

# The Feasibility of Transfer Development Credits for Conservation in the Beaver Hills Initiative Area



**Ducks Unlimited Canada**  
Conserving Canada's Wetlands



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September 21, 2007

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## **ACKNOWLEDGEMENTS**

The authors would like to acknowledge the generous support of the Max Bell Foundation which provided the funding for this study.

We gratefully acknowledge the contributions of our partners Brenda Wispinski, Executive Director of the Beaver Hills Initiative, Brian Ilnicki of Ducks Unlimited Canada, and the BHI Board Members.

We would also like to thank Dee Patriquin of Spencer Environmental Management Services Ltd. for providing the GIS maps and answering questions. The contents of the report are the sole responsibility of the authors.

## EXECUTIVE SUMMARY

This report reviews the potential for an inter-jurisdictional Transferable Development Credit (TDC) program to achieve conservation objectives in the Beaver Hills Initiative (BHI) Area. A review of the recently completed draft BHI Land Management Framework, County Municipal Development Plans, and land values in the region suggest that a TDC program is feasible and the BHI should consider further design and evaluation of a TDC program.

TDC programs provide voluntary incentives for limiting development in environmentally sensitive areas and accommodating development in areas designated for growth. TDCs are typically created through conservation easements but may also be created through designation of sites as historically or culturally significant. TDC programs provide several benefits:

- Benefits to land owners by providing monetary compensation for limiting development;
- Benefits to developers by allowing development at higher densities and increasing returns to investment;
- Benefits to the public by improving ecosystem services and other landscape features.

A TDC program requires clearly stated and publicly acceptable goals and objectives. Potential goals and objectives for the TDC program are identified in the Land Management Framework including:

- Reducing Surface Water Risk;
- Reducing Groundwater Risk;
- Promoting Habitat Connectivity;
- Protecting Core Habitat

Adoption of the Land Management Framework by the BHI is the first step towards establishing public acceptance of TDCs and appears as a goal in the BHI 2007-2010 Business Plan.

Respecting existing property rights and encouraging development in appropriate areas are core principles of the Land Management Framework and are consistent with the TDC approach. In theory TDC programs have several desirable characteristics:

- Voluntary
- Growth Neutral
- Flexibility
- Low Fiscal Burden

TDCs rely on the voluntary participation of land owners and developers. TDCs provide landowners in areas targeted for conservation with economic incentives to limit development without relying on municipal tax dollars. TDCs do not necessarily restrict growth. Rather they accommodate growth by clustering development near existing infrastructure while conserving environmentally sensitive landscapes. Unlike tax incentives, TDCs can be targeted to specific landscape objectives. TDCs programs are flexible and can be modified over time to achieve numerous objectives including historic and cultural site protection, and increased affordable housing. Due to the effect of substitute incentive programs on participation in TDC programs TDC programs should not be used in conjunction with tax incentives unless they are considered directly in the program design.

Although in terms of area and growth pressures Strathcona County is critical to the sustainability of the BHI, an inter-jurisdictional approach is required to ensure that actions undertaken by Strathcona County alone are not undermined by leapfrogging of development and subdivision applications to neighbouring jurisdictions. One of the drawbacks of inter-jurisdictional programs is the need to consider the cross-county revenue implications if TDCs shift nodes of intensive development between jurisdictions.

A number of keys for a successful TDC program already exist in the BHI:

- The BHI Land Management Framework clearly identifies goals for the program as well as specific criteria and parcels of land in the BHI that could be used for identifying conservation sites;
- The BHI is a transparent inter-jurisdictional planning initiative;
- Proposed new restrictions on development for Strathcona County's BHI Special Policy Area will generate a supply of TDCs and landowners in the Special Policy Area will be compensated for conservation;
- A strong market for development will support demand for TDCs;
- Price differentials for different lot sizes and zoning restrictions within and between the five member counties in the BHI provide preliminary support for voluntary participation of landowners and developers in the program and financial feasibility.

Risks to a TDC program include the current rapid rate of development in the region as well as lack of mechanisms for regional cooperation and revenue sharing between counties. Currently all five member counties are undergoing unprecedented rates of growth and pressures to subdivide agricultural land are increasing. Opportunities to accommodate this growth in a sustainable yet politically acceptable way are rapidly diminishing. If it is to be successful, a TDC program must be implemented quickly before land prices and scarcity of sending areas make a voluntary approach infeasible. Finally the idea of regional planning commissions has been resurrected in the province and may provide a future venue for working out equitable fiscal arrangements between the counties sharing the burden of conservation.

Next steps for successful implementation of a TDC program include:

- Identification of sending areas to be protected and receiving areas and bonuses;
- Analysis of the economic feasibility of alternative TDC design options including calculation of credit requirements and transfer ratios;
- Establishment of administrative structures for facilitating transfers.

Immediate effort should be made to review and ensure that any legislative or bylaw changes required to enable TDCs are implemented. In particular, any required legislative changes should be secured under the current review of the Municipal Government Act.

Municipalities also need to build awareness about TDCs and consult with citizens on design options – particularly the willingness of residents to accept land uses permitted in receiving areas. Many other jurisdictions in Alberta are facing similar growth challenges and interest in TDCs for conservation is increasing. For example, Miistakis Institute is currently working with Red Deer County on TDCs. Municipalities can benefit from sharing information and resources required to establish TDC programs, particularly in the area of legal review and public education and awareness.

# 1. INTRODUCTION

Local governments face difficult decisions regarding how much development to allow and where to allow it. Development creates jobs and housing and helps feed the local tax base, but municipalities are also concerned with the effects of growth on natural capital and quality of life. This report provides an overview of Transferable Development Credits (TDCs) as a mechanism for municipal land management, and examines the feasibility of developing a TDC program in the Beaver Hills area of Alberta. The Beaver Hills area, located in central Alberta, is an extensively treed, upland area consisting of rolling to hummocky terrain rich in native wetlands and aspen dominated Boreal mixed wood forest habitat. The Beaver Hills is valued by area residents and Albertans for its ecological significance and contribution to natural capital. The 'knob and kettle' topography supports a high diversity of vegetation, waterfowl, mammals and birds. The area is also a critical source of surface and ground water. A large proportion of lands, both public and private, exist in their natural state.<sup>1</sup>

The Beaver Hills area includes the five rural municipalities of Strathcona County, Lamont County, Camrose County, Beaver County, and Leduc County. It also includes Elk Island National Park as well as several provincial parks and protected areas. The Beaver Hills are situated immediately east of the City of Edmonton — the fastest growing metropolitan region of Canada. Regional growth is sustained by major industrial areas in the Beaver Hills, including Nisku in Leduc County and the recently established Alberta Industrial Heartland, in Strathcona County. Although past land use in the Beaver Hills has mainly been restricted to agriculture, the ecosystem is threatened by increasing demand for recreational, urban, and country residential land use and requires special consideration for conservation. The Beaver Hills Initiative (BHI) developed from a collective recognition among government agencies and locally-active environmental groups that for this ecosystem to remain sustainable, growth and development must consider these shared resources, and their sensitivity to development.

## 1.1 MUNICIPAL TOOLS FOR LAND MANAGEMENT

Zoning is the most direct method of controlling the amount, location and density of development and has traditionally been the primary tool used by governments to regulate and conserve land (e.g. Walls and McConnell 2004; Thorsnes and Simons 1999). Zoning works by separating, excluding and limiting dissimilar land uses as well as through restrictions on the 'density' of development, such as the number of dwellings that can be built on a certain area of land. Despite its widespread use, restrictive zoning is fraught with problems when used as a stand alone tool for conservation.

The biggest barrier to adopting restrictive zoning is the negative impact on land values in areas that are downzoned. In the US, landowners have viewed restrictive zoning as a "taking" which has led to court battles and high administrative and social costs (Walls and McConnell 2004). Zoning is also associated with 'rent-seeking' behaviour by developers seeking to avoid zoning restrictions (e.g. Kopits et al. 2005, Walls and McConnell 2004, and Mills 1989). Rent seeking occurs when developers apply for zoning exceptions allowing them to override subdivision size and other limits. Appeal processes are costly for governments as well as developers seeking zoning variances. In addition an often overlooked impact of rent-seeking is the burden placed on area residents who are required to participate in the appeal process. Finally, zoning is economically inefficient because it does not consider landowner and community preferences for land use or differences in building costs within a zoning designation.

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<sup>1</sup> Information on the Beaver Hills area is obtained from the Beaver Hills Initiative Website <http://www.beaverhills.ab.ca/landscape/challenges.html>

In response to these challenges municipalities are increasingly turning to market based instruments to support zoning decisions and enhance ecological services beyond zoning requirements. Examples of market based instruments include development charges, tax credits, and tradable development rights/credits. Market based instruments create financial incentives for conservation and stewardship practices and send signals about the social and environmental costs of development activities. By providing financial incentives to support land use decisions, the use of market based instruments strengthens the capacity of municipalities for land management.

Transferable Development Credits (TDCs) are tools that support zoning by allowing private landowners in areas designated for conservation to sell development credits in areas targeted for intensive growth.<sup>2</sup> Under TDC programs municipalities establish baseline development restrictions such as subdivision density limits or building height restrictions through zoning. Zones targeted for conservation and development are designated as “sending” and “receiving” areas respectively. TDC programs may be voluntary or mandatory. For voluntary programs, landowners in sending areas can either develop their land up to the zoning limit or voluntarily choose to develop below the allowable limit. For mandatory programs land owners have development rights curtailed, but in return receive transferable credits for those rights. In either case, TDCs are created through easements which permanently restrict allowable uses of land in sending areas. TDCs are sold to developers in receiving areas who wish to develop their land beyond the base zoning requirement up to a maximum “bonus” or limit.

Well designed TDC programs have several desirable characteristics. First they compensate individuals who conserve land and remove the perception that zoning is unfair to landowners (e.g. McConnell et al. 2003; Fulton et al. 2004). Recent experience in the US indicates that development rights are between 30%-70% of market value which means that landowners receive a significant portion of the development value of their land, while still retaining control and ownership (Chattahoochee Hill Country Alliance, 2007). By making it clear that changes in zoning restrictions can only be achieved through the TDC program, rent seeking behaviour on the part of developers and landowners seeking special zoning allowances is minimized. TDCs are also more economically efficient than simple zoning because they take advantage of the preferences of landowners and the relative development potential of different sites. Landowners with low development potential or high preservation values for their land have an incentive to sell their development rights in areas with high development potential. Since landowners can at least partially recover lost land value resulting from protection of their land, municipalities can protect desirable parcels without placing the burden solely on land owners in conservation areas. Instead the costs of protecting sending sites are spread among landowners and developers leading to a more equitable distribution of the costs of conservation.

## 2. TDC BASICS

TDC programs have three basic components: identification of zones for conservation and development; transferable development credits that quantify the development rights being traded between conservation and development zones; and an administrative procedure for carrying out TDC transactions (Dorfman et al. 2005).

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<sup>2</sup> Development Credits are known as Transferable Development Rights (TDRs) in the US. The use of Transferable Development Credits acknowledges the implicit limitation of rights to develop private property in Canada.

## 2.1 ESTABLISHING ZONES FOR CONSERVATION AND DEVELOPMENT

The first step of a TDC program involves establishing baseline zoning restrictions, such as maximum development densities or minimum subdivision area sizes. TDC programs typically use a dual zoning mechanism where zones are designated as either “sending” (targeted for preservation) or “receiving” (targeted for development) areas based on differences in baseline zoning restrictions. Sending area landowners have the choice to either use/develop their land as allowed under the baseline zoning, or to participate in the TDC program by selling credits to receiving landowners. A credit sale is associated with a permanent deed restriction on the allowable uses on their land. Receiving area landowners can either develop their land to levels allowed under baseline zoning, or they can purchase rights to develop their land beyond baseline zoning limits through the TDC program (Fulton et al. 2004).<sup>3</sup>

Areas designated as sending sites can be any properties containing land types that are important to the community, but typically include agricultural lands, forest lands, and historic properties. For protection of environmentally sensitive areas, the following criteria may be used to designate sending sites: amount of tree cover, incidence of steep slopes, habitat for species of concern or rare species and incidence of wetlands (Dorfman et al. 2005). Programs aiming to preserve agricultural land generally use soil classification or soil quality as criteria or simply allow all lands zoned as agriculture to be sending sites (e.g. Highlands Council 2007; McConnell et al. 2003). In the mandatory Highlands New Jersey program, any property can be a sending site if it could have legally been developed prior to the Highlands Act (Highlands Council 2007). Some TDC programs also have minimum size and/or adjacency criteria for eligible sending sites. For example in the Calvert County program, sending sites must be at least 50 acres if they are stand alone, or 10 acres if they are adjacent to an existing Agricultural Preservation District registered property (McConnell et al. 2003).

Receiving areas are properties that the community has designated as appropriate for development. Receiving areas typically include commercial and residential zones and may also include country residential zones. They are often chosen because of their proximity to existing developments, commercial areas, and urban infrastructure (Fulton et al. 2004). Selecting sending areas is generally easier than receiving areas because there is often consensus regarding the need to protect specific resources (Highlands Council 2007). However the preferences of developers regarding the value of bonuses are often unclear. Because program participation is voluntary, the benefits of participation by developers must exceed the cost. Therefore it is critical that developers are consulted to determine the value of waiving density and other zoning requirements in receiving areas. Examples of bonuses that could be used in a TDC program include higher density allowances for single or multifamily units per acre, increased height limits, and relaxed landscaping, parking in front of commercial, frontage, and open space requirements. Bonuses might target ‘smart growth’ and include TDC obligations for insufficient mix of housing, insufficient road linkages, excessive lawns, excessive asphalt, and ‘McMansions’. The key to identifying receiving areas is to ensure that there is adequate consultation

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<sup>3</sup> In some TDC programs (e.g. Calvert County, Maryland), properties are designated as both sending and receiving areas (McConnell et al. 2003), in which case landowners have three options. First they can choose not to participate in the TDC program and develop their land to baseline zoning levels. Alternatively they can sell the TDCs for their land thus permanently preserving the property, or thirdly they can purchase additional TDCs to develop their land at density levels higher than baseline zoning allows (Walls and McConnell 2004; McConnell et al. 2003). Mixed sending/receiving zones can be used to stimulate demand, by allowing some sending areas to become receiving areas if there are not enough buyers in the TDC market, or stimulate supply by allowing some receiving areas to become sending areas if there are not enough sellers in the TDC market.

with communities. Poor consultation and education about the program can result in a “not in my backyard” backlash resulting in too few receiving areas to sustain the program (Dorfman et al. 2005).

One of the strengths of TDCs is the ability to handle multiple objectives within a single program. Once the objectives of a program are chosen, it is relatively straightforward to identify potential sending and receiving areas within the program area. Dorfman et al. (2005) provide a number of examples of how sending and receiving areas can be designed to satisfy various program goals. These are summarized in Table 1.

**Table 1 Examples of Sending and Receiving Areas**

Program Goals	Sending and Receiving Areas
Historic Preservation	TDCs awarded to historic properties
Affordable Housing	Builders of affordable rental or owner occupied housing receive additional density in exchange for affordable housing
Farmland and Open Space Preservation	Sending areas are Agricultural Reserve zones
Corridor Preservation	Sending areas are undeveloped land along major habitat corridors
Environmental Protection	Sending areas include environmentally sensitive areas, or areas covered by regulations such as stream buffer requirements

## 2.2 BALANCING DEMAND AND SUPPLY

The success of a TDC program is determined by design features that establish relative prices and incentives for trade between sending and receiving areas. Supply and demand conditions for TDCs are determined administratively through the zoning regulations as well as credit allocations and obligations in sending and receiving areas. The trick is to get these right. In the US, TDR programs have often failed either because zoning created thin markets by limiting numbers of buyers or sellers, or because additional regulations governing land use and permit trading resulted in onerous transactions costs and reduced participation in the market.

Relative prices for TDCs are established through allocations, transfer rates, and density bonuses. The transfer rate is the number of TDCs required to build an additional unit of development (e.g. one more housing unit) on a parcel of land. The density bonus is the maximum amount by which development in the receiving area can exceed the zoning limit. Together the transfer rate and the density bonus determine the demand for TDCs. Note that the bonus is only valuable if developers demand development at a higher density than allowed by baseline zoning. Without such demand, developers will not participate in the TDC market.

The rate of TDC allocation to parcels in sending areas must be high enough to maintain adequate supply but at the same time low enough to maintain prices high enough for landowner participation. There are generally three methods of allocating TDCs to sending area parcels (Highlands Council 2007):

1. TDCs can be issued on a per lot basis, for example if a lot is 100 acres and is zoned for 1 dwelling per acre it might receive 100 TDCs (if TDCs are allocated at 1 per applicable acre).
2. TDCs can be issued based on acreage of certain land characteristics (e.g. soil types, forestland, wetlands or simply total land in the parcel). For example in the Chesterfield, New Jersey program lands with best soils for accommodating septic are allocated 1 TDC per 2 acres, while moderate soils are allocated 1 TDC for every 10 acres and poor soils are allocated 1 TDC for every 50 acres. In addition, bonus TDCs can be awarded to parcels that have unique ecological or agricultural characteristics in order to encourage preservation of those parcels (e.g. Highlands Council, 2007).
3. TDCs can be allocated based on the value of lost development potential, however this method is administratively complex and requires appraisals for sending area parcels (and sometimes receiving parcels).

## 2.3 ADMINISTERING TDC TRANSACTIONS

A TDC program must have a process for recording, transferring, and tracking credits and requires an administrative and legal framework to carry out these activities either within existing municipal structures or through a new organization set up specifically for these purposes. TDC programs perform poorly if transaction costs reduce participation in the market (thin markets). Transactions costs include the costs associated with buyers and sellers finding each other, as well as costs associated with negotiating prices for TDC transactions (McConnell et al. 2003). Thin markets themselves also contribute to transactions costs by making it more difficult for market participants to find each other. From a market performance perspective, institutions that facilitate competitive interactions among a large number of buyers and sellers tend to be more efficient. Transactions costs are also associated with statutory requirements that require public hearings for transfers. In these cases the uncertainty and cost associated with the hearing process may deter developers from participating in the market.

Thin markets are typically a result of too little demand for additional development rights on the part of developers (Kopits et al. 2005; Walls and McConnell 2004). Sufficient demand for TDCs requires that developers believe they will be able to sell additional bonuses (e.g. extra housing units per acre) at high enough prices to cover the costs of purchasing TDCs. In order to sustain demand developers cannot be granted bonuses through other means such as special zoning variances (Walls and McConnell 2004, Kopits et al. 2005). Low demand due to limited population growth, and regional recessions have hampered the development of other kinds of environmental markets in the United States. For example, two nutrient trading programs for water quality in Colorado suffered because demand for nutrient reduction offsets was insufficient to sustain water quality trading. Some state level wetland mitigation banking programs have encountered similar problems. In some cases TDC markets are dominated by a small number of well organized developers resulting in too few permits being traded at too low a price. This problem is exacerbated by localization of TDC programs to individual communities or municipalities and restrictions on who can buy or sell TDCs (McConnell et al. 2003). Therefore getting the scope of the market right is important for program success.

TDC banks play a critical role in the success of a TDC program. A TDC bank is typically a governmental or non-profit entity that can act as both an intermediary in the TDC and as a central clearinghouse for TDC

transactions. TDC banks reduce transactions costs by registering credits, publishing information on credit purchases and prices, and assisting buyers and sellers of TDCs in finding each other. A TDC bank can also purchase development credits to stabilize TDC prices, add liquidity to the market, and provide a benchmark for other TDC transactions (Dorfman et al. 2005). Performing these roles can greatly improve the efficiency of a TDC market and improve the likelihood of success for the program. TDC banks can also accelerate land preservation by buying and holding substantial numbers of TDCs.

## 2.4 IMPACTS OF TDC PROGRAMS

### 2.4.1 Development Impact

The expected impact of a TDC program on overall development is determined by the transfer ratio - the rate at which zoning limits in the sending site are converted to bonuses in the receiving area. For example, if a sending site can have a maximum of two housing units per acre and its development rights can be sold to a receiving site for an additional two housing units per acre at the receiving site, then the transfer ratio is 1:1. If development rights provide fewer than two additional housing units per acre at the receiving site, then the transfer ratio is less than 1:1. In contrast, if development rights create more than two additional housing units then the transfer ratio is greater than 1:1. TDC programs with a transfer ratio greater than 1 will accommodate an increase the overall amount of development, while programs with a transfer ratio less than 1 will reduce overall development. Higher transfer ratios also increase the relative payoff from selling TDCs, and increase the incentive for landowners in the sending areas to participate in the program (McConnell et al. 2003).

In spite of large participation in some TDR programs, it is often difficult to measure the net conservation benefit because landowners who choose to maintain their land in an undeveloped state by selling TDCs may not have developed their land in any case (e.g. McConnell et al. 2003; Walls and McConnell 2004). It has also been suggested that TDCs can lead to more development than would occur under a straight zoning policy because of development rights that would not have been exercised in the absence of the TDC program.

### 2.4.2 Fiscal Impact

Municipalities are often concerned about the impacts of conservation programs on their budgets. Since municipalities rely on property taxes, the impact of TDCs on the rate base is a concern. In general the tax base follows the credit. This means that when a credit is created through an easement and traded, land values in the receiving area will decrease and have a negative fiscal impact on the municipality. However, the decrease in development value in sending areas is offset by increases in development values in the receiving area. Dorfman et al. (2005) suggest that property value increases in receiving areas are in the range of 10%, so that the overall impact tends to be neutral or slightly positive. Note that cross jurisdiction programs would need additional mechanisms to ensure that the counties maintain an equitable distribution of fiscal capacity.

### 2.4.3 Affordable Housing

Municipalities in the BHI are faced with a number of growth challenges, including affordable housing. Because they are development neutral, TDR programs neither help nor hurt housing affordability. Low density zoning and policies that preserve land without offsetting the loss of potential housing in other areas are more likely to have an impact on affordable housing. TDCs can be designed to have a positive

impact on the supply of affordable housing by providing additional bonuses to developers who promise to make low cost units available (Dorfman et al. 2005).<sup>4</sup>

#### 2.4.4 Regional Impacts

Leapfrogging has been a problem with some TDR programs as developers choose to develop in neighbouring counties without permit requirements. However the potential for leapfrogging is not limited to TDC and TDR programs. Any program that places restrictions on development has the potential to encourage leapfrogging over the program area into other regions. Leapfrogging has not been as much of an issue with larger mitigation banking programs in the US. This is likely because the program region is large enough that development nodes are contained within the region. Therefore we expect inter-jurisdictional programs to have fewer opportunities for leapfrogging.

#### 2.4.5 Combining Instruments

Governments often use a suite of instruments to achieve conservation and other objectives. Some instruments are complementary. For example, tax credits for conservation easements will increase the participation of landowners in TDC programs. On the other hand, the effects of other types of tax incentives are not clear and may be negative. Tax credits for maintaining land in agriculture rather than some other use, for example, will adversely affect the supply of TDCs since landowners will now be given the option of either receiving a tax credit or participating in the TDC program. The availability of the substitute policy will interfere with participation in the TDC program. Therefore it is important that decision makers consider the full suite of policy options when designing a conservation strategy to ensure that there are not conflicting interactions between policies.

### 2.5 TDC CASE STUDIES

As of 2003, there were approximately 142 Transferable Development Right programs in operation in the United States with program goals ranging from farmland preservation and protection of environmentally sensitive areas to building height limits and historical preservation (Kopits et al. 2005). Many of these programs are inactive with few rights ever having been transferred. While nearly 90,000 acres have been preserved by TDR programs in the US, 40,000 of those have come from the Montgomery County program and only eight programs have preserved more than 1000 acres each (Kopits et al. 2005). A review of the US experience provides lessons for successful implementation of TDC programs in Canada. Examples of several US programs are provided below to highlight the design choices facing municipalities considering these instruments.

#### 2.5.1 Chattahoochee Hill Country (CHC), Fulton County Georgia<sup>5</sup>

The CHC program was initiated in 2001 due to perceived threats of growth on rural areas and valued open space. Stakeholders were concerned that if growth followed the pattern of one house per acre, then 80% of the land in the CHC would be disturbed. The goal of the program is to cluster development while leaving surrounding land unspoiled. Consultants assessed existing conditions and found environmental, open space, historic, and agricultural values to be protected, as well as existing

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<sup>4</sup> Dorfman et al. (2005) note the need for adequate monitoring and enforcement to ensure housing objectives are fulfilled.

<sup>5</sup> See Chattahoochee Hill Country Alliance (2007).

infrastructure. The Master Plan for the CHC maintains the same level of development that would have occurred under existing zoning, but clusters it into higher density villages and hamlets, resulting in only 16% of land disturbed. The Master Plan was implemented by first amending the South Fulton Comprehensive Plan and the county's zoning ordinance to draft a TDR ordinance to transfer density from protected areas to the villages and hamlets. Developers in the villages and hamlets were required to purchase TDRs to obtain the necessary density. The ordinance delineates sending and receiving areas and allows for the creation of a TDR bank. The program was initiated in April 2003. One problem with the program has been the requirement for local government to approve transfers of TDRs which has made landowners hesitant to enter the program. As a result a special bill was put forward to eliminate the requirement for local government approval on TDR transfers.

### 2.5.2 Montgomery County, Maryland<sup>6</sup>

The two most successful TDR programs in the US in terms of acreage preserved are the Montgomery County (40,000 acres preserved as of 2004) and Calvert County (13,000 acres preserved as of 2002) programs in Maryland. Both of these programs have preservation of agricultural land as their goal and both also involve Purchase of Development Right (PDR) programs.<sup>7</sup> The Montgomery program has been successful for several reasons. First the design is straightforward making it relatively simple to administer. In addition, planners did not try to protect farmland that was in a rapid growth area. The agricultural sending zone was located on the opposite side of the County from where urbanization was occurring. Baseline zoning in the sending area was restricted to one dwelling per 25 acres, however TDRs were allocated at a rate of one per 5 acres, creating a 5 to 1 transfer ratio and a strong incentives for sending area landowners to participate in the program.

### 2.5.3 Calvert County, Maryland<sup>8</sup>

Like the Montgomery County program, the Calvert County program is relatively simple to administer and there are few restrictions on participation and trading. Unlike most TDR programs, some land parcels in Calvert can be designated as both sending and receiving areas. This provides more choice for landowners with the result that development is clustered within the sending area as well as between sending and receiving areas. Sending areas in Calvert are not restricted to any specific geographic area but instead are based on agricultural productivity of individual parcels. In addition to this flexibility, other factors contributing to the success of the Calvert County program are actions carried out by the county to increase demand and supply for

TDRs and to stabilize TDR prices. In 1999, the County reduced baseline zoning levels in both sending and receiving areas, while increasing transfer ratios and density bonuses in receiving sites. These actions increased both supply and demand for TDRs. In 1993 Calvert County began purchasing and retiring TDRs. In addition the county began publishing information on TDR sales and prices, as well as contact information for potential TDR buyers. These actions significantly increased activity in the market.

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<sup>6</sup> See McConnell et al. (2003), Fulton et al. 2004; and Walls and McConnell (2004).

<sup>7</sup> Purchase of Development Right programs are a variation of TDCs in which the municipality or some other agency pays landowners to permanently protect their land from development. On their own, PDRs do not include the capability of developers to transfer density to a receiving area. PDRs are used to target specific properties or increase the total area of land protected.

<sup>8</sup> See Kopits et al. (2005) as well as McConnell et al. (2003) and Walls and McConnell (2004).

### 2.5.4 New Jersey Pinelands<sup>9</sup>

The New Jersey Pinelands Program is an inter-jurisdictional TDR program designed to protect environmentally sensitive areas and specialty agriculture. In 1980, the Pineland Planning Commission adopted a comprehensive management which limited residential development using TDRs. The program spans 7 counties and 56 municipalities and is managed by the regional Pinelands Commission which is made up of representatives from the various jurisdictions. The program was created by state statute. Pineland Development Credits are transferred at a specific rate based on the land's development potential and environmental sensitivity. The program lacks sufficient receiving sites and is administratively complex. A key feature of the program is the specificity in terms of how credits are calculated – with woodlands being allotted more credits if they are located above a watershed, wetlands given different credits depending on whether they are in areas where berry harvesting takes place, and so on. Nonetheless, since 1981 a total of 54,831 acres of land have been preserved under the program.

### 2.5.5 Boulder County, Colorado<sup>10</sup>

The Boulder County program allows TDR transfers between Boulder County and its cities. It is sometimes used in conjunction with city and county acquisition where landowners first sell their TDRs to other landowners and then sell the property to the city or county at a reduced price. The city then leases or sells the lots back to area farmers while retaining the easement. The program operates as a revolving fund with the county receiving revenue from leases and sales. Since 1981, 6500 acres of rural land have been preserved under the program. Boulder County is currently considering expanding its TDR program to include requirements on large homes in order to help preserve housing diversity. This proposal is controversial and it faces organized opposition as the goals and objectives are not clearly understood or accepted by landowners.

### 2.5.6 Factors for Success

The factors for success from these case studies and other examples are summarized as follows:

- **Clear Objectives**
  - The TDC program must have clear objectives and should address problems of regional significance. The inclusion of the TDC program in a regional master plan is desirable. The expansion of the Boulder Colorado program is controversial because the goals of the program are not clear.
  - The TDC program should be transparent. Sending areas should be clearly defined and designated, and relate to the objectives of the program.
- **Economic Feasibility**
  - Ensure that zoning creates adequate sending and receiving areas.
  - Ensure strong regulations prohibiting or limiting development on environmentally sensitive land in order to encourage participation in the TDC market.
  - Ensure that TDCs are the only method for obtaining bonuses or relaxations in zoning restrictions.

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<sup>9</sup> See the New Jersey Pinelands Commission (2007).

<sup>10</sup> See Boulder County Colorado (2007).

- A strong market for development will support demand for TDCs. Successful programs also recognize that land directly in the path of growth can't be protected because it is too valuable.
- **Transactions Costs**
  - The agency administering the program should reduce the complexity, confusion and costs associated with the acquisition, transfer and use of TDCs. In particular, requirements for additional approvals in transferring TDCs should be removed.
  - Allocation of TDCs to sending area properties should be simple and equitable, and the program should clearly describe the permissible property uses after property has been deed restricted. The program should also clearly articulate development allowed in receiving areas, with and without TDCs.
- **Monitoring**
  - The administrating agency should monitor the program carefully and be willing to adjust program parameters to address changing market conditions. Older TDR programs in the US have had to evolve to maintain adequate supply and demand.

### **3. FRAMEWORK FOR IMPLEMENTING A TDC PROGRAM IN THE BEAVER HILLS**

#### **3.1 SETTING GOALS TO DIRECT THE TDC PROGRAM**

Setting goals and objectives is the most important aspect of TDC program development. Without clear objectives, it will be difficult to develop other aspects of the program such as choosing sending and receiving areas, and deciding on transfer ratios and density bonuses. Once a program has been initiated, it should be periodically reviewed and assessed to ensure that it is meeting its goals (Highlands Council 2007). The goals and objectives of a TDC program as well as the description and adoption of the program should be set out in a municipality's land use plans (Kwasniak 2004).

For the Beaver Hills Initiative, a TDC program could be used to protect important natural features inside the Beaver Hills Moraine and/or create a buffer zone around important areas of the Moraine. Potential TDC program goals are set out in the BHI Land Management Framework (LMF).<sup>11</sup> According to the BHI 2007-2010 Business Plan a key goal for the BHI is to have the 5 participating municipal councils adopt the LMF. If adopted this framework would form the basis for an inter-jurisdictional TDC program.

The LMF identifies a number of goals that could be achieved voluntarily through the use of a TDC program.<sup>12</sup> These include:

- Preserving the present character and quality of the moraine landscape by protecting aspects of the landscape valued by its residents and visitors for their distinctive natural or cultural configuration;
- Maintaining patches of woodlands and wetlands that now form linkages between or surround, protected areas;
- Maintaining natural areas that provide the aesthetic feel of abundant greenspace;

<sup>11</sup> See Spencer Environmental Management Services Ltd. (2006a) and (2006b).

<sup>12</sup> Spencer Environmental Management Services Ltd. (2006b).

- Conserving intact wetlands where possible, and particularly those that are critical to the hydrology of the BH moraine;
- Providing a riparian buffer on wetlands;
- Retaining native upland habitat (woodlands and grasslands) prominently featured within the Beaver Hills;
- Focusing expanded development on areas most suited to agricultural, industrial, recreational or residential land use.
- Directing new development to cleared, disturbed, isolated and fragmented areas with existing infrastructure to support development;
- Encouraging environmentally sustainable development and land management practices;
- Focusing future development in areas with existing infrastructure (e.g., roads, water & wastewater, schools, etc.) to minimize additional development requirements.

A key principle governing implementation of these goals is respect of existing property rights. As stated in the LMF the BHI promises to:

*“respect existing land use designations, ... respect the rights and responsibilities of private and public landowners and enlist their voluntary cooperation to manage their lands and the resources of the Beaver Hills in a sustainable manner.”*

Based on these principles, a voluntary TDC program is suitable for achieving conservation objectives in the BHI.

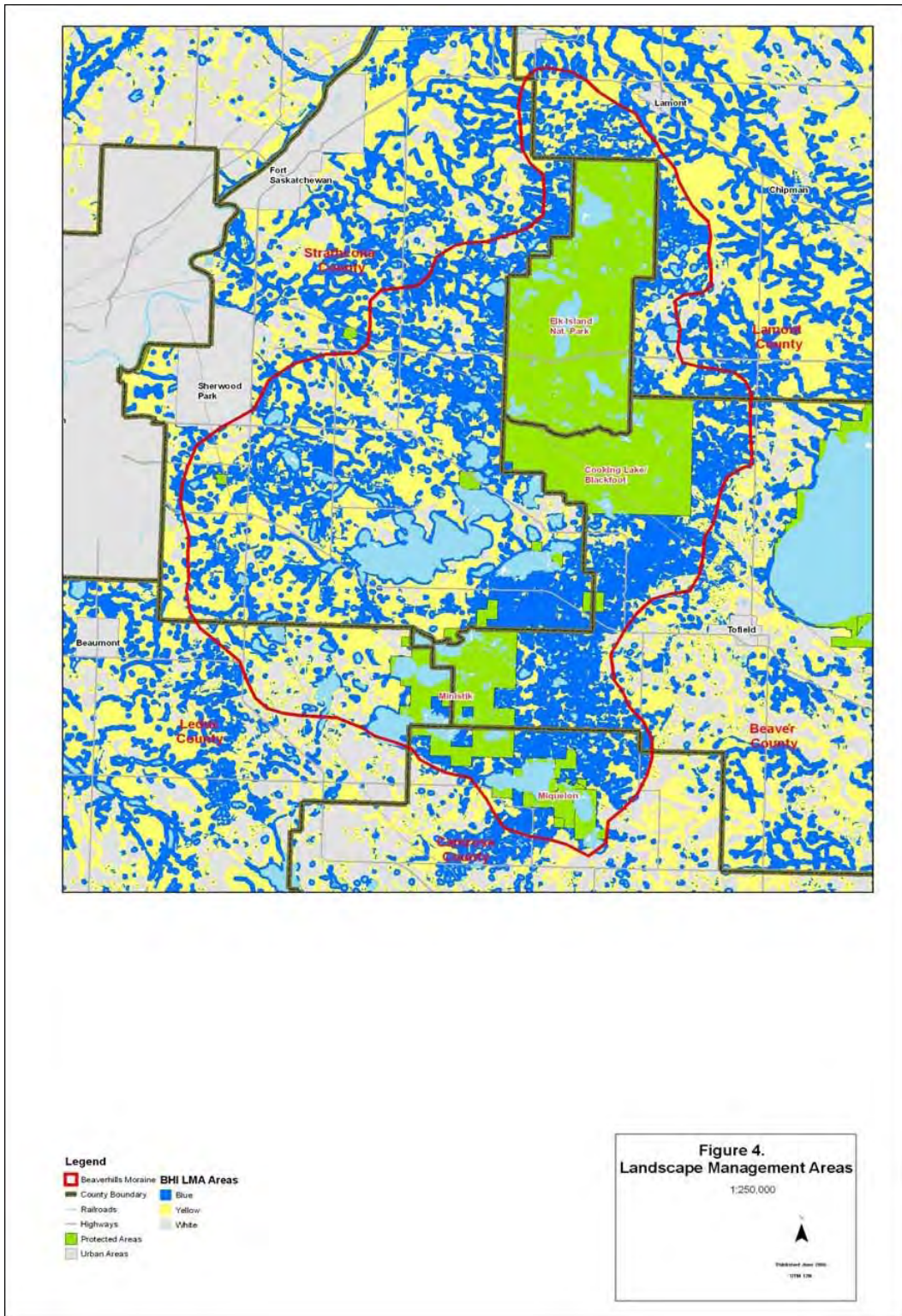
### **3.2 IDENTIFYING POTENTIAL SENDING AREAS**

The LMF provides several potential criteria for selecting sending sites in the five participating counties. At the coarsest resolution, the LMF sets out three types of Land Management Areas (LMAs) that could be used to designate sending and receiving areas. These are ‘blue’, ‘yellow’, and ‘white’ areas which correspond to areas in which resources occur.<sup>13</sup> Blue LMAs are critical to the moraine’s ecology due to the concentration of resources that are critical for retaining the area’s biodiversity value, ecological integrity, and natural capital outside designated protected areas (Green Area). The LMF proposes protecting landscapes in the Blue LMA from extensive development. While Yellow LMAs also contain environmentally sensitive resources, they are more developed and less valuable than blue areas. White LMAs have no significant resources, and coincide with urban and industrial infrastructure and development. The LMAs for the BHI are set out in Figure 1.

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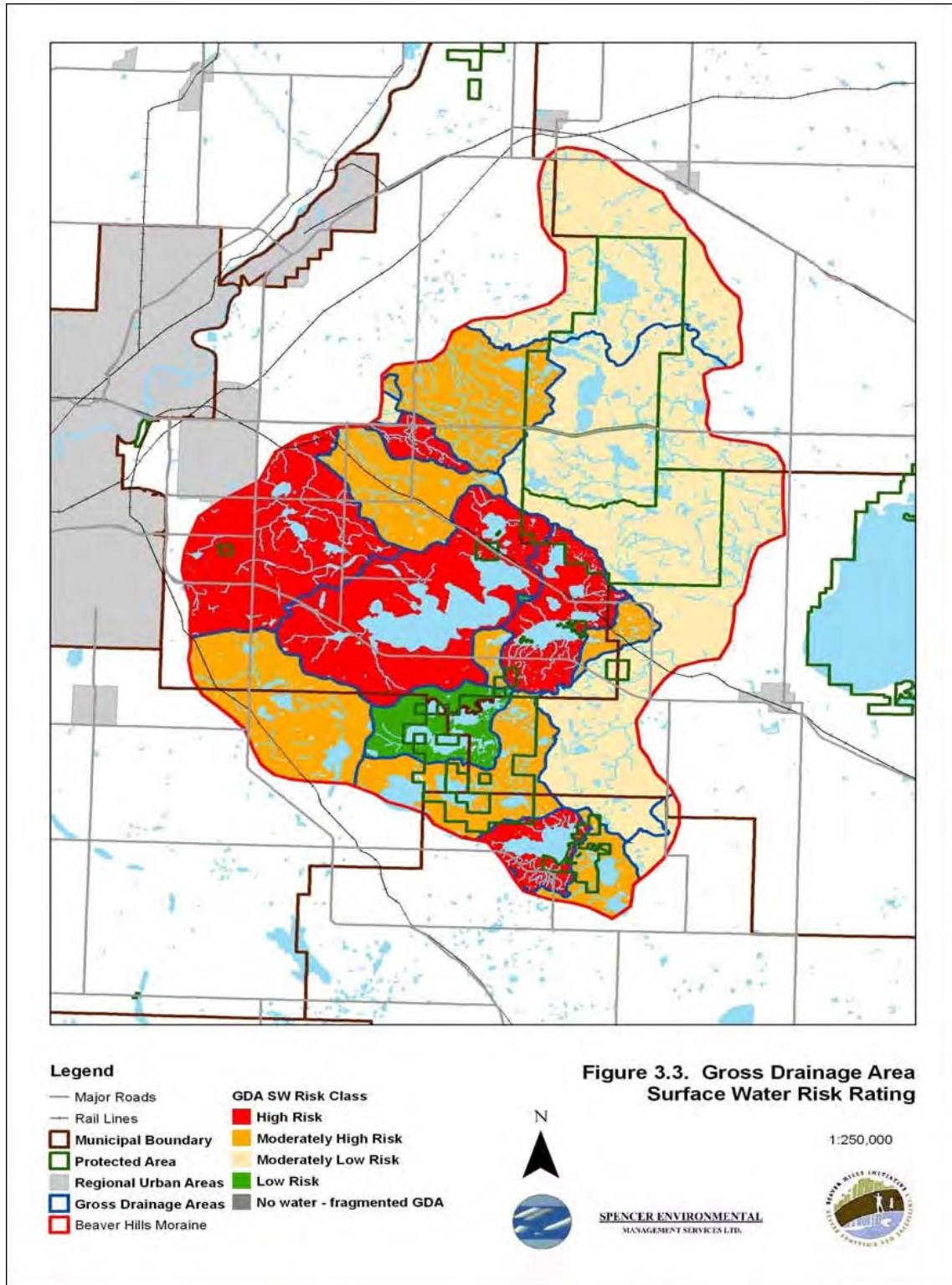
<sup>13</sup> See Spencer Environmental Management Services Ltd. (2006a).

Figure 1 BHI Landscape Management Areas



Credits can be allocated to sites within the blue LMA using criteria for Ecological Functional Zones (EFZs) set out in the LMF. The EFZs of interest are surface water risk, groundwater contamination risk, landscape connectivity and biodiversity core areas. Included in Phase 2 of the Framework are maps of the five counties showing areas of differing levels of concern for each of the EFZs listed above (Spencer Environmental Management Services Ltd. 2006b). These maps could be used to decide on properties' eligibility for sending site status by determining which of the EFZs the property occurs in. Using the information in the Framework, the participating municipalities would have several options for determining sending site eligibility. For example, the counties could set out guidelines that being in certain zones for any one EFZ is sufficient to be a sending site, or alternatively they could require being located in multiple EFZs or restrict eligibility to only certain EFZs. If the BHI counties choose to protect natural values within the Beaver Hills, the Land Management Framework should provide all the necessary information for selecting sending sites. The GIS layers for LMAs and EFZs contained in the Land Management Framework will aid in calculation of potential sending and receiving areas under alternative program specifications. For example Surface Water Risk rating areas for the BHI are given in Figure 2.

Figure 2 BHI Surface Water Risk Rating Areas



### 3.3 IDENTIFICATION OF POTENTIAL RECEIVING AREAS

While there is a great deal of information on ecologically and culturally significant features in the BHI, there has been little analysis to support the identification of potential receiving areas, beyond the White LMAs identified in Figure 1. It is important that receiving areas are chosen in such a way as to ensure sufficient demand for TDCs in the market, which can be aided by looking at predicted housing needs and starts to help predict demand for TDCs (Dorfman et al. 2005). Receiving zones must also take into account whether the areas have the infrastructure capacity to accept increased development, and whether or not increased development in those areas will be publicly and politically acceptable (Highlands Council 2007). Receiving area criteria in the BHI may include:

- areas close to existing areas of concentrated development and existing population centres;
- areas with access to multi-modal transportation utilizing existing transportation networks;
- areas where lands is under-utilized or previously undeveloped.

Residential development in Strathcona County has tended to spread east from the Edmonton area, and industrial development has been clustered along the eastern and northern edges of the county. Further analysis of the White LMAs in the LMF, as well as consultation with developers about the value of bonuses will help establish receiving areas, and the potential demand for TDCs.

### 3.4 EXISTING ZONING

Figure 3 shows the current zoning as set out by existing MDPs for the five counties that have land in the Beaver Hills Moraine area. The moraine area is outlined in red. The percentage of moraine covered by each county as well as the percentage of area that is moraine within each county's total area is illustrated in Table 2. Phase 1 of the LMF (Spencer Environmental Consultants Ltd., 2006a), provides an analysis of county MDPs and the extent to which environmental features within the moraine area are protected. For each county there is an opportunity to conserve unprotected land within the moraine through use of a TDC program. We illustrate opportunities by reviewing the current zoning for each county within the moraine. The exercise also highlights the need for an inter-jurisdictional approach within the moraine to ensure that leapfrogging of development doesn't undermine the objectives of the program. Finally there are opportunities for each county to use TDCs not only to conserve land within the moraine area, but to cluster developments within the county to conserve agricultural landscapes and encourage smarter growth within the larger region.

*Table 2 Relative Areas of BHI by County*

	Beaver Hills Area as % of County	% Beaver Hills Area by County
Strathcona County	55.2	43.9
Leduc County	4.6	7.9
Camrose County	3.4	7.8
Beaver County	8.7	19.8
Lamont County	5.3	8.5
Elk Island Park	100	12.1

### 3.4.1 Strathcona County

Strathcona County is the “industrial heartland” of Alberta. Strathcona County is located at the junction of some of the most important pipelines in the nation and, further, is home to Canada's largest oil refining complex as well as North America's third largest petrochemical complex.<sup>14</sup> The increase in new investment in Alberta’s oil sands has led to increased pressures on suburban counties such as Strathcona to subdivide agricultural land. For example, in 2006 the number of subdivision applications in the county more than doubled from the previous year. Strathcona has the greatest percentage of county area within the Beaver Hills, and also represents more than 40% of the moraine area. Excluding Elk Island National Park, Strathcona has more than 50% of the unprotected area within the Beaver Hills Moraine. Due to its strategic importance in the moraine and the concentration of industrial development in the province, Strathcona County’s policies are pivotal to the sustainability of the region.

Strathcona recently updated its MDP and it is currently in the process of being approved. A key feature of the new MDP is the creation of the new Beaver Hills Moraine Policy Area which will cover much of Strathcona’s section of the moraine, including the most dense Blue LMA zone in that area, and provide a buffer along both Elk Island National Park and the Cooking Lake/Blackfoot Reserve. In the new MDP the policy area is extended to enclose most of the Blue LMAs and the lands around Cooking Lake. As a result, it provides a linkage between the key protected areas of the moraine: Elk Island National Park and the Cooking Lake/Blackfoot Reserve to the north and Ministik and Miquelon to the south. Environmental protection will be a primary focus in this area, and subdivision will not be permitted beyond first parcel out or 80 acre split. The Agricultural Small Holding Policy Area, immediately west of the new Beaver Hills Moraine area, will provide a zone of transition from the more dense and urban policy areas to the west (see Spencer Environmental Management Services Ltd. 2006a).

The Beaver Hills Moraine Policy Area is currently sparsely populated agricultural land. The restrictions on subdivision development in the extended policy area represent a significant downzoning from existing zoning requirements. In the past where land owners were permitted 10 lots per quarter section, they will now be restricted to first parcel out, or two 80 acre parcels. A mandatory TDC program in this area could compensate landowners who choose to go one step further and permanently prevent subdivision through an easement, or protect or restore important features of the subdivided land (e.g. wildlife corridors). Easements maintaining land in agriculture would also prevent fragmentation of the landscape from infrastructure and road requirements to each lot within the farm. Finally, TDCs may also be used to conserve land or cluster development within the Country Residential, and agricultural small holding areas.

### 3.4.2 Beaver County

Beaver County has the second largest share of land within the BHI Moraine, however the moraine represents a relatively small percentage of land in the county. Beaver County established the Ministik Lake Game Bird Sanctuary Buffer and the Rural Country Residential Policy Areas in their draft MDP, which captures much of the Blue LMA lands in the southeast part of the moraine. The boundary of the Cooking Lake/Blackfoot Reserve, and the Blue LMA lands to the eastern edge of the moraine boundary, remain without formal protection. TDCs could be used to enhance conservation objectives in the Blue LMA areas without formal protection.

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<sup>14</sup> From Mayor Cathy Oelsen’s address October 18, 2006 to the Sherwood Park and District Chamber of Commerce.

### 3.4.3 Lamont County

Lamont's MDP manages the lands within the moraine, along the north and east border of Elk Island National Park, as Agricultural Policy Areas. Land designated as A2 Agricultural is lower quality for agriculture, and therefore is more vulnerable to subdivision. The moraine lands directly east of the Park have a White-tailed deer overlay that captures a large Blue LMA zone in this part of the moraine (Figure 4). A small lake between that area and Highway 16 is a valued waterfowl area and includes the Blue LMA zone surrounding that waterbody. The MDP states that critical fish and wildlife areas such as these should be conserved where possible, but does not provide any specific measures related to these identified areas. Other Blue LMAs to the north and immediately adjacent Highway 16 and the park are not protected with any special policy areas. As in Beaver County, there are opportunities to protect Blue LMAs in Lamont County through a TDC program.

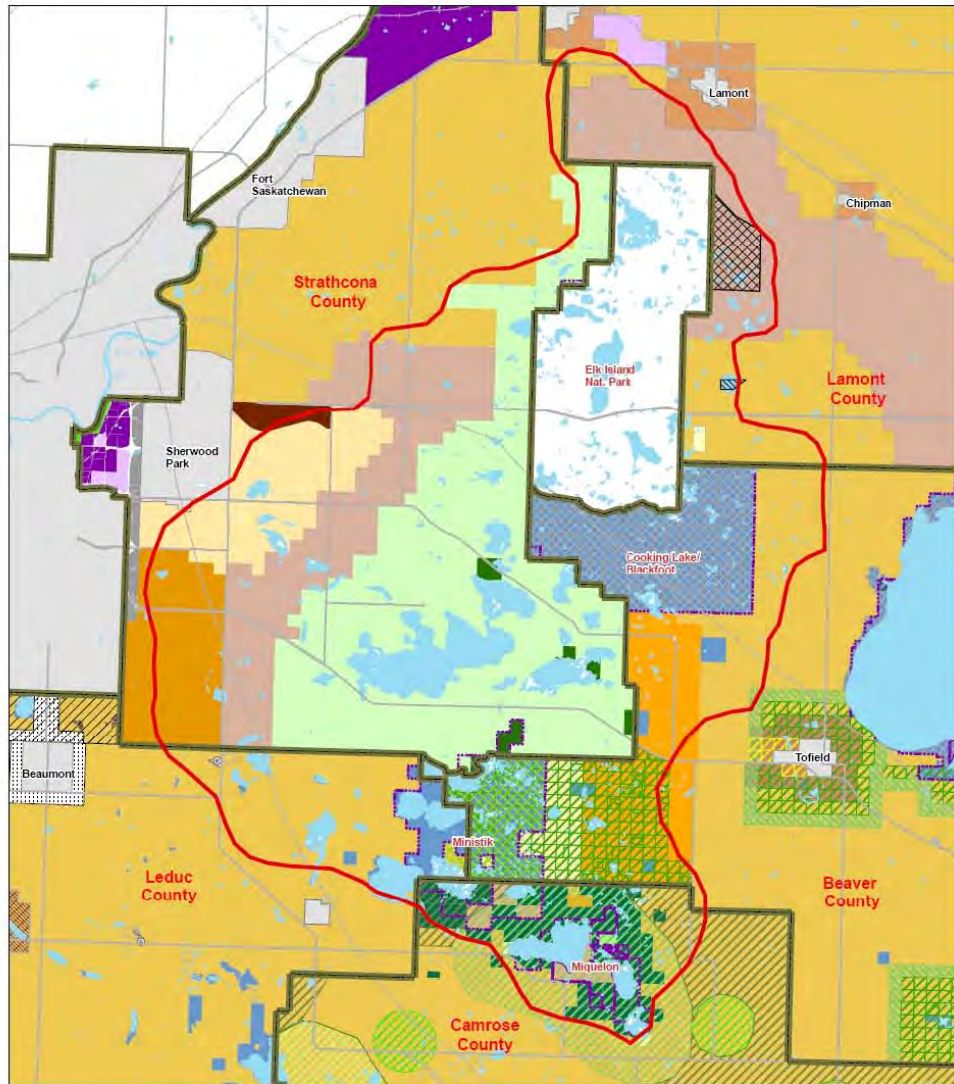
### 3.4.4 Camrose County

Camrose County has only Confined Feeding Operation (CFO) areas delineated in the MDP (Figure 2). All of their lands within the moraine fall within two CFO overlay zones (the Recreational Lakes and F zones), which captures the broad area of Blue LMA at the County has no other specific policy areas associated with this part of the moraine. They do, however, have a requirement for a lake management plan for recreational lakes (including Miquelon) in their MDP, which considers both recreational potential and sustainable development. The Environment/Wildlife section of the MPD also outlines other protective measures for groundwater function, wildlife corridors, tree and native vegetation retention and key wildlife habitat that could be applied to maintain key features in this part of the moraine. These features could be brought into a TDC program.

### 3.4.5 Leduc County

Leduc County has one main agricultural policy area within the moraine which extends to the boundary of the Ministik Game Bird Sanctuary. Small parcels of Crown lands, including those within Ministik, are the only other policy areas within this area. Leduc's section of the moraine contains a roughly equal mix of Yellow and White LMAs, with Blue LMAs clustered around wetlands and lakes. There is no distinction in terms of policy areas for the Blue LMAs (mainly waterbodies), or for the lands immediately adjacent Ministik. Instead, like Camrose, their MDP provides measures for protection of environmental features, primarily waterbodies. Unlike Camrose, no protection measures to address specific environmental features such as groundwater or large areas of naturally vegetated land are provided. Country residential uses are permitted in these agricultural areas, provided they meet certain criteria and are set back from any waterbodies, although developments adjacent to environmentally sensitive areas (which would include Ministik) require prior evaluation through an EIA process. There are no specific policies to foster restoration of the agricultural lands adjacent Ministik, and no criteria defining an appropriate transition in land use between Ministik and more densely populated areas. An alternative would be to allow properties in environmentally sensitive areas and areas that might buffer land use next to Ministik to participate in a TDC program. One challenge with Leduc County is its proximity to intensive development nodes. An inter-jurisdictional program might also consider a transfer in development density from other counties to growth nodes in Leduc as well as Strathcona Counties.

Figure 3 Comparative MDP Map



**Figure 2 Comparative MDP Map**  
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### 3.5 FINANCIAL FEASIBILITY OF A TDC PROGRAM IN THE BEAVER HILLS

In order to be financially feasible the TDC program must be designed so that buying/selling a TDC generates net benefits for developers and sellers respectively. A full economic analysis of potential TDC options is beyond the scope of this report. However, a review of the Multiple Listings Service (MLS) for vacant and agricultural lands in the five counties provides some initial support for both landowner and developer participation in a TDC program under existing zoning. To evaluate the value of TDCs to potential sellers, we consider the value of vacant agricultural land as a proxy for maintaining land in agricultural parcels rather than subdividing. Development values in potential sending regions are proxied by comparing the values of land in quarter sections of agriculture to land split into 80 acre and 40 acre parcels; to values of higher density parcels (3-5 acres); and finally to most densely subdivided parcels (.5-3 acres). Table 3 sets out a range of values for vacant land in the 5 counties based on MLS the week of September 17-21, 2007. For example, in Strathcona County, the only agricultural land parcel that we identified for sale was valued at ~\$10,000 per acre. On the other hand, subdividable vacant land ranged from 23,000-182,500 per acre depending on whether it was zoned for industrial, commercial or residential purposes. Similar price differentials exist between the different zonings and parcel sizes for the other counties.

**Table 3 Vacant Land Values in the BHI**

Zoning/Lot Size <sup>15</sup>	County Land Value Ranges (\$/acre)				
	Strathcona	Leduc	Camrose	Beaver	Lamont
<b>Agricultural (from ¼ section)</b>	\$9,916	\$2,400-\$3,100	\$4,225	\$595-\$2,800	\$1,125-\$1,548
<b>Country Residential</b>		\$21,000		\$16,566	
<b>Industrial-Commercial</b>	\$23,000-\$40,000	\$83,000-\$85,000	\$25,000	\$10,000-\$34,000	\$30,000
<b>Subdividable</b>	\$182,500	\$49,000-\$90,000		\$1,112-\$2,235	\$2,496-\$2,750
<b>80 acres</b>		\$2,737		\$2,800-\$3,700	
<b>40 acres</b>			\$5,500-\$5,600		
<b>10-40 acres</b>			\$7,900-\$23,000	\$11,000-\$30,000	
<b>3-5 acres</b>			\$14,294-\$34,000	\$38,000-\$125,135	
<b>.5-3 acres</b>		\$21,000-\$41,250	\$64,000	\$57,234	

To understand how TDCs could work in practice, we consider a hypothetical example based on the relative values of properties in Camrose County taken from the MLS. The first property is 142 acres of farm land valued at \$599,000, or \$4,225 per acre. The second property is a 40 acre parcel valued at \$220,000 or \$5,500 per acre. The third parcel is 5.02 acres listed at \$129,900 or \$25,876 per acre. Finally the last parcel is 2.44 acres and listed at \$82,500 or 33,811 per acre.

First consider the potential buyer’s perspective. The example illustrates that a developer would benefit by \$20,376 per acre if allowed to subdivide the 40 acre parcel into eight 5 acre parcels. The developer would benefit by a further \$7,935 per acre if the property could be subdivided into sixteen 2.5 acre parcels. Now consider the seller’s perspective. Assume that the agricultural land can be subdivided into 40 acre parcels. Keeping the land intact (142 acres) rather than subdividing into four approximately 40

<sup>15</sup> Note that property values vary due to a number of omitted criteria. In addition, variations in the way properties are listed prevents direct comparison across categories for different counties. Zoning categories were used if zoning was mentioned in the listing (for example Country Residential). Agricultural lands are either mentioned in zoning or else the listing identified the land as farm land. Note also that not all counties report vacant lands for sale under each of these categories – depending on both zoning within the county, as well as how the property was advertised.

acre parcels results in a loss of \$1,275 per acre. The landowner would have to be compensated a total of \$181,000 for this loss in development potential. At the same time, the value to the developer of being able to convert a single 40 acre parcel to 8 units is equal to \$815,000 in total. The value per hectare is even higher if density is increased to 2.5 acres parcels. This suggests that developers might be willing to pay for additional density in receiving areas which currently allow limited subdivision, and that the value of this extra density might be sufficient to compensate agricultural landowners from subdividing their land in sending areas with more restrictive zoning. Table 3 illustrates similar opportunities for trading between counties within the BHI. This suggests that TDCs could be used both to cluster developments within counties so that more area can be protected within the moraine, as well as to cluster development between counties.

### **3.6 LEGAL ANALYSIS OF TDC PROGRAM IN THE BEAVER HILLS**

In order to assess the legal feasibility of TDCs we consider first whether municipalities have the right to use TDCs, and second, what mechanisms are available for restricting land uses on properties. The analysis presented in this section is taken from Kwasniak's (2004) review of these issues for the BHI.

#### **3.6.1 Authority to use TDCs**

Even though municipalities have the legal right to turn down land development applications that would violate the municipal landscape protection policies, councils often do not turn them down because of pressure by developers, claims for compensation, perceived needs for increased tax base, and a desire to avoid denying land owners the development benefits of their land. With only a few exceptions, rarely in Canada could a council's denial of a zoning change, subdivision, or development application, legally give rise to a compensation claim. However, councillors are often unaware of the municipality's legal rights, or for other reasons are unwilling to assert such rights. Incentive-based instruments such as TDCs have the potential to alleviate one of the above concerns by allowing developers to retain some of the development value of their land, while at the same time not giving up their property rights.

Currently it is not clear whether municipalities have the legal right to employ TDCs. As statutory organizations, municipalities have no authority beyond the powers expressly or implicitly conferred by legislation, for example those outlined in the Alberta Municipal Government Act (MGA) and acting beyond their authority can lead the court to declare that the municipality's policy is void. On the other hand, while no province in Canada has legislation that expressly authorizes municipalities to develop TDC programs, it is likely that the MGA implicitly authorizes a TDC program in Alberta as long as the municipality's actions in setting up the program are not unreasonable, uncertain, discriminatory, made in bad faith or intended for an "improper purpose". Moreover, if TDC programs aid in developing viable communities (Part 1, Section 3 of the MGA), or in achieving orderly, economical and beneficial development, and maintaining or improving the quality of the physical environment without infringing on the rights of individuals for any public interest (Part 17, Section 617), then the program would fit the prescribed purposes of a municipality according to the MGA. Finally, the MGA and case history implicitly or explicitly authorize the use of Area Structure Plans (ASP) and land use bylaws that are required for the TDC program.

#### **3.6.2 Mechanisms for Restricting Land Use**

TDC programs require a mechanism for restricting land use on protected properties. Conservation easements are commonly used in Canada to preserve natural features such as wetlands and wildlife

habitat. Most provinces in Canada have conservation easement legislation specifically allowing municipalities to hold conservation easements. However the Alberta Environmental Protection and Enhancement Act states that conservation easements can only be used to protect natural landscapes and their components. Therefore, a TDC program in Alberta could only use conservation easements to protect natural or ecological values on properties and not to protect agricultural land or other cultural and historic features (Kwasniak 2004).

A second option for restricting land use is through designating the property as a historic or heritage site. The Alberta Historical Resources Act authorizes landowners to enter into agreements with municipalities to preserve or restore land or buildings designated as historical resources. The Act defines historic resources to include works of nature or humans that are “primarily of value for their palaeontological, archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest including but not limited to, a palaeontological, archaeological, prehistoric, historic or natural site, structure or object”. The broad application of historic/heritage designations make them a versatile tool for protecting lands through a TDC program.

In spite of their possibilities we believe that further investigation is necessary to understand how the historical designation might function in practice. Could it be applied to specific areas within a parcel of land (for environmentally sensitive features for example); what is the level of permanence associated with such designations; is the approval process for designations too cumbersome and prevent participation in the TDC market. The MGA in Alberta is currently under review. The above discussion highlights the need to ensure that requirements for instruments that might be utilized by municipal governments for conservation are enabled within the new legislation and that municipalities are not saddled with second best alternatives.

### 3.7 CONCLUSIONS

This report outlines TDC instruments and examines the feasibility of implementing TDCs for conserving ecological assets in the BHI area. In particular a voluntary TDC program would support the guiding principles for land management in the BHI which include preservation of ecologically significant features, encouraging environmentally sustainable development, encouraging development in areas most appropriate for development, and in particular, respecting the existing rights and responsibilities of private land owners. Unlike other instruments such as taxes, TDC programs can target specific parcels of land without being discriminatory, and are voluntary. In addition, the fiscal burden on municipalities is lower than for other incentive programs.

In any TDC program, deciding on the goals and objectives of the program is the most important aspect of its development. The proposed Land Management Framework for the BHI provides the foundation for a TDC program. With clear goals established developing the rest of the program and garnering public support is easier. We review the current zoning for each county in the BHI and show that the objectives of the BHI could likely be advanced through existing zoning with complementary TDC incentives associated with Blue LMAs and/or EFZs for unprotected lands within the moraine area. TDCs could also be used to compensate land owners in Strathcona County’s Special Management Area. The exercise highlights the need for an inter-jurisdictional approach within the moraine to ensure that leapfrogging of development doesn’t undermine the objectives of the program. A preliminary analysis of land values in the BHI suggests that the TDC program is economically feasible. The variance in property values within and between different zones and counties supports moving forward with a more detailed economic feasibility study to assess different design options for TDCs.

Because of the planning work already completed under the BHI, many of the factors required for a successful TDC program are already in place. These include:

- **Inclusion of the TDC program in a Master Plan.**

BHI Land Management Framework can be considered a master plan for the region. The Framework addresses problems of regional significance (water quality, ecologically significant areas, and habitat protection), and clearly states objectives that could be used as the basis for the TDC program.

- **Strong regulations prohibiting or limiting development on environmentally sensitive land.**

The proposed MDP for Strathcona County includes the BHI Special Policy Area which has strong restrictions on development. All of the other counties have differential zoning which could be strengthened to build a TDC program

- **Strong market for development.**

Currently all of the counties in the BHI are currently exhibiting an unprecedented rate of investment and growth which could sustain a TDC market. TDC values should be less than the marginal value of increased density in receiving areas, otherwise no demand for TDCs will be generated. The relative land values in the five counties demonstrate that the value of increased density exceeds the cost to agricultural land owners of not developing up to zoning limits.

- **Sending areas should be clearly defined and designated, and relate to the objectives of the program.**

The BHI Land Management Framework clearly identifies potential sending areas in the Beaver Hills Moraine based on multiple objectives (water quality, habitat protection, etc.)

In spite of the many opportunities for establishing TDCs in the BHI, a number of threats are also on the horizon. The greatest of these is the current rapid rate of development in the region which is quickly eliminating opportunities for implementing a successful program. The more land developed outside of a TDC program, the fewer opportunities for conservation and the less likely there will be strong participation in the market. The second threat to TDCs is the lack of a mechanism for regional municipal cooperation and planning in the province. The second factor is being addressed through the revival of the idea of regional planning commissions initiated by the current provincial government.

### **3.8 NEXT STEPS**

Next steps for successful implementation of a TDC program include: identification of potential receiving areas and the value of bonuses; detailed economic feasibility study of alternative TDC design options including calculation of credit requirements and transfer ratios; and design of administrative structures for facilitating transfers. Municipalities also need to build awareness and consult with citizens regarding their willingness to accept land uses permitted in receiving areas as well as to participate in a TDC program in sending areas.

Choosing sending sites requires decisions on criteria for eligibility including land types, and the possibility of minimum size requirements for sending site lots. Phase 1 and Phase 2 of the Land

Management Framework provide much of the necessary information for choosing potential sending and receiving sites in the five Beaver Hills counties. Once criteria for sending site eligibility have been decided upon, the municipality must then decide how to allocate TDCs to those sites, using allocations per lot, per acre of certain characteristics, or based on lost development value. Municipalities must also decide if sending site parcels will be deed restricted upon initial registration of the parcel or upon sale of TDCs from the parcel, and must also decide whether or not deed restricted lands will be eligible for reductions in property tax assessments.

When deciding on potential receiving sites, municipalities must consider where extra development is desirable both politically and publicly, and must also consider whether or not such development is feasible economically, ecologically and in terms of infrastructure. Once potential receiving sites have been selected, transfer ratios must be chosen such that total development is influenced in the desirable manner (increased or decreased) while also ensuring sufficient incentives for developer participation in the program. Similarly, bonus ratios must be chosen so that developers have incentives to purchase TDCs. Municipalities need to work with the development industry to identify potential bonuses and their values, as well as potential receiving areas. Once sending and receiving sites are identified hypothetical analysis of the financial feasibility of two or three TDC design options should be undertaken before the program is finalized. It is highly recommended that a TDC bank be instituted. The bank would carry out the tasks of recording and tracking TDC registries and sales, along with carrying out actions to facilitate development of the TDC market either by assisting buyers and sellers in finding each other and/or by actively participating as a buyer and seller of TDCs.

Efforts should be made to review and ensure that any legislative or bylaw changes required to enable TDCs are implemented. In Alberta restrictions on the use of conservation easements may increase transactions costs of TDC programs and reduce their flexibility and performance. Due to potential transactions cost implications it is not yet clear whether a historical designation is a suitable substitute for an easement in a TDC program for Alberta. It is preferable to expand the scope for the use of easements within the province in order to maintain flexibility for municipalities in conservation program design. A priority for the BHI and any other municipalities considering the use of TDCs is to ensure that requirements for enabling TDCs are incorporated into the Municipal Government Act during the current review process. Once the design of the TDC program is finalized, the criteria for establishing TDCs and permitted land uses in receiving areas should be included in the municipality's land use bylaws.

Public and municipal support is critical to a successful TDC program. No matter how well a program is designed, it is unlikely to succeed without the support of landowners and developers, since any TDC program is dependent on the voluntary participation of both groups. One method for increasing public support for a program is to provide for citizen input into the planning stages of a program through a Citizens Advisory Committee. This group should include landowners in both potential sending and receiving areas, real estate professionals, homeowner groups, and community activists. By holding meetings with citizen groups, the program can be adjusted in ways that increase its attractiveness for both landowners and developers while still achieving the goals of the municipality (Dorfman et al. 2005).

If a TDC program is developed with clear and easy to understand objectives and gains public and political support, then it will likely succeed in promoting conservation objectives in the BHI.

## 4. REFERENCES

Boulder County Colorado Land Use Department. 2007. Expanded TDR Program, [http://www.co.boulder.co.us/lu/comp\\_plan\\_update/tdr\\_expanded\\_media\\_index.htm](http://www.co.boulder.co.us/lu/comp_plan_update/tdr_expanded_media_index.htm)

Chattahoochee Hill Country Alliance. 2007. TDRs: Land Conservation and Development Incentives Questions and Answers, <http://www.chatthillcountry.org/hot-topics/tdrl.htm>

Dorfman, J.H., J.H. Atilas, J.B. Roskie, J. Boring, N. Nelson and B. Gavrilles. 2005. The feasibility of a transferable development rights program for Athens-Clarke County, Georgia. The University of Georgia Alliance for Quality Growth and the Athens-Clarke County Planning Department.

Fulton, William, Jan Mazurek, Rick Pruetz, and Chris Williamson. 2004. TDRs and other market-based land mechanisms: How they work and their role in shaping metropolitan growth. Washington, DC: The Brookings Institution

Highlands Council. 2007. Transferable development rights technical report – Draft. Prepared by State of New Jersey Highlands Water Protection and Planning Council.

Kopits, Elizabeth, Virginia McConnell, and Margaret Walls. October 2005. Making Markets for Development Rights Work. What Determines Demand? Discussion Paper 05-45 Resources For The Future.

Kwasniak, Arlene J. 2004. The potential for municipal transfer of development credits programs in Canada. *Journal of Environmental Law and Practice* 15(1): 2-21.

McConnell, Virginia; Kopits, Elizabeth; and Walls, Margaret. March 2003. How well can markets for development rights work? Evaluating a farmland preservation program. Discussion Paper 03-08. Resources For the Future.

Spencer Environmental Management Services Ltd. 2006a. Beaver Hills Initiative Land Use Planning and Management Framework – Phase I Report.

Spencer Environmental Management Services Ltd. 2006b. Beaver Hills Initiative Land Management Framework Phase 2 (Draft).

Thorsnes, Paul, and Gerald P.W. Simon. 1999. Letting the Market Preserve Land: The Case for a Market-Driven Transfer of Development Rights Program. *Contemporary Economic Policy* 17(2): 256–266.

Walls, Margaret and Virginia McConnell. March 2004. Incentive-Based Land Use Policies and Water Quality in the Chesapeake Bay. Discussion Paper 04-20 Resources For the Future.

New Jersey Pinelands Commission, March 2007. Pineland Development Credits Summary Report Through December 31, 2006. New Jersey.

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