

**The Conservation of Biological Diversity
Through Land Use Policy
The Great Sand Hills Case Study**

Introduction:

Conservation of the earth's in-situ biological diversity requires effective land use policies and wise resource use. Land use policy development, planning and zoning are proactive mechanisms to identify development and resource use constraints and opportunities. Ensuring that conservation of biological diversity is a primary objective in land use policies is a prerequisite to protecting natural heritage resources.

Zoning is the division of a parcel of land with zones being defined according to permissible uses or land use objectives. Biological diversity is defined here as the variety and variability among living organisms and the ecological systems of which they are part; this includes diversity within species, between species and of ecosystems. Conservation is the wise use of resources.

Recently, much attention has been given to the establishment of "protected areas" as a means to conserve biological diversity. Establishment of protected areas is important to the conservation of biological diversity, but should not be viewed as the total solution. Rather, protected areas should be viewed as important components within a land use strategy where conservation of biological diversity is a primary objective. Within a land use development strategy, protected areas should be the least developed or used sites. However, conservation of biological diversity will likely be as important - if not more important in areas outside of protected areas.

Protected areas are defined here as landscape units that have been designated and are managed for biological diversity. Development and use are possible provided biological diversity is not compromised.

The purpose of this paper is to promote the concept of land use policy development and planning as a means to conserve biological diversity while achieving sustainable social and economic benefits. A land use strategy for an area in southern Saskatchewan known as the Great Sand Hills was recently prepared. The strategy was developed to ensure that the biological diversity and heritage resources of the Great Sand Hills were protected

while the area was being developed to achieve social and economic objectives.

Background:

The Great Sand Hills area is a unique and sensitive region consisting of two large blocks located between the Trans-Canada Highway and the South Saskatchewan River (see Figure 1). This area has more or less continuous surface deposits of unconsolidated sands. The Great Sand Hills area contains the greatest concentration of dunes in populated areas of Canada and the largest contiguous area of dunes in the Canadian prairie.

The major land uses in the Great Sand Hills are agricultural (primarily domestic grazing), gas exploration and development, and recreation (hunting, hiking, bird-watching, etc.) Major utility and gas and oil transmission lines also cross the Great Sand Hills. Increased gas exploration in the Great Sand Hills has been the primary reason for public concern regarding development in the area.

The majority of the Great Sand Hills area is Crown land, much of which is under grazing and mineral leases.

Planning Process:

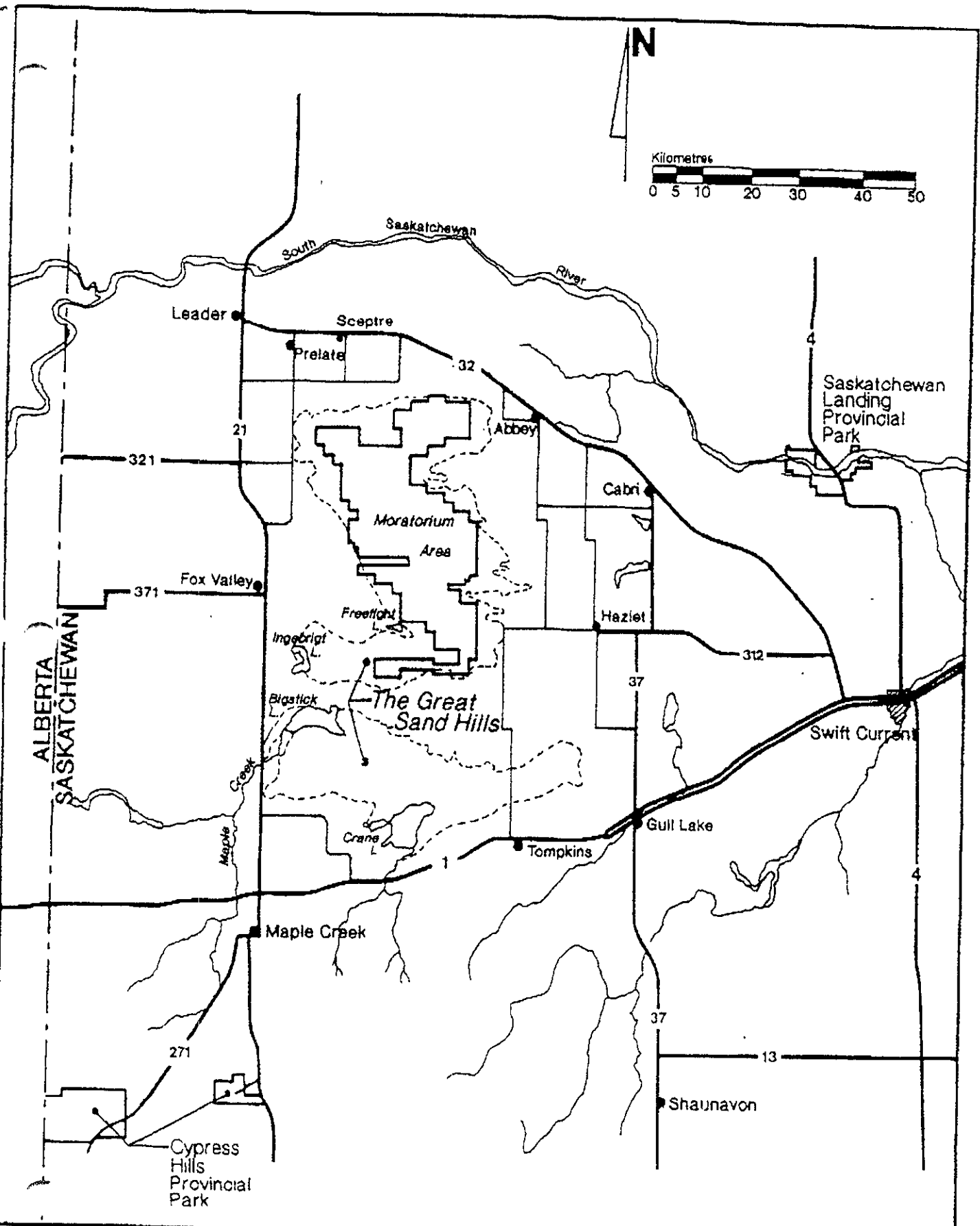
In July, 1990, the Minister of Environment and Public Safety announced the establishment of a planning committee to prepare an integrated land use strategy for the Great Sand Hills. The planning committee's role was to identify and solve key issues and establish land use objectives for the area.

The planning committee consisted of representatives from the Departments of Environment and Public Safety, Energy and Mines, Parks and Renewable Resources and Rural Development. A private consultant was employed to facilitate public participation.

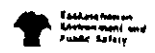
While the study was taking place, a moratorium was placed on new developments within the most sensitive area of the Great Sand Hills (see Figure 1). The immediate effect of the moratorium was to temporarily halt oil and gas exploration and any other new land uses.

Land Management Goal and Objectives

The planning committee agreed to a primary goal and a set of objectives relatively early in the planning process.



GREAT SAND HILLS
Integrated Land Use Plan



Goal: To maintain the Great Sand Hills as a distinctive landscape for social, cultural and economic benefits.

Objectives: To maintain biological diversity.

To protect representative and unique landscapes.

To ensure sustainable use of renewable resources.

To ensure that development of non-renewable resources occurs in an environmentally sound manner.

To protect heritage resources and support heritage awareness and understanding.

The objectives set the context or criteria for development in the Great Sand Hills. That is, development may occur in the Great Sand Hills provided it does not destroy biological diversity or heritage resources.

One objective also allows for the establishment of non-development areas to protect unique features and provide wilderness opportunities, if appropriate.

Land Use Zoning

As a result of biophysical analysis, the planning committee concluded that land zoning would be necessary to achieve multiple land use objectives in the Great Sand Hills. Three major zones were recommended. These are the Prime Protection, Multiple Use, and Facility zones. A fourth zone called Special Use was also recommended to define land units where certain conditions may be imposed. For example, gas development may be restricted from an area during critical nesting periods for endangered raptor species.

Prime Protection Zones

The purpose of Prime Protection Zones is to protect unique features, provide wilderness opportunities and provide bench marks to evaluate the use and management of developed areas.

Three areas were recommended for designation as Prime Protection totalling 8,741.5 ha (21,500 acres). The

areas range in size from 5439.2 ha (13,440 acres) to 194.3 ha (480 acres). The intermediate area is 3,108.1 ha (7,680 acres).

The most immediate effect of designation of areas as Prime Protection was to prevent gas development. The government of Saskatchewan is currently negotiating the return of sold mineral leases in Prime Protection Zones to the Crown.

Facility Zones

Facility Zones include the most intensively developed areas of the Great Sand Hills such as ranches, pipelines, roads and other utilities. One area was recommended by the planning committee for establishment of a Facility Zone. This was the development a modest day use recreation facility in the northwest portion of the Great Sand Hills to accommodate and control tourists.

Multiple Use Zones

The Multiple Use Zone consists of all areas not zoned as Special Use, Prime Protection or Facility. The Multiple Use Zone is the largest area of the Great Sand Hills. In this zone, traditional land uses such as grazing and hunting will continue. New land developments such as gas exploration and development may be allowed subject to environmental assessments and government and municipality approval.

After the zones were identified, current land uses or activities were evaluated to determine which zones they were appropriate in. The results of this evaluation are presented in Table 1.

Table 1

COMPATIBLE ACTIVITIES

ZONE	Prime Protection	Multiple Use	Facility
ACTIVITY			
Hunting	Y	Y	M
Trapping	Y	Y	M
Primitive Camping	M	M	M
Intensive Recreation	N	M	M
Off-Road Vehicle Use	N	M	M
Non-motorized Vehicle Use	M	Y	Y
Scientific Study	M	Y	Y
Domestic Grazing	Y	Y	Y
Cultivation	N	N	M
Natural Gas Development	N	Y	M
Mineral Development	N	Y	M
Recreation Trails	M	M	M
Transportation and Utility Corridors	N	Y	M

Y Uses that are considered to be compatible with the intent of a land use area under normal guidelines and land use regulations.

M Uses that may be compatible with the intent of a land use area under certain circumstances and under special conditions and controls where necessary.

N Uses that are not compatible with the intent or capabilities of a land use area.

Source: Adapted from the Great Sand Hills Land Use Strategy. 1991.

Discussion:

Land use planning was successful in identifying key development issues in the Great Sand Hills, establishing multiple land use objectives and zoning or allocating land based upon land opportunities and constraints.

It is the author's view that any parcel of land can be divided into essentially three types of zones. Protected areas which are non-development or more typically, limited-development zones; multiple use zones, which are areas that permit greater development than protected areas; and intensive use zones where land alternation is typically very significant and often to achieve a single primary objective.

In term of the conservation of biological diversity, the most significant difference between multiple use areas and protected areas is that within multiple use areas, parcels of land may be significantly altered reducing biological diversity. However, on a regional basis biological diversity should be protected. Biological diversity should not be significantly reduced anywhere within a protected area.

In Canada, multiple use areas will probably be the largest land units. They are therefore likely to be of even greater importance than protected areas in conserving biological diversity. Fortunately, development and conservation are not mutually exclusive. In rangeland areas of Saskatchewan conservation of substantial native biological diversity has occurred while areas are used for grazing by domestic livestock and other uses.

The essential factor for the conservation of biological diversity is to ensure that it is a primary land use objective in multiple use zones as well as in protected areas. Protected areas in themselves will likely never be large enough to support Canada's biological resources.

Intensive use areas such as cities and cultivated fields must be designed and managed so that they do not significantly impact a region's biological diversity. If properly located and designed, they may even contribute to the conservation of biological diversity. However, conservation of biological diversity will probably only be a minor land use objective in intensive use areas.

In the example of the Great Sand Hills, conservation of biological diversity of the region is feasible and has been recommended by the land use planning committee. While three protected areas (Prime Protection Zones) have been recommended, their role in conserving biological

diversity is much smaller than wise development and management of resources in the multiple use zone. The critical factor will be how well resource managers integrate conservation of biological diversity into development and management strategies. For example, domestic grazing needs to be allocated and managed so that it is compatible with native flora and fauna. Disturbed sites that result from gas develop or establishment of transmission corridors must be reclaimed to as near natural conditions as possible. In fact, project approvals should be based upon the proponents ability to restore sites to pre-disturbance conditions.

Intensely developed zones in the Great Sand Hills currently constitute a relatively small land area. It has been recommended that this continue to be the case. Another recommendation in the Great Sand Hills Land Use Strategy was to officially designate the entire region as critical wildlife habitat under The Critical Wildlife Habitat Protection Act. This designation would protect the area from land use activities that severely alter natural condition, activities such as cultivation.

Summary

In Canada, land use policies and planning are generally recognized as essential for effective and efficient development and to conserve biological diversity.

Protected areas are very important in conserving biological diversity as well as having many other values such as providing wilderness experience and research opportunities. However, they should not be relied upon as the single mechanism to conserve biological diversity.

In the author's opinion the following steps in order of priority must occur to conserve in-situ biological diversity:

- 1) Ensure that the conservation of biological diversity is a primary land use objective in multiple use areas;
- 2) Establish a system of representative protected areas; and
- 3) Minimize the extent and effects of intensely developed areas on biological diversity.

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