

Wabamun Lake Sub-Watershed Land Use Plan



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EXECUTIVE SUMMARY

With current and increasing economic growth and development in the watershed, Parkland County, in collaboration with its provincial and municipal partners, stakeholders, indigenous communities, and residents has developed the Wabamun Lake Sub-Watershed Land Use Plan. This plan provides a solid framework for a coordinated approach to addressing the key environmental challenges and issues facing it as identified through a “State of the Watershed” report as well as feedback received from the public, stakeholder and indigenous communities.

The plan establishes our collective vision for a desired future, outcomes that support achieving the vision, and land use objectives that identify “what” we want to accomplish to meet these outcomes. The plan also identifies the action and tools/procedures that we will use to achieve these objectives, to address our challenges and take advantage of our opportunities. The plan provides direction and support to all land use decision makers in the watershed that can affect its health with respect to:

- Improving our Surface Water Quality
- Improving our Groundwater Quality and Quantity
- Improving our Upland/ Riparian Health
- Attracting Economic Opportunities that Support the People and Health of our Watershed
- Reducing the Environmental Impacts of our Development
- Improving Our Knowledge of the Watershed
- Creating/Enhancing our Community Stewardship

1 PURPOSE OF THE PLAN

Lake Wabamun and the surrounding watershed is one of the crown jewels of Parkland County, providing major benefits to residents, businesses, landowners, and visitors alike. A large portion of the watershed has been modified or influenced by human activities. This includes residential development, resource extraction, agriculture, power generation/transmission, transportation, and recreational use. The current health of the lake is rated as “fair” (Wabamun Watershed Management Council 2013). In addition, Wabamun Lake is one of the most heavily used recreational lakes in the province, due to its large size and proximity to the City of Edmonton. For these reasons, the watershed requires special attention. Parkland County and its partners are committed to developing and implementing well thought out land use approaches to assist in maintaining or improving the health of the watershed.

As a community we expect land use decisions to contribute to a sustainable system that preserves the health and beauty of our landscapes and ecosystems, provides a plentiful and safe water supply, and supports appropriate economic and community opportunities for this and future generations. We desire a community where residents and visitors alike embrace a culture of shared stewardship and have the capacity, knowledge, skills, and resources to work effectively to that end. We recognize that land use decisions have a direct impact on the health of our watershed and our community, that trade-offs need to be made, and that we must address challenges and pursue the right opportunities enthusiastically to achieve our collective goals.

To support this community-based approach, Parkland County, in collaboration with its provincial and municipal partners, stakeholders, indigenous communities, and residents have developed the Wabamun Lake Sub-Watershed Land Use Plan. This plan provides a guide to coordinated regulatory and non-regulatory land use decision-making in the watershed based on the needs of the community.

This plan will also become the land use component of a broader integrated watershed plan for Lake Wabamun, which will identify the shared goals and actions to manage land, water and related resources on a watershed basis. It will also support the development of the North Saskatchewan Regional Plan, which will identify strategic directions for the entire North Saskatchewan watershed. It also meets the goals of the province's Water for Life: Alberta's Strategy for Sustainability, the Land Use Framework, as well as the Capital Region's Growth Management Plan.

2 STRUCTURE OF THE PLAN

This land use plan first provides a short summary of the current state of the watershed based on the results of the “State of the Watershed” technical reportⁱ (Phase 1). The State of the Watershed report compiled and summarized the best available information on the watershed and identified the key environmental challenges and issues that need addressing related to land use.

The watershed plan establishes our collective vision for a desired future, outcomes that support achieving the vision, and land use objectives that identify “what” we want to accomplish to meet these outcomes. These objectives will be achieved through the actions we will take, and the related tools and procedures we will use to address the challenges and issues identified in the State of the Watershed report.

3 PLANNING PROCESS

Parkland County carefully considered the advice from a Steering Committee with representatives from Parkland County, Alberta Environment and Parks, the North Saskatchewan Watershed Alliance and the Wabamun Watershed Management Council in developing this plan. A Stakeholder Committee with representatives from the Village of Wabamun, the five Summer Villages in the watershed, TransAlta, environmental and other interested groups also provided their knowledge and expertise in the development of the plan. The North Saskatchewan Watershed Alliance also provided important watershed health assessment and modelling information to support the planning process.

As mentioned previously, this land use plan is the second step in an overall land use planning process for the watershed, as shown in **Figure 1**. The process started with the development of a “State of the Watershed” technical report (Phase 1). This report summarized the best current available information on the watershed and identified the key environmental challenges and issues facing it. This was done through an evaluation of policy documents, technical reports and other documents as well as through public, stakeholder and indigenous engagement.

The development of this plan is the second phase in the process. It provides land use related actions that will guide and support current use and future development while addressing key environmental issues in the watershed as identified in the Phase 1 report. The next phase in the process (Phase 3) will be the development of an Implementation Plan that will provide specific details on how the actions in this Plan are accomplished. The final phase will use our learnings from the development of this Plan to produce a toolbox for use in the development of other land use plans in other watersheds.

Critical to the success of the development of the plan was the engagement process used to gather input and garner support from a wide range of stakeholders and community residents. A public consultation process was undertaken, vetting information and data with multiple

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stakeholders and target audiences through public open houses, online, formal presentations and face-to-face meetings. The community engagement focused on:

1. Creating awareness and a common understanding of the scope, purpose and plan development process so unrealistic expectations were not created;
2. Creating awareness and a common understanding of the current health of the watershed and the impact that land use decisions have on its health;
3. Providing an opportunity to contribute traditional and local knowledge to the planning process, and
4. Providing opportunities for community input into the development of the plan.

A Stakeholder session and Public Open House was held September 9, 2015 in Seba Beach and another Public Open House was held in the Village of Wabamun on September 16, 2015. Information about the planning process, the status of the watershed and the impacts of related land use activities were presented as well as potential actions to address these challenges.

A second Stakeholder session and Public Open House was held August 23, 2016 in the Village of Wabamun and another Public Open House was held in Seba Beach on September 8, 2016. These sessions provided an opportunity to review and receive input on the proposed draft plan.



Indigenous community members have a long and close relationship with the watershed and understand the needs of their communities and the need to protect the environment. A number of indigenous engagement sessions were held through the development of the plan, which provided a First Nation perspective in the planning process.

In addition to these opportunities, community members were also able to participate in online discussion using the MindMixer online platform. MindMixer functioned as a virtual town hall, where the public and stakeholders generated ideas, and evolved ideas through a safe, easy-to-use interface via the Internet. It functioned not only as a forum for collaboration, but also as a resource for informational materials about the project and the planning process.

All input and feedback gathered through this broad engagement approach was considered in the development of this plan.

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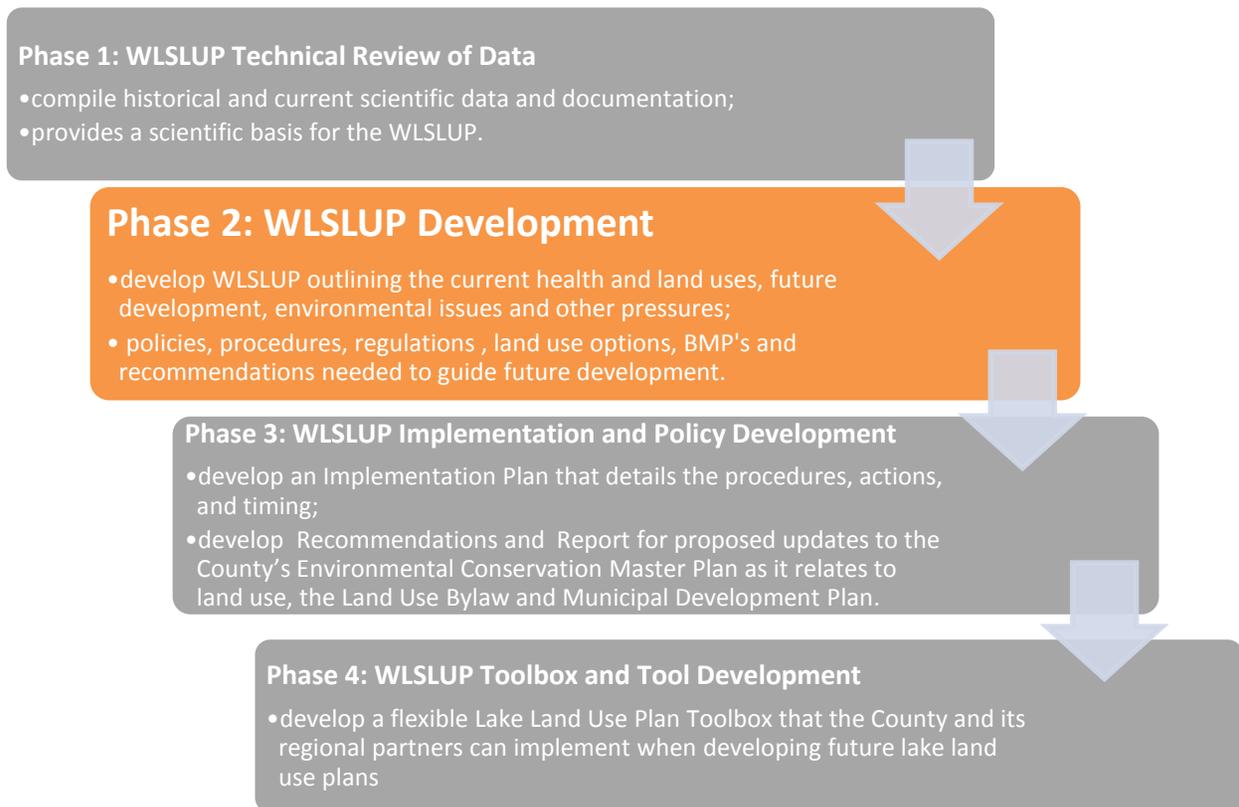


Figure 1: Wabamun Lake Sub-watershed Land Use Plan Process

4 THE WABAMUN LAKE WATERSHED

The Wabamun Lake watershed is the area of land that catches precipitation (snow, rain) that eventually makes its way as surface runoff into Wabamun Lake, as illustrated in **Figure 2**. The name "Wabamun" is derived from the Cree word meaning "mirror". Wabamun Lake is a shallow headwater lake approximately 80 km² in area, located in the North Saskatchewan River basin, approximately 65 km west of Edmonton. The watershed is approximately 347 km², which is relatively small compared to the size of the lake.



Legend

- - - Wabamun Study Boundary
- Railway
- Primary Road
- Secondary Road
- Other Road
- Parcels



Figure 2: Wabamun Lake Watershed Boundary
 SOURCE: Created by Stantec Consulting Ltd.; watershed boundary created by Parkland County

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The topography of the watershed is dominated by steep slopes (>15%) on the north shore of the lake, with several >20% slopes present. Due to these steep slopes, this area has high potential for erosion. The soils in the watershed are predominantly Grey Luvisolic soils, which are the main forest soils across Alberta. There are some Chernozemic soils in the watershed, which are some of the best agricultural soils in Alberta.

In addition to Wabamun Lake, there are at least 35 small drainages as well as a number of wetlands in the watershed, as identified in **Figure 3**. Seven of the largest natural creeks contribute the majority of flow. There is one outlet that maintains lake levels at approximately 724.55 meters above sea level through a constructed weir on Wabamun Creek on the east side of the lake. The lake is a well-buffered, alkaline lake, which protects it from the effects of acidification. The lake is considered mesotrophic to mildly eutrophic.

There are many groundwater discharge areas in the watershed some of which directly influence the level of the lake. There may also be localized areas within the watershed that are important recharge areas that can only be confirmed through hydraulic analysis. Groundwater levels have slowly decreased over the past 20 years. The groundwater in the watershed often exceeds drinking water criteria for total dissolved solids, sodium, iron, and manganese.

Wabamun Lake is unique in that TransAlta diverts and treats water to drinking water standards from the North Saskatchewan River for the operation of its Sundance power plant. This water is then de-chlorinated before being released into the lake. This water addition offsets impacts to lake level as a result of TransAlta's operations on the south shore of Wabamun Lake. Phosphorus concentrations have decreased in the lake since the beginning of treated water additions. Even with this treated water being added on a regular basis, the current health of the lake is still rated as "fair" due to other influences such as nutrients and pollutants entering the lake mainly through surface runoff and precipitation, and those already contained in lake sediments.

There are three First Nations that have interests in the watershed: Paul Band; Alexis Nakota Sioux Nation and the Enoch Cree Nation with portions of the Paul First Nation Reserve located within the watershed itself.



Legend

- - - Wabamun Study Boundary
- █ Lake
- - - Stream - Indefinite
- - - Other Hydrology Features
- █ Stream - Perennial
- █ Ditch
- - - Stream - Intermittent
- - - Arbitrary Flow

Figure 3: Wabamun Lake Tributaries

4.1 CURRENT LAND USE

Lands in the watershed have seen significant development over the last 150 years. These developments have resulted in the conversion of much of the lands to residential, resource extraction, agriculture, recreational uses and linear developments including roads, trails, railways, pipelines, seismic lines, and transmission lines.

Land ownership is a mix of private and public (municipal, provincial, and federal) lands. Although the province owns the “bed and shore” of most waterbodies, in much of the watershed, private lands border these areas. This requires the province and municipalities to work with landowners to cooperate in the management of these waterbodies and their associated shorelines. In most cases, adjacent landowners require authorization from the province and the municipality for work or development on the shoreline and on the bed and shore of these waterbodies.

There are seven municipalities within the watershed: Parkland County, which includes the Hamlet of Fallis, 27 residential subdivisions, and many country residential acreages: the Village of Wabamun and five Summer Villages, (Betula Beach, Kapasiwin, Lakeview, Point Alison, and Seba Beach). The Paul Band Reserve No. 133A is located on the eastern shore of the Lake and Wabamun Lake Provincial Park is located on Moonlight Bay adjacent to the northeast part of the lake. The total estimated permanent population of the watershed is 1,360 with a potential seasonal residential population (not including visitors or day-trippers) increasing to 3,425 during the summer months. Parkland County has established land use districts within the watershed as outlined in Parkland County’s Land Use Bylaw (**Figure 4**).

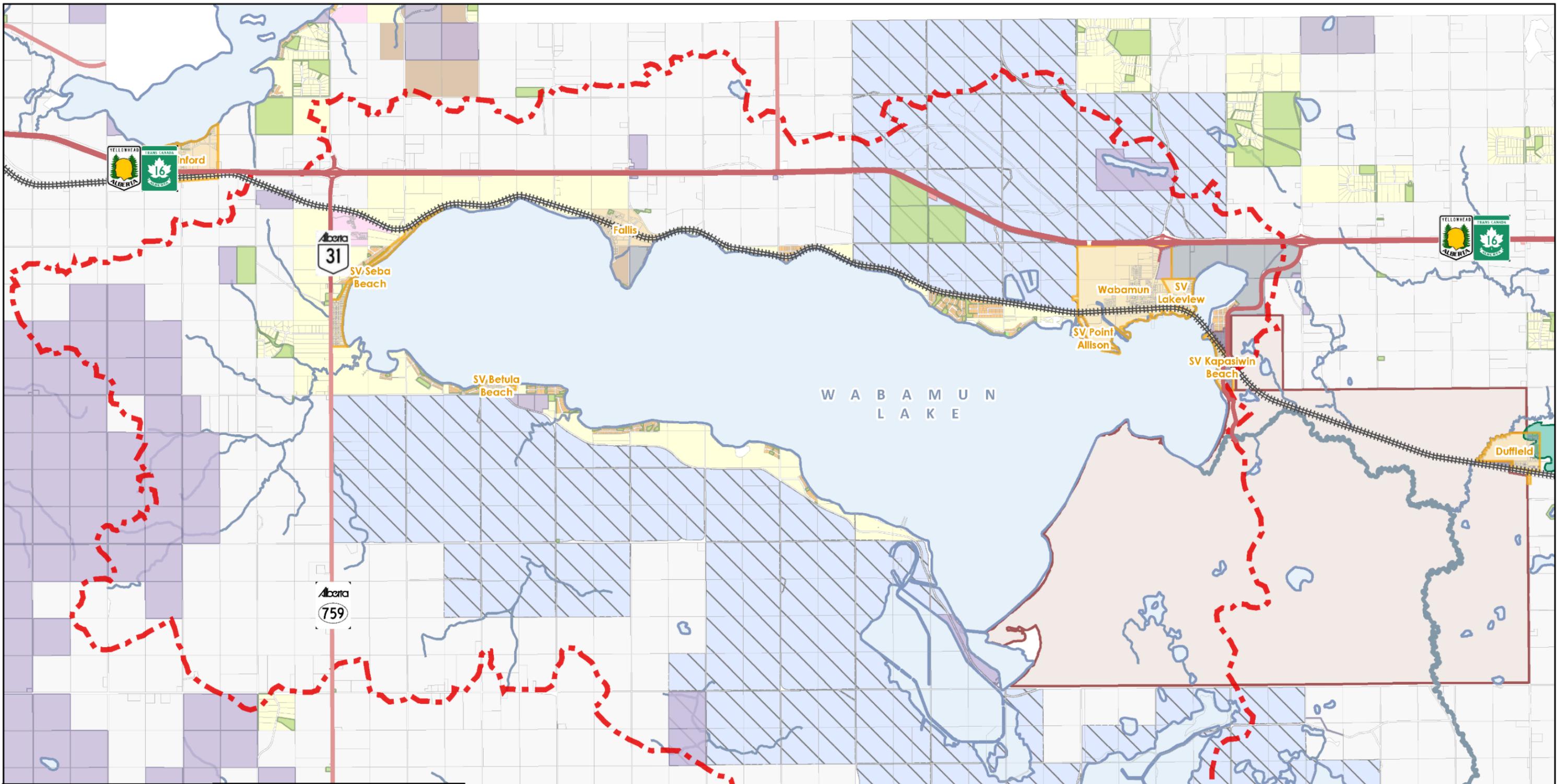


Figure 4 - 3 Overall Land Use in the Wabamun Lake Subwatershed

- - - Wabamun Study Boundary
- Railway
- Primary Road
- Secondary Road
- Lakes
- County Land
- Crown Land
- Parcels
- Hamlet | Summer Village | Village
- Paul Band Reserve
- AGG - Agriculture General District
- ANC - Agriculture Nature Conservation District
- CR - Country Residential District
- LSR - Lakeshore Residential District
- BRR - Bareland Recreational Resort District
- RC - Rural Centre District
- LC - Local Commercial District
- RE - Resource Extraction District
- PC - Conservation District
- PR - Recreation District
- Direct Control District

SOURCE: Data from Parkland County



Figure 4 - Parkland County Land Use Bylaw Districts within the Wabamun Lake Watershed

SOURCE: Data from Parkland County

Alberta
627

N. Sask
Burtonsville
Island Reach ESA

The proportion of land within each of these Land Use Districts is summarized in **Figure 5**. The Village of Wabamun and the Summer Villages have also established land use districts in their respective Land Use Bylaws that regulate how subdivision and development must occur within their respective boundaries.

The watershed has faced historic and varied developments including agriculture (crop and livestock), coal mining, power generation, oil and gas development, residential uses and extensive recreational activities. A portion of the Jackpine Provincial Grazing Reserve (provincial lands) located in the west side of the watershed is used for summer grazing of livestock. There are no commercial hog, poultry or sheep operations located in the watershed.

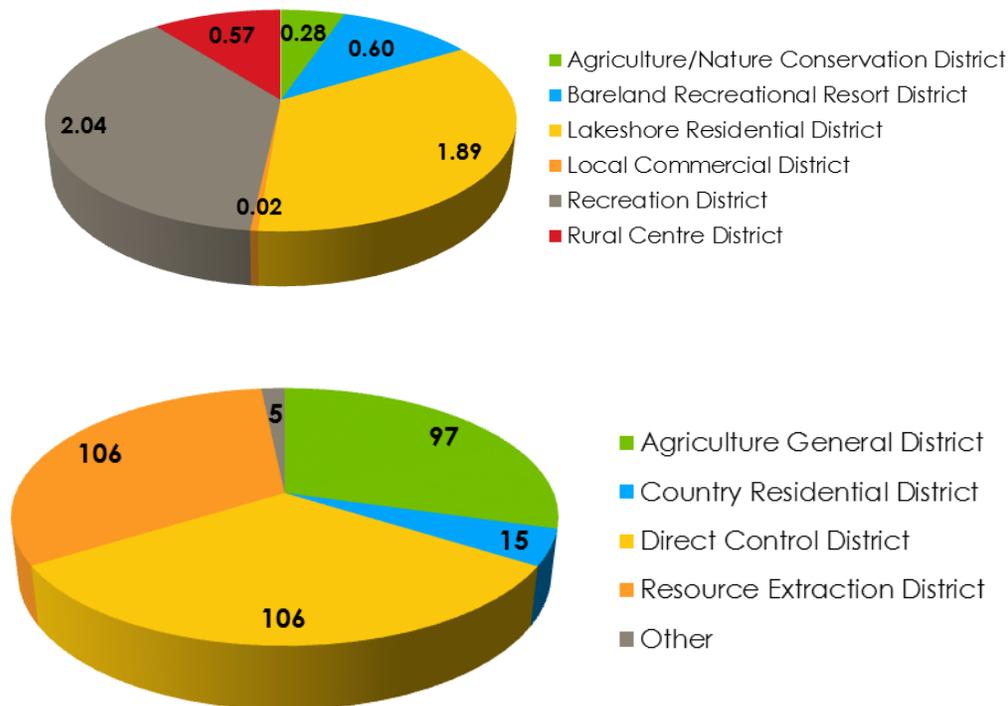


Figure 5: Proportion of Land in Land Use Districts in Square Kilometers
 SOURCE: Data from Parkland County

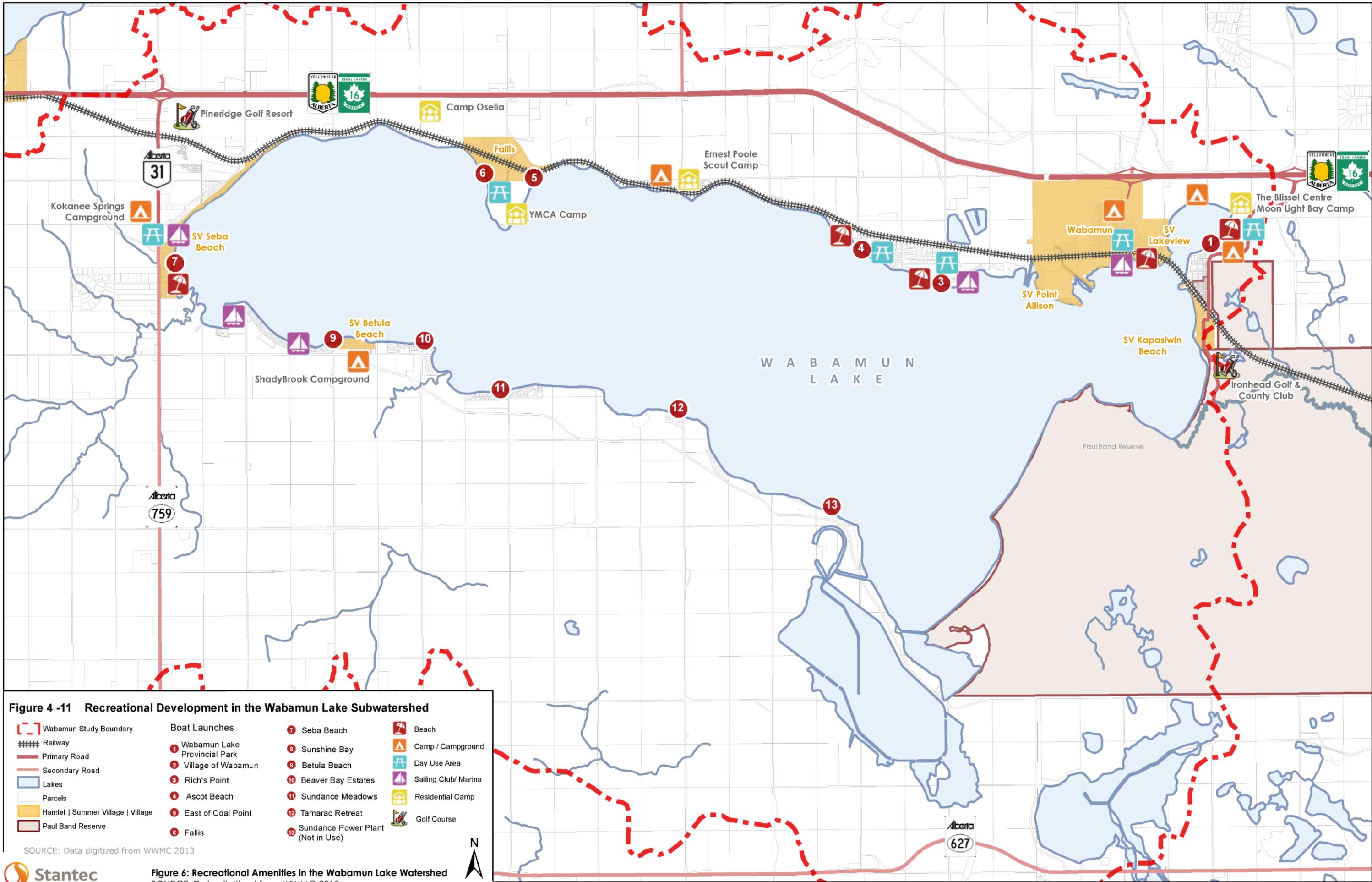
TransAlta has coal mining rights to a considerable portion of the land surrounding the lake. The Whitewood Mine area on the north side of the lake ceased active mining operations in 2010. Of the 1900 hectares of mine land reclaimed at Whitewood, 1,130 hectares are certified by the Alberta Energy Regulator with a mix of agricultural, wildlife and wetland habitat present in the Whitewood Mine footprint. The Highvale Mine area, covers a significant portion of land south of the lake, and is actively mined with 15 km² reclaimed to date. TransAlta also operates two power-generating sites within the area and there is transmission infrastructure emanating from the power plants in the region. There is active oil and gas drilling and extraction activity, primarily in the southwest and southeast portions of the watershed, (108 sour and non-sour oil and gas wells are currently in the watershed).

There are ten groundwater diversion licences in the watershed, with the Village of Wabamun being the largest single groundwater user. Domestic wells used for potable and sanitary water systems for small businesses can divert up to 1,250 m³ per year without requiring a diversion licence and wells for combined purposes of domestic supply and stock (traditional agriculture) can divert up to 6,250 m³ per year without a licence.

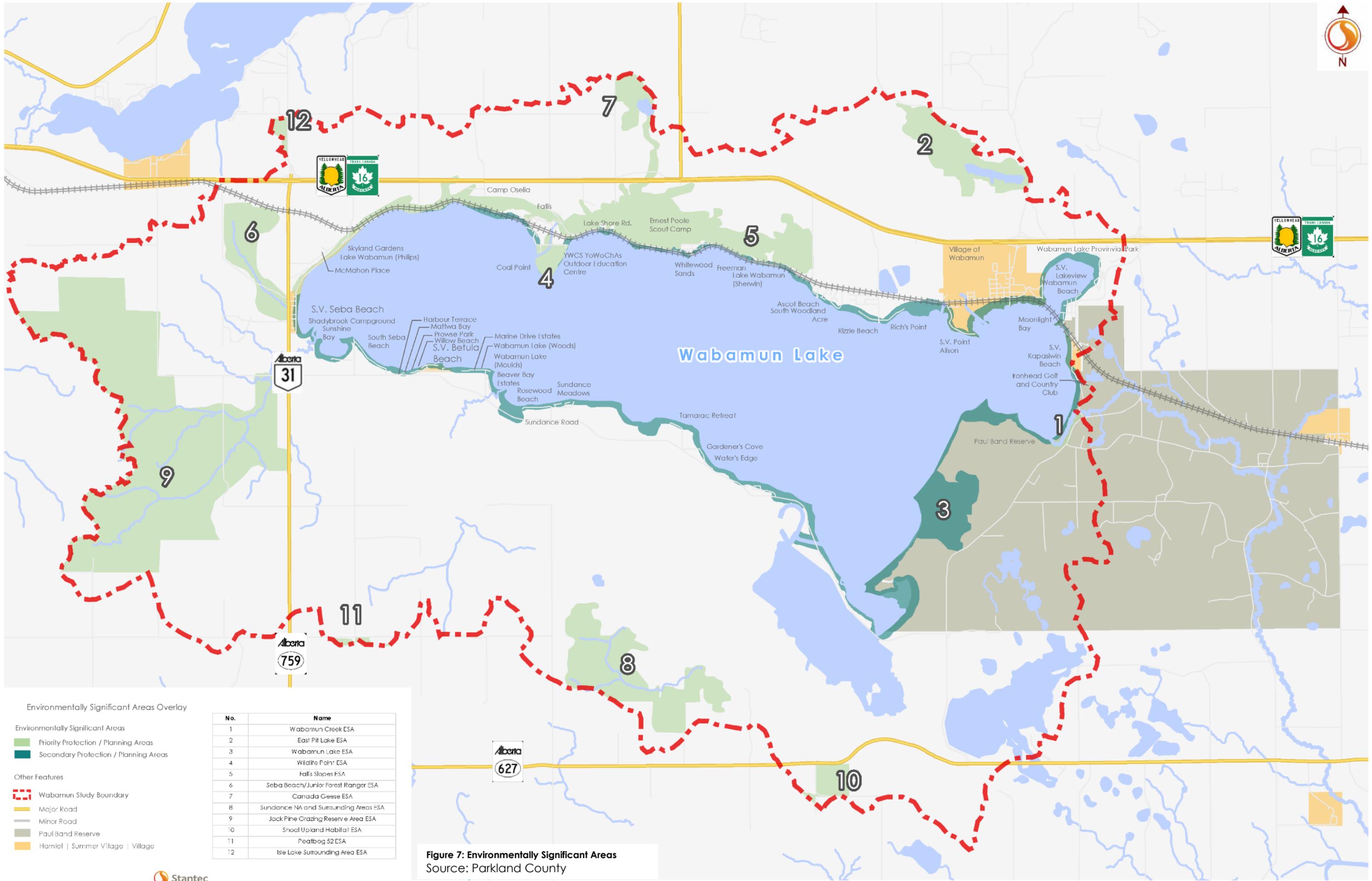
Wabamun Lake is one of the most heavily used recreational lakes in the province, especially during the summer months. The popularity of Wabamun Lake is not surprising due to its proximity to major urban centres within the Capital Region including the City of Edmonton, Spruce Grove and Stony Plain, as well as the numerous residential acreages within proximity of the lake and the residential and cottage development that exist around the lake itself.

There are a number of outdoor education facilities in the watershed, two golf courses, two privately operated campgrounds, and five sailing clubs that operate on Lake Wabamun. **(Figure 6).**

In the 2014 Environmental Conservation Master Plan, Parkland County identified twelve Environmentally Significant Areas in or partially within the watershed. These are places vital to the long-term maintenance of biological diversity, soil, water, or other natural processes at multiple scales. **Figure 7** identifies the ESAs within the watershed.



SOURCE: Data digitized from WWMC 2013



Environmentally Significant Areas Overlay

- Environmentally Significant Areas
- Priority Protection / Planning Areas
 - Secondary Protection / Planning Areas

- Other Features
- Wabamun Study Boundary
 - Major Road
 - Minor Road
 - Paul Band Reserve
 - Hamlet | Summer Village | Village

No.	Name
1	Wabamun Creek ESA
2	East Pit Lake ESA
3	Wabamun Lake ESA
4	Wildlife Point ESA
5	Falls Slopes ESA
6	Seba Beach/Junior Forest Ranger ESA
7	Canada Geese ESA
8	Sundance NA and Surrounding Areas ESA
9	Jack Pine Grazing Reserve Area ESA
10	Shoal Upland Habitat ESA
11	Peatbog 52 ESA
12	Isle Lake Surrounding Area ESA

Figure 7: Environmentally Significant Areas
Source: Parkland County

4.2 JURISDICTIONS IN THE WATERSHED

All three levels of government – municipal, provincial and federal – have land use jurisdiction, in the watershed.

Municipalities have jurisdiction over subdivision of land, land use and development within their respective municipal boundaries under the *Municipal Government Act*. They are responsible for overseeing the construction of buildings and supporting structures so they comply with the *Alberta Safety Codes Act* (plumbing, electrical, and sewage systems.)

All municipalities must adopt a Land Use Bylaw, which regulates and controls the use and development of land and buildings within the municipality. These bylaws include land use districts and corresponding regulations concerning permitted and discretionary uses within each district. The bylaws may also address development setbacks from property lines, the number of structures allowed on a property, the size and height of buildings and requirements regarding site clearing, etc. Municipalities are also responsible for bylaw enforcement within their boundaries.

Under Section 60 of the *Municipal Government Act*, a municipality can provide direction, control and management of the rivers, streams, watercourses, lakes and other natural bodies of water within the municipality as long as these decisions are consistent with provincial/ federal enactments. **Figure 8** shows a typical bank location that distinguishes the bed and shore of a waterbody/watercourse from the adjacent uplands.

The Federal Department of Fisheries and Oceans has authority over any activities that may have an impact on significant fish in the watershed. Transport Canada and the Canadian Transportation Agency regulate the activities and operation of the Canadian National Railway. The Paul Band Reserve falls under the jurisdiction of the Department of Aboriginal Affairs and Northern Development. The Federal Government also regulates uses on the lake (boat speeds, reckless boating,) through the Ministry of Transportation (enforced by the RCMP) and the development of structures which may affect navigation (piers, docks, breakwaters, etc.).

The Alberta Government manages and enforces land, natural resource and environmental regulations under various Acts including the *Environmental Protection and Enhancement Act*, *the Water Act*, *the Public Lands Act*, and *the Parks Act*. It is responsible for all development and activities that occur within the bed and shore of the lake and waterbodies, protecting wildlife, and endangered species, regulating activities that affect ground water, surface water and water use, as well as air quality and contaminated sites.

The Alberta Government also has a number of agencies with authority in the watershed. The Natural Resources Conservation Board (NRCB) has authority to approve and regulate confined livestock feeding operations and agricultural practices related to the management of manure through the *Agriculture Operations Practices Act*. Activities connected to energy resource extraction, including TransAlta's coal mining activities, are under the authority of the Alberta Energy Regulator. TransAlta's power generation facilities, fall under the authority and regulation of the Alberta Utilities Commission.

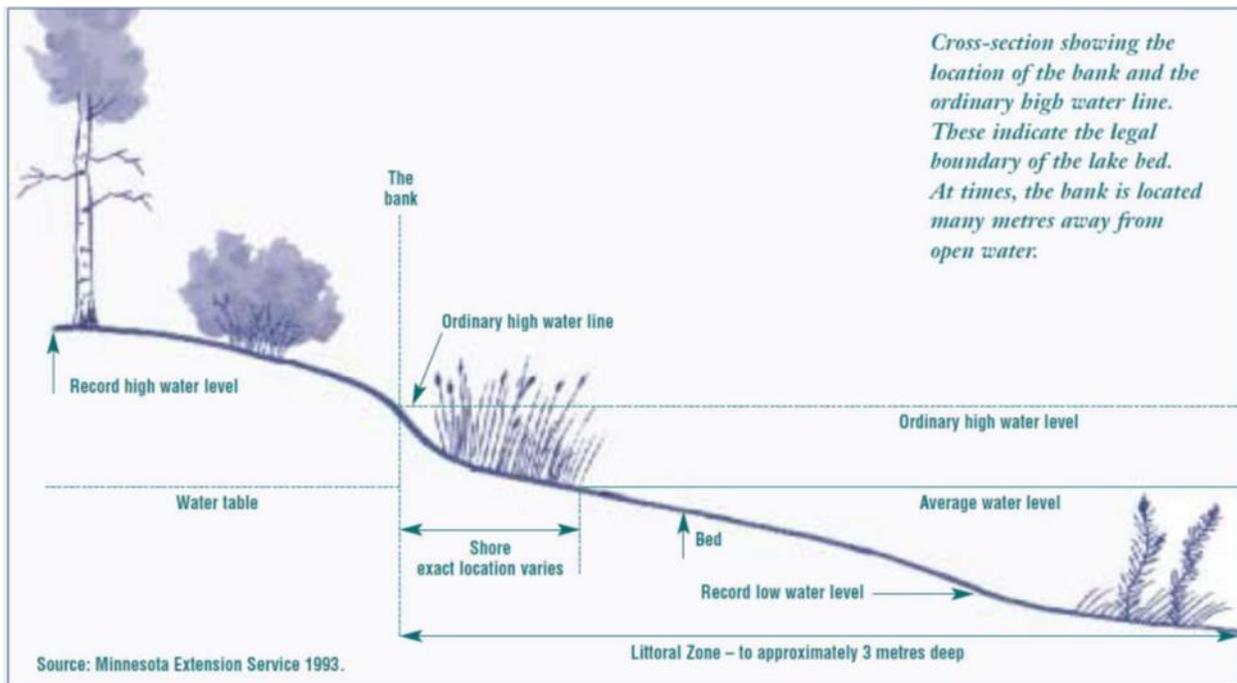


Figure 8 - Cross Section of Bank Location in Relation to Adjacent water
 Source: ACA (1999)

5 VISION, OUTCOMES, OBJECTIVES, RECOMMENDED ACTIONS, TOOLS/PROCEDURES/ORGANIZATIONS

Our vision for the Wabamun Lake watershed recognizes that land use not only affects the land but also the environment and people who use or live in the watershed. We recognize that these land use challenges are complex and require that we work better together as a community to make and support land use decisions that improve the quality and sustainability of our ecosystem while meeting the economic and social needs of residents and visitors. Our vision for the watershed plan is:

“A multi-stakeholder land use plan that, as a component of an integrated watershed plan, will improve the health and resiliency of the Wabamun watershed and sustain our communities through the improved stewardship of our land and water.”

To support the achievement of our vision, the following outcomes and supporting objectives, actions, tools and procedures (consistent with Parkland County's Integrated Community Sustainability Plan and Municipal Development Plan) provide the basis for future land use decision-making in the watershed.

Outcomes are “the result” we want in the watershed. Objectives are “what we want to achieve” in order to reach our outcomes. Actions are “how we are going to achieve” the objectives. Procedures/ tools/organizations identify the specific mechanisms we will use to implement the actions and the organizations who will lead these initiatives. The majority of these recommended actions, tools and procedures will be funded through existing municipal and provincial budgets.

Implementing our vision can only be achieved through the cooperation and coordination between provincial and municipal decision makers, industry, residents, indigenous people, visitors and others with an interest in the watershed. Everyone must share the responsibility to support and participate in these efforts.

The organizations responsible for using the specific tools or procedures are identified under the Tools/Procedures/Organizations subheading under each of the following plan Outcomes.

5.1 OUTCOME 1- OUR LAND USE PRACTICES PROTECT THE ENVIRONMENT

As a community, we expect that our land use practices will protect our environment and support a healthy ecosystem that provides sustainable opportunities for current and future generations to enjoy.

5.1.1 Objective 1: Our Land Use Practices Improve Surface Water Quality

Our land use practices must protect the quality of our surface water to ensure ongoing environmental health and for maximizing the quality of life and benefit to residents and other users. Land use practices can affect the water quality of the lake through surface water run off that carries nutrients (e.g. phosphorous and nitrogen), pesticides, sediments, bacteria, litter, oil and grease and other pollutants into wetlands, streams and the lake.

The State of the Watershed Report confirms that Wabamun Lake water quality has decreased over time due to land use changes in the watershed and may continue to decrease if land use practices do not improveⁱⁱ. This included an increase in total phosphorus concentrations and loads levels of fecal coliform bacteria on some beaches, increased salinity and higher concentrations of metals including cadmium, copper, and mercury than in other central Alberta lakes.

Developed areas contribute disproportionately higher amounts of sediments, nutrients, and other contaminants than undeveloped areas. This is typically through increased surface water runoff over fertilized lawns, and hardened surfaces (roads, roofs, parking areas, etc.) where pollutants can accumulate and then easily washed away. Old or malfunctioning septic systems can also contribute to bacteria pollutants in surface water.

Land use practices that contribute phosphorous to surface runoff have a significant impact on the health of the Lake. Once phosphorous enters the lake, it generally builds up in sediments



and cycles between these sediments and the water above encouraging algae growth. Wabamun Lake has ideal conditions for this cycling to occur due to its shallow depth and the mixing of water especially in the summer.

Estimated annual phosphorous concentrations in individual tributaries that contribute phosphorous to Wabamun Lake are illustrated in **Figure 9**.

The following actions, tools and procedures are intended to

improve the surface water quality in the watershed by decreasing salinity and phosphorus concentrations in the lake, lowering levels of fecal coliform bacteria on beaches, and lowering concentrations of metals including cadmium, copper, and mercury in the lake.

5.1.1.1 Recommended Action 1:

No new confined feeding operations will be located within the watershed boundaries north of Highway 627. They may only be considered south of Highway 627 as identified in **Figure 10** and when in compliance with all applicable regulations. This includes but is not limited to this plan, the Highvale End Land Use Area Structure Plan and the Municipal Development Plan.

Tool/Procedures

Planning and Development will lead the amendment of County regulatory documents and standards to prohibit new CFOs within the watershed as stipulated in this plan.

5.1.1.2 Recommended Action 2:

Establish water quality objectives for the lake and watershed and manage within these limits.

Tool/Procedure/Organizations

Alberta Environment and Parks will lead the development and implementation of a Surface Water Quality Management Framework in the watershed.

5.1.1.1 Recommended Action 3:

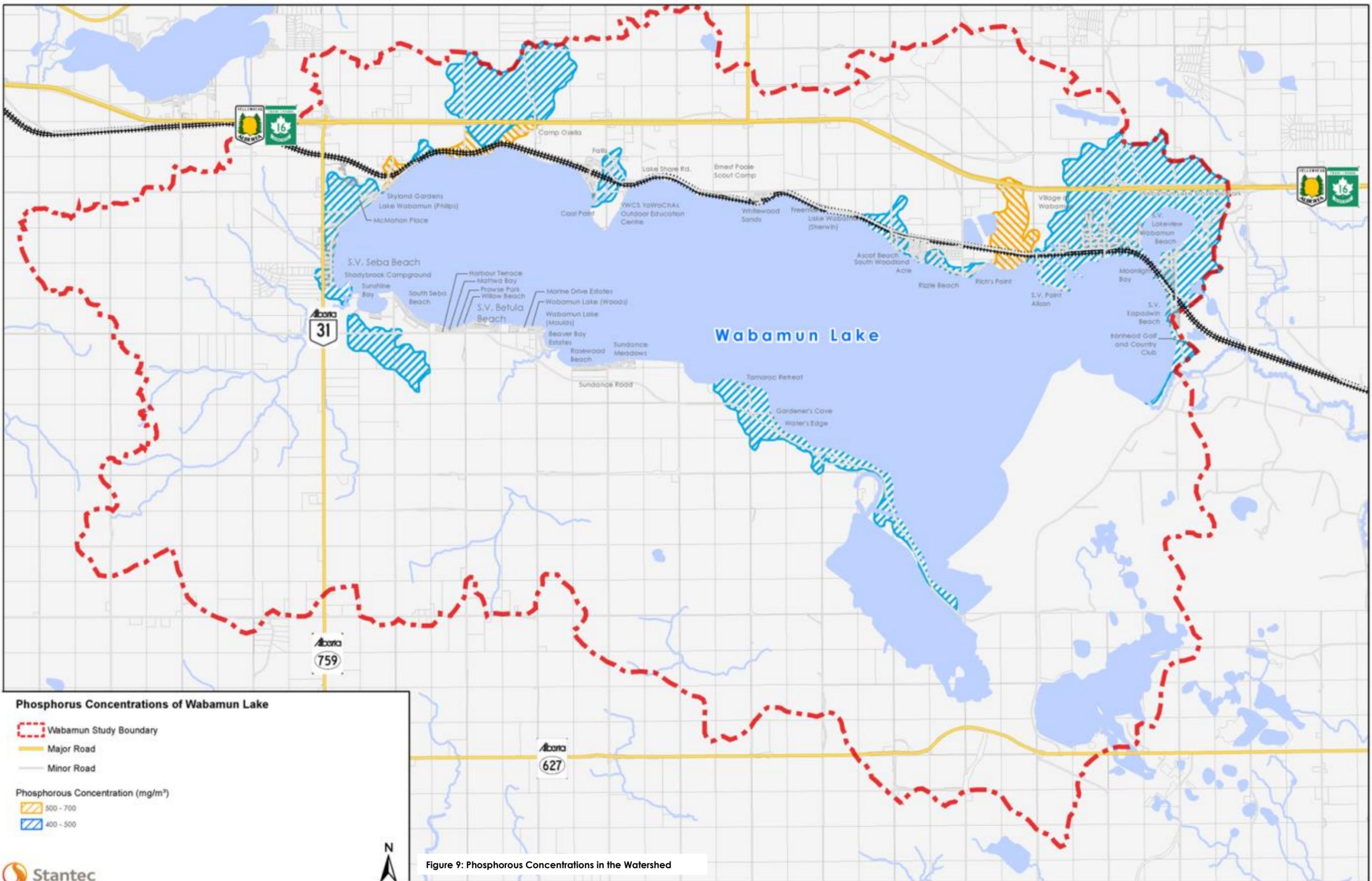
Minimize the potential for future impacts of the Canadian National Railway mainline on the watershed.

Tool/Procedure/Organizations

Alberta Environment and Parks, Villages, Summer Villages and the County will provide input to Canadian National Railway in undertaking a railway corridor risk assessment in the watershed, and identify and implement required mitigation strategies as a result.

5.1.1.1 Recommended Action 4:

Reduce nutrients, manure, pesticide and other chemicals in runoff from agricultural operations, acreages and lots with a particular focus in 1:100 floodplain and phosphorous concentration areas over 400 mg/m³.



Tool/Procedure/Organizations

Environment and Community Sustainability will coordinate with Cows and Fish to develop and deliver education and incentive programs that focus on:

- Encouraging livestock watering and salt/mineral sites away from riparian areas and discourage livestock grazing adjacent to waterbodies/lakes/streams/wetlands;
- Reducing pesticides, fertilizers, petroleum products and manure in runoff;
- Reducing tillage and summer fallow and returning stubble to the soil to reduce soil erosion and increase water infiltration.

Tool/Procedure/Organizations

Environment and Community Sustainability, Planning and Development, and Safety Codes will coordinate with the Wabamun Watershed Management Council and the Land Stewardship Centre to develop and delivery education programs focused on:

- Reducing the use of phosphorous-based fertilizers, pesticides and other chemicals in runoff;
- Repairing/replacing faulty septic systems;
- Enhance and encourage landowner hazardous waste collection, waste reduction, and composting programs.

Tools/Procedure/Organizations

Engineering Services will develop a Storm Water Management report for the watershed including an Area Drainage Master Plan that provides an integrated, comprehensive approach for all catchment areas and directs the management, planning and operations of municipal storm drainage systems to prevent discharge of pollutants from municipal operations, and minimizes direct runoff to the lake. This includes:

- a) Functional storm water management areas;
- b) Runoff volume control targets and release rates;
- c) Identification of environmental resources;
- d) Point and non-point sources of pollution;
- e) Spill response and prevention;
- f) Control levels for storm water;
- g) Total suspended solids management;
- h) Best management practices;
- i) Low impact development strategies and technologies.

Planning and Development will undertake a watershed capacity study, which explores the potential residential carrying capacity of the watershed. Findings from the study will be used to promote appropriate infilling, cluster development, higher density and mixed-use developments adjacent to existing municipal infrastructure (e.g. water, sewer, and road), protection of natural drainage patterns, steep slopes, sensitive groundwater recharge areas, and major vegetation cover types.

5.1.2 Objective 2: Our Land Use Practices Improve Groundwater Quality and Quantity

Many rural landowners and some urban communities within the watershed rely on groundwater as a water source and are therefore at risk of groundwater contamination and reduction in groundwater levels if land use practices result in reducing groundwater recharge or enable contamination. Although we know how important groundwater is, it is normally not visible and pollution pathways are not readily seen. We need to better identify and protect ground water quality by protecting recharge areas and preventing potential contamination from unused or improperly capped wells, leaking sewers, and old/malfunctioning septic systems.

Groundwater levels can depend on water levels of lakes and wetlands, precipitation, groundwater use, climatic parameters and natural cycles. Groundwater replenishment can occur slowly, at rates depending on the properties of the groundwater recharge areas. Excessive groundwater use that exceeds this recharge can lead to the draw down or depletion



of groundwater. Over time, this could permanently collapse an aquifer, eliminating future capacity to store groundwater.

Although there is not a good understanding of groundwater resources in the watershed, based on data from the provincial Groundwater Observation Network, groundwater levels have slowly decreased over the past 20 years in all monitoring wells in Parkland Countyⁱⁱⁱ. Groundwater in the watershed often exceeds drinking water standards for total dissolved solids, sodium, iron, and

manganese, which are typically observed as natural background concentrations in Alberta^{iv}. Groundwater contamination can occur in areas of groundwater recharge and through unused wells, leaking sewers and septic systems. Excessive use in relation to recharge can lead to the depletion of groundwater. New developments add additional pressure on groundwater supply and potential for groundwater drawdown and contamination. ^v

5.1.2.1.1 Recommended Action Intended to Improve Ground Water Quality and Quantity

Identify and protect groundwater recharge and discharge areas from new developments and contamination from existing and new land uses, reduce groundwater use in depleted areas and rehabilitate recharge areas that have been negatively impacted.

Tool/Procedure/Organizations

Alberta Environment and Parks, Environment & Community Sustainability and Planning and Development will undertake a Regional Groundwater Assessment Study for the watershed.

Tool/Procedure/Organizations

Alberta Environment and Parks, Planning and Development, Village of Wabamun and the Summer Villages will lead the amendment of regulatory documents and standards so that the groundwater table is given more consideration in the design and construction of new developments and storm water management systems as follows:

- Approval for the development of new domestic water wells will be based on the results of the Groundwater Assessment Study;
- Require surface grading on new developments to promote recharge of the groundwater;
- Require new developments to minimize clearing of vegetation and size of impervious surfaces to facilitate groundwater recharge;
- Landowners with private wastewater septic systems shall maintain them on an annual basis. If the municipality requests proof of annual maintenance, the landowner shall provide such proof;
- No new outhouses shall be considered;
- Unused water wells will require proper abandonment procedures to protect groundwater quality.

5.1.3 Objective 3: Our Land Use Practices Improve Upland/ Riparian Health

Healthy, well-vegetated upland and riparian areas are an important part of maintaining a healthy watershed. They help protect water quality and the ecosystem by providing fish and wildlife habitat, reducing flood risk and improving water quality and quantity through its soil stabilization, water holding and pollution and nutrient removal capacity. Past land use practices have seen significant conversion of these lands to residential, resource extraction, agriculture,

recreational, energy generation and other uses over the last 150 years.



Riparian areas are lands adjacent to streams, rivers, lakes and wetlands where the vegetation and soil are strongly influenced by the presence of water. These include shorelines, which are particularly sensitive to development. Riparian

areas are particularly valuable for fish and wildlife because of the spawning, rearing and feeding areas they provide.

A riparian health assessment of the shoreline of Wabamun Lake was completed in 2014 by the North Saskatchewan Watershed Alliance. It showed that just over half of the lakes shoreline riparian area were rated healthy (57%, 38 km) with natural emergent and shoreline terrestrial vegetation generally intact in these areas. The assessment also showed that riparian health has been reduced for a considerable length of shoreline with 34% highly impaired and 9% moderately impaired. Some of these areas have been hardened with concrete, armor stone, and other materials.^{vi} See **Figure 11**.

A large portion of the native mixed wood forest in the watershed has also been removed and fragmented because of development for residential, resource extraction and agriculture. Encroachment onto municipally owned reserves along the shoreline has also become a concern, as some landowners adjacent to these public reserves have been clearing, developing and largely treating them as extensions of their own properties.

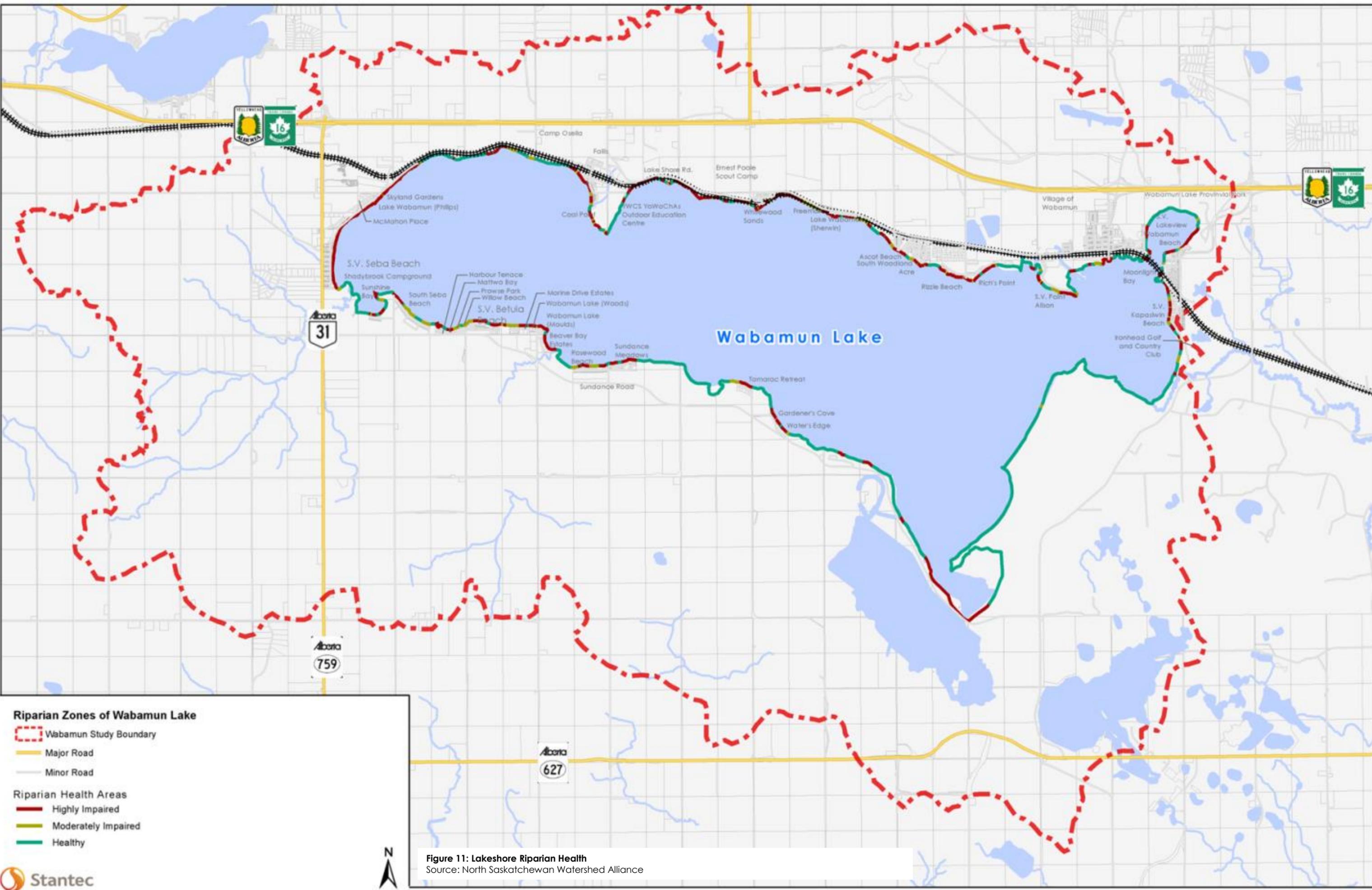
To help ensure that existing healthy wetlands (including the lake) and riparian areas are protected and moderately and significantly impacted areas are reduced and restored where feasible, Parkland County is currently completing its Municipal Wetlands Policy. The policy is intended to ensure no net loss of wetlands and associated riparian areas during the process of land development and building construction. It is using the following principles, in order of priority:

- Avoidance: Avoid impacts to wetlands wherever and whenever possible. Wetlands of higher relative value shall require stronger evidence of effort to avoid than lower value wetlands.
- Minimization: Where avoidance is not possible, proponents must minimize the direct and indirect impacts to wetlands via best management practices, codes of practice, and operating standards.
- Replacement: Where avoidance and minimization efforts are not feasible or proven effective, wetland replacement shall be undertaken as a last resort in the mitigation process.

Land use practices that introduce/support Invasive species also pose a threat to native ecosystems and biodiversity by outcompeting native species and altering habitat. They can be very difficult to remove or control once established. The watershed, due to its heavy human use is particularly prone to the introduction and spread of invasive species.

5.1.3.1 Recommended Action Intended to Improve Upland/Riparian Health

Reduce fragmentation of upland and riparian areas and maintain/ enhance intact habitat types and connectivity by discouraging development/activities and manage invasive, weedy and/or non-native species that threaten ecological integrity and connectedness. Wetlands of Class III or greater within the Wabamun Lake watershed shall be preserved in their natural state.



Riparian Zones of Wabamun Lake

- Wabamun Study Boundary
- Major Road
- Minor Road
- Riparian Health Areas**
- Highly Impaired
- Moderately Impaired
- Healthy



Figure 11: Lakeshore Riparian Health
 Source: North Saskatchewan Watershed Alliance

Tools/Procedures/Organizations

Planning and Development will lead the following initiatives.

- Undertake a Habitat Connectivity Study, and improve wildlife habitat and range by locating municipal reserve lands in strategic locations and connecting them to privately owned or public natural areas where habitat and features that provide for and function as movement corridors or landscapes in new development proposals exist.
- Undertake a Hazards and Assessment analysis identifying hazard lands (flood plain, steep slopes greater than 15%, soils that could become unstable if cleared) and protect these lands from development.
- Establish municipal programs to support and monitor riparian areas and Conservation Easements to protect sensitive areas.
- Encourage voluntary developer contributions for the provision of parks, open space amenities, and protection of sensitive lands.
- Redistrict lands within the watershed as appropriate including an evaluation of existing Reserves (roadway, municipal, environmental) to ensure that they have the appropriate designations and change designations if required.
- Seek opportunities for the sale or exchange of reserve lands not required to protect sensitive lands and use the proceeds to acquire sensitive lands including funding from the provincial Land Stewardship Fund and Alberta Land Trust Grant Program.
- Pursue County designation as a Wetlands Restoration Agency to allow the use of developer funds to restore wetlands according to the Wetland Policy.

Tools/Procedures/Organizations

Alberta Environment and Parks, Planning and Development, Villages and Summer Villages will amend regulatory documents and Standards to include requirements that:

- Preserve natural features, minimize impacts on agricultural lands, and provide adequate setbacks and protection of the environmental integrity of riparian areas, steep slopes, shorelines, wetlands, and watercourses.
- A minimum of 30 meters from the legal bank of Wabamun Lake and any key areas of important upland and riparian areas be dedicated as Environmental Reserve and retained in their natural state.
- An approval for tree clearing will be required on all lands identified as hazard/sensitive in the Hazard and Assessment Study.

- Only approve naturalized approaches using best management practices for the construction/reconstruction of erosion protection within 3 meters of the legal bank of Wabamun Lake.

Tool/Procedure/Organizations

Planning and Development, Environment & Community Sustainability, Enforcement Services, Villages and Summer Villages shall work with adjacent landowners to Environmental Reserves and the public to:

- Restrict the use of off highway vehicles on Environmental Reserve lands unless authorized by the municipality.
- Restrict mowing, cutting or removal of natural vegetation on Environmental and Municipal Reserve lands unless authorized by the municipality.
- Restrict development or buildings on Reserve lands unless authorized by the municipality.

Tool/Procedure/Organizations

On an ongoing basis, Alberta Environment and Parks will maintain the weir on the east side of the lake.

Tool/Procedure/Organization

Parks and Recreation & Culture will designate areas and design trails for off highway vehicle use that minimizes environmental impacts and watershed health as recommended by the Parks, Recreation and Culture Master Plan.

Tool/Procedure/Organization

Alberta Environment and Parks, Environment & Community Sustainability, Enforcement Services Villages, Summer Villages, will develop and implement a regular watercraft inspection to reduce opportunities for the spread of invasive species. (e.g. Responsible Boat care, PlayClean Go)

Tool/Procedure/Organization

Planning and Development and Environment & Community Sustainability will lead the development of management plans for the priority Environmentally Significant Areas **Figure 12** consistent with the area-specific management considerations outlined in the ESA inventory of the Environmental Conservation Master Plan as follows:

Environmental Significant Area	Area Specific Management Considerations
Canada Geese	<ul style="list-style-type: none"> • Maintain the natural character of the area • Ensure connectivity with neighbouring natural patches • Ensure disturbances occur away from erodible areas • Prevent groundwater contamination
East Pit Lake	<ul style="list-style-type: none"> • Limit fragmentation by restricting linear feature development and maintaining large patches of native vegetation for wildlife corridors and ungulate wintering habitat.
Fallis Slopes	<ul style="list-style-type: none"> • If future gravel pits are approved, appropriate erosion and sediment control practices, best practices, progressive reclamation, and landscape ecology principles should be incorporated into plans and designs. • Prohibit clear cutting on slopes to minimize risk of erosion and sediment loading in Wabamun Lake.
Isle Lake Surrounding Area	<ul style="list-style-type: none"> • Protect and enhance wetlands and riparian areas in and around the ESA to enhance filtration of nutrient laden runoff from nearby source areas. • Use best management practices to protect creeks and rivers.
Peatbog 52 ESA	<ul style="list-style-type: none"> • Undisturbed peatland should be maintained and the drainage of the area left unmodified • Agricultural practices in the surrounding areas should be guided by principles which minimize impact to the natural areas they surround • Barriers to wildlife movement should be minimized
Seba Beach Junior Forest Wardens	<ul style="list-style-type: none"> • Minimize access points into the area in order to minimize land disturbance by off highway vehicle use. • Prevent potential for expansion of adjacent mobile home park west into the ESA.
Shoal Upland Habitat	<ul style="list-style-type: none"> • Grazing practices should be designed to maintain wildlife connectivity between the river valley and the lakes to the north. • Drainages should remain undisturbed wherever possible
Sundance Natural Area and Surrounding Areas	<ul style="list-style-type: none"> • Maintain stepping-stones of habitat between the ESA and larger patches of natural habitat in the southern portion of the County to conserve overall landscape connectivity and regional biodiversity.
Wildlife Point	<ul style="list-style-type: none"> • Ensure wildlife movement along the northern shore is maintained.

	<ul style="list-style-type: none"> • Access from the northeast and northwest into the Fallis Slopes ESA should be maintained.
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Planning and Development, Environment, Alberta Environment and Parks, Villages, Summer Villages will lead the development of a management plan for the secondary Environmentally Significant Area **Figure 12** consistent with the area-specific management considerations outlined in the ESA inventory of the Environmental Conservation Master Plan as follows:

Environmental Significant Area	Area Specific Management Considerations
Wabamun Lake	<ul style="list-style-type: none"> • Adequate development setbacks are required for the western grebe-nesting colony along the north shore of lake and Peregrine falcon nesting sites to reduce human disturbance. • The industrial lands in the contributing watershed should be reclaimed to locally common habitats as soon as they are no longer required for operations.

Alberta Environment and Parks will lead the development of a management plan for the priority Environmentally Significant Area **Figure 12** consistent with the area-specific management considerations outlined in the ESA inventory of the Environmental Conservation Master Plan as follows:

Environmental Significant Area	Area Specific Management Considerations
Jackpine Grazing Reserve	<ul style="list-style-type: none"> • Wildlife movement between forested areas should be ensured. • Recreational uses (off-highway vehicles) should be managed appropriately.

Planning and Development and Environment will work with the Paul Band to develop a management plan for the secondary Environmentally Significant Area **Figure 12** consistent with the area-specific management considerations outlined in the ESA inventory of the Environmental Conservation Master Plan as follows:

Environmental Significant Area	Area Specific Management Considerations
Wabamun Creek	<ul style="list-style-type: none"> • Agricultural activities must be managed to avoid impacts to remaining sensitive riparian areas. • Creek bed must be maintained to ensure spawning grounds remain intact. Access to riparian areas should be limited in order to minimize disturbances. • Wildlife movement corridors between Wabamun Lake and the North Saskatchewan River valley should be maintained.

5.2 OUTCOME 2 – OUR LAND USE PRACTICES PROVIDE ECONOMIC OPPORTUNITIES THAT SUPPORT THE PEOPLE AND HEALTH OF OUR WATERSHED

As a community, we expect our land use practices to support a future that provides equitable prosperity through collaboration, innovation and economic diversification that protect and enhance our environment.

5.2.1 Objective 1: Our Land Use Practices Attract Economic Opportunities that Support the People and Health of our Watershed

Land use practices that encourage the right type of development in the right way are an important part of watershed stewardship, especially when experiencing severe pressures from high recreational demand and development. We need to consider our future economic opportunities in a responsible, coordinated manner that brings prosperity while preserving our natural environment. These include recreational, residential and industrial/commercial



development that helps build a sustainable local economy while improving/maintaining the health of the watershed.

The economic base of the watershed has traditionally been coal mining, electric power generation, oil and gas extraction, acreage and lakeshore residential development, recreational pursuits and agriculture production. Agricultural soils have been lost in the watershed due to residential, industrial, commercial and

recreational development.vii).

A significant portion of land adjacent to the south shore of the lake is being actively mined or reserved for future coal mining by TransAlta. This development is economically important for the watershed community, and reclamation activities have already begun for some mine pits using stockpiled topsoil. The estimated closure of the mine and completion of all reclamation activities is 2070. Given the Government of Alberta's Climate Leadership Plan, closure of the mine, these required reclamation activities may be expedited to the mid 2030's.

Parkland County has recently updated the Highvale End Land Use Area Structure Plan (ASP). Based on the approved Alberta Energy Regulator reclamation plan for the Highvale Mine, the future land uses for the mine area identified in the ASP include a combination of agricultural land uses, wetlands and 'end pit lakes', and forested natural areas. In the ASP, the majority of lands (post reclamation) will be CLI category 3 or 4, with a mixture of 'agriculture/natural use' on lands south of the Wabamun Indian Reserve #133A (Paul Band), and adjacent to the Sundance



and Keephills Cooling Pond. A number of future wetlands and end pit lakes within the watershed will provide new recreation uses, waterfowl and wetland habitat.

The watershed is a popular recreational destination for boaters, swimmers, etc. in the summer and for ice fishing, snowmobiling, cross-country skiing and other sports in the winter, all of which are economically important for the watershed. Wabamun Lake is one of the most heavily used recreational

lakes in the province due to its proximity to major population centers.^{viii} Parkland County is currently developing a Parks, Recreation and Culture Master Plan with a major trails component anticipated to be completed by the end of 2016. In addition, a review of the County's Off Highway Vehicle bylaw will be initiated in 2016 with an updated bylaw anticipated to be approved in 2017. These initiatives will provide recreational opportunities for residents and visitors as well as reduce the environmental impact of these activities.

5.2.1.1 Recommended Action Intended to Attract and Support Economic Development Opportunities that Support Watershed Health

- Agricultural lands will be protected from non-agricultural development.
- Any new non-agricultural development must achieve a healthy synergy with any new development that is adjacent to existing farming operations or Wabamun Lake.

Tool/Procedure/Organizations

Planning and Development, Environment & Community Sustainability and Agriculture Services will implement recommendations from the Future of Agriculture Study.

Tool/Procedure/Organizations

Planning and Development and Environment & Community Sustainability will explore the potential to establish municipal programs including Conservation Easements to preserve environmentally sensitive lands in the watershed.

Tool/Procedure/Organizations

Planning and Development will explore the concept of amending the Land Use Bylaw to change environmentally sensitive areas existing areas to Natural Environment-Recreational District designation (new district designation). This is intended to provide better protection to significant biophysical and aesthetic features in these areas, while at the same time encouraging where appropriate extensive recreational opportunities that occur.

Tool/Procedure/Organizations

On an ongoing basis, the Alberta Energy Regulator, Community Sustainability and Parks Recreation & Culture, and Planning and Development will monitor the development and reclamation of lands on the Highvale Mine Site so that the following elements of the Highvale Plan End Use Area Structure Plan are achieved:

- Create agricultural cropland to replace the historic loss of cropland to non-agricultural uses in the watershed.
- Country Residential Development will be encouraged to the Hamlet of Keephills.
- Create conservation and parks areas in an open space network linked by a multi-use trail network.
- Explore opportunities and programs for renewable energy production within the watershed.

5.3 OUTCOME 3 – REDUCE THE ENVIRONMENTAL IMPACTS OF DEVELOPMENT

As a community, we want our land use practices to employ the best techniques for the design, construction and operation of our buildings, infrastructure, services etc. that are efficient and effective in reducing environmental impacts.

5.3.1 Objective 1: Our Land Use Practices Reduce the Environmental Impacts from Development

Practices that encourage the appropriate infilling, clustering and promoting higher density residential and mixed uses adjacent to existing municipal infrastructure (e.g. water, sewer, roads), utilize storm water retention, enhance natural drainage patterns, protect steep slopes, sensitive vegetation and sensitive groundwater recharge areas, all contribute to reducing the environmental footprint of our developments.

Although the amount of pollutants from a single residence, commercial, industrial or construction site may seem insignificant, the cumulative amounts of these contaminants in storm water can threaten water quality, damage fisheries and can affect the recreational uses of the lake. Developments with increased paved areas may also reduce rainfall infiltration and



increase surficial runoff with additional contaminants in storm water. The best way of controlling contamination in storm water is usually at the source, where the contaminants can be reduced and contained. If such contaminants can be directed to safe storage and treatment areas, away from the lake, then one of the most significant sources of water quality contamination can be removed.

5.3.1.1 Recommended Action to Reduce Environmental Impacts from our Developments

Our development practices will encourage the use of low impact design and construction methods and landscaping techniques that reduce impacts on the environment.

Tool/Procedure/Organizations

Planning and Development, Villages and Summer Villages will lead the amendment of regulatory documents and standards so that the subdivision, major development or redevelopment of land will enhance and protect existing natural resources and avoid fragmentation of habitat and natural features as much as possible as follows:

- Structures may be prohibited if they are within the 1:100 year flood plain, adjacent to the shore of Wabamun Lake or in an ESA;
- A site plan is required at the time of development application that includes the following:
 - The location of the geotechnical “top of bank” of Wabamun Lake or any other watercourse if the development is adjacent to it. Ground disturbance at the top

of bank will be prohibited unless supported by a geotechnical report confirming that it will not negatively affect the environment;

- The location and dimension of existing natural features and how impact or loss of these natural features including shoreline vegetation, and riparian lands will be avoided, mitigated or restored;
- The location and dimensions of all yards, buildings, parking areas, driveways and other developments located or proposed to be located on the site;
- Location of all proposed accesses on to public roads and locations of all municipal services to and within the site;
- How low-impact principles will be implemented including dust control and emission reduction;
- A Storm Water Management Plan is required at the time of development application designed so that post development runoff does not exceed predevelopment natural flows. The plan will include:
 - How storm and other runoff will be managed prior to discharge into natural environmental features. This could include:
 - Use of the exiting topography, construction/enhancement of ponds and landscaping to naturally collect, retain, filter, and filter runoff that maintain existing topography and drainage patterns, and minimizes grading to improve water quality and control peak discharge rates;
 - Reducing amounts of impervious surface areas (rooftops, paved areas, buildings), and increasing the permeability of developed areas by maximizing the amount of green space;
 - Lot level storm water re-use using Beneficial Management Practices;
- Minimize erosion and dust on construction sites by:
 - Locating and stabilizing stockpiles away from watercourses and environmentally sensitive areas;
 - Designating access points for construction vehicles to sites and construct access roads with non-erodible material (gravel);
 - Protect the integrity of existing catch basins and sewer inlets through the construction period;
 - Control on-site drainage through temporary storage facilities;
 - At minimum the use of silt fencing or equivalent will be used to control runoff;
 - Restoration of vegetation within the current construction season or the start of the next season will be required.

Tool/Procedure/Organization

Planning and Development will explore and if feasible implement the following:

- Determine an appropriate percentage of required indigenous plants and permeable surfaces in all new and redeveloping development sites;
- Providing Incentive programs to encourage low-impact designed construction and technologies for built form and servicing that protects the natural environment and reflects innovative sustainability practices and Parkland County's design standard requirements;
- Explore the possibility of communal potable water, wastewater, systems;
- Determine minimum building setback from Wabamun Lake, waterbodies and watercourses;
- Review permitted potential uses within existing development setbacks and determine how to better manage their impacts;
- Promote and develop low impact development strategies and technologies;
- Maximum combined site coverage of all buildings and other impervious structures;
- Requiring an Environmental Impact Statement prepared by a qualified expert as part of an application for subdivision, major development, or redevelopment of lands within 100 metres of Wabamun Lake and other identified natural environmentally sensitive areas or features water sources, or Reserves in the watershed.

Public Works will explore and if feasible implement a salt and snow regulation and or plan for the watershed to minimize the negative impacts on surface water quality.

Engineering Services will explore and if feasible implement engineered wetland and discharge of storm water opportunities that reduce the impact on the watershed as development is proposed and opportunities present themselves.

Safety Codes will explore and if feasible implement an inventory of all private septic systems and testing of all systems for leakage and impact on the lake.

Tool/Procedure/Organizations

Alberta Environment and Parks will implement dust control procedures at Wabamun Lake Provincial Park.

Tool/Procedure/Organizations

Alberta Environment and Parks will only approve individual and community seasonal docks, piers and associated mooring structures on the bed and shore of the lake that are consistent with local municipal plans.

5.4 OUTCOME 4 – COORDINATED GOVERNANCE

As a community, we want a future where all decision-makers provide a consistent, inclusive, participatory, transparent, and coordinated planning, decision-making and enforcement approach that effectively and efficiently responds to the needs of the watershed, as well as current and future generations.

No single government or non-governmental organization has all the resources, technical expertise, or jurisdiction to implement all of the regulatory and non-regulatory approaches needed to maintain a healthy watershed. These shared responsibilities require a shared, coordinated, unified approach.

5.4.1 Objective 1: Coordinated Policy, Planning and Enforcement

There are a number of jurisdictions, Federal, Provincial and Municipal, which have land use planning, approval, regulatory and enforcement authority in the watershed. A commitment to better coordinate the process of land use decision making is required so that an effective, efficient, consistent, transparent and reliable approach is used. There is a perceived inconsistency of approval and enforcement of land use, environment, and safety regulations in the watershed because of the different jurisdictions.^{ix}

As referenced earlier, Parkland County has established land use districts within the watershed outlined in Parkland County's Land Use Bylaw. Given the potential impacts of land use decisions on the health of the watershed, three specific land use overlays have been established to accomplish specific conservation objectives. These overlays build on the underlying Land Use Bylaw district provide a higher level of requirement than provided by the underlying district.

Environmentally Significant Areas Overlay

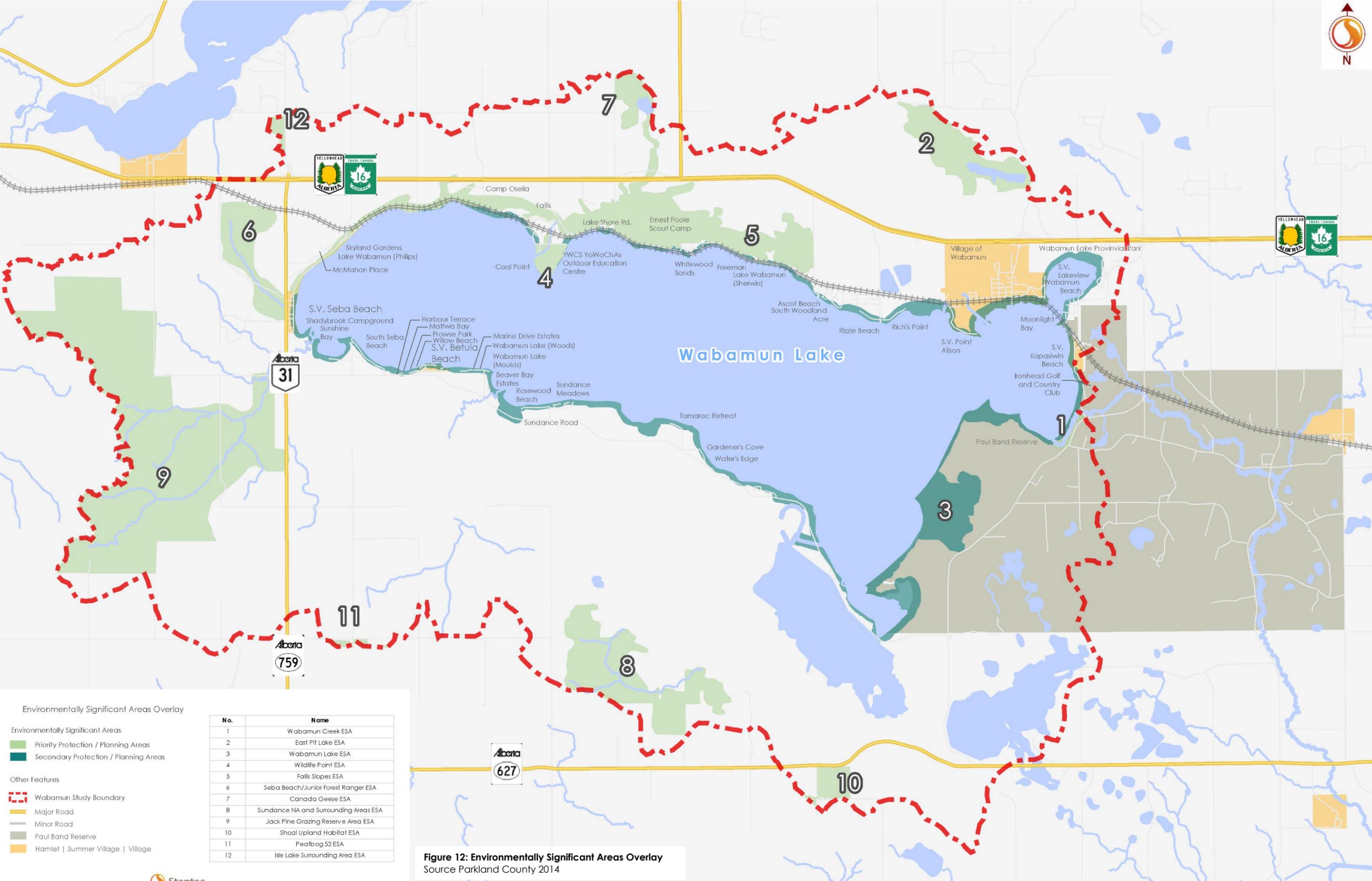
The Environmentally Significant Areas Overlay in **Figure 12** is consistent with the identified boundaries of the Environmentally Significant Areas identified earlier. Specific management plans will be developed for each of these ESAs within the timelines identified above to protect the ecological attributes of these areas. Land use decisions within each Environmentally Significant Area will be consistent with the relevant management plan and the applicable underlying land use bylaw district regulations.

Phosphorous Concentration Reduction Overlay

A phosphorous overlay will be established upon completion of Water Quality Objectives for the watershed for the areas with phosphorous concentrations greater than 400 mg/m³ as identified in **Figure 13**. The County will work with landowners and residents in these areas to implement strategies and practices to reduce phosphorous concentration and runoff from these areas. The underlying land use bylaw district regulations continue to apply in these areas.

Wabamun Lake Shoreline Riparian Protection/Restoration Overlay

A Riparian Shoreline Health Overlay (**Figure 14**) will be established to protect and remediate where feasible riparian areas along the shore of Wabamun Lake based on the 2014 Wabamun Lake Shoreline Riparian Health Assessment. Within this area, the remaining natural shoreline riparian areas (low impacted area) will be retained to the greatest extent possible in their natural state. They will not be altered or existing vegetation removed or damaged through construction, or the addition of hardened surface like riprap or break walls. The regulations of the underlying land use bylaw district regulations will continue to apply in these areas. Parkland County and its partners will work with landowners in areas identified as being highly/ moderately impacted to improve the naturalization of these shorelines.



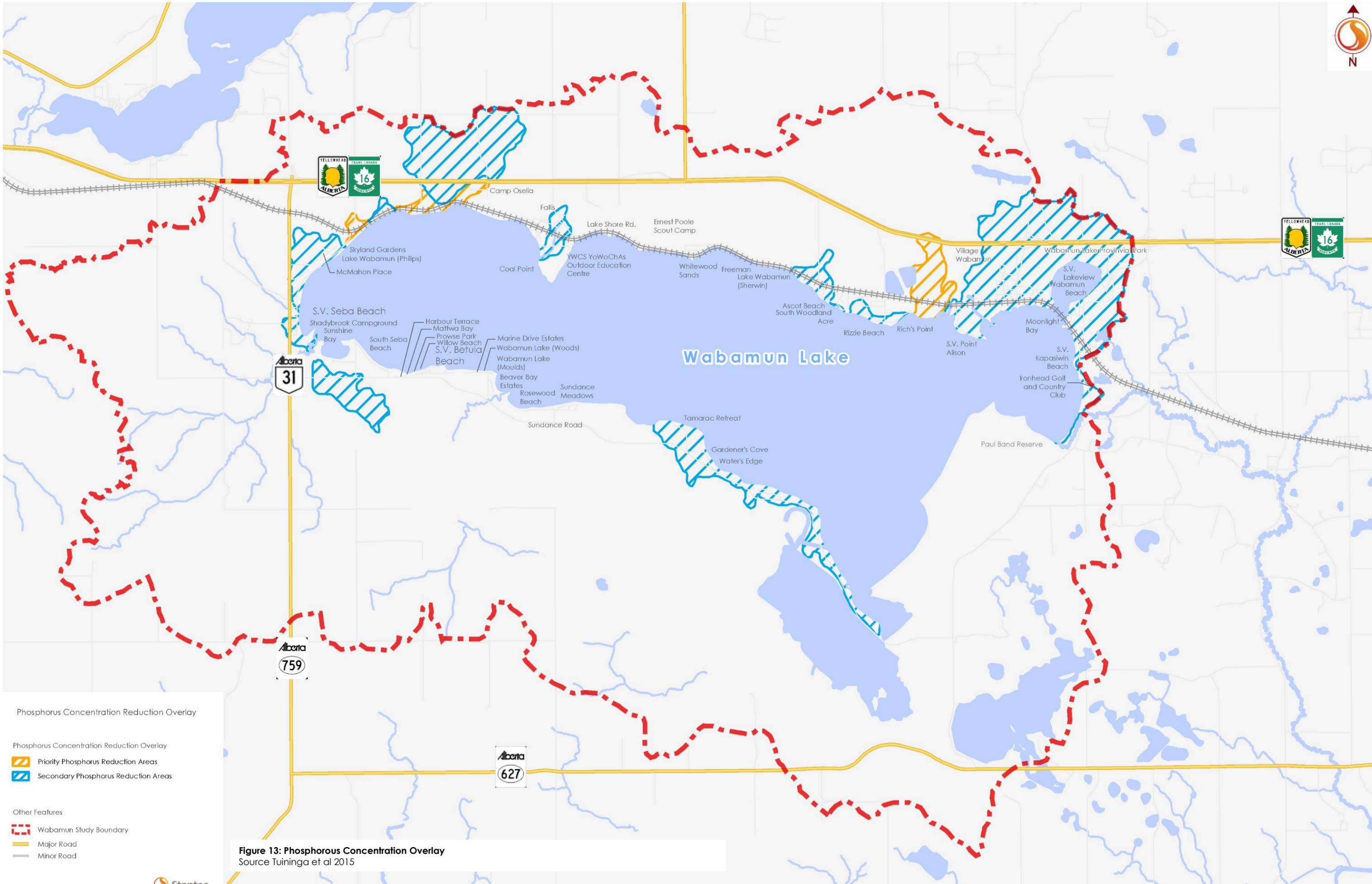
Environmentally Significant Areas Overlay

- Environmentally Significant Areas
- Priority Protection / Planning Areas
- Secondary Protection / Planning Areas

- Other Features
- Wabamun Study Boundary
- Major Road
- Minor Road
- Paul Band Reserve
- Hamlet | Summer Village | Village

No.	Name
1	Wabamun Creek ESA
2	East Pit Lake ESA
3	Wabamun Lake ESA
4	Wildlife Point ESA
5	Fallis Slopes ESA
6	Seba Beach/Junior Forest Ranger ESA
7	Canada Geese ESA
8	Sundance NA and Surrounding Areas ESA
9	Jack Pine Grazing Reserve Area ESA
10	Shoal Upland Habitat ESA
11	Peatbog 52 ESA
12	Isle Lake Surrounding Area ESA

Figure 12: Environmentally Significant Areas Overlay
Source Parkland County 2014

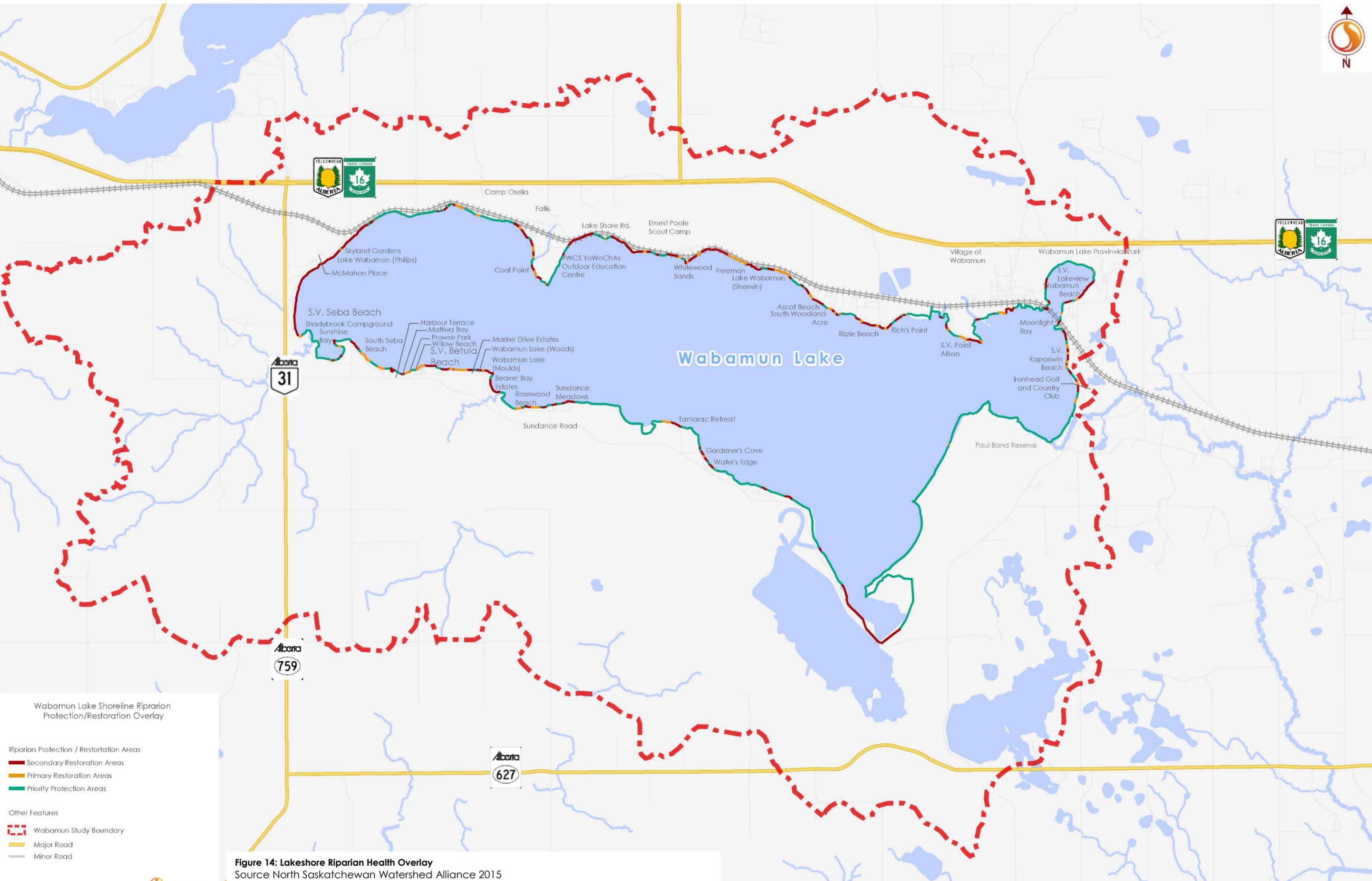


Phosphorus Concentration Reduction Overlay

- Phosphorus Concentration Reduction Overlay
-  Priority Phosphorus Reduction Areas
-  Secondary Phosphorus Reduction Areas

- Other Features
-  Wabamun Study Boundary
-  Major Road
-  Minor Road

Figure 13: Phosphorous Concentration Overlay
Source Tuininga et al 2015



Wabamun Lake Shoreline Riparian Protection/Restoration Overlay

Riparian Protection / Restoration Areas

- Secondary Restoration Areas
- Primary Restoration Areas
- Priority Protection Areas

Other Features

- - - Wabamun Study Boundary
- Major Road
- Minor Road

Figure 14: Lakeshore Riparian Health Overlay
 Source North Saskatchewan Watershed Alliance 2015

5.4.1.1 Recommended Action intended to Improve Coordination of Policy, Planning and Enforcement

Coordinate inter-agency planning, policy and processes to improve alignment and transparency of permitting, enforcement, and education initiatives between jurisdictions.

Tool/Procedure/Organizations

Planning and Development, Villages, Summer Villages, Alberta Environment and Parks will assess, and where needed, amend existing plans, bylaws, policies, and create standards aligned with the watershed plan and communicate these to the public and development industry.

Tool/Procedure/Organizations

Planning and Development, Villages, Summer Villages, Alberta Environment and Parks will update and amend Regulatory documents, Standards and other documents as required to support the framework for development within the watershed consistent with this plan including:

- Developing an Inter-Municipal Area Structure Plan to describe the sequences of development, population density, and location of major transportation routes and public utilities consistent with the watershed plan.
- Identifying and establishing a protocol and process to coordinate approvals and referrals within the watershed for applications for major developments.
- Actively participating in the development of the North Saskatchewan Regional Plan and to ensure it supports this plan.
- Integration of the Wabamun Lake Watershed Land Use Plan into an Integrated Watershed Management Plan.

5.5 OUTCOME 5 – OUR STEWARDSHIP PROGRAMS INSPIRE US TO ACTION

As a community, we want a future where we are all inspired, empowered and supported to take collective and individual actions that protect and improve the health of the watershed. A sustainable community allows residents and visitors alike to enjoy its benefits while living in harmony with the natural environment.

Although the awareness and use of environmentally friendly practices has grown across the watershed we must guard against the perception that we have done all that we can do.

Responsible stewardship requires the willingness and commitment of governments, residents, visitors, landowners, and user groups to understand the implications of their activities and access to support needed to modify behaviours to reduce and prevent harmful impacts to the environment and the lake. Lack of knowledge by decision makers and the public related to

activities that either harm or can help watershed health and cumulative effects of those activities on the watershed.^x Decision makers, residents and visitors have the required knowledge to make informed decisions that reduce their impact on the watershed

5.5.1 Objective 1: Improve Our Knowledge

We must all have a good understanding of how our collective and individual actions affect the watershed. While some organizations and individuals are collecting information in the watershed, there is no coordinated approach to these efforts, or a location where this information can be easily found. While the State of the Watershed Report developed in support of this plan brought much of this information together, continuing efforts to keep this information current is important to measure our progress.

Further and ongoing monitoring is crucial for determining the effectiveness of current and future watershed based educational and awareness programming and for identifying issues and opportunities.

5.5.1.1 Recommended Action Intended to Improve our Knowledge of the Watershed

Undertake a stream classification study in the watershed to aid the understanding of stream condition and potential behavior under the influence of different types of changes.

Tool/Procedure/Organizations

Environment & Community Sustainability and Alberta Environment and Parks will undertake a stream classification study in the watershed that will provide a consistent frame of reference for understanding and communicating stream morphology and condition including:

- Predicting a stream's behavior from its appearance;
- Developing specific hydraulic and sediment relationships for a given stream type and its state; and
- Providing a mechanism to extrapolate site-specific data to stream reaches having similar characteristics.

Tool/Procedure/Organizations

Parkland County, Villages, Summer Villages, and Alberta Environment and Parks will undertake:

- A detailed study to identify and quantify point sources of nutrients such as nitrates and phosphorus, and to identify and estimate non-point sources;
- Water and Land Use Carrying Capacity Studies which will identify the limits of recreational and other activities that protect the health of the watershed based on anticipated population, land use, watercraft numbers, and access and road requirements. It will also identify opportunities and limitations for expanded/new swimming areas, areas for restricted (watercraft speeds), and infrastructure to protect riparian habitat, other land uses while promoting and supporting sustainable recreational activities; and

- A boat wash facility and feasibility study.

5.5.1.2 Objective 2: Create/Enhance Voluntary Community Stewardship Programs

The health of the watershed depends upon the support and involvement of its citizens. Providing the tools needed for community members to voluntarily make informed decisions that improve the health of the watershed are important to our success. Involving youth in these initiatives is critical if we want these initiatives to carry into the future.

A shared stewardship approach, where our community works together, and where local authorities and government agencies lead by example, will achieve and sustain a healthy watershed. Although many residents and visitors are willing to undertake these initiatives, they are often not aware of the impact their activities have or what they can do to improve watershed health.

There are a number of current initiatives in the watershed that focus on reducing environmental impacts including the following:

- Parkland County has implemented the Alternate Land Use Services program that assists agricultural producers in improving the productivity and environmental quality of their lands. The program provides education and financial support to farmers and ranchers to retain and reconstruct natural areas such as wetlands, grasslands, riparian areas and trees on their lands.
- Parkland County Green Acreages Program provides education and financial assistance to rural landowners (acreage, hobby farm, and recreational property owners) in adopting practices that reduce environmental impacts and protect environmentally sensitive features such as wetlands on their property.
- The Alberta Lake Management Society (ALMS) offers a number of programs in the watershed including LakeWatch, a water quality-monitoring program that is offered to volunteers who are interested in collecting information about Wabamun Lake. ALMS technicians assist volunteers in testing the lake during the summer and collecting important data. Once data is collected, ALMS produces a LakeWatch Report, which summarizes the data, which can support educational and lake stewardship programs, restoration and management efforts.

ALMS also provides Secchi Disks to boaters to monitor water transparency, supports the IceWatch program to collect freeze and thaw data from lakes, and the Invasive Species Monitoring program to track the introduction and spread of zebra and quagga mussels. It also provides a number of fact sheets on water quality monitoring parameters and lake nuisances to help educate lake users and volunteers on water quality issues and management and has created a scholarship to encourage and support students in disciplines related to lake or watershed management.

ALMS also runs the Alberta Water Quality Awareness (AWQA) program which is a province-wide program focused on increasing people's awareness and understanding of water quality and watershed health, through hands-on water quality testing. AWQA participants use water quality test kits to explore the health of their local waterways. Using their test kits, participants gather basic information about the health of Alberta's surface waterbodies and then contribute what they find to an online database and watershed map.

- The Wabamun Watershed Management Council (WWMC) provides a coordinated role in maintaining and improving the health of the watershed and works with governments, organizations, businesses and individuals to inform and educate stakeholders about issues affecting the watershed and lake. It sponsors and coordinates programs and activities that gather information about the biology and use of the watershed and has been involved in projects, including:
 - Mapped the riparian area around the lake;
 - A State of the Watershed Report;
 - Providing information about invasive species in or threatening to enter the lake;
 - Providing information to lakeside residents about how to reduce nutrient loading and maintaining and improving lake-water quality; and
 - Developing a biological inventory of the flora and fauna in the watershed.
- The North Saskatchewan Watershed Alliance (NSWA) is the official Watershed Planning and Advisory Council for the North Saskatchewan River watershed, which includes the Wabamun watershed. It supports stakeholder and public discussion concerning all aspects of integrated watershed management in the North Saskatchewan River watershed. The NSWA prepared an Integrated Watershed Management Plan for the North Saskatchewan River watershed in 2012 and is currently working with governments, watershed stewardship groups, industry, organizations and communities to find innovative ways to implement it.

Expanding these programs and if necessary developing new programs that promote public understanding, and encourage residents, youth, business and industry to voluntarily implement best practices that protect/improve the integrity of the watershed is required.

5.5.1.3 Recommended Action intended to Create/Enhance Voluntary Community Programs

Develop/improve and implement multi-media education programs with incentives to foster an ethic of environmental stewardship.

Tool/Procedure/Organizations

Parkland County, Villages, Summer Villages, and Alberta Environment and Parks will develop a multi-year communications and engagement plan to promote watershed stewardship through:

- Developing a “Living in the Watershed” education package and seasonal based watershed newsletter and factsheets to keep residents informed of current watershed management practices, programs, and educational opportunities including:
 - Responsible maintenance of septic systems;
 - Reduction of personal water consumption;
 - Proper disposal of waste;
 - Responsible off highway vehicle use;
 - Appropriate development and the impacts of improper clearing, landscaping, fertilizer and chemical use;
 - The purpose of, and activities permitted in Environmental Reserves, parks, open spaces and trails; and
 - Prevention and control of invasive species.
- Developing a BMP guide for contractors, consultants, project managers, developers and residents;
- Highlighting and enhancing stewardship recognition as part of the existing Community Champions, and Sustainability Awards Programs;

Tool/Procedure/Organizations

The Wabamum Watershed Management Council and Environment will:

- Provide information for local school curricula, local youth environmental education programming, and support internship, co-op, summer student, and/or volunteer opportunities related to watershed health.
- Promote watershed stewardship community activities (e.g. Watershed cleanup days, hazardous waste collection, Yellow Fish storm sewer program, waste reduction, composting, and invasive species).

Tool/Procedure/Organizations

Environment & Community Sustainability will expand the ALUS and Green Acreages Programs to encourage and provide financial support to agricultural producers and other rural landowners to retain and improve the environmental function and quality of their properties.

Tool/Procedure/Organizations

Planning and Development, Environment, Parks, Recreation & Culture, Villages, Summer Villages, will collectively explore the feasibility of obtaining “Lake Friendly” Aquavist Certification in the watershed. This will include evaluating the level of compliance with the program requirements (governance, wastewater, surface water, landscape, facilities and roads, and education and engagement) with respect to:

- Nutrient reduction and recycling;
- Increased infrastructure capacity for drought and flood resilience;
- Enhanced ecosystem health;
- Reduced greenhouse gasses;
- Education, information sharing and engagement

Tool/Procedure/Organizations

Planning and Development, Environment & Community Sustainability, Engineering Services, Villages, Summer Villages will establish new incentive programs for:

- Source control of storm water to maintain and enhance water quality and manage runoff;
- Building and/or landscaping including features, fixtures that encourage water harvesting and savings, maintain water quality, and enhance area biodiversity;
- Collection of wastewater in community and multi-subdivision shared systems;
- Septic System Repair Program including dye testing requirement to determine leakages and requirement for permits and cost share funding for needed repairs/replacement.

6 PLAN IMPLEMENTATION

Residents of the watershed, stakeholders, provincial and municipal staff, and indigenous peoples have put considerable effort and thought into the development of this plan. We have a strong interest in protecting the health of the watershed so that it continues to be an attractive place to work, live and play. We want to see the plan direct and guide the coordinated efforts of province, municipal, other decision makers, stakeholders and the public in the watershed to achieve the results so many want, and not have this Plan sit on a shelf.

This plan provides a solid framework for a coordinated approach to maintaining a healthy watershed for all users. However, successful implementation will require ongoing commitments, (financial and otherwise) from all partners to fully realize and sustain a healthy environment.

This plan will also support the development of a broader integrated watershed plan for Lake Wabamun, the North Saskatchewan Regional Plan, and meet the goals of the province's Water for Life: Alberta's Strategy for Sustainability, the Land Use Framework, as well as the Capital Region's Growth Management Plan.

Through the public, stakeholder and indigenous engagements conducted in the development of this land use plan, many good comments were received that although are out of scope for this plan, should be considered in the development of these other initiatives. These comments have been captured in Section 9.



6.1.1 Objective 1

Municipalities (individually and collectively), the provincial government and its agencies, stakeholders, residents and visitors to the watershed commit to this plan, mutually support each other and will work collaboratively to meet its objectives.

6.1.1.1 Recommended Action to help ensure the plan is successfully implemented

Assess, and where needed, amend existing plans, bylaws, policies, and create standards aligned with the watershed plan.

Tool/Procedure/Organizations

Planning and Development, Villages, Summer Villages, and Alberta Environment and Parks will lead the amendment of existing Municipal Development Plans, Area Structure Plans, bylaws, policies, etc. so they are consistent with and support implementation of this plan.

Tool/Procedure/Organizations

Planning and Development, Villages and Summer Villages will actively participate in broader planning initiatives including the Capital Region Growth Plan and the North Saskatchewan Regional Plan to promote this plan and inter-municipal planning within the watershed.

Tool/Procedure/Organizations

Planning and Development, Villages and Summer Villages, and Alberta Environment and Parks will establish a Wabamun Watershed Land Use Plan Implementation Committee that will oversee implementation of this plan. This will include:

- Developing a detailed multi-year priority based work, communications plan, and funding model;
- Publicly report annually on the progress of plan implementation; and
- A formal plan review at five-year intervals to ensure the plan remains current, effective, achievable and responsive to change. Provisions in the plan that are no longer relevant or attainable will be either modified or removed and new provisions added in response to stakeholder input, resident needs and concerns and environmental conditions;

The committee will include senior provincial and municipal representatives, stakeholders, indigenous peoples, and residents of the watershed with the appropriate authority and interest in effectively implementing the plan.

A summary of the proposed actions and the lead agencies responsible is summarized in the following table.

Proposed Parkland County Recommendations

No new confined feeding operations will be located north of Highway 627. CFO’s may only be considered south of Highway 627 as identified in the plan and when in compliance with all applicable regulations.
Develop a Storm Water Management report including an Area Drainage Master Plan that provides an integrated approach to prevent discharge of pollutants from municipal operations, and minimizes direct runoff to the lake.
Undertake a Watershed Capacity Study, which explores the watersheds potential residential carrying capacity.
Wetlands of Class III or greater shall be preserved in their natural state.
Undertake a Habitat Connectivity Study and locate municipal reserve lands that connect to private/public lands in new development proposals.
Undertake a Hazards Land Assessment to identify hazard lands and protect these lands from development.
Redistrict lands as appropriate including an evaluation of existing Reserves and change designations if required.
Seek opportunities for the sale or exchange of reserve lands not required to protect sensitive lands and use the proceeds to acquire sensitive lands.
Pursue designation as a Wetlands Restoration Agency to allow the use of developer funds to restore wetlands.
Designate areas and design trails for off highway vehicle use that minimizes environmental impacts as recommended by the Parks, Recreation and Culture Master Plan.
Any new non-agricultural development must achieve a healthy synergy with adjacent farming operations or Wabamun Lake.
Implement recommendations from the Future of Agriculture Study.

<p>Explore the concept to change the existing Recreation District designation areas to Natural Environment-Recreational District designation to better protect significant biophysical and aesthetic features while encouraging appropriate extensive recreational opportunities.</p>
<p>Expand the ALUS and Green Acreages Programs to encourage and provide financial support to agricultural producers and other rural landowners to retain and improve the environmental function and quality of their properties.</p>
<p>Proposals for Development will include:</p> <ul style="list-style-type: none"> a) The location of the geotechnical “top of bank” of any adjacent waterbody. Ground disturbance at the top of bank will be prohibited unless supported by a geotechnical report confirming that it will not negatively affect the environment. b) The location and dimension of existing natural features and how impact or loss will be avoided mitigated or restored. c) How low-impact principles will be implemented including dust control and emission reduction. d) A site specific Storm Water Management Plan so that post development runoff does not exceed predevelopment natural flows.
<p>Minimize erosion and dust on construction sites by:</p> <ul style="list-style-type: none"> a) Locating and stabilizing stockpiles away from watercourses and environmentally sensitive areas. b) Designating access points for construction vehicles with non-erodible material (gravel). c) Protect the integrity of existing catch basins and sewer inlets. d) Control on-site drainage through temporary storage facilities.
<p>Explore and if feasible implement the following:</p> <ul style="list-style-type: none"> a) Determine an appropriate percentage of required indigenous plants, site coverage of impervious and permeable surfaces in new and redeveloped sites. b) Promote and develop low impact development strategies and technologies and provide incentive programs to encourage them. c) Explore the possibility of communal potable water and wastewater, systems. d) Determine minimum building setback from waterbodies. e) Review permitted potential uses within existing development setbacks and determine how to better manage their impacts. f) Require an Environmental Impact Statement as part of an application for development within 100 meters of Wabamun Lake and other identified natural environmentally sensitive areas or features. g) Salt and snow regulation and or plan to minimize the negative impacts on surface water quality. h) Engineered wetland and discharge of storm water opportunities that reduce impacts. i) Inventory and testing of all private septic systems for leakage.

Proposed Partnership Recommendations

Lead (s)	Recommendation
Alberta Environment and Parks	Develop and implement a Surface Water Quality Management Framework.
	Maintain the weir on the east side of the lake.
	Implement dust control procedures at Wabamun Lake Provincial Park.
	Only approve individual and community seasonal docks, piers and associated mooring structures on the bed and shore of the lake that are consistent with local municipal plans.
Alberta Environment and Parks, Parkland County and Villages	Provide input to Canadian National Railway in undertaking a railway corridor risk assessment, identify, and implement required mitigation strategies.
	Lead the amendment of regulatory documents and standards so that groundwater is given more consideration in the design and construction of new developments and storm water management systems.
	Amend regulatory documents and Standards to include requirements that: <ul style="list-style-type: none"> a) Preserve natural features, minimize impacts on agricultural lands, and provide adequate setbacks and protection of the environmental integrity of riparian areas, steep slopes, shorelines, wetlands, and watercourses. b) A minimum of 30 meters or the use of the Riparian Setback Matrix Model (RSMM) from the legal bank of Wabamun Lake and any key areas of important upland and riparian areas be dedicated as Environmental Reserve and retained in their natural state. c) An approval for tree clearing will be required on all lands identified as hazard/sensitive in the Hazard Land Assessment Study. d) Naturalized erosion protection using Best Management Practices will only be permitted within 3 meters of the legal bank of Wabamun Lake.
	Develop and implement a regular watercraft inspection program to reduce opportunities for the spread of invasive species.
	Lead the development of management plans for ESAs consistent with the Environmental Conservation Master Plan.
	Assess, and where needed, amend existing plans, bylaws, policies, and create standards aligned with the watershed plan and communicate these to the public and development industry including: <ul style="list-style-type: none"> a) Environmentally Significant Areas Overlay; b) Phosphorous Concentration Reduction Overlay; c) Wabamun Lake Shoreline Riparian Protection/Restoration Overlay; d) An Inter-Municipal Area Structure Plan to describe the sequences of development, population density, and the location of major transportation routes and public utilities; e) Identifying and establishing a protocol and process to coordinate approvals and referrals for applications for major developments; f) Actively participating in the development of the North Saskatchewan Regional Plan to ensure it supports this plan; and g) Integration of the Wabamun Lake Watershed Land Use Plan into an Integrated Watershed Management Plan.
	Undertake:

	<ul style="list-style-type: none"> a) A Stream Classification Study that will provide a consistent frame of reference for understanding stream morphology and condition. b) A detailed study to identify and quantify point sources of nutrients such as nitrates and phosphorus, and identify and estimate non-point sources; c) Water and Land Use Carrying Capacity Studies, which will identify the limits of recreational and other activities and identify opportunities and limitations. d) A boat wash facility and feasibility study.
	<p>Develop a multi-year communications and engagement plan to promote watershed stewardship through:</p> <ul style="list-style-type: none"> a) Developing a “Living in the Watershed” education package, seasonal based watershed newsletter and factsheets to keep residents informed of current watershed management practices, programs, and educational opportunities; b) Developing a BMP guide for contractors, consultants, project managers, developers and residents; c) Highlighting and enhancing stewardship recognition as part of the existing Community Champions, and Sustainability Awards Programs.
	<p>Establish a Wabamun Watershed Land Use Plan Implementation Committee that will oversee implementation of this plan.</p>
	<p>Integrate the Wabamun Land Use Plan into a larger more inclusive Integrated Watershed Management Plan under the Province’s Water for Life Act.</p>
Parkland County, Cows and Fish, Wabamun Watershed Management Committee, Land Stewardship Centre	<p>Develop and deliver education and incentive programs that reduce nutrients, manure, pesticide and other chemicals in runoff with a particular focus in 1:100 floodplain and phosphorous concentration areas over 400 mg/m3.</p>
Alberta Environment and Parks, Parkland County	<p>Undertake a Regional Groundwater Assessment Study.</p>
Parkland County and Villages	<p>Work with adjacent landowners to Environmental Reserves and the public to:</p> <ul style="list-style-type: none"> a) Restrict the use of off highway vehicles; b) Restrict mowing, cutting or removal of natural vegetation, adjacent to the water’s edge; c) Restrict development or buildings within the 100-year floodplain or within the designated setbacks.
	<p>Lead the amendment of regulatory documents and standards so that major developments (redevelopment) will enhance and protect existing natural resources and avoid fragmentation of habitat and natural features as much as possible.</p>
	<p>Collectively explore the feasibility of obtaining “Lake Friendly” Aquavist Certification in the watershed.</p>
	<p>Establish incentive programs for:</p>

	<ul style="list-style-type: none"> a) Source control of storm water to maintain and enhance water quality and manage runoff; b) Building and/or landscaping including features, fixtures that encourage water harvesting and savings, maintain water quality, and enhance area biodiversity; c) Collection of wastewater in community and multi-subdivision shared systems; d) Septic System Repair Program including dye testing requirement to determine leakages and requirement for permits and cost share funding for needed repairs/replacement. <p>Actively participate in broader planning initiatives including the Capital Region Growth Plan and the North Saskatchewan Regional Plan to promote this plan and inter-municipal planning within the watershed.</p>
<p>Alberta Environment and Parks, Alberta Energy Regulator</p>	<p>Monitor the development and reclamation of lands on the Highvale Mine Site so that the elements of the Highvale Plan End Use Area Structure Plan are achieved.</p>
<p>The Wabamun Watershed Management Council and Parkland County</p>	<p>Provide information to local school curricula, local youth environmental education programming, and support internship, co-op, summer student, and/or volunteer opportunities related to watershed health and promote watershed stewardship community activities.</p>

7 GLOSSARY

Aquavist Certification – A certification process focused on reducing nutrients in waterways, improving aquatic ecosystem health, recycle and reuse nutrients, and enhance environmental, community and economic benefits from water, enhance awareness and collaboration.

Area Structure Plan - A statutory plan prepared pursuant to the *Municipal Government Act*, that applies to a ¼ section or more of land that provides a framework for more detailed subdivision and development. (Staging of development, land uses, densities and infrastructure matters).

Bed and Shore – Most lands under permanent and naturally occurring bodies of water, the boundary of which is usually the ordinary high water mark of the waterbody. The ordinary high water mark is generally determined by identifying where there is a distinct change in vegetation or the ground caused by the presence of water.

Beneficial Management Practices – A method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things.

Biophysical Assessment – A review of an area defined as an Environmentally Sensitive Area by the Environmental Conservation Plan or an area proposed for subdivision contains natural features. The review identifies and assesses the environmental significance and sensitivity of existing vegetation, wetlands and other water features, wildlife habitat and unique physical features.

Built Green - An industry driven voluntary program that promotes "green" building practices to reduce the impact that building has on the environment. It benefits the homebuyer, the community and the environment and is an opportunity for everyone to choose a "green" future. Members and homebuyers have the flexibility of choosing their level of participation, thereby offering broader appeal. Bronze represents the minimum of achievement level, Silver is the intermediate level, and Gold is the maximum level of recognition.

Canada Land Inventory (CLI) - Is a comprehensive multi-disciplinary land inventory identifying land capability for agriculture. There are seven land capability classes used to rate agricultural land capability. Class 1 lands have the highest and Class 7 lands the lowest capability to support cultivated agricultural crops.

Chernozemic Soils –Best Agricultural soils in Alberta with a soil structure very favorable for air and water movement in the soil and subsequently for plant growth.

Cluster Country Residential – A residential subdivision comprising smaller ½-acre lots that are serviced with piped water and sewer systems and which maintain a significant portion of the site as green infrastructure.

Confined Feeding Operation (CFO) - Means an activity on land that is fenced or enclosed or within buildings where livestock are confined for the purpose of growing, sustaining, finishing or breeding by means other than grazing, but does not include seasonal feeding and bedding sites.

Conservation Easement - Is a voluntary legal agreement defined in the Environmental Protection and Enhancement Act between a landowner and government or conservation agency. The easement agreement is intended to protect the natural values of the land by giving up all or some of the rights to develop the land.

Environmental Impact Statement – A document prepared to describe the effects for proposed activities on the environment.

Eutrophic Lake- Lakes with a higher accumulation of nutrients that support the growth of algae and other organisms, the decay of which may deplete waters of oxygen in summer.

Farmland Assessment Rating – In Alberta, farmland is assessed on the ability of land to produce agricultural products. The assessment takes factors such as soil quality, topography, stones, creeks, etc. into consideration. To ensure consistent farmland ratings across the province the Alberta Government requires that the Farmland Assessment Manual be utilized in preparing farmland assessments.

Geotechnical Report – Developed by geotechnical engineers or engineering geologists to obtain information on the physical properties of soil and rock around a site to design earthworks and foundations for proposed structures and for repair of distress to earthworks and structures due to subsurface conditions.

Green Infrastructure – A wide range of natural and constructed landscape elements including natural areas; public and private conservation lands; over ground storm water systems; recreation areas (e.g. golf courses); and trail networks. Green infrastructure in developed areas may be public open spaces dedicated as Municipal or Environmental Reserve or private conservation or recreational land.

Grey Luvisolic Soils - Main forest soils in Alberta with normally low organic matter, poor tilth, and generally low plant nutrients.

Hamlet – An unincorporated community consisting of five or more buildings as dwellings, a majority of which are on parcels of land smaller than 1850 square metres, has a generally accepted boundary and name, and contains parcels of land that are used for non-residential purposes.

Hazard Lands – Land that consists of a swamp, gully, ravine, coulee or natural drainage course, or land that is subject to flooding or is, in the opinion of the subdivision authority, unstable.

Land Stewardship Fund and Alberta Land Trust Grant Program - Focuses on conserving ecologically important areas to prevent habitat fragmentation, maintain biodiversity and preserve native landscapes. Grants are available to eligible land trust organizations for the purchase of conservation easements and the administration and management of new conservation projects on private land.

Leadership in Energy and Environmental Design (LEED) – A Green Building Rating System for the design, construction, and operation of high performance green buildings. It promotes a whole-building approach to sustainability by recognizing performance in areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

Legal Bank - Synonymous with what is commonly known as the "ordinary high water mark" or "top of bank".

Life Estate The right to occupy possess or otherwise use a property during one's lifetime.

Major Development - means any land use that increases the intensity of the land use relative to the surrounding lands and that may affect adjacent land uses by way of two or more of the following: noise, dust, odor, noxious emissions, traffic and lighting. For the purposes of this policy, "major development" also includes Natural Recourse Extraction/Processing.

Mesotrophic Lake- Lakes with a lower accumulation of nutrients that support the growth of algae.

Multi-parcel Residential Subdivision - A subdivision of land, registered by plan of survey or descriptive plan containing four or more residential lots where the residential lots are predominantly 4.0 ha (10.0 ac) in size or less, and have been created for, or are being principally used for, residential purposes.

Municipal Reserve - Land required at the time of subdivision for park and/or school purposes. When subdividing an area larger than two acres, up to a 10% reserve dedication is required. The County may accept cash-in-lieu of Municipal Reserve land.

Natural State – Undisturbed by human development.

On-site Services – The combination of the water acquisition and storage and the disposal of sewage within the limits of the property.

Outline Plan – A document that details the location, dimension and boundaries of a parcel of land to be subdivided (eg. parcels dimensions, roads, points of access, contours/natural features, associated infrastructure, proposed methods of surface drainage, proposed municipal and environmental reserves).

Piped Water and Sewer Systems – Municipally operated communal utility systems that convey treated water and raw sewage through publicly or privately owned underground networks of pipes.

Restricted Development Area – Areas where limits or restrictions to the use of the land are required.

Riparian Setback Matrix Model – A scientific and legally defensible method for establishing Environmental Reserves and development setbacks.

Smart Growth - Applying development principles that promote enhanced quality of life, efficient use of land to preserve the natural environment to the extent possible, and that result in healthy, sustainable communities that are fiscally responsible.

Stewart and Kantrud Wetland Classification System – A system that classifies wetlands based on vegetation structure and the length of time surface water is at or above surface level. Ephemeral Wetlands (Class 1) typically have free surface water for only a short period after snowmelt or storm events in early spring. Temporary Wetlands (Class 2) are periodically covered by standing or slow moving water and typically have open water for only a few weeks after snowmelt or several days after heavy storm events. Seasonal Ponds and Lakes (Class 3) are characterized by shallow marsh vegetation, which generally occurs in the deepest zone (usually dry by midsummer). Semi-permanent Ponds and Lakes (Class 4) are characterized by marsh vegetation, which dominates the central zone of the wetland, as well as coarse emergent plants or submerged aquatics, including cattails, bulrushes and pondweeds. Permanent Ponds and Lakes (Class 5) have permanent open water in central zone that is generally devoid of vegetation. Alkali Ponds and Lakes (Class 6) are wetlands where deep water is typically not permanently present. Alkali wetlands are characterized by a

pH above 7 and a high concentration of salts. Fen Ponds (Class 7) are wetlands in which fen vegetation dominates the deepest portion of the wetland area.

Storm Water Management Plan - Assesses the current drainage network and identifies opportunities for improvements within the system.

Top of Bank – The first major change in the slope of the incline from the ordinary high water level of a water body.

Traditional Country Residential Subdivision - A residential subdivision comprising four or more lots of between 2 to 10 acres in size that are serviced on site.

Transfer of Developments Credits – A tool designed to help communities deal with the rapid conversion of their valued landscapes, while simultaneously promoting appropriate landscape development. The tool allows for the transfer of development potential from areas less suited to development (based on a community desire to see its character and function maintained), to areas more suited to increased development (based on their capacity to accept greater development activity).

Value-added Agricultural Industry – A project that can clearly demonstrate it adds value to a primary agriculture product and includes agricultural product manufacturing, food-processing activities, and non-food-processing activities.

Watershed Recreational Land Use Carrying Capacity Study - Identifies the limits of recreational and other activities that protect the health of the watershed based on anticipated population, land use, watercraft numbers, and access and road requirements. It also identifies opportunities and limitations for expanded/new swimming areas, areas for restricted (watercraft speeds), and infrastructure to protect habitat, other land uses while promoting and supporting sustainable recreational activities.

Wetlands Restoration Agency - An organization responsible for restoring drained wetlands to near natural conditions.

8 PARTNERS

- Parkland County
- Alberta Environment and Parks
- The Alberta Lake Management Society
- Paul, Alexis Nacota Sioux, and Enoch Cree Nations
- North Saskatchewan Watershed Alliance
- Summer Village of Betula Beach
- Summer Village of Kapasiwin
- Summer Village of Lakeview
- Summer Village of Point Alison
- Summer Village of Seba Beach
- Summer Village of Spring Lake
- Village of Wabamun
- Wabamun Watershed Management Council

9 SUGGESTIONS FOR CONSIDERATION IN THE DEVELOPMENT OF OTHER ASSOCIATED PLANNING INITIATIVES

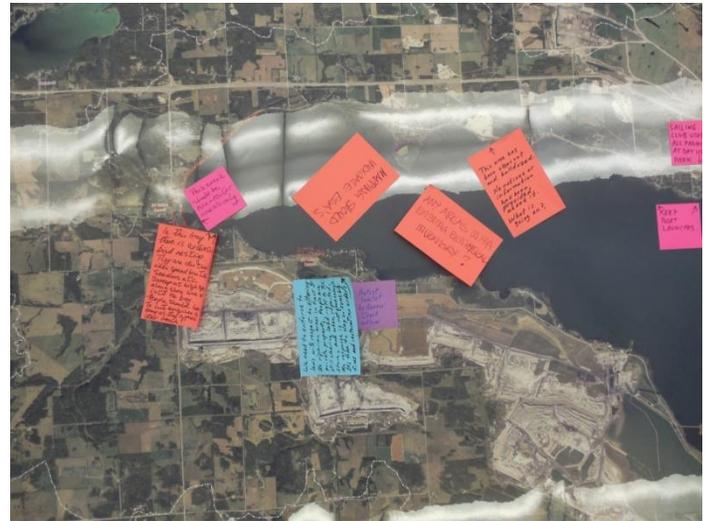
- AEP will establish and maintain a groundwater level and quality-monitoring program including a system of long-term monitoring wells with seasonal/annual baselines and targets.
- AEP will identify unused water wells and provide incentives to properly decommission and reclaim them.
- AEP will enhance the boat sanitation program to reduce the risk of introducing aquatic invasive species.
- AEP will develop and implement an Air Quality Management Framework within the North Saskatchewan Regional Plan.
- AEP will encourage new green and alternative energy use and pilot projects including green business/community development and alternative energy use opportunities.

- AEP will complete the Alternative and Renewable Energy Policy Framework that will set the direction for how government will help grow alternative and renewable energy production and use in the province.
- AEP will explore opportunities to improve water circulation in the west side of the lake.
- AEP will expand public boat launch access at Wabamun Lake Provincial Park including boat inspection and wash stations.
- AEP will minimize the size and number of docks on the lake and encourage sharing of docks and establishment of community docks with interested communities. A provincial policy is under development and should provide guidance for municipal and provincial regulators.
- AT will work with Transport Canada to implement appropriate no wake zones, restrictions to sensitive areas, limits to watercraft speeds, etc. through changes in federal regulation based on the results of the Lake Recreation Capacity Study.

10 SUMMARY OF INPUT FROM PUBLIC AND STAKEHOLDER CONSULTATIONS

Built Environment

- Need to support Seba Beach on lake access issues
- Use low impact development criteria
- New lake management zoning with new rules needed
- Agriculture land use - remove some discretionary uses
- Use field staff to keep records of illegal developments
- Limit new residential and commercial development on the lake front and sensitive bird/animal/amphibian habitats i.e. Wabamun (village) proposed development of old warm/cold H₂O outlets
- Need to increase requirements for EIA for major development/redevelopment from 100 to 250(at least) – 500 m from the lake and other sensitive areas
- Concern with gravel pit development: now and after reclamation
- Concern with septic that goes directly into the lake (both gray and black)
- Audit septic systems
- Is there pollution from the fly ash and Wabamun lagoons going into the lake
- How certain people add dirt or fertilizers and sand to the boat launch does not affect the lake
- People filling in swamp areas and stopping the flow of water to the lake
- People clearing reeds in front of their cabin and effecting ecosystems eg. Frogs etc. Need to stop people doing what they want to do because they think they can - Fallis area
- We need rules about tree removal
- Use best practices when developing/redeveloping bank stabilization eg. Naturalization
- Recognized/designated boat launches for everyone. (Residents users alike – “no favorites”)
- Regulate boat launches to more properly designated locations -Shut down illegal boat launches (short term problems will = long term access)
- Minimize boat launches and dock/motorized boat capacity on the lake
- Do not support reopening Seba Beach Boat launch
- Part of TransAlta lands should be used to create a new provincial park with boat launch (reopen Sundance boat launch)
- Need Fallis launch back to where it was before 2015 May



- Use/partner with Wabamun to set up boat cleaning facility (No boat goes on the lake without a wash ticket).
- Is there a contingency to take over the Sundance water treatment plant & pumping station if current legislation forces closure of the power plant

Community

- Need better sewage management & enforcement. Parkland County needs to enforce bylaws
- Too many speedboats too close to shore
- Strongly support coop + internship programs
- "Enforcement is key"
- Lake recreation capacity study needed. But difficult
- Enforcement is too often after the fact & slap on hand. Need system that is proactive not reactive
- Public need to know the rules. Citizens can then watch out but need education to understand rules
- Spring each year reduces the shoreline through ice action
- Educate the cabin and homeowners to what is happening around area
- The 1980 has had more rec. pop to the lake then 2010 + years
- Can't tell people they you can't boat at the lake because their boat is too big
- Traditional Development models based on Growth. Consider Tax incentives and reductions for sustainable practices and low impact practices
- Develop communities within limits and not notions of "growth " esp. growth as built environments
- Limit the number of high impact recreational activities and compliance regime improvements for things like noise, speed and dangerous behavior (boats, cars, motor bikes, RV's, OHV's). Also industrial noise pollution) from power plants and highways)
- Develop pilots with private property owners to improve their properties and business practices to include environment and cultural sustainability.
- SW corner bay beside Seba – need speed limits to protect wildlife
- Limit high impact recreational activities i.e. motor boat/jet skis and promote low impact recreation services
- Motorized access to ER along the water (along with piers) needs to be prevented.

Economic

- Encourage & support Eco-tour & green business in the watershed
- Support Seba Beach in closing Boat launch
- 9 street community dock works well in Seba Beach – a good example
- People need to have the understanding of getting permits before they strip land and remove trees
- Have County change the day use campsite to an actual campground with facilities
- Promote eco-business and sustainable resource development
- Arts based development
- Economic development – aimed at research (i.e. based on environmental sustainability and renewable technologies and energy

- Need new boat launch west side of lake to accommodate local campground boats but need county funding (campground sites to increase)

Governance

- 30+ years we have been working on this stuff: What are the different levels of Government going to commit to action and resources
- Land use regulations required
- Need to restrict engine size on the lake
- Need to rezone land use to support watershed objectives
- Should focus plan on land use planning & that will take care of issues
- Wabamun natural area on Sundance Rd & R.R. 53 – is restricted for OHV use. Someone is mowing OHV trails.
- Provincial & Municipal joint system that “pulls” up all relevant bylaws, reports & studies associated to that property. (+ provincial statutes) (i.e. Development officer can pull up all relevant legislation before making a decision) *digital* *develop a system*
- Support communal sewage system(s) in Seba Beach to replace septic tanks & small # of grandfathered fields
- Cut engine zones need to be extended out further into the lake to reduce wake
- We are a community Association that implemented our no wake zone for swimmers
- Speeds are usually pretty good until you get someone that does not care on the no wake zone – who is going to police it?
- There will always be growth to the lake due to generations
- If you do not like the number of boaters, do not buy at the lake.
- Enforce bylaws re: single residential which are turning into trailer parks
- Don't have to close the boat launches due to the number of cabin and homeowners on the lake.
- Improve the fish and wildlife cabin (Fallis) area for them to check people w/ boating licenses
- Need to have RCMP police speed limits from the Y camp east of Fallis
- Enforce/patrol over-used areas (Fallis) re: licenses, speeding, noise pollution
- More cooperation and coordination between different jurisdictions
- More public input aimed at creating long-term sustainability
- Prioritizing natural environments over human activities and \$

Environment

- Need monitoring of tributaries
- Phosphorous restriction in high areas based on soil test location next to drainage etc.
- Riparian clearing -Concern re: existing properties -Will they be required to change
- Lake water levels should be based on weir & natural fluctuations not by treated water pumping
- There needs to be more “requirements” than “encouragements” in the plan
- Flexibility needs to be included in dumping & clearing. Should not be black & white.
- No septic fields. -Replace with pumps. No spray of manure from tanks on fields-Cluster sewage - communal
- Eliminate septic tank & need pump out tanks

- New developments need pump outs
- Diluting environmental issues/concerns
- Education has to be priority
- Includes outhouses & septic fields in phase out
- Don't destroy existing infrastructure
- Surface water quality. Add requirement for a phosphorous soil test
- Clarity re when a requirement for EIA would be triggered
- Improve upland/riparian health.
- Need better definition of who does what enforcement
- "Identify & protect groundwater recharge area. Identification is important
- Need better definition of who is included in EIA & rules, + what developments included/excluded eg. sheds?
- Need long term monitoring of water quality
- Restrict access to the lake to authorized boat launches only
- Study needed to tie groundwater to surface water
- Province needs to develop province wide land use system including categories and associated relevant rules for each, to facilitate accurate permitting
- Province to put forward stronger regulations to prohibit the spread of invasive species in Lake Wabamun (+all lakes)
- Concern about invasive species (aquatic weeds) what landowners can do?
- Stream near 9th St and 1 Ave in Seba Beach has fish spawning and needs protection
- Stop allowing destruction of wetlands, which are turning into private trailer parks
- Close ad-hoc boat launch areas, which are being over-used summer and winter
- Concern over Village of Wabamun's development Discovery Wharf. It is environmentally irresponsible it will destroy wildlife habitat, bird nesting, etc. – Use political pressure to resist this development as well as existing legislation
- Protect the clearing of beaches in front of cabins or homeowner places
- Need stronger regulations w/ Parkland County and the Government of destruction of land and development
- Limit # of high powerboats, wake boats, jet skis (because of impact on shorelines, nesting birds, noise and impact on non-motorized users)
- Work with homeowners, businesses to develop sound environmental practices re-introduces native plants and such
- Consider development models not based on growth but on sustainability and limits

11 REFERENCES

- i Wabamun Lake Sub-watershed Land Use Plan Technical Report, Stantec Consulting Ltd, 2016
- ii Section 4.5.1
- iii Section 4.5.3
- iv Section 4.5.3
- v Section 4.5.3
- vi Section 4.6.1
- vii Section 4.4.2.1
- viii Section 4.4.1.4
- ix Section 5.1
- x Section 5.1