BUFFALO POUND LAKE LAND USE AND RESOURCE MANAGEMENT PLAN

Photo: Prairie Farm Rehabilitation Administration, Regina

BACKGROUND INFORMATION DOCUMENT

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Saskatchewan
Environment
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Management

TABLE OF CONTENTS

FIGURES

1.0 INTRODUCTION

The Buffalo Pound Lake Planning Area is located on lands adjacent to Buffalo Pound Lake north of the city of Moose Jaw. The Planning Area contains the Rural Municipality of Dufferin No. 190, Rural Municipality of Marquis No. 191, Resort Village of North Grove, Resort Village of Sun Valley, and the Resort Village of South Lake. Within the R.M. of Marquis No. 191 are the hamlets of Parkview and Sand Point Beach. The R.M. of Dufferin No. 190 has two subdivisions, North Shore Estates and Valley View.

The planning process was initiated for this area due to concerns about land use conflicts and lakeshore management on Buffalo Pound Lake. In the late 1950's, a take line was established for the Buffalo Pound Lake reservoir by the Prairie Farm Rehabilitation Administration (PFRA) to accommodate an increase in lake levels. Land below the 1685 foot (513.59 metres) elevation was purchased from landowners adjacent to the original surveyed bank of the lake. Later in the process, the PFRA obtained flood easements on private land on the lake. The land below the takeline was transferred in the 1960's to the Department of Natural Resources (currently Saskatchewan Environment and Resource Management). Since this period, numerous structures have been built on the Crown land without any proper authorization or permits. Concerns have been raised about the impact of lakeshore development on the water quality of Buffalo Pound Lake. Land use conflicts occur periodically on the lakeshore, which initiated the need for an integrated land use planning process.

Integrated land use planning requires that all resource users and interests be considered, and that all users are involved in planning, to reduce conflicts and optimize uses. Public involvement used in land use planning is critical in resolving land use conflicts and managing resource issues which exist across a land base. Due to the different jurisdictions involved, Saskatchewan Environment and Resource Management (SERM) joined with Municipal Affairs, Culture, and Housing (MACH), Sask Water, and Saskatchewan Agriculture and Food (SAF) in an integrated land use process for Buffalo Pound Lake. The departments approached the local municipalities in February 2000 who supported a voluntary land use planning process for the area. Public input is an integrated part of the integrated land use planning process.

1.1 Planning Process

Step One - Plan Initiation

In April 1999, SERM Grassland Ecoregion approached the department about the ongoing problems regarding land use on Buffalo Pound Lake. An interdepartmental committee was struck consisting of SERM Sustainable Land Management Branch, Sask Water Water Resource Management section, SAF Lands, and MACH Community Planning Branch. The committee held several meeting during the summer and fall to discuss a process for Buffalo Pound Lake.

Step Two - Information and Issue Gathering

Once support of the government had been established, urban and rural municipalities were contacted to participate in a meeting in January 2000. In the subsequent meetings, other interests such as the hamlets and commercial operators were identified. Using the consensus-based model, the working group agreed to participate in an integrated land use planning process in April 2000.

After the February 2000 meeting, the participants were presented four land use planning options which consist of the following:

- District planning commission with formal legislated authority
- Reservoir Development Area administered by Saskatchewan Water Corporation
- Land Use Plan for Crown Land only which was not binding on the municipalities
- Land Use Plan for the entire lake including both Crown and private land which would not be legally binding on the municipalities

Discussions on the boundary of the planning area lead to a decision to include all Crown land below the takeline or the 513.59 metre (1685.0 foot) elevation.

During these meetings, participants were provided background information on Buffalo Pound Lake and the roles of each department or Sask Water. An initial listing of important issues was completed at the February 2000 meeting. During the July, August, and September meetings, information was shared on the legislation and policy relevant to management of shoreline areas.

Step Three - Advisory Committee Meetings

Using a public advisory committee of local stakeholders and municipalities ensure that all interests will have a strong input into the process. This approach allows a broader and more balanced range of solutions. The advisory committee will help the technical planning team develop the plan and will consist of representatives of all interested local municipalities along with applicable stakeholder groups.

Members were selected for the Buffalo Pound Lake Management Advisory Committee at the April 2000 meeting. Discussions focused on the jurisdiction of the government and municipalities in shoreline areas during the July and September 2000 meetings. The Terms of Reference were introduced at the August 2000 meeting and concluded during the November 2000 meeting. The important issues of the group were identified in the January 2000 meeting.

Step Four - Draft Plan Preparation

A draft plan will be prepared using gathered information, potential land management techniques, and implementation strategies developed by the technical planning team and the advisory committee. The plan will have strategies to both resolve issues and reach goals and objectives. During the process, a round of public meetings will be held, to update on progress and seek further input.

Step Five - Draft Plan Review

The draft plan will undergo a government and public review. Feedback will be obtained from the municipalities involved with the process.

Step Six - Plan Revision and Approval

The draft plan will be revised, based on comments received during the review process. The plan will then be submitted to the government for approval.

Step Seven - Plan Implementation

Implementation of the plan is the final step in the planning process. The municipalities will be encouraged to amend or adjust their local bylaws and zoning to comply with the plan. Implementation will also include a process for monitoring plan strategies. Information collection is an ongoing mechanism and as new information comes available, it will be incorporated in the plan. The plan will remain a flexible, working document, which will respond to the needs of adaptive management.

1.2 Ecosystem Management

Ecosystem management is an approach, which considers ecological, social, and economic values. The technical planning team will follow this approach for land use planning.

Ecosystem management requires an understanding of ecosystem function, dynamics, and processes that extend across time and space. This management must consider the whole ecosystem, including water, soil, trees, animals, and human activity, when developing strategies to meet the objectives of the plan.

Integrated land use planning works with people who are involved with and have a stake in the Buffalo Pound Lake shoreline. The local knowledge of these people is invaluable to the process.

1.3 Public Involvement

Public involvement is critical to any consultation or planning process. Saskatchewan Environment and Resource Management has adopted the consensus-based model for decision-making. All departments involved with the technical planning committee have adopted this approach.

An important component of the planning process is the involvement of local stakeholders, municipalities, and the general public. Understanding all of the shoreline and planning issues is fundamental for meaningful public involvement. The management advisory committee, consisting of key stakeholders and municipal representatives, will work with the technical planning team to develop strategies to address resource conflicts and management.

2.0 GENERAL HISTORY AND BACKGROUND

Buffalo Pound Lake is situated 20 kilometres north of Moose Jaw. The lake was created 10,000 years ago from the glacial spillways that formed the Qu'Appelle Valley.

The communities adjacent to Buffalo Pound Lake consist of the R.M. of Dufferin No. 190, the R.M. of Marquis No. 191, the Resort Village of South Lake, the Resort Village of North Grove, and the Resort Village of Sun Valley (Figure 1). Within the Rural Municipality of Dufferin are the unorganized hamlets of North Shore Estates and Valley View. The Rural Municipality of Marquis contains the Organized Hamlet of Sand Point Beach and the Organized Hamlet of Parkview.

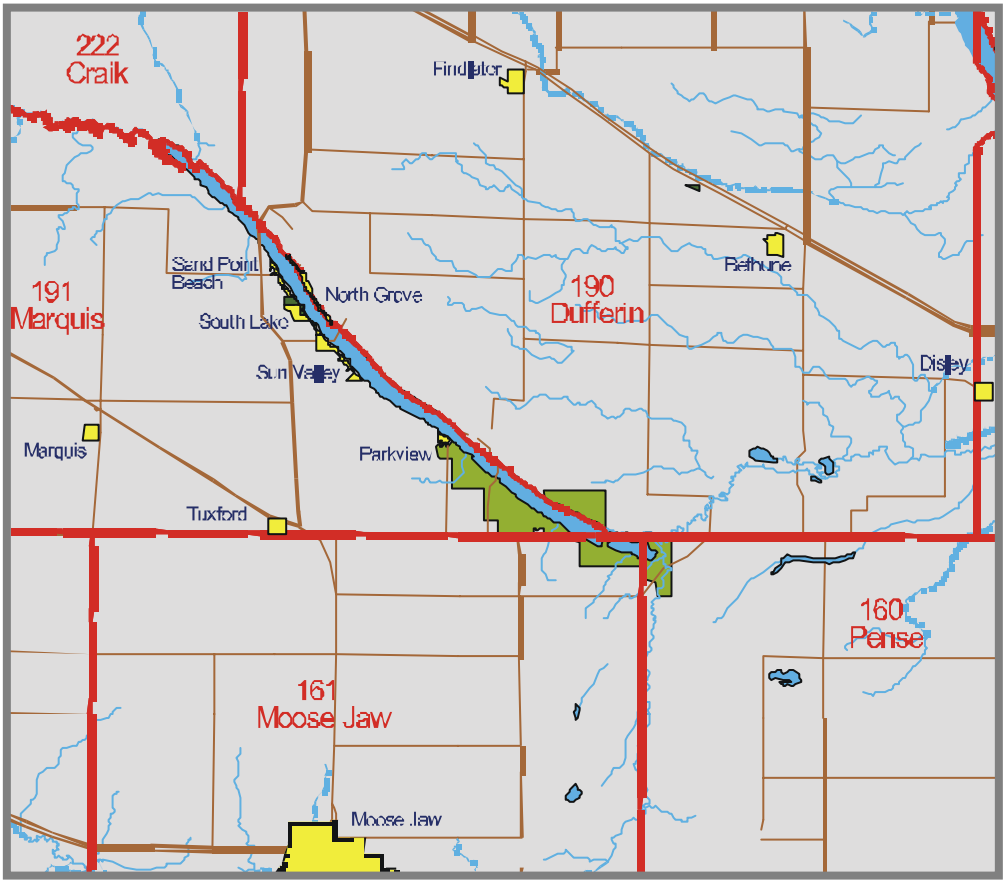
The Prairie Farm Rehabilitation Administration constructed the first water control structure on Buffalo Pound Lake in 1939. This dam maintained the full supply level at 1,666.6 feet (508.0 metres) for irrigation and domestic purposes. PFRA later replaced the dam, which resulted in the current full supply level of 1671.0 feet (509.3 metres).

In order to accommodate the higher lake levels, the PFRA created at a takeline at 1685.0 feet. The purpose of this line was to protect the shoreline from erosion, run-off, ice, and flooding. A legal survey was carried out to approximate the 1685.0 foot elevation. On most of the lakeshore, land was purchased from the existing owners below the takeline. Later in the process, the PFRA took flood easements under caveat on private land along the north shore of the lake. The Crown land was transferred to the Department of Natural Resources (now SERM) in 1969.

The first cottage subdivision was established on the lake in 1958 even though several landowners had allowed cottages under private leases prior to this date. Since that time, several hundred structures have been built along the lakeshore consisting of docks, boatlifts, boathouses, storage sheds, and pump houses. In addition, several cottagers have not moved their cabins to the surveyed lots created behind the takeline. These structures were not authorized by land use dispositions (i.e., permits). In 1990, Saskatchewan Parks and Renewable Resources issued a land lease to the Resort Village of Sun Valley for all Crown resource land within the municipality.

As no control has been exercised on past development, many land use conflicts arise when an individual elects to develop the shoreline. Local residents, the municipalities, and SERM often become embroiled with conflicts between landowners. The government has expressed reluctance to take action on new trespasses due to the past activity on the shoreline. Similarly, no zoning controls or development bylaws are in place along the shoreline areas as the municipalities believed that the Crown land was outside of their authority.

Figure 1



3.0 COMMUNITY PROFILES

3.1 Rural Municipality of Dufferin No. 190

The Rural Municipality of Dufferin No. 190 is located 20 kilometres northwest of Regina in south central Saskatchewan. The rural municipality varies from the traditional square or rectangular layout of other municipalities as the southwest corner is angular and defined by Buffalo Pound Lake. The total area of the rural municipality is approximately 380 square miles (90.6 km²). The area consists of townships 19, 20 and 21 in ranges 23, 24, 25 as well as a portion of 19-26 lying north of Buffalo Pound Lake. Provincial Highway No. 11, a major transportation corridor, passes diagonally through the centre of the municipality.

The advent of the railways in the 1880's brought the first settlers to this area. A small Local

Improvement District was formed under the Territorial Government in 1898 (Bethune and District Historical Society, 1983). After the formation of the Province in 1905, a local improvement district was established in Bethune with four townships. The Rural Municipality of Dufferin was formed in September 1912.

The villages of Bethune and Findlater are within the municipal boundaries with the rural municipality office located in Bethune. Valley View Resort, an unorganized hamlet, and North Shore Estates, a recreational subdivision, have been developed on Buffalo Pound Lake. Several recreational subdivisions are located on Last Mountain Lake around the resort community of Keddleston Beach.

The 1996 Census indicates that the population of the municipality is 582 (Statistics Canada, 1996). The majority of adults work in the agricultural industry as much of the land is dedicated to livestock operations. The second most important employer is the service industry as the area is accessible to the city of Regina. No commercial enterprises are located on Buffalo Pound Lake as the seasonal users obtain services in the larger communities.

3.2 Rural Municipality of Marquis No. 191

The Rural Municipality of Marquis is situated 20 kilometres north of the city of Moose Jaw in south-central Saskatchewan. While most municipalities are rectangular blocks of land, the Marquis Municipality deviated from this plan. The municipality is a right-angle triangle with the northeast bounded by Buffalo Pound Lake and Qu'Appelle Valley, south to the correction line and west to the third meridian.

The district was originally settled after the arrival of the railway in the 1880's. Originally a portion of the Northwest Territories before Saskatchewan became a province in 1905, the area was then designated as a Local Improvement District. The municipality was organized in 1911 and incorporated in 1912.

Several communities are situated within the municipality. The villages of Keeler, Marquis, and Tuxford are situated on Provincial Highway No. 42. On Buffalo Pound Lake, the resort communities are the Organized Hamlets of Sand Point Beach and Parkview. Buffalo Pound Provincial Park is situated in the eastern portion of the municipality along the lake.

The current population of the municipality is 445 people (Statistics Canada, 1996). The principal economic activity is agriculture consisting of grain farming and cattle production. A significant number of residents are employed in the service industry. Tourism is of some importance, with the Buffalo Pound Lake being a destination for the cities of Moose Jaw and Regina.

3.3 Resort Village of North Grove

The Resort Village of North Grove lies on the north bank of Buffalo Pound Lake approximately 40 kilometres north of Moose Jaw. The community's development is linear in nature with a total length of 4.8 km. The resort village has 15 permanent residents but this number increases during the summer season.

The area encompassing a portion of the village was originally settled by Mr. W. (Billy) Downs and his family (Resort Village of North Grove, 1990). In 1890, the family established a market garden operation, which employed employment for many local settlers.

Cottage development began in the 1920's and accelerated after the construction of the first permanent dam in 1944. Cottagers originally rented land from Daniel Difley (Resort Village of North Grove, 1990). Some lots were subdivided in 1960 but most cottagers continued to rent their parcels until the major subdivision in 1987. This subdivision was due to the continuing efforts of the leaseholders to obtain title for their land. The Resort Village of North Grove was incorporated on January 1, 1989.

The primary land use of the village is seasonal residential. More recently, a trend is evident of the summer cottages being winterized for year round recreation or retirement purposes. Several of the older cabins have been removed and replaced by larger residences. No commercial or industrial activity exists within the community (Resort Village of North Grove, 1990). The nearest stores are located in the Resort Village of Sun Valley or the Village of Chamberlain.

3.4 Resort Village of Sun Valley

Similar to the other resort communities, the Resort Village of Sun Valley originated from cottage subdivisions that formed along the south shore of Buffalo Pound Lake. The community is linear in nature running for four kilometres within Section 34, Township 19, Range 26, West of the Second Meridian and Section 4, Township 20, Range 26, West of the Second Meridian. Cottage subdivisions in this area were originally under the administration of the Rural Municipality of Dufferin No. 191. The Resort Village of Sun Valley was incorporated on January 1, 1985. 1996 Census figures indicate a permanent population of 95 residents (Statistics Canada, 1996). The permanent and seasonal population was estimated to be approximately 400. The permanent residents tend to be employed in the service industries with a small number working in the construction business.

The resort village has commercial activity with a local store and several contractors. A trend identified in the Basic Planning Statement is that a number of seasonal cabins are being winterized and converted to year-round vacation homes or residences. Several cabins have been removed and replaced by larger permanent residences.

3.5 Resort Village of South Lake

The Resort Village of South Lake is situated on the south shore of Buffalo Pound Lake. The community is located within the East Half of Section 8 and the Southwest Quarter of Section 9, Township 20, Range 26, West of the Second Meridian. Development is linear with a length of 1.6 kilometres. The City of Moose Jaw is approximately 40 kilometres to the south.

One of the first European settlers of the area was by Mr. Charles Nabess and his family during the 1890's. Mr. Nabess operated several ventures including a dance hall, a summer concession**,** and a ferry across Buffalo Pound Lake (Resort Village of South Lake, 1990) Another early landowner was Mr. Richard Loney who built a hunting lodge on SW 9 in 1911. Apparently the marsh area was excellent waterfowl hunting until the construction of the permanent dam in 1943-1944. Loney's Point day use area is named after these early settlers.

While the first cottages were probably established around 1910, the first major cottage subdivision did not occur until 1958. The community became an Organized Hamlet on April 20, 1960. Taxes within Organized Hamlets are collected by the Rural Municipalities but the elected Hamlet boards have some limited control over revenue expenditures. The local residents petitioned for Resort Village formation in 1987 and the Resort Village of South Lake was officially incorporated on January 1, 1989.

The Resort Village is linear in nature following the shoreline of Buffalo Pound Lake. Residential subdivisions are situated on most of the usable lakeshore land and some back shore land.

The permanent population of South Lake is 41 with increased numbers during the summer season (Statistics Canada, 1996). As noted previously, several cottages are being converted to year round recreational or permanent residential use. The Resort Village has limited commercial activity through services (i.e., construction) to the local residents. The nearest store is located 0.8 kilometres to the east within the Resort Village of Sun Valley.

3.6 Organized Hamlet of Sand Point Beach

The hamlet is located to the west of the Resort Village of South Lake on Section 17, Township 20, Range 26, West of the Second Meridian. The cottage area was originally developed on native pasture owned by the late John Maurer (Gasper, 2000). The first subdivision was registered on May 6, 1968.

The subdivision became an Organized Hamlet in September 1988 and is managed by a three-person committee (Gasper, 2000). The hamlet has a total of 167 parcels with a total of 80 occupied. Thirteen parcels are residential with 74 properties defined as seasonal. The hamlet is not distinguished from the rural municipality for census purposes but there are several permanent residents.

3.7 Organized Hamlet of Parkview

Parkview is situated immediately adjacent to the western boundary of Buffalo Pound Provincial Park within the South East Quarter of Section 19, Township 19, Range 26, West of the Second Meridian. The community occupies land originally owned by the late George and Eunice Franks (Gasper, 2000). The Franks created the original development with the first subdivision registered on May 10, 1960.

Parkview became an Organized Hamlet on August 6, 1985 and is also administered by a three-person committee. The community contains a total of 103 parcels with 21 unoccupied lots. Of the occupied parcels, 16 are residential and 69 are seasonal. No individual census is provided for the area but several residents live year round.

3.8 Valley View Resort

The unorganized hamlet of Valley View Resort is situated within the R.M. of Dufferin No. 190 approximately 10 kilometres south of the Village of Findlater. The resort community lies on the north shore of Buffalo Pound Lake within the northeast quarter of Section 17 and the south half of Section 20, all within the Township 19, Range 25, West of the Second Meridian.

The first recreational use of the area in the 1940's was a fishing camp situated at the base of a hill relative to the current hamlet. The subdivision was developed by a partnership consisting of Art Hartwell, Les Garbutt, and Herb Garbutt. The first lots were registered on August 3, 1959 (Hartwell, 2000). The subdivision was expanded in three stages over the next five years and currently consists of 67 lots.

3.9 North Shore Estates Subdivision

North Shore Estates Subdivision lies within the Rural Municipality of Dufferin No. 190 immediately west of the Resort Village of North Grove and approximately 1.6 kilometre east of the Highway No. 2 crossing. The resort community is situated within the Southeast Quarter of Section 20, Township 20, Range 26, West of the Second Meridian.

The subdivision was created from Crown land adjacent to Buffalo Pound Lake. Approval of the subdivision occurred on May 28, 1991 as North Shore Estates is the newest resort. The principal developers were Larry Johnson and Chuck Guillaime. The subdivision consists of 35 lots which were surveyed to the edge of the lake. A caveat for flood easement was placed on each of the titles.

Due to the recent development of this area, all of the buildings have been built since 1991. The houses are year-round homes rather than seasonal cottages, which reflect a trend in the Buffalo Pound Lake area. No specific record is available of permanent residents as the community is included within the Rural Municipality of Dufferin for census purposes.

4.0 ECOLOGICAL DESCRIPTION OF THE PLANNING AREA

4.1 Ecoregions

Saskatchewan contains four ecozones and eleven ecoregions. Ecozones, at top of classification system, consist of major physiographic features of the country (e.g., Coast Mountains, Great Plains, Canadian Shield). The principal ecozone found within the planning area is the Prairie with the specific ecoregion identified as the Moist Mixed-Grassland (Acton et al, 1998). Each ecoregion consists of a variety of ecodistricts, which are also referred to landscape areas provincially.

Ecoregions are the natural subdivisions of the ecozone, and are characterized by distinctive climatic zones or regional landforms. Landscape areas, or ecodistricts, are subdivisions of ecoregions, characterized by distinctive groupings of landform, relief, geology, soils, vegetation, water bodies, and land uses. The following section describes the ecoregion found within the planning area and the associated landscape areas.

4.1.1 Moist Mixed Grassland

The Moist Mixed Grassland marks the northern extensions of the open grassland in Saskatchewan and is closely correlated with semiarid moisture and dark brown soils (Acton et al, 1998). Most of the ecoregion consists of glacial till with short, steep slopes and numerous undrained depressions or sloughs. However, several large, level glacial lakes also occur within the ecoregion.

The climate of the Moist Mixed Grassland is warmer and slightly dried that the Aspen Parkland to the north and east. The mean July temperature is 18.4° Celsius and the mean January temperature is -16.7° Celsius. The total annual precipitation is 383 mm with 240 mm occurring from May to September. The summers are short and warm with a frost-free period of 110 days.

Dark Brown Chernozemic soils predominate throughout this ecoregion due to the relatively large additions of organic matter and slower rates of decomposition on the cooler parts of the mixed-grass prairie. Soils tend to be thin and lower in organic matter on upper slopes, becoming progressively thicker and higher in organic matter on mid and lower slopes due to the increased supply of moisture and plant growth.

4.1.1.1 Grassland Ecosystems

Agriculture is the dominant land use with cereals as the main crop. Native species is largely confined to non-arable pasturelands, where the common species are speargrasses and wheatgrasses. The ecoregion reflects the regular alteration of woodland, scrubland, and grassland that is evident in the Aspen Parkland Ecoregion. Woodlands are restricted to small areas around sloughs and major river systems. Northern wheatgrass and western porcupine grass dominate on loamy soils with a diverse community of grasses, scrubs, and trees in sandy areas. In presettlement times, fires prevented aspen from encroaching on the grassland.

4.1.1.2 Wildlife

Fifty-one species of mammals have been identified with the grassland zone of southern Saskatchewan (Acton et al, 1998). Prevalent mammals found in the area include Richardson=s ground squirrel, coyote, striped skink, least weasel, mule and white-tailed deer, and red fox.

A wide diversity of bird species is found within this ecoregion. One hundred and ninety-eight species of birds have been identified within this grassland area. Typical birds include the western meadowlark, eastern kingbird, yellow-headed blackbird, piping plover, sharp-tailed grouse, and Franklin's gull.

A total of 42 fish species has been observed in the Moist Grassland Ecoregion. Some common game fish are the walleye, northern pike, yellow perch and burbot. The most common reptiles and amphibians are the tiger salamander, great plains toad, painted turtle, plains garter snakes, boreal chorus frog, wood frog and northern leopard frog.

4.1.3 Arm River Plain

A portion of the planning area (eastern section of Buffalo Pound Lake) is within the Arm River landscape area (Acton et al, 1998). The Arm River plain extends from southward from Davidson to Lumsden and eastward from Outlook to Imperial (Diagram). The characteristic terrain of the area is moderately sloping hummocky moraine with numerous kettles. These landscapes are associated with dark brown loamy soils formed in glacial till.

Native mixed grass vegetation is limited to the hummocky moraine landscapes interspersed with the dominant cropland. More continuous cover occurs in areas of sandy soil such as gullies and valleys associated with the Arm River channel and the Qu'Appelle Valley. The river valleys contain mixed grasses and shrubs with trembling aspen on north-facing slopes. Sloughs and depressions are populated with sedges and grasses surrounded by willows and trembling aspen. Saltgrass, alkali, and red samphire are more common in saline soil areas.

4.1.4 Eyebrow Plain

The western portion of Buffalo Pound Lake is located within the Eyebrow Plain (Acton et al, 1998). This plain includes the small, gentle morainal upland near Eyebrow and the slightly lower area straddling the Qu'Appelle Valley from Marquis to Riverhurst.

This landscape has been greatly modified by agricultural activities. Native mixed-grass vegetation is limited to local areas off stony or sandy hummocky moraines that are often interspersed with cropland. Sandy soils within the South Saskatchewan and the Qu'Appelle Valley also contain native vegetation. Uplands contain shrubs and mixed grasses while sloughs exhibit sedges surrounded by trembling aspen and willows. Within the PFRA pastures, sandgrasses are prevalent on the poorly stabilized sandy areas along with shrubs such as juniper.

Brown loams and sandy loams are prevalent with this landscape. Sand dunes near the elbow of the South Saskatchewan River are dominated by Regosolic soils. Within the Eyebrow Hills, the dark brown loamy soils developed on the glacial till with glaciolacustrine and glaciofluvial deposits nearer the Qu'Appelle Valley.

5.0 LANDFORMS AND GEOLOGY

Buffalo Pound Lake forms a portion of the Qu'Appelle Valley thus it has landforms which are unique in southern Saskatchewan. Three major landforms are evident within the valley:

- Old valley slump blocks
- Smooth valley sides
- Alluvial fan deposits

5.1 Old Valley Side Slump Blocks

These valley sides slumped principally at the time of the maximum Qu'Appelle downcutting in late glacial and post glacial time (J.D. Mollard, 1972). In this period, the valley sides were much steeper and higher than the present eroded condition. Much of the slumping occurred before the deposition of the thick valley fills. If these old slumps are left undisturbed, they will remain stable. The failure planes and failure zones within these formerly slumped valley walls are believed to occur mainly in weak marine shale underlying the drift cover.

5.2 Smooth Valley Slide Slopes

Smooth valley sides are evident along the Qu'Appelle Valley a short distance downstream from the Qu'Appelle Valley dam. These valley walls are characterized by thick deposits of glacial drift and thus not as prone to slumping in places where the thin drift overlies the clay shale. These areas have not developed deep ravines and gulleys as very little drainage crosses them. However, some old slump blocks do still occur within the smooth valley slope areas.

5.3 Individual Alluvial Fan Deposits

Alluvial fan deposits have developed at the mouth of large creeks and tributary rivers that enter the Qu'Appelle Valley. These fan deposits consist mainly of complex layered sand and gravel with lesser silt and cobbles. Where these fans are capped by relatively deep impervious material such as heavy clay, the underlying sand and gravel may contain water under artesian pressure. Deep cuts in the alluvial fans may cause local sloughing of the canal banks. Rain and snowmelt waters often enter permeable layers in the middle and upper portions of the larger gully and ravine bottoms. As the groundwater moves downslope in these deposits, quicksand conditions can be created in the silty and fine sandy layers in the lower reaches of the ravine bottoms.

5.4 Geology

This area is characterized by a variable thickness (average of 10 to 50 metres) of unconsolidated Quaternary glacial material which underlies the region (Rogers, 2001). This material is underlain by about 2000 metres of Phanerozoic sedimentary rocks of the Western Canada Sedimentary Basin. These rocks in turn rest unconformably on Precambrian basement rocks.

The Phanerozoic sedimentary section consists of Mesozoic sandstones and shales in the upper portion, and Paleozoic limestone and dolomite carbonate rocks, with subordinate evaporites, shales and sandstones, in the lower portion. Cretaceous shales, siltstones, and sandstones of the Bearpaw and Belly River Formations directly underlie the Buffalo Pound Lake area, covered in most places by the younger glacial material.

6.0 LAND AND RESOURCE USES

6.1 Water

Buffalo Pound Lake forms a reservoir that is 29 km long and 1 km wide with an average depth of 3 metres. The surface area is 2,900 hectares and it has a capacity of 90 million cubic meters at the full supply level of 509.3 metres above sea level (Buffalo Pound Water Administration Board, 1999).

The principal source of water is rain and snowmelt from the mountains of Alberta, collected by various tributaries draining to the South Saskatchewan River and stored in Lake Diefenbaker. Very little water enters the lake from rain or spring run-off except in abnormally wet years. The typical release from the water control structure at the east end of the lake is one to five cubic metres per second thus the residence time of water in the lake varies from six to thirty months.

Buffalo Pound Lake is a source of drinking water to approximately 215,000 people or about 22 percent of the population of Saskatchewan. The lake is the municipal water source for the communities of Moose Jaw and Regina and, a number of smaller communities in the vicinity (Marquis, Tuxford, Pense, Grand Coulee, etc.). A number of farmsteads and acreages are provided water by the Buffalo Pound Lake to Regina treated water supply pipeline.

Industrial users also make significant use of the water resource. Both the Kalium potash mine and the Saferco fertilizer plant obtain water from Buffalo Pound Lake.

Local residents also make use of the water directly for domestic use or irrigating their properties. As none of these users are permitted, it is difficult to determine the amount of water that is used. Buffalo Pound Lake is used to supplement water, to downstream users for irrigation purposes. Buffalo Pound Lake is free of chemical pollution but is naturally rich in nutrients (phosphate, nitrogen, and carbon) which encourage algae growth of diatoms in the winter and blue green algae in the summer (Buffalo Pound Water Administration Board, 1999). The large number of summer cottages and year round homes provide a considerable opportunity for point source lake contamination. Upstream agricultural activities are another potential source of nutrients and pesticides. The Buffalo Pound Water Administration Board has identified the need to manage the watershed to protect the water supply for the cities of Moose Jaw and Regina.

6.1.1 Buffalo Pound Water Treatment Plant

The Buffalo Pound Water Treatment Plant is situated adjacent to Buffalo Pound Provincial Park within the North Half of Section 28 and South Half of Section 33, Township 18, Range 25, West of the Second Meridian. During the 1940's, the cities of Moose Jaw and Regina explored the possibility of a collective water supply for the two cities (Buffalo Pound Water Administration Board, 1999). The first plant was building in 1951 and several expansions to the capacity were made in the intervening years. The facility was upgraded with the installation of the installation of granulated activated carbon in 1985 and a major plant expansion was completed in 1989. In 1999, the plant treated provided 26,830 megalitres (1 megalitre = 1 million litres) to the City of Regina, 5,893 megalitres to the City of Moose Jaw, and 180 megalitres to the Sask Water (Taylor, 2001).

At the plant, raw water from Buffalo Pound Lake passes through a series of treatment stages designed to remove impurities such as clay particles, bacteria, algae, and dissolved organic materials. The object of treatment is to produce water which is clear, colourless, odour free, aesthetically pleasing and safe to drink. Periods of poor water quality in Buffalo Pound Lake have created treatment challenges for the plant management.

6.2 Agriculture

Agricultural operations are quite extensive within the planning are, particularly on the undeveloped western portion of the lake. Due to sandy soils and sloping terrain within this portion of the Qu'Appelle Valley, cultivation is minimal with few cereal crops. Mixed farming is the dominant activity on agriculture land within the study area.

6.3 Tourism and Recreation

Tourism is important economic activity within the planning area. As noted previously, the Nabess family operated a dance hall and tourist concession in the 1890's. Richard Loney operated a hunting lodge beginning in 1911 within the current Resort Village of South Lake. Recreational use of the Buffalo Pound Lake increased greatly in the 1940's after construction of the first water control structure in 1944. The first cottage subdivision was established in 1958 even though local landowners had been leasing land for summer homes since the 1940's. New subdivisions have been added and the number has increased since 1958, particularly in the 1960's and 1970's.

Summer recreational activities on the lake include boating, water skiing, angling, swimming, hiking, picnicking, and camping. Popular winter activities include downhill skiing, cross-country skiing, snowmobiling, and ice fishing. Two private trailer parks are located on the lake, Buffalo View Campground on the south shore near Parkview and Sand Point Trailer Inc. in the Hamlet of Sand Point Beach. Residents of the cottage subdivisions are active participants in these recreational pursuits.

6.3.1 Buffalo Pound Provincial Park

A major focus of recreational activity is Buffalo Pound Provincial Park. The park was first established in 1963 and included land along the north and south shore of the lake. In 1978, the Nicolle Flats, which includes Nicolle Marsh, lying to the east of the lake was added to the park.

Buffalo Pound Provincial Park offers year round recreational activities. Summer recreation consists of swimming, camping, fishing, and picnicking. Winter recreation is centered on downhill skiing and skating at White Track ski area and ice fishing on the lake.

6.3.2 Buffalo Pound Recreation Site

The two day use areas situated on the lake make up the Buffalo Pound Recreation Site. Loney's Point, with picnicking, boat launch, and swimming, is within the Resort Village of South Lake. The other recreational facility is located on the north side of the Highway No. 2 causeway and consists of a boat launch.

6.4 Fisheries

Buffalo Pound Lake provides good angling opportunities. Angling pressure is significant, both during the summer and winter. Populations of walleye are considered good while yellow perch and lake whitefish are moderate (Jensen, 1996). The northern pike population is considered poor to moderate. A rough fish population of buffalo fish, carp, suckers, and various minnows are present in the lake. A commercial fishery for carp and buffalofish was attempted in 1998 but failed due to poor markets.

Angling pressure on the lake is heavy to moderate. The water control structure at the south end of the lake receives moderate to heavy use for angling. Ice fishing is popular activity during the winter months.

6. 4.1 Critical Fish Habitat

The planning area adjacent to Buffalo Pound Lake contains critical fish habitat. Several lake studies have analyzed the lake's productivity but no analysis has been made of critical habitat areas such as spawning and rearing areas for valuable species. The development of the shoreline for recreational use has been identified as one of the important issues as these structures often reduce fish habitat. One object of the plan will to be to work with local residents and communities to ensure protection of these areas.

6.5 Wildlife

The presence of trees, shrubs, and water source within the Qu'Appelle Valley make the area important for a wildlife habitat. Lands near the lake are considered Class 1 Terrestrial Wildlife Habitat as more than 90% of the land is covered by native vegetation either native prairie or other native habitat such as aspen stands (see Figure 2).

This habitat supports a wide diversity of mammal and bird species. Among the larger animals found in this area are coyotes, striped skunk, least weasel, red fox, mule and white-tailed deer (Acton et al, 1998). Prominent mammals are the big brown bat, porcupine, white-tailed jack rabbit, prairie vole, northern grasshopper mouse, olive-backed pocket mouse, white-footed mouse, deer mouse, masked shrew, thirteen-lined ground squirrel, eastern cottontail, northern pocket gopher, meadow jumping mouse, Richardson's ground squirrel, and sagebush vole.

Common birds species prevalent in the area include waterfowl such as Canada Goose, Mallard, Gadwall, Green-winged Teal, American Widgeon, Northern Pintail, Northern Shoveler, Blue-winged Teal, Ruddy Duck, Canvasback, Redhead, Lesser Scaup, and American Coot (Saskatchewan Environment and Resource Management, 1994). Common shorebirds include the Killdeer, Willet, Spotted Sandpiper, and Common Snipe. Birds of prey evident in the valley include the Swainson's Hawk, Short-eared Owl, and Great-horned Owl. Upland game birds include Sharp-tailed Grouse and Gray Partridge. Other birds common to the area include the Morning Dove, Eastern Kingbird, Western Kingbird, Horned Lark, Black-billed Magpie, American Crow, Marsh Wren, Mountain Bluebird, American Robin, Western Meadowlark, Yellow-headed Blackbird, Red-winged Blackbird.

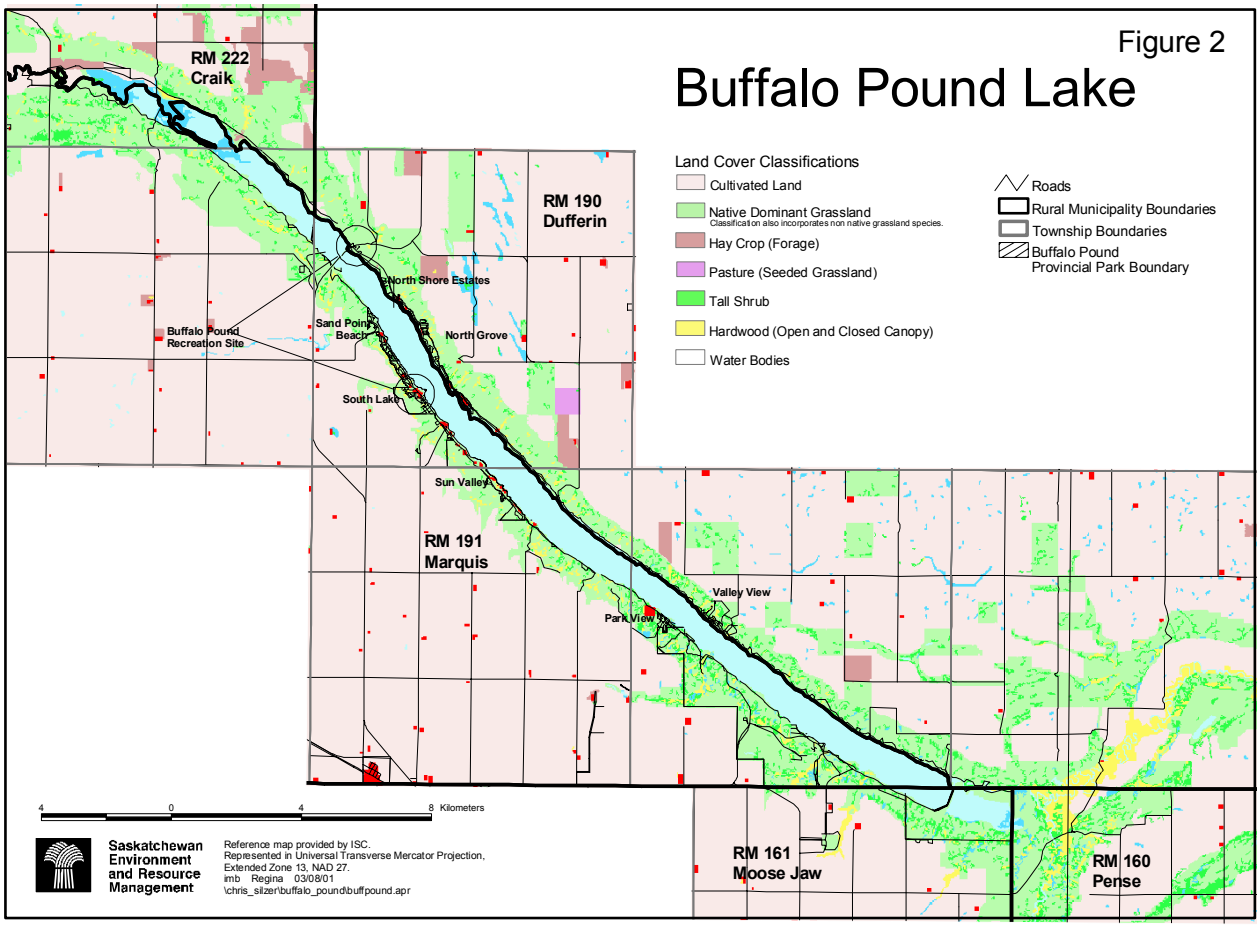
No specific inventory has been made of amphibian or reptile species but information from Buffalo Pound Provincial Park indicates the presence of the western plains garter snake, leopard frog and western painted turtle (Saskatchewan Environment and Resource Management, 1994).

6.5.1 Hunting

The study area receives considerable hunting pressure for both white-tailed and mule deer (Riendeau, 2001). High-powered rifle hunting is not permitted as the valley is within a wildlife management zone for black powder rifles and archery.

Several resort villages have bylaws restricting hunting within their municipal boundaries. Provincial legislation prohibits hunting within 500 metres of a dwelling which prevents hunting in most cottaging areas.

Figure 2



6.5.2 Critical Wildlife Habitat

Critical wildlife habitat is site-specific habitat which is often essential to the survival of a species. Examples include heron rookeries, raptor nesting sites, and cover for deer.

Analysis of current information indicates that this area is critical wildlife habitat. The vegetation cover, availability of water, and undisturbed native prairie all contribute to this classification. Thought the area has been identified as important habitat, no specific study has been made of the lakeshore areas to determine those sensitive sites which require protection.

6.6 Mineral Resources

Saskatchewan Energy and Mines is responsible for the administration of all Crown-owned mineral and petroleum commodities, including quarried commodities, in the Province, with the exception of aggregates and horticultural peat. The Provincial Crown owns the subsurface rights in the plan area. Saskatchewan Energy and Mines manages the subsurface rights and associated minerals for the Province.

Extensive potash deposits of the Devonian Prairie Evaporite Formation underlie the area at a depth of about 1500 metres (Rogers, 2001). These are solution mined by I.M.C. Kalium Inc. at the nearby Belle Plaine operations. The Kalium mineral leases extend under the south end of Buffalo Plain Lake and their water supply is drawn from the lake.

Although the area is remote from any current activity, there is potential for oil and natural gas to be hosted by the sedimentary rocks that underlie the region. Many of these formations do produce oil and natural gas elsewhere in the province.

The Bearpaw Formation, where exposed at the surface, has some modest potential to host bentonite clay and ammolite gemstone deposits.

7.0 OTHER VALUES

7.1 Heritage Resources

Buffalo Pound Lake lies within the moist mixed grassland ecoregion of the prairie ecozone. This area of the province was first occupied shortly after the recession of the continental glacier some 12,000 years ago. All of the pre-contact cultures that occupied this area of the province were nomadic hunters and gatherers that depended on a wide variety of plant and animal species for survival (Brewer, 2000).

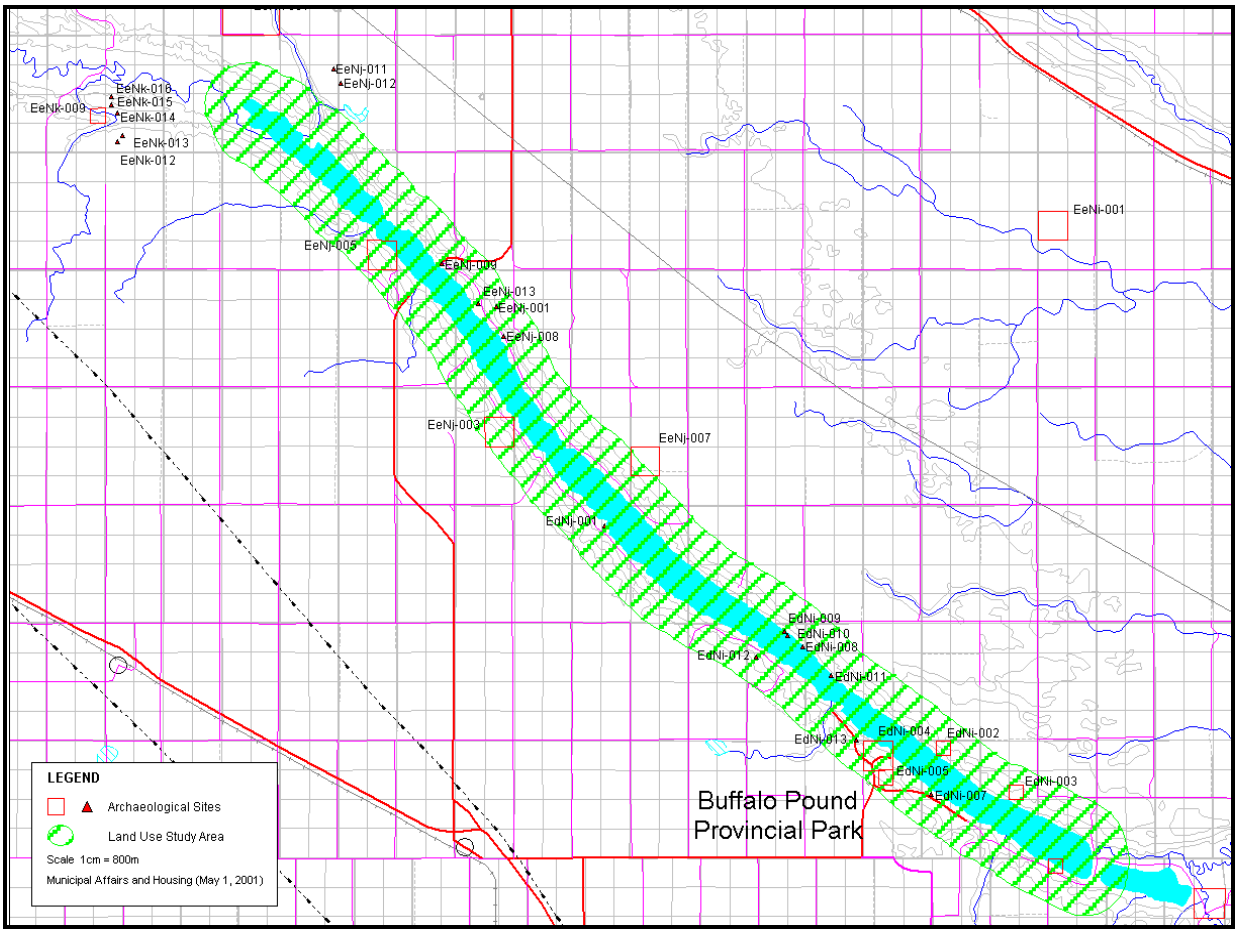
The earliest people have been identified by archaeologists as Paleo-Indian, and are characterized by the creation and use of distinctive Clovis and Folsom spear points. By 8,000 B.C. Agate Basin, Alberta, Hell Gap, Scottsbluff and Eden spear points had replaced the Clovis and Folsom forms.

As early as 5,500 B.C. a technological change occurred with the invention/introduction of the atl atl or dart thrower. Rather than using a thrusting spear, hunters could now project a smaller spear or dart over a considerable distance with significant force. In addition to this technological advancement, this time period (known as the Middle Prehistoric) shows the first evidence of formalized ritual and ceremony. Cemeteries were established that show evidence over use for hundreds and, in some cases, thousands of years. The first medicine wheels and tipi rings also date to this time period. While impossible to date with any accuracy, it is also assumed that the first stone effigies representing animals and human figures date to this period as well.
The Late Prehistoric Period began some 2,000 years ago and is marked by the appearance of two

new technologies on the northern Plains: the bow and arrow, and pottery. As occurred with the atl atl, the bow and arrow provided hunters with a tool that increased their efficiency by enabling them to reload and shoot in a much more rapid manner. The earliest pottery on the Northern Plains appears to have developed in the eastern Woodlands/western Great Lakes region. Whether its appearance represented a movement of people onto the Plains or simply a sharing of ideas remains a point of much debate. By 1750 A.D. horses had become widely available and the desired mode of transportation on the Northern Plains. This predated contact with Europeans in much of the Northern Plains and all of the early European explorers and traders encountered equestrian nomads on their travels through southern Saskatchewan.

Homesteading of this area began in the 1870's but did not really take hold until the decision was made in 1881 to take the railway south through Saskatchewan. By 1883 the communities of Moose Jaw and Regina were well established and farming had already become the dominant land-use in the region.

Figure 3



Seven professional archaeological studies have been completed in the vicinity of Buffalo Pound Lake (Figure 3). In addition, numerous sites have been discovered and reported by local

residents and cottagers. As a result, 20 archaeological sites have been recorded along the shores of Buffalo Pound Lake and on the adjacent uplands (Brewer, 2000). The oldest remains date to the Paleo-Indian Period (Agate Basin), while the youngest relate to the homestead era. The sites are predominantly pre-contact campsites (n=8), while at least four confirmed or potential burial sites have been identified. Site EeNj-7 is the location of the bison trap (or pound) from which the lake takes its name. Site EeNj-1 is also a bison killsite. The remainders of the sites are small scatters of artifacts from which no functionally diagnostic artifacts have been recovered.

8.0 ADMINISTRATIVE PARAMETERS

The land use planning process must be developed within certain constraints. A number of agreements, basic planning statements, plans and strategies have been developed over the years but the various levels of government relative to the planning area. The direction of the Integrated Resource Use and Land Management Plan must be consistent with these agreements.

8.1 Acts and Regulations

This planning process would be subject to all provincial legislation but several acts and regulations are prominent in this situation:

- *The Provincial Lands Act*
- *The Planning and Development Act*
- *Designated Lands Regulations*
- *The Water Corporation Act*
- *The Environmental Management and Protection Act*
- *The Fisheries Act*

At the time of writing, the federal government is assuming responsibility for management of fish habitat within Saskatchewan. Matters involving alteration of fish habitat will be the responsibility of Fisheries and Oceans Canada. This process will take several months during staffing and administration matters.

8.2 Municipalities

The authority for development controls is provided by *The Planning and Development Act*. Municipalities exercise considerable control through their basis planning statements and bylaw over land use and development within the planning area. Both rural and urban municipalities are prominent in the process in order to integrate municipal interests within planning policy.

As this process is voluntary and does not have force of legislation, the objective is to have the policies developed by the plan to be reflected in each municipalities' bylaw or basic planning statement. Government departments and Sask Water will also adapt their policies to comply

with the land use plan.

8.3 Aboriginal Rights

It is not within the mandate of the planning process to interpret Aboriginal or Treaty rights outside of existing court decisions.

9.0 CONCERNS

Sustainable, multiple use planning of land and resources requires the resolution of several constraints and concerns. These concerns have been raised during consultation meetings held with the municipalities and interest groups. The government departments and Sask Water have also identified concerns during the process.

9.1 Enforcement and Compliance

- Several hundred structures are located on Crown resource land below the takeline without any disposition or authorization.
- Ice fishing shacks being left on the shoreline and garbage on the lake after fishing season.
- The "trespass" issue - what is to be done about the structures people have built on the land that they do not own.
- Identify trespass structures and implement time line to legalize.

9.2 Erosion

- Need to determine where and how some areas of the shoreline need to be stabilized?
- Erosion of the shoreline may cause siltation and destruction of fish habitat

9.3 Fish and Wildlife Habitat

- Minimize impacts upon fish and wildlife habitat and maintain water quality
- Maintain shoreline cover and native prairie vegetation on Crown land
- Ensure that a healthy ecosystem is established around the lake through protection of sensitive and critical areas

9.4 Flood Control and Liability

- Who is responsible for liability if flooding does occur?
- Safe Building Elevation for all developments on the lake are set at 512.7 metres elevation which is the 1:500 peak calm water level of the lake.
- Primary use of the lake will continue to be flood control of the Qu'Appelle and Moose Jaw Rivers
- Cottages are situated in flood prone areas but caveats were placed on these lots and the

occupants warned of the flood issues.

9.5 Legal and Legislative Questions

- Who controls administration of lands between the titled lots and the water?
- Municipal and environmental reserves do not exist in some locations, could some Crown land be designated as municipal or environmental reserves and transferred to the municipal authority?
- "Water's edge" was used when establishing resort villages, need definition of what this term means?
- Objective of the committee should be to return lands expropriated for the reservoir back to the citizens of Saskatchewan
- Understanding of legal concepts such as bank, high water mark, safe building elevation, takeline, and Crown land

9.6 Sewage

- An effective sewage disposal plan/strategy for the lake and surrounding cottages as part of the management of the shoreline by either SERM or the communities/rural municipalities
- Concerns about effluent disposal practices on agricultural land
- A sewage lagoon is necessary as sewage trucks have to travel long distances with effluent
- Concerns about cottagers who have leaking septic tanks

9.7 Shoreline Management and Administration

- Will the Crown land remain under the control of SERM or another provincial agency or will the authority over the land "to the water's edge" be delegated to the communities/rural municipalities? Everyone on the lake would like to have consistent common rules around the lake and the rules should be applied to all areas.
- Access to the Crown land for ranching purposes and whether free access by cattle on the Crown land will be continued. Related to this, if there are fees for people accessing the Crown land for recreational purposes, will there be fees for people accessing the Crown land for business (farming/ranching) purposes?
- Proposal for transfer of land use control between the surveyed bank and the water's edge through lease or title transfer to the respective community (e.g., Resort Village of North Grove).
- Transfer of land use control between the original Prairie Farm Rehabilitation Administration (P.F.R.A.) takeline and the water's edge through lease or title transfer to the respective municipality.
- Retention of lands below the takeline by the Crown (SERM) with the municipality continuing to retail zoning control and administration of public and environmental reserves

- Will the guidelines be equal, fair, and equitable to all municipalities around the lake?
- Opposition to land rental fees for shoreline installations which are considered a form of bureaucracy and taxation**.**
- Are the problems encountered at Buffalo Pound Lake unique within the province?
- Proposal for transfer of administration to the municipalities.
- Standardization of lakeshore development.
- Identify process to legalize Crown land/municipal reserve trespass situations around Buffalo Pound Lake where SERM will issue permits, sell some land, or require structure removal.
- Develop guidelines that will be adopted and followed by all interested parties regarding developments. Guidelines would include what type of structures will be accepted and where, surveyors certificate required for development, and the permits involved.
- Ensure that the general public has access to Buffalo Pound Lake.
- Transfer of Saskatchewan Agriculture and Food administered land which lies within the resort villages on Buffalo Pound Lake to Saskatchewan Environment and Resource Management. This process will ensure that one agency has jurisdiction over lands rather than two departments.

9.8 Water Quality, Supply, and Lake Levels

- Concerns about the current water quality on Buffalo Pound Lake as information indicates a deterioration over the past ten years.
- Protection of the lake for municipal and domestic use.
- Protection of the lake for all other users.
- Protection of the lake (quality and quantity) for future water users including shoreline erosion as well as the maintenance of the newly constructed outlet works.
- Potential conflicts between the use of the lake as a water supply and for recreational use.
- Options of adjusting the lake levels to improve water quality.

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