of marginal land. Setting program payments through the use of land rental rates has been identified as a practice that discourages grain producers from participating in programming. Land rental rates fail to identify the opportunity cost of converting grain lands to natural cover.

Competitive bidding will encourage transparency between program participants and administrators and will help to define the true costs of programming in the area. Landowners and

program administrators in the Whitewater Lake sub-watershed are currently familiar with the competitive bidding process so the learning curve would be gradual or minimal for implementation. It is important to highlight that survey participants appeared unsatisfied with their experiences of TMCD's reserve auction, with 19.1% identifying this as their least preferred program. Some participants did highlight their frustration of a lack of acceptance for some of their project applications. The conservation district will have to be clear in defining objectives of the program so that miscommunication about eligible programing does not occur. Additionally, TMCD should be encouraged to follow up with applicants and participants of the program to determine areas for improvement.

6.2.9 Implement a targeted program using a benefit-cost analysis

Landowners in the Whitewater Lake sub-watershed generally conceded that a number of conservation projects were located on land that would have been left idle, regardless of the compensation received through programming. Ecological goods and services programming in the area should target program payments to wetland restoration and agricultural land retirement. Land retirement of marginal crop land and ecologically significant lands that have been impacted by agricultural practices should be ranked higher than marginal land projected to remain in forage. In addition, smaller wetlands that are at a greater risk of being drained should be ranked higher than larger wetlands. A substantial amount of wetland consolidation has occurred across the watershed, resulting in a number of larger wetlands which could generally be considered less at risk of being drained due to technical difficulties and current regulatory measures. A benefit-cost indexing processes would screen applications based on the outcomes produced by the proposed project. Program administrators should index projects based on the projected water retention capacity of the project. Benefit cost indexing should also result in targeted payments. A blanket payment system that compensates all landowners at the same rate would be costly and

would not produce the greatest environmental benefit at the lowest cost. A targeted payment scheme, however, should present itself through the competitive bidding process as landowners identify the true costs associated with the conservation practise.

6.2.10 Ensure eligible practices complement land use concerns in the area

Program administrators should accommodate land use concerns and characteristics into program development when identifying eligible practices. In this study, a number of land use issues were identified in the Whitewater Lake sub-watershed, including water erosion, flooding, salinity, and runoff. Taking these factors into consideration will encourage enrollment and increase satisfaction of participants. The following practices are recommended to be included as eligible programming:

- Retirement of ecologically sensitive land areas.
- Retirement of high slope land in the Turtle Mountain and upland areas.
- Wetland restoration and conservation.
- Small water storage projects.
- Crop rotation programming, including the use of forages and tillage practises, for soil health and the management of alkaline soils.
- Expansion of riparian buffer zones.

To increase compliance, participant satisfaction and enrollment, haying and controlled grazing should be permitted where suitable.

6.2.11 Implement shorter-term contracts

Landowners in the Whitewater Lake sub-watershed identified their preference for shorter-term contracts in both surveys and interviews. The implementation of shorter-term contracts (three to five years) would yield higher programming uptake within the Whitewater

Lake sub-watershed. In this study, farm operator age was indicated as a significant defining factor in program participation. As a result, landowners expressed hesitation towards enrollment in longer term contracts. The average age of survey respondents was 66 years, which highlights a risk that many landowners close to retirement may not be willing to participate in longer-term contracts. While offering shorter-term contracts does increase the likelihood of participation, there is a risk that land would be returned to production after contract obligations cease and thereby reducing the environmental benefit. By introducing eligible practises which complement land use concerns in the area, such as alkalinity and erosion, a number of landowners may maintain programming if funding continues to become available. Program administrators may recognize the need for longer-term contracts when developing flood mitigation services, such as through the restoration of wetlands. If longer term contracts are considered, it is recommended that program contracts be restricted to ten years in length. Shorter-term contracts should remain available for other eligible land use practises.

6.2.12 Allow flexibility in contract conditions

A number of interview participants indicated their frustration over the land use restrictions imposed under current programming. It is recommended that programming solutions involve flexibility and inclusion of local land issues. It is recommended that program development include flexibility to allow participants to undertake adaptations that were felt to be appropriate at the local level. In particular, permitting landowners to withdraw from programming earlier than their contractual obligation may provide a level of reassurance to landowners who are hesitant to initially enroll. Requiring the repayment of compensation would be necessary to maintain a sustainable program.

6.2.13 Ensure additionality

Program implementation should aim to recognize past positive land use behaviour but should prioritize restorative efforts. Some landowners recognized the positive land management actions that they were undertaking but inferred that programs would not recognize them. While recognition of positive behaviour is important to build creditability within the program, payments for pre-existing natural features should only be allowed if restorative efforts are also included on that land, or if the existing feature is enhanced. Payments for pre-existing natural features should be ranked based on their ecological benefit to the watershed and the risk associated with removing the feature. This may be the best method to satisfy all landowners within the watershed. This would also help for the marketing of the program. Otherwise, individuals who identify themselves as highly environmental may have negative thoughts against the program. As discussed above, alternative options can be achieved for permanent areas that cannot be enhanced. For example, property tax reductions could be employed to ensure conservation of wetlands.

6.2.14 Ensure compliance monitoring

During the interviews, a few landowners expressed their concern that conservation organizations and conservation districts do not have enough resources to enforce contracts and undertake compliance of programming. While communication was recommended above as the first priority for maintaining compliancy within the program, monitoring a percentage of projects per year will be important to ensure that contractual obligations are being followed. It is recommended that administrators undertaking compliance monitoring s be involved in the program development by having a designated spot within the local program development model. Ensuring that contractual expectations are understood and recognized by both participants and compliance technicians will be important for overall moral within the program.

6.3 Future research

Implementing an EGS program in the Whitewater Lake sub-watershed will begin to recognize the public ecosystem services that have been previously provided by private landowners for free. However, further market mechanisms are required to recognize societal demand for these services. The correction of this market failure may be facilitated through a framework to support the production and sale of products under the classification of an ecologically sustainable product. Jack, Kousky & Sims (2007) identify that the benefits of providing an ecosystem service are accrued by the individual making the management decision. Identifying a measurable willingness to pay in our contemporary markets is necessary to reduce the market failure associated with the provision of public ecosystem services on private lands.

With annual based incentive programming there is a concern that land will be returned to farmland when contract periods end. Landowners have previously indicated that land must be generating income through agricultural production or through an ecological goods and services payment. Creating a market for sustainable products would likely encourage landowners to continue with program components into the future beyond contractual obligations. Further research into the implementation of this type of program would be required to assess the feasibility of building a local or regional food system to support this.

Research into the public's willingness to support such a program will be important. In doing so, increasing public awareness and understanding of environmental and on farm issues will be a fundamental component to help recognize the market responsibility placed on landowners.

6.4 Conclusion

It is important to highlight the constraints of programming implementation that emerged through the survey responses and personal interviews. At the time when responses were

collected, many landowners were facing hardships with high lake levels. The prevalent concern of respondents was the responsibility of the area to deal with high water levels through level management with the construction of an outlet. The researcher identified that a number of respondents included this as an inhibiting factor to participation. In the time since the research was collected, a Manitoba Environment Act proposal for the Whitewater Lake Management Project was submitted by the rural municipality of Deloraine-Winchester. While the outcome of the Manitoba Environment Act proposal is still undetermined, this may be enough of an indication to some hesitant landowners to change their condition based response about participating in EGS programming.

Additionally, landowners in the Whitewater Lake sub-watershed identify with three overall environmental responsibilities, including responsibility to protect the earth, social/personal responsibly and responsibility to future generations. Clearfield (1986) identifies that landowners with an identified conservation ethic, such as the responsibilities identified above, will be more likely to undertake in conservation programming. The recognition of positive environmental responsibility in the area is a positive indicator that EGS programming could be feasible.

This research identified a general frustration with the current constraints of conservation programming. However, landowners expressed a number of values that correlate with the concepts of EGS programming. With implementation of the above recommendations an EGS could be successful in the Whitewater Lake sub-watershed. Program evaluation would be required to assess participant satisfaction, achieved outcomes and sustainability of the program.

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Appendix A – Recruitment Poster

UNIVERSITY OF MANITOBA | Department of Environment and Geography

220 Sinnott Building
Winnipeg, Manitoba
Canada R3T 2N2
General Office (204) 474-9667
Fax 474-7699

PARTICIPANTS NEEDED FOR RESEARCH IN LANDOWNER INCENTIVE PROGRAMS

We are looking for volunteers to take part in a study of
Ecological Goods and Services Program Creation in Whitewater Lake, Manitoba: Options and Attitudes

You would be asked to participate in a personal interview exploring water management decisions on your land and in your community, as well as discussing your opinion on programs that provide incentives for landowners to provide ecological goods and services. There is also an opportunity to participate in a photo-voice component of the study – demonstrate your most appreciated landscapes through photos.

Your participation would involve *one* session with the interviewer;
each session will be about *60-120* minutes long.
In appreciation for your time, you will receive
$40.00

For more information about this study, or to volunteer for this study,
please contact:
Stephanie Woltman
[redacted]
Or email: umwoltms@cc.umanitoba.ca

This study has been reviewed by, and received ethics clearance by the Joint-Faculty Research Ethics Board (JFREB) at U of M

Call Stephanie Woltman [redacted] Or Email: umwoltms@cc.umanitoba.ca

Call Stephanie Woltman [redacted] Or Email: umwoltms@cc.umanitoba.ca
Call Stephanie Woltman [redacted] Or Email: umwoltms@cc.umanitoba.ca
Call Stephanie Woltman [redacted] Or Email: umwoltms@cc.umanitoba.ca
Call Stephanie Woltman [redacted] Or Email: umwoltms@cc.umanitoba.ca
Call Stephanie Woltman [redacted] Or Email: umwoltms@cc.umanitoba.ca

Appendix B – Recruitment Letter (Questionnaire)

UNIVERSITY OF MANITOBA | Department of Environment and Geography

220 Sinnott Building
Winnipeg, Manitoba
Canada R3T 2N2
General Office (204) 474-9667
Fax: 474-7699

November 7, 2014

I am currently undertaking a research project for my Masters of the Environment degree at the University of Manitoba. I was provided your mailing address by the Turtle Mountain Conservation District. I was wondering if you would be willing to be interviewed, at a time and place convenient to you as part of that research. The interview should take no longer than 2 hour and will take place at your home or alternative public place of your choosing (ex. Restaurant, coffee shop, conservation district office).

The title of my research project is Ecological Goods and Services Program Creation in Whitewater Lake, Manitoba: Options and Attitudes.

I hope to explore water management decisions on your land and in your community, as well as discuss your opinion on programs that provide incentives for landowners to maintain or restore wetlands on your land. The ultimate goal is to provide you an opportunity to voice your opinion on how landowners can benefit from providing public goods through ecosystem services. I will be focusing on three geographic regions of interest; landowners surround Whitewater Lake, landowners in the uplands of Whitewater Lake and landowners beyond in the East Souris Watershed. I will be hoping to interview 10 participants in each category. If more interest in participation occurs, I may be able to accommodate more interviews, but will notify respondents when I have reached capacity. Interviews will be filled in each category based on participants who respond first. I am hoping to additionally carry out a photo-voice component of my project. Photo-voice projects allow participants to express feelings they may not be able to describe in person. If you are interested, I will request that you take photos on your land or around your community that are of importance to you. During the interview we can look at them and discuss each photo and its importance to you.

Before you agree to the interview I can confirm that:

- Joint-Faculty Research Ethics Board (JFREB) has approved of this research and I will need informed consent signed,
- With your permission will the interview will be recorded,
- A transcript of the interview will be sent to you after the interview,
- I may take meaningful quotes out of the interview and place them in documentation about this research project. If you wish to have some or all of your interview remain anonymous please notify the interviewer,
- You will be free to withdraw from the research at any time during the interview and/or request that your transcript not be used up until July 15, 2014,

- A copy of the interview questions will be sent to you seven days before the interview, and
- I will write to you on completion of the research and a copy of my final research report will be made available to you upon request.

I sincerely hope that you will be able to help me with my research. If you are interested in taking part in my project or have any additional questions regarding the project please contact me by email at umwoltms@cc.umanitoba.ca or phone ([redacted] Please respond no later than November 20, 2014 to arrange the scheduling of an interview as I am hoping to complete interviews in late November and early December.

Finally, I thank you for taking the time to consider my request and I look forward to your reply.

Yours sincerely,
Stephanie Woltman

Appendix C – Informed Consent

UNIVERSITY OF MANITOBA | Department of Environment and Geography

220 Sinnott Building
Winnipeg, Manitoba
Canada R3T 2N2
General Office (204) 474-9667
Fax: 474-7699

Research Project Title: Ecological Goods and Services Program Creation in Whitewater Lake, Manitoba: Options and Attitudes

Principle Investigator: Stephanie Woltman
umwoltms@cc.umanitoba.ca
Ph: [redacted]

Research Supervisor: Rick Baydack
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Clayton H. Riddell Faculty of Environment, Earth, and Resources
255 Wallace Building
Winnipeg, Manitoba, Canada, R3T2N2
Ph: (204) 474-6776
Fax: (204) 474-7699

Sponsor: Delta Waterfowl & Manitoba Habitat Heritage Corporation

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

1. In 2005, TMCD (Turtle Mountain Conservation District) completed the East Souris River Integrated Watershed Management Plan. The plan outlined a "road map" for future conservation incentive programming to be completed in the watershed over the next 10 years. Surface Water Management was identified as one of the main goals within the plan with specific actions related to flooding and water levels around Whitewater Lake. Since 2005, the district has completed many projects around Whitewater Lake, but issues continue to persist. Ecological goods and services (EGS) programs focus on the multi-functionality of land use; incorporating environmental, social and economic aspects of agriculture. EGS programs compensate for agricultural land that has transformed natural processes into functions useful for the general public. These alternate land use processes may produce benefits such as: soil erosion protection, climate regulation, water purification, maintenance of biodiversity and flood and drought protection.

A literature review of EGS programs present in Canada and the United States has been completed and a catalogue of program components has been created. The goal of this thesis project is to provide an opportunity for landowners to voice their opinions in regards to EGS programs and to discover how they currently manage water on their land. The Whitewater Lake area is an interesting geographic location due to the fact that there are three distinct areas that can be categorized; land adjacent to the lake, the uplands and surrounding residents in the East Souris Watershed. A comparison of landowner results from all three local regions will help to assist in understanding the broader view of the issue at hand.

2. The personal semi-structured interviews will occur at your place of residence to provide an opportunity for the researcher to understand your land management choices. If you prefer, the interview can occur at an agreed upon location in town (Deloraine, MB or Boissevain, MB). It will be requested that participants are prepared to be involved in the interview for up to 120 minutes, but the length of interviews may fluctuate dependent on responses. The questions in the interview will focus around seven discussion points. I hope to discuss how you currently manage water on your land, what motivations influence your land management, your understanding of ecological goods and services, your opinion on ecological goods and services programs, your current involvement in conservation programming, your opinion of conservation programming, your opinion on how conservation programming could improve and any partnerships that you may wish to pursue for conservation programming and your opinion on the current flooding situation in Whitewater Lake, Manitoba.

3. The personal semi-structured interviews will be recorded with a tape recorder and personal notes will be taken by the researcher.

4. This project will provide you, the participant, with the opportunity to be involved in the bottom level of community conservation planning. This provides a benefit to both yourself and the rural community at large.

5. The risk associated with this research project is assumed to be minimal. If there are any questions that you feel put you in greater harm (ex. psychological harm associated with the discussion of sensitive topics, disclosure of personal information, etc.) please notify me and the question(s) may be removed from our discussion.

6. Interviews will be constructed on a first name basis. I will record the interview and interview notes by association with your name. I hope to provide an opportunity for you to voice your opinion in regards to water management in your community. I may take meaningful quotes out of the interview and place them in documentation about this research project. If you wish to have any part of the interview not be associated with your name please notify me at the time of the interview or please feel free to contact me afterwards. I will store recordings and notes from the interview on a password protected hard drive. I will be the only individual who will have access to the hard drive.

7. A remuneration of $40 will be provided to participants and will be provided once the interview completes. This payment will be provided directly to the participant in cash.

8. If at any point in the research (before the interview, during the interview or after the interview) the participant chooses to withdraw, they may do so without any negative consequences. Please notify the researcher at this time and any necessary data related to interview will be disposed of.

9. As a master's thesis, I will be submitting a final copy to my committee and the University of Manitoba by June 2015. If you choose to have your interview removed from the study please contact the interviewer before March 31, 2015. Withdrawing from the study will not affect participants' compensation received at the end of the interview process. Any data containing personal and sensitive information will be destroyed following the submission and approval of the final thesis. This information will be destroyed no later than December 31, 2015.

10. Debriefing of the interview will occur at the end and will include specifications to participants explaining how the researcher will analyze their responses. If participants have any questions in regards to how the questions were posed or why they were asked, that can be discussed.

11. Research results will be compiled in a complete master's thesis which will be presented to the researchers committee at the University of Manitoba. The research results will also be presented to the two sponsors; Delta Waterfowl and Manitoba Habitat Heritage Corporation.

12. A summary of results will be provided to participants in the fall of 2015. The results may be provided by email or mail. Space is allotted below for you to fill in your email address or mailing address. If you wish to receive a hard copy, please fill in your mailing address. If you wish to receive an electronic copy, please fill in your email address. If you fill out both options, you will receive an electronic and hard copy of results.

13. The data accumulated for this project is anonymous and may be kept indefinitely. The list of names and contact information will be destroyed at the end of the research project (September 2015).

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the [insert full name of appropriate REB]. If you have any concerns or complains about this project you may contact any of the above-names persons or the Human Ethics Coordinator (HEC) at 474-7122. A copy of this consent form has been given to you to keep for your records and reference.

Participant's Signature _____ Date _____
Please provide contact information to receive a summary of the study:

Participant's Email: _____
Participant's Mailing Address: _____
Participants Phone Number: _____

Researcher and/or Delegate's Signature _____ Date _____

Appendix D – Personal Interview Questions

UNIVERSITY OF MANITOBA | Department of Environment and Geography

220 Sinnott Building
Winnipeg, Manitoba
Canada R3T 2N2
General Office (204) 474-9667
Fax: 474-7699

Information about these interview questions: This gives you an idea what I would like to learn about water management on your land and your attitude towards incentives for ecological goods and services programming. Interviews will be one-to-one and will be open-ended (not just "yes or no" answers) semi-structured interviews. Because of this, the exact wording may change a little. Sometimes I will use other short questions to make sure I understand what you told me or if I need more information when we are talking such as: "So, you are saying that …?), to get more information ("Please tell me more?"), or to learn what you think or feel about something ("Why do you think that is…?").

1. Take me through your normal process of planning on your land (drainage, bush clearing, crops to grow etc.); do you see the plans changing in the future? Please explain.

2. What is the most important land management consideration in your farming/ranching operation? Why is this most important? What are the second and third most important considerations? Are there any others? Why have you ranked them as you did?

    a. Are you familiar with the concept of ecological goods and services (EGS)?

3. Let's discuss EGS programs specifically. Have you heard of or seen any programs that you think would be successful in this area of Manitoba?

4. Are you participating in or would you be willing to participate in programing that provides incentives for creating ecological goods and services on your land?
   [ ] Yes [ ] No
   Please tell me more about why you think that?

5. Are there any partnerships you could see feasible in creating funds for EGS programming (eco-tourism, eco-certification of crops, local watershed fund)?

6. Why do you think flooding around Whitewater Lake is occurring? How do you think EGS programs could play a role in mitigating the issue? Please discuss.

7. There is often a disconnect between agriculture and policy makers, while many landowners are making great efforts on their land. What conservation initiatives do you currently have underway and how do you believe you could improve water storage on your land?

8. Is there something important I forgot? Is there anything else you think I need to know?

Appendix E – Survey Recruitment Letter

UNIVERSITY OF MANITOBA | Department of Environment and Geography

220 Sinnott Building
Winnipeg, Manitoba
Canada R3T 2N2
General Office (204) 474-9667
Fax 474-7699

Hello,

March 7, 2015

I am currently undertaking a research project for my Masters of the Environment degree at the University of Manitoba. I was provided your mailing address by the Turtle Mountain Conservation District and I am hoping that you will be willing and interested to fill out the attached questionnaire. The title of my research project is **Ecological Goods and Services Program Creation in Whitewater Lake, Manitoba: Options and Attitudes.**

I hope to explore water management decisions on your land and in your community, while also exploring programs that provide incentives for landowners to implement conservation efforts on their land. The goal is to provide you an opportunity to voice your opinion on how landowners can benefit from providing public goods (reduce soil erosion, enhance water supplies, improve water quality, increase fish and wildlife habitat, and reduce damages caused by floods and other natural disasters) through ecosystem services.

The sponsors of this research project are Delta Waterfowl and Manitoba Habitat Heritage Corporation. The Joint-Faculty Research Ethics Board (JFREB) has approved of this research and your participation is completely voluntary. You may decline altogether, or leave blank any questions you don't wish to answer. There are no known risks to participation beyond those encountered in everyday life. Your responses will remain confidential and anonymous. Data from this research will be available to only the researcher.

You can find a copy of the questionnaire online at: https://www.surveymonkey.com/s/RSZT2H8 and may complete it there without submitting the attached copy. If you wish to fill out the attached questionnaire, please return it to the Turtle Mountain Conservation District office (Deloraine, MB) or return it by mail to:

Stephanie Woltman
[redacted]

If you are able to complete and submit the questionnaire (online/paper copy) by **March 30, 2015** your name will be entered into a random draw for an Apple iPad Mini, with one survey respondent winning.

I sincerely hope that you will be able to help me with my research. If you have any additional questions regarding the project please contact me by email at umwoltms@cc.umanitoba.ca or phone [redacted] Finally, I thank you for taking the time to consider my request and I look forward to hearing your responses.

Sincerely,

Stephanie Woltman

Appendix F – Survey Questionnaire

UNIVERSITY OF MANITOBA | Department of Environment and Geography

220 Sinnott Building
Winnipeg, Manitoba
Canada R3T 2N2
General Office (204) 474-9667
Fax: 474-7699

Part One – Your Land:

1. Do you currently live on:
    a. A farm
    b. An acreage in the country
    c. In a city or small town

If you are a rural resident, tell me the approximate amount of land you own (in quarter sections) and how far it is from Whitewater Lake (0-2 miles, 2-4 miles, 6 miles or more)?

2. How many acres of your land are directly affected by the current levels of Whitewater Lake?

3. Do you consider yourself a:
    a. Grain producer
    b. Livestock producer
    c. Mixed (grain & livestock) producer
    d. Other

4. Approximately what percentage of your land is farmed or ranched as opposed to in conservation such as bush or slough?

5. Are you planning on making any changes next year in terms of your mix of cropland, pasture and conservation (bush and slough)?

6. If you have grass/pasture on your land:
    a. How long has it been in grass/pasture?

    b. How do you use it?

    c. Would you be considering converting this to crop land?

    d. How is this land different than your cropped fields?

Part Two – Conservation Programming[1]:

7. Rank the conservation approaches from 1 to 9, according to your preference (eg. 1=first choice, 9=last choice)
    _____ Regulatory Programs (bylaws, regulations, legislation)
    _____ Educational Programs (workshops, manuals, mail outs, one-on-one discussion)
    _____ Recognition Programs (acknowledgement of land stewardship activities - Signage, conservation awards)
    _____ Financial Incentive Programs – One Time Payments
    _____ Financial Incentive Programs – Annual Payments
    _____ Market-Based Programs (Tradable Permit System)
    _____ Reverse Auction System
    _____ Municipal watershed fund
    _____ Purchases of land by conservation agencies

8. How much land do you have enrolled in conservation programs?

[1] "conservation programs" refer to the wide range of programs delivered by government and non-governmental organizations which provide or direct funds to private lands to reduce soil erosion, enhance water supplies, improve water quality, increase fish and wildlife habitat, and reduce damages caused by floods and other natural disasters; these programs employ a diversity of approaches including regulation, land purchase, conservation easements or agreements, and incentives.

9. Are there any programs currently available that would be available to you to maintain wetlands on your land? (Please list any that apply and the reasoning why you would be interested in partnering)

10. To what extent does conservation programming affect your land management?

11. Have you done an environmental farm plan (EFP)? In your opinion, should there be alternatives to an EFP for qualifying for some conservation programing?

12. In your opinion, what percentage of the Whitewater Lake issue is related to (please list as a percentage of 100):

    An extended wet cycle _____
    Agricultural drainage into Whitewater Lake _____
    Deforestation of the Turtle Mountain_____

13. There is a growing recognition across Canada of the need to provide funding for conservation activities on private land. Do you support or oppose the idea of creating a dedicated conservation fund in the Whitewater Lake Watershed to support environmental conservation initiatives and water storage on private land? Please explain.

14. To generate more financial benefit for landowners who participate in these types of programs, one method would be to create an "Ecologically Sustainable Product" designation that would certify products from enrolled lands and allow them to sell at a higher price in the grocery store. Would you be interested in a system, similar to "Fair Trade" or "Organic", where your crops could be sold at a higher price if a certain % of your land was enrolled in conservation programming? Please explain.

15. Whose financial responsibility should it be to pay for wetland conservation/restoration (please list as a percentage of 100)?

Landowners	_____
Municipalities	_____
Provincial or Federal government	_____
Non-governmental organizations	_____
Conservation District	_____

16. Do you support using the property tax system as an effective means of compensating landowners for taking part in conservation programs that support conservation funding?

17. If a municipality decided to create a dedicated fund for conservation through a special levy, what in your opinion is a reasonable levy to pay per acre for a watershed conservation fund?
    a. $10 or less
    b. $30 or less
    c. $50 or less
    d. $70 or less
    e. $90 or less

18. Who should have the responsibility of delivering the programs?
    a. Municipalities
    b. Provincial or federal governments
    c. Conservation ngo's
    d. Crop insurance (MASC)
    e. Local Conservation District
    f. Landowner
    g. Combination of all

19. What are the weaknesses or gaps you see in current conservation programming that make then unattractive to you?

20. Do you believe conservation programs that support water storage save money on infrastructure costs in the long run? (i.e. downstream flood damage)?

21. Conservation programming could pay farmers to help protect components of a healthy watershed (land, water, soil, air). Which of the two would you say are the most important benefits of conservation programs?

22. Do you see wetlands as an impediment to daily farming activities and the production from your land? Please explain.

23. Do you have areas of your land that you find difficult to farm that would be suitable for conservation programming? Please explain.

24. If landowners refuse to enroll their marginal acres in conservation programming, should those marginal lands still be eligible for crop insurance? Please explain.

25. What would make conservation programming easier for you to access as a producer? How would you like to interact with the people who deliver it?

26. Do you have any other ideas that may assist landowners in receiving payments for producing environmental goods and services?

27. Are there acts of unlicensed drainage occurring near your land? Are drainage regulations effective in enforcing man-made drainage?

28. What changes have you made as a result of governmental regulations?
    a. No change to operation as a result of governmental regulations
    b. Changed the area of production on your land
    c. Reduced the area of production on your land
    d. Capital investments – large monetary improvements
    e. Adopted BMP's

29. Who stands to benefit from the adoption of conservation practices on your land? Rank 1 – 5:

Manitoba residents	_____
Consumers	_____
Agricultural industry	_____
Farmer's	_____
Rural communities	_____

30. Do you believe you have to make changes to your farm through the adoption of conservation practices? If so, which of these most closely approximate the reasons why? Rank 1-4

To meet public expectations	_____
Meeting market expectations	_____
Meeting government regulations	_____
An environmentally conscious mind	_____

31. Are public expectations of environmental standards in your farming operations increasing?

Part 3 – Personal Demographics:

32. What year were you born?

33. Are you male or female?

34. Is farming your primary source of household income?

35. For the years 2008 and 2012, what was your approximate total net farm income before taxes and deductions?

2008	2012
____less than $10,000	____less than $10,000
____$10,000-$19,000	____$10,000-$19,000
____$20,000-$29,000	____$20,000-$29,000
____$30,000-$39,000	____$30,000-$39,000
____$40,000-$49,000	____$40,000-$49,000
____$50,000-$59,000	____$50,000-$59,000
____$60,000-$69,000	____$60,000-$69,000
____$70,000-$79,000	____$70,000-$79,000
____$80,000 or over	____$80,000 or over