

Skeleton Lake Watershed Management Plan



SKELETON LAKE STEWARDSHIP ASSOCIATION

May 15, 2009

Skeleton Lake - a Lake at the Crossroads

Aquatic habitats in Skeleton Lake have been negatively impacted by human activities. For example, extensive developments adjacent to the lake have resulted in the impairment of riparian zones and wetlands, fish habitat, and water quality. The active withdrawal of water and natural outflows from Skeleton Lake appear to exceed the inflow of water into the lake via surface water and groundwater flow. This results in a continual lowering of the water level, which further exacerbates the impairment of water quality, fish habitat and riparian and wetland areas.

The Skeleton Lake Stewardship Association (SLSA) commissioned the development of a State of the Watershed report for Skeleton Lake in 2006. The State of the Water-

shed report was completed in August 2007 and highlighted the limited data on lake water quality and groundwater dynamics within the watershed.

Consequently, the State of the Watershed report recommended a thorough hydrologic study, including a water balance and groundwater mapping, for the Skeleton Lake watershed along with assessments of land use practices, riparian health and fish habitat and fish population dynamics along and in the lake. In addition, it was recommended that the SLSA develop a Watershed Management Plan and formulate Water Conservation Objectives.

The Terms of Reference for the development of the Watershed Management Plan was composed by SLSA in consulta-

tion with the County of Athabasca No. 12, the Village of Boyle, the Summer Villages of Bondiss and Mewatha Beach and the general public.

The Terms of Reference was submitted to Alberta Environment on September 06, 2006, and approved on September 22, 2006 (see <http://www.skeletonlake.com/info/ApprovalLetter.pdf> for more information). In 2009, SLSA commissioned the development of the Watershed Management Plan for Skeleton Lake by Aquality Environmental Consulting, Ltd. A draft of this plan was completed May 15, 2006, and will be available for public review and comment in upcoming open house events in Edmonton and Boyle. We welcome you to join us and provide your input to the plan.



Inside this issue:

SKELETON LAKE - A LAKE AT THE CROSSROADS	1
WHAT IS A WATERSHED MANAGEMENT PLAN	1
THE SKELETON LAKE WATERSHED MANAGEMENT PLAN	2
LAKE WATER LEVELS	2
LAND USE PRACTICES	3
WATER QUALITY	3
RIPARIAN ZONES AND WETLANDS	3
FISH AND WILDLIFE HABITAT	4
GROUNDWATER RESOURCES	4
TOWN HALL MEETINGS	4

What is a Watershed Management Plan?

A Watershed Management Plan is a site-specific, comprehensive tool that watershed groups, municipalities and others can use to achieve their stewardship goals. An approved Watershed Management Plan is used by government and

other resource decision makers as a reference when making decisions that impact water within that watershed.

In Alberta, Alberta Environment is responsible for approving Watershed Management Plans.

Many other municipalities have completed plans, including Moose Lake, Lac La Biche and Northern Sunrise County.



Skeleton Lake Watershed Management Plan

The Skeleton Lake Watershed Management Plan

AQUATIC HABITATS IN SKELETON LAKE ARE NEGATIVELY IMPACTED BY HUMAN ACTIVITIES, SUCH AS DEVELOPMENTS ALONG THE LAKESHORE AND RESOURCE EXPLORATION IN THE WATERSHED.

The Watershed Management Plan for the Skeleton Lake watershed aims to determine the causes of the decline in the environmental quality of the lake and watershed. The plan discusses the current state of knowledge of several issues identified in the 2007 State of the Watershed report and through public consultation.

Several recommendations are provided in this report, including the development of education and awareness programs and community-based watershed management tools, a review of enabling legislation to aid SLSA and a set of monitoring and performance measures.

The Watershed Management Plan strives to balance environmental, social and eco-

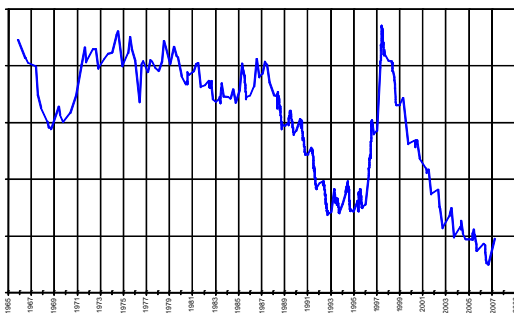
nom ic issues with government legislation for the protection and management of water resources. Alberta Environment has regulatory responsibility for allocating water and protecting the aquatic environment (under the *Water Act*) and for controlling wastewater releases into the environment (under the *Environmental Protection and Enhancement Act*).

The vision of the SLSA for Skeleton Lake is that the lake be managed as a resilient, high quality, sustainable, aquatic ecosystem for the mutual benefit of all Albertans and for the protection and sustainment of waterfowl and fish. The SLSA has agreed to assume the obligations for the development of the Skeleton Lake Watershed Management Plan.

The main functions of the SLSA will be to:

- Provide direction for the Skeleton Lake Watershed Management Plan;
- Build partnerships with government agencies, environmental organizations and the public who can assist in achieving the plan's goals and objectives;
- Coordinate and facilitate public consultation during the planning process;
- Establish, if necessary, subcommittees to assist in developing the Watershed Management Plan;
- Submit the final WMP to Alberta Environment; and
- Promote public education and awareness.

Lake Water Levels and Lake Sustainability



Lake levels in Skeleton Lake have been relatively constant from 1965-1987, but dropped dramatically from 1987-1997, increased to record highs by 1997 and then began to steadily decline again. In October 2006, lake levels reached a historic low, which is a drop of 1.69 m in 10 years. It has been estimated that the surface area of the lake has been reduced by about 70 ha.

If water levels continue their current decline, there will be an extensive loss of riparian zones and wetlands, fish and wildlife habitat and a loss of recreational use of the lake.

The following are the key issues related to lake water levels and their sustainability in the long-term:

- Increased development in the vicinity of the lake has increased the demands for water;
- Declining lake water levels and the cumulative impacts of water diversions;
- Inflows into the lake have

been adversely affected by the increased development in the watershed;

- Drying of the narrows between the north and the south basins of the lake; and
- Declining lake water levels pose a significant threat to aquatic ecosystems.



Skeleton Lake Watershed Management Plan

Land Use Practices

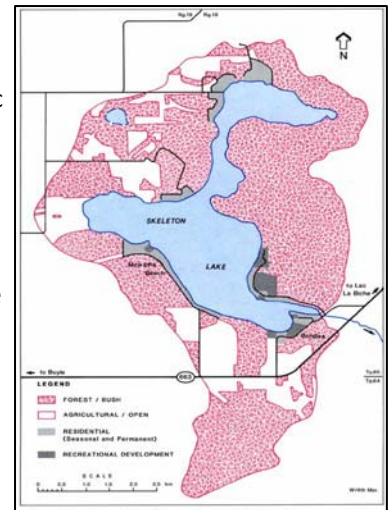
Currently, there are three municipalities around the lake: the Summer Villages of Mewatha Beach and Bondiss and the County of Athabasca.

The southeast and entire western portion of the watershed has experienced the most growth, with the development of three new subdivisions, the expansion of others and the development of a public golf course.

Land use has dramatically changed between 1986 and 1998. Most notably, many wetlands have been lost (see bottom of page). These wetlands may have formed an important groundwater recharge system for the lake, and loss of these wetlands may contribute to the groundwater drawdown.

The following are key issues associated with land use changes in the watershed:

- Land use practice effects on water quantity, quality and aquatic resources in the Skeleton Lake watershed; and
- A lack of watershed perspective in the current municipal land use planning practices.



Water Quality

Skeleton Lake is a mesotrophic lake, which means that its nutrient concentrations are intermediate compared to other lakes.

Nutrient runoff from developed areas may negatively impact water quality in Skeleton Lake due to its relatively small watershed to lake area ratio. To compound the problem, decreases in water levels will likely exacerbate

water quality problems within the lake through concentration of solutes and nutrients.

While there are limited water quality data for Skeleton Lake, key issues of surface water quality concerns include:

- Potential for algal blooms and unpleasant odors;
- Protection of drinking water source;

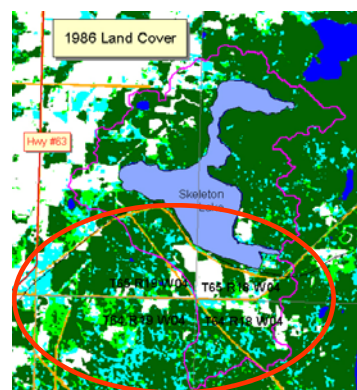
- Pollutants entering the lake from the watershed, leaky septic systems, erosion, and other sources;
- Land use in the watershed and how this affects water quality;
- Lowering water levels and how this affects water quality; and
- Protection of water quality and sensitive areas for future generations.

DECLINING WATER LEVELS IN SKELETON LAKE THREATEN AQUATIC RESOURCES AND HABITAT FOR WILDLIFE. IN THE PAST 10 YEARS, WATER LEVELS HAVE DECLINED BY ABOUT 1.7 M.

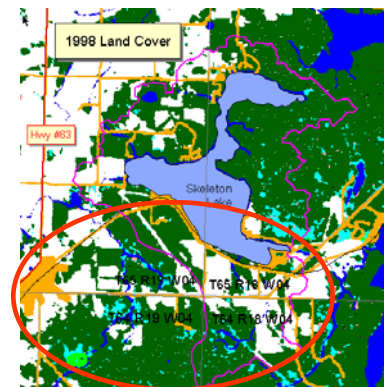
Riparian Zones and Wetlands

Functional riparian zones and wetlands develop and maintain stream banks and shorelines, reduce erosion and sedimentation, decrease water velocities, store water, recharge aquifers, filter nutrients and contaminants and increase biodiversity. Riparian zones and wetlands provide water treatment, flood mitigation, wildlife and other vital environmental services. The incremental loss and deg-

radation of riparian zones and wetlands contributes to the decline in fish communities in Skeleton Lake. Current land use and development practices and lowered lake water levels have been cited as causing the loss of this habitat. While there are no inventories of riparian zones and/or wetlands in Skeleton Lake, the extent of wetland loss from 1986-1998 can be seen in the following maps:



Wetland cover (aqua) in 1986 (red circle shows area of greatest cover)



Wetland cover (aqua) in 1998 (red circle shows area of greatest loss)

Skeleton Lake Watershed Management Plan

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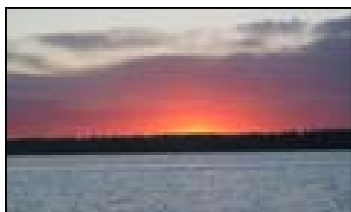
Skeleton Lake Stewardship Association
370 Carleton Drive
St. Albert, Alberta, T8N 7L3

Media Inquiries:
Hugh Harper
Phone: 780-449-5468

Brian Curial
Phone: 780-430-7348

We're on the Web!

www.skeletonlake.com



Fish and Wildlife Habitat

Skeleton Lake supported abundant populations of northern pike, yellow perch, cisco, lake whitefish and some walleye; however, commercial fishing operations likely contributed to the decline of the populations of most fish species over the past 50 years. Recovery operations were only partially successful.

While the lake is not a significant waterfowl or waterbird nesting area, many bird species, including at least two bird species at risk or of special concern, have been spotted near the lake.

Similarly, the Skeleton Lake area is home to numerous ungulates, black bears, game birds, small mammals and coyotes.

The following key issues and concerns have been identified for the protection of the aquatic resources:

- Continuous disturbance of the shoreline and the riparian areas poses significant threat to critical fish and wildlife habitat; and
- Concerns regarding disappearance of fish spawning areas and critical wildlife habitat.

Groundwater Resources

Groundwater dynamics are likely relevant components of water resources in Skeleton Lake and throughout the watershed. There is a growing concern regarding groundwater availability and its relationship to lake water levels.

Within the Skeleton Lake Watershed, about 280 groundwater wells (domestic, industrial and diversion) have been

drilled, which includes all active and reclaimed wells registered since 1977; however, not all wells drilled have been reported. At this time, there are not enough data available to determine what effect groundwater allocations have on the overall groundwater budget in the Skeleton Lake watershed.

Areas near the Summer Vil-

lages and the Village of Boyle have high groundwater contamination risks. Detailed hydrogeologic studies must be completed at any proposed development site to minimize the risk of groundwater contamination.

The key issue for the Skeleton Lake watershed is the complete lack of detailed groundwater data.

Town Hall Meetings

Two town hall meetings have been organized to discuss recent news at Skeleton Lake.

- Deepest snowpack in years - where has all the water gone?
- How will we stabilize the lake?
- What can we do to restore the fisheries?
- When will withdrawals by the town of Boyle cease?

- Are lake residents going on a regional water system?
- Alberta Environment plans for 2009?
- Watershed Management Plan first draft.

Your participation in these meetings will be greatly appreciated.

Meeting #1 - Edmonton

Tuesday, May 19, 7 p.m., Beverly Heights Community Hall at 4209 - 111 Avenue

Meeting #2 - Boyle

Saturday, May 23, 10 a.m., Boyle Community Centre