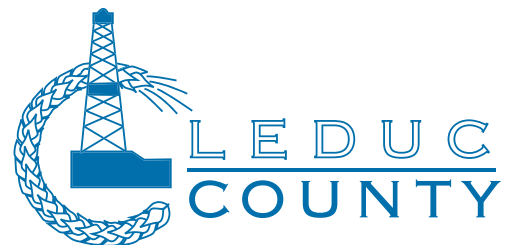


# North Pigeon Lake

## Area Structure Plan





**BYLAW NO. 19-10**

**LEDUC COUNTY**

**A BYLAW OF LEDUC COUNTY, IN THE PROVINCE OF ALBERTA, FOR THE PURPOSE OF  
ADOPTING NORTH PIGEON LAKE AREA STRUCTURE PLAN.**

---

**WHEREAS**

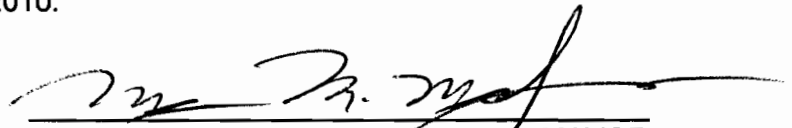
Pursuant to the Municipal Government Act, being Chapter M-26, Revised Statutes of Alberta 2000 and amendments thereto, the Council of Leduc County deems it to be in the public interest to adopt the North Pigeon Lake Area Structure Plan;


**NOW THEREFORE**

Be it resolved that the Council of Leduc County, duly assembled, enacts that the North Pigeon Lake Area Structure Plan, being Schedule "A" attached to and forming part of this Bylaw, be adopted.:

This Bylaw shall take effect on the date of the third reading and signing.

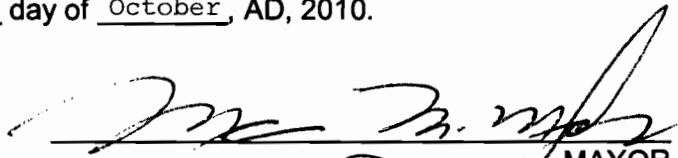
Read a first time this 17<sup>th</sup> day of August, AD, 2010.


  
\_\_\_\_\_  
MAYOR

  
\_\_\_\_\_  
COUNTY MANAGER

Read a second time this 5<sup>th</sup> day of October, AD, 2010.

Read a third time and finally passed this 5<sup>th</sup> day of October, AD, 2010.

  
\_\_\_\_\_  
MAYOR

  
\_\_\_\_\_  
COUNTY MANAGER

# Acknowledgements

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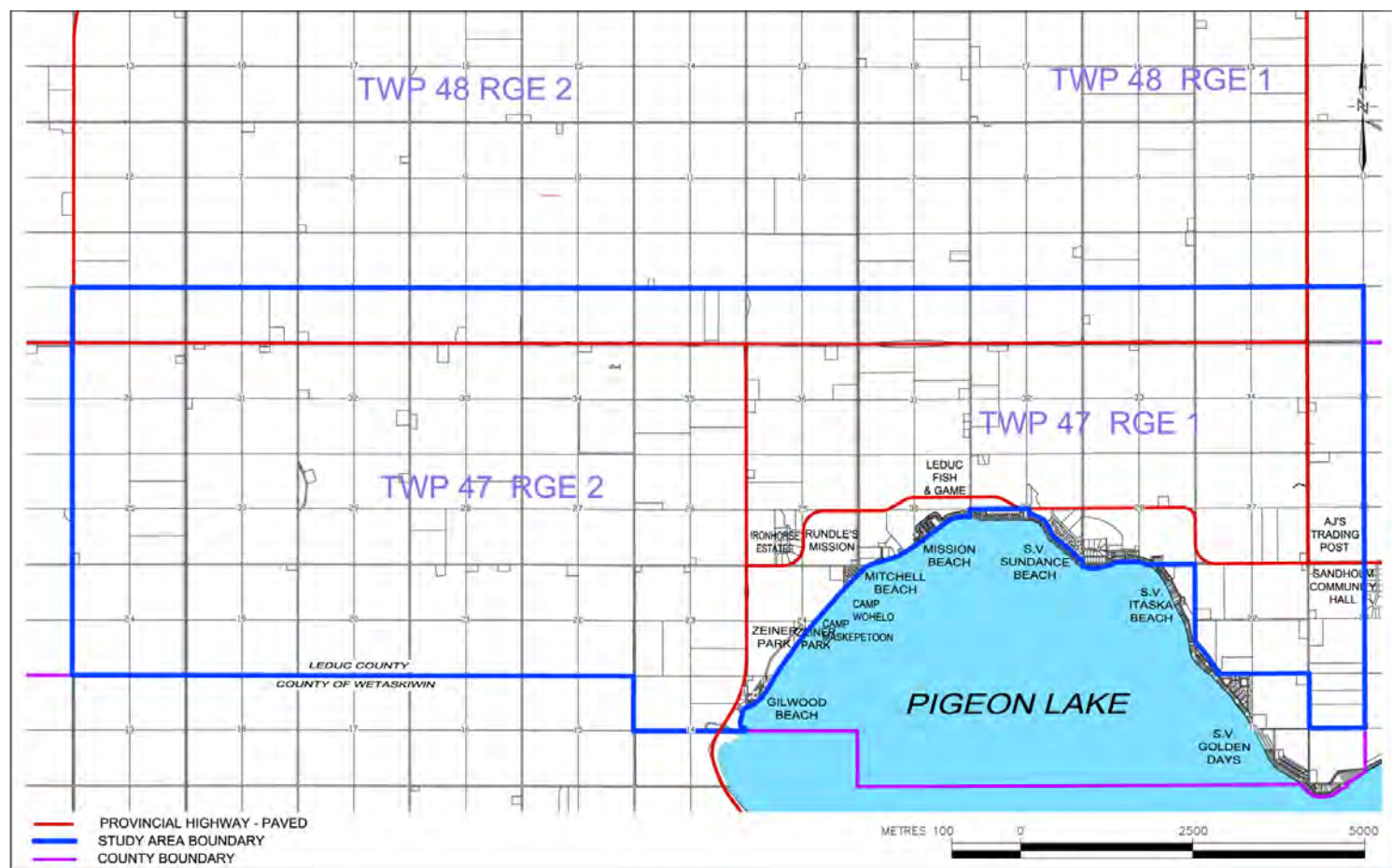
# Part A: Background

# 1.0 Introduction

Pigeon Lake is one of the most popular and heavily used recreational lakes in central Alberta. It is a destination for leisure activities and has attracted increasing recreation property development activity in recent years (this is discussed in further detail in Section 9.9). Over the past few years, serious concerns have been raised with regards to the water quality and lake water level. In response, Leduc County launched the preparation of an Area Structure Plan (ASP) that encompasses all of the Pigeon Lake watershed which lies within the County, as well as some lands outside of the watershed area (See Figure 1: Study Area). Significant resources were mobilized to ensure that the health of the lake is prioritized and that future development is carried out in a responsible and sustainable manner.

The plan is driven by the need to protect the lake as well as preserve the natural environment, while integrating future development in a responsible manner.

Figure 1: Study Area





## 1.1 The Plan Intent

The purpose of the North Pigeon Lake Area Structure Plan is to provide a policy framework which allows for orderly and environmentally conscious development that responds to future subdivision and development proposals, and establishes a preliminary servicing concept.

The objectives of this Area Structure Plan (ASP) are to:

- Provide environmental protection of the Pigeon Lake watershed.
- Identify sustainable land uses that are complementary to one another and to existing uses.
- Recognize transportation routes which will support these land uses.
- Conceptually identify public utilities and design parameters for storm water management facilities necessary to support identified land uses.
- Determine the appropriate amount, location, and sequencing of development based on servicing, access and market demand.
- Establish a framework through which future developments will be assessed.
- Establish a framework for the Pigeon Lake community on the future direction of the ASP area.

The North Pigeon Lake Area Structure Plan (hereinafter referred to as the NPLASP) is a long-range plan with a 25 year planning horizon. It provides a policy framework to manage the demand for recreational properties and land uses around the Lake, and will address a number of issues affecting the watershed as defined by Pigeon Lake stakeholders.

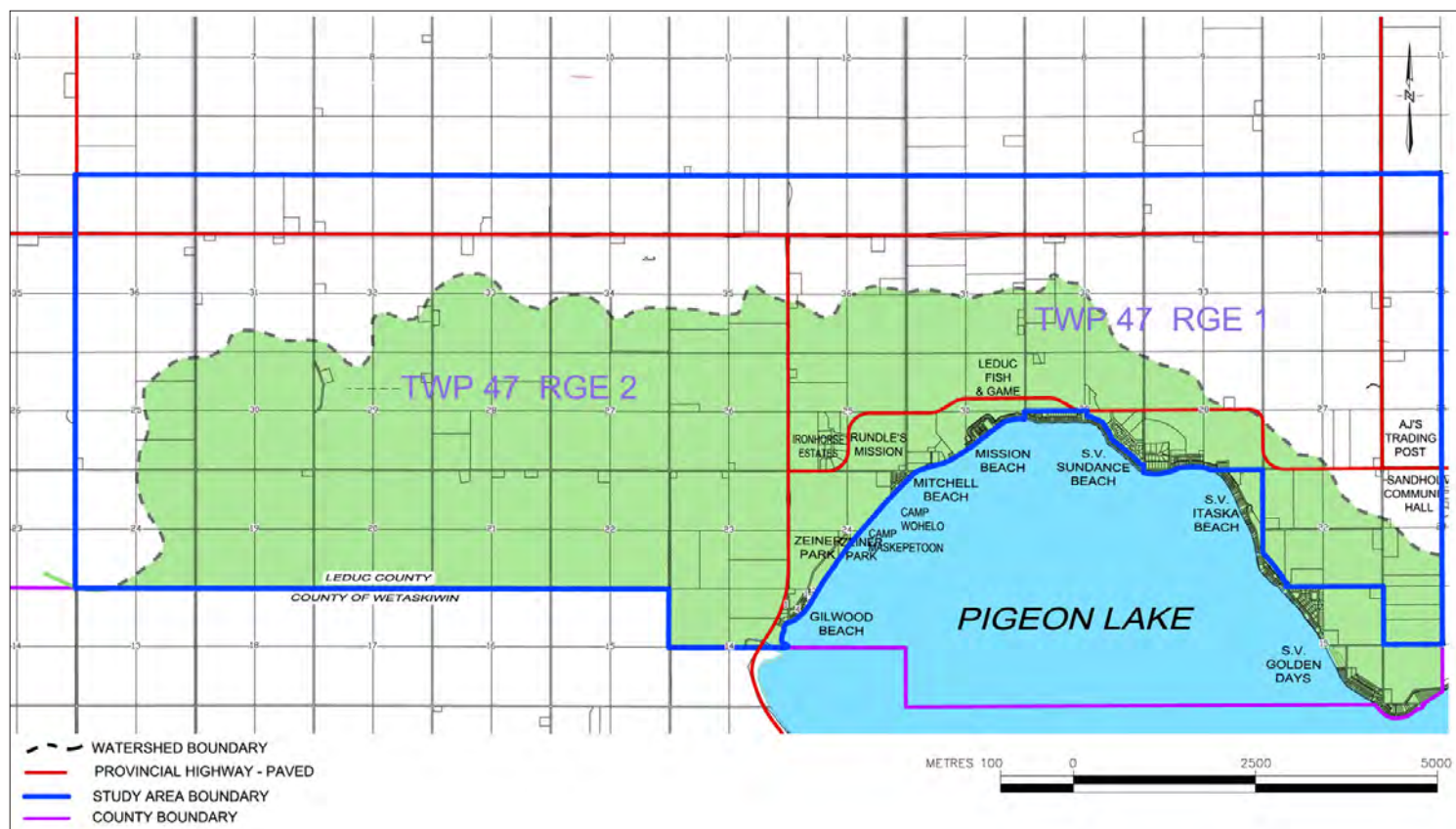
The intent of the plan is to provide suitable land uses (i.e. residential, recreation, park and open space, agricultural, community service, commercial and mixed land uses) that will create a vibrant and sustainable recreational community while protecting the watershed environment. The NPLASP addresses connectivity of the natural spaces through trails, lake access, passive recreation opportunities, integrated water and waste water management, and the organization of open spaces and land uses.

In addition the NPLASP recommends current and long term land uses; servicing standards appropriate for the use intended; prioritizes the creation of parks and open space; and the protection of environmentally sensitive areas.

The NPLASP is a reflection of best practices in the development of integrated land use policies that will govern the location, use, density and intensity of development within the plan area (see Figure 2 Watershed Boundary).

Once the NPLASP is adopted by County bylaw, redistricting, subdivision and development permit application decisions will be guided in part by the NPLASP.

Figure 2: Watershed Boundary



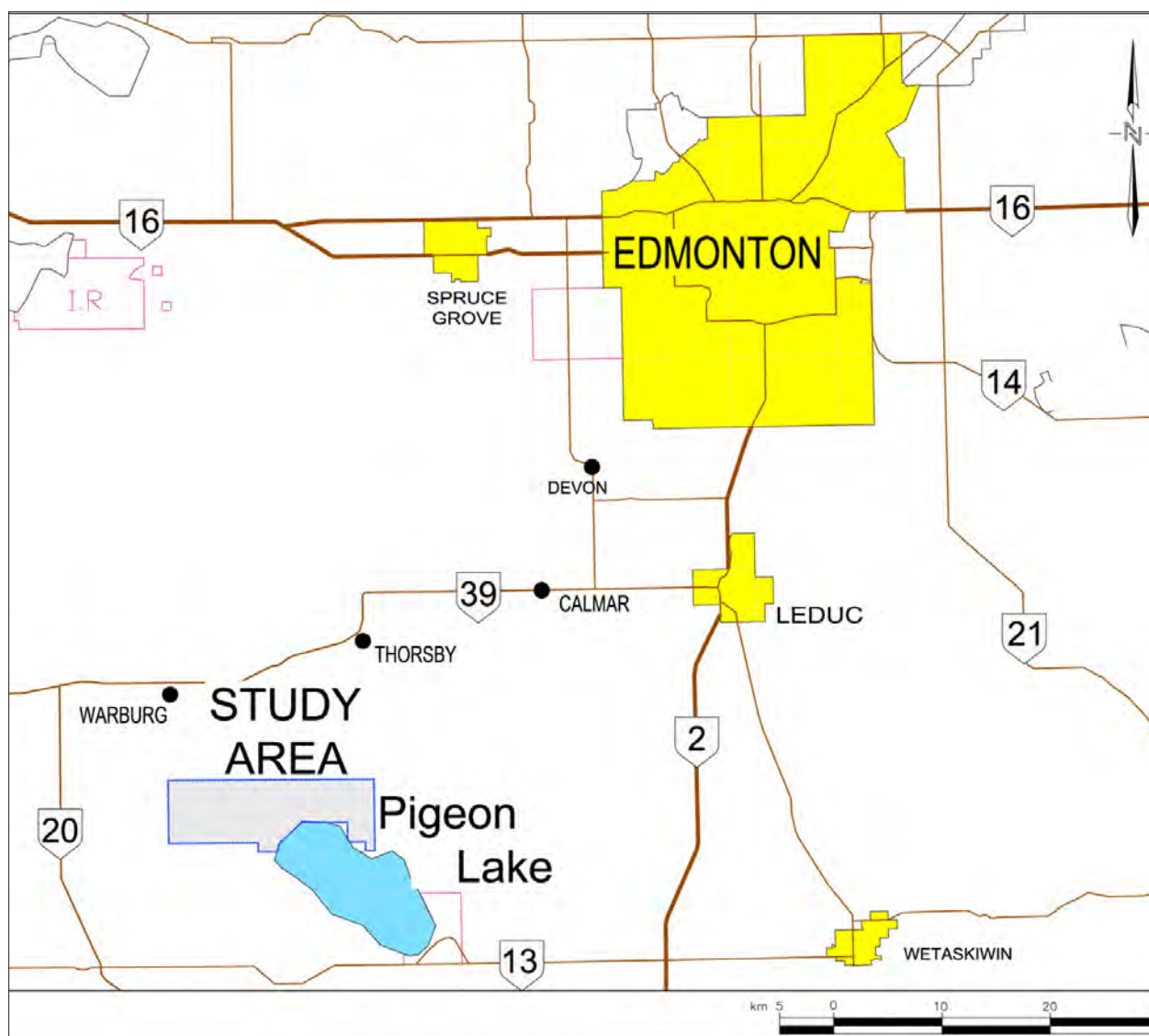
## 1.2 Plan Area

The Plan area is shown in a regional context in Figure 3 (Regional Context) and consists of approximately 98.5 square kilometres (9850 hectares, 24,339 acres) of lands within Leduc County's jurisdiction. The north boundary of the Plan is parallel to and extends 800m (0.6 miles) north of Highway 616. The west boundary is Highway 770. In the east, the plan boundary lies 800m (0.6 miles) east of and parallel to Highway 778. To the south, the plan area boundary coincides with the municipal boundary between Leduc County, the summer villages of Sundance Beach, Itaska Beach and Golden Days and the County of Wetaskiwin.

Of the total plan area, approximately 54 square kilometres (5400 hectares, 13,343 acres) are within the Pigeon Lake watershed.

The predominant land use within the plan area is agriculture, with recreational property development of some 825 lots (including those in the summer villages) limited generally to within 400m of the lake.

Figure 3: Regional Context



### 1.3 Legal Framework

The North Pigeon Lake Area Structure Plan is a statutory document that is enabled under the Municipal Government Act, Section 633. It has been prepared in the context of its geographic location within Alberta's Capital Region and Leduc County. It has been prepared having regard for Leduc County statutory plans and policies which govern land development, as well as the Capital Region Growth Plan.

Other relevant policies and design principles are identified in Section 4 as they relate to and impact the creation of this ASP.

Future applicants seeking to amend the NPLASP and redistrict for a multi-lot subdivision are required to submit a Local Area Structure Plan (LASP) or Outline Plan and provide a site-specific, more detailed analysis of their site. LASPs shall conform to the requirements of such documents as outlined by Leduc County and in Section 633 of the Municipal Government Act.

## 2.0 The Planning Process

The planning process involved four significant tasks: the formulation of the terms of reference, the technical studies, a series of public input sessions and the preparation of a draft plan.

The Terms of Reference were formulated by Leduc County Planning and Development and took into account the many aspects of planning study that needed to be addressed by this ASP document.

A number of specialist consultants were engaged to address environmental, geotechnical, hydrogeological, transportation, surface water, municipal servicing and agricultural issues.

Public consultation sessions, managed by the County and facilitated by Populus Community Planning Inc., were held on May 26, June 18 and July 14, 2009 and on June 22, 2010 to gather the input of stakeholders having an interest in the area. This gave the public four opportunities to voice their concerns, ask questions and provide input into the planning process.

Taking the public's concern about the health of the lake into account, and based on the various studies that the specialist consultants provided, the plan took shape in its present form.

### 2.1 Public Engagement

As a cornerstone for the development of a new vision for the Leduc County portion of the Pigeon Lake watershed, consultation with those who live in the watershed or have a stake in the watershed is essential.



## Purpose of engaging the public

The purpose of engaging the public was to:

1. Brainstorm issues and strategies to enhance the health of Pigeon Lake
2. Raise awareness of individual impact on the health of Pigeon Lake
3. Cultivate a common vision for the future of Pigeon Lake and surrounding communities
4. Create opportunities for regional relationships to enhance the health of Pigeon Lake
5. Provide opportunities for participants to connect with their community
6. Develop the creation of an Area Structure Plan for Leduc County lands that fall within the watershed and that respond to the needs of Pigeon Lake and its residents
7. Provide additional review of the Area Structure Plan by the public prior to its completion and submission to Council
8. Create an Area Structure Plan to guide development and enhance the health of Pigeon Lake
9. Gather a core of local preliminary environmental policies for possible inclusion in the Municipal Development Plan

Participants were expected to be actively engaged in the above and were expected to:

1. Define goals
2. Recognize the current context in the area
3. Identify opportunities
4. Identify constraints
5. Create action plans (identify how to implement the goals in the ASP)

## Consulting Team

The consulting team to engage the public was Beth Sanders and Margaret Sanders from Populus Community Planning Inc. The intention of the team's work was to create opportunities for reflective individual and collective inquiry and create generative conversation that would lead to increased understanding of the true needs of various and diverse stakeholders.

Working as a team, Beth and Margaret created opportunities for participants to understand their surroundings more deeply and the actions needed to bridge the gap between what we know we ought to do, and what we actually do.

## Hosting Team

As the hosting team, Leduc County Planning and Development conducted the public engagement. The role of the \ hosting team was as follows:

1. Guide the participants through a process that gave them an opportunity to express their interests and concerns, as well as drawing attention to opportunities and solutions
2. Coaching the attendees at the public events to identify:
  - a) Clear goals
  - b) Realistic options to reach the goals
  - c) Obstacles to reaching the goals
  - d) An action plan to achieve the goals
  - e) A willingness to commit to the goals
3. Coach and support the design team to fulfill its objective to generate discussion on how to make sure development enhances the lake by supporting their work to:
  - a) Establish clear, defined goals
  - b) Assess reality in ability to reach the goals
  - c) Identify options to reach goals, as well as obstacles and the ensuing action plan
  - d) Recognize willingness to commit to action plan

## Schedule of Public Engagement Events

The intention of the consulting team and County planners was to foster and facilitate the exchange of ideas perspectives and create opportunities for learning.

The following events took place in the preparation of the North Pigeon Lake Area Structure Plan:

Schedule of Engagement Events			
	Intention	Questions to explore	Materials on hand
<b>Event #1</b> <b>May 26, 2009</b>	Create common ground on the lake and its health	What do we know about the lake? What do we know about what harms the lake? What do we know about what helps the lake?	Map of the whole process. Map of the event's process Related documents
<b>Event #2A</b> <b>June 18, 2009</b>	Use common ground as "jumping off point" – clarify define and refine issues to become goals and objectives for the ASP	How do we put the above into action?	As above Planning 101 material Results of previous session
<b>Event #2B</b> <b>July 14, 2009</b>	Participants create guiding principles and values for the ASP	How do we put the above into action? How will we recognize what we are looking for?	As above Results of previous session
<b>Event #3</b> <b>June 22, 2010</b>	Stakeholders and citizens test the results of the work that the consultants have done – draft ASP	Does the document reflect what you have in mind? If yes, in what way? If no, in what way?	As above Draft copies of the ASP to people ahead of time Large maps Worksheets to explore the document

## Outcomes of Public Engagement

At the close of the first three public events, a photo record was created of all comments received from and mapping completed by the public. These photo records remain available for all to access via the internet at <http://picasaweb.google.ca/110325021218632799550/NorthPigeonLakePlanningProcess?feat=directlink#>.

Following the fourth public meeting, held on June 22 2010, transcripts were created of all comments contributed through a short workshop, as well as of a question and answer session which followed a short presentation of the draft plan. These documents also remain available via the County's website at <http://www.leduc-county.com/plan-long-northpigeon.htm>.

On August 17, a public hearing was held for the North Pigeon Lake ASP. Eight written submissions were received in advance of the hearing and were included in Council's agenda package. At the hearing itself, 13 speakers made representations. Subsequently, two of these speakers requested that their presentations be forwarded to Council as addenda to the agenda package. The package contents and minutes of the public hearing are available via the County's website at <http://www.leduc-county.com/plan-long-northpigeon.htm>.

### 3.0 Watershed Setting and History

Pigeon Lake is a large and very popular recreational lake geographically shared by Leduc County and the County of Wetaskiwin, within easy driving distance from the cities of Edmonton, Leduc and Wetaskiwin. Approximately 27 per cent (12.4 km) of the lakeshore is located within the boundaries of Leduc County and the summer villages of Sundance Beach, Itaska Beach and Golden days. Of this, some 25 per cent (3.1 km) of shoreline are publically owned. The remaining 73 per cent (33.6 km) of the lakeshore is under the jurisdiction of the County of Wetaskiwin, the Cree Nation Four Bands Reserve and Pigeon Lake Provincial Park, as well as seven additional summer villages (Ma-Me-O Beach, Silver Beach, Argentia Beach, Norris Beach, Grandview, Poplar Bay, Crystal Springs).

The lake is located approximately 60 km (37.5 miles) southwest of Edmonton. Several provincial highways provide good access to most of the Lake shore.

The Pigeon Lake watershed offers summer and winter activities such as fishing, water sports, cross country skiing, golfing, etc. However, much of the land-based activity and most of the services that support this activity are concentrated on the south and east sides of the lake.

Once known as “Woodpecker Lake,” a translation of the Cree name Hmi-hmoo, the name Pigeon Lake was in use by 1858 (Holmgren and Holmgren, 1976). The name might have originated from the huge flocks of passenger pigeons that once ranged over the area (Falun Hist. Soc., 1974). In 1847, Reverend Robert Rundle established Rundle’s Mission on the north-west shore of the lake. This agricultural settlement, which was Alberta’s first Protestant mission, is commemorated by a cairn at Mission Beach (Warburg Dist. Hist. Soc., 1977). A Hudson’s Bay Company trading post was built on the west shore in 1868, but operated only until 1875 (Falun Hist. Soc., 1974). In 1896, the Pigeon Lake Indian Reserve was established on the south-east shore of the lake. Later, the summer village of Ma-Me-O Beach was developed at the south end of the lake on land purchased from the Indian reserve in 1924. Ma-Me-O is a Cree word meaning “white pigeon.” Logging, commercial fishing and farming were important livelihoods of residents of the area in the early 1900s. Near the hamlet of Mulhurst, a sawmill operated year-round, and a fish packing plant operated during winter (Millet Dist. Hist. Soc., 1978).

Two provincial parks are located on Pigeon Lake. Ma-Me-O Beach Provincial Park, located within the summer village of the same name, was established in 1957 (Alta. Rec. Parks n.d.). It is the smallest provincial park in Alberta (area of 0.016 km<sup>2</sup>). The park provides day-use services only. Facilities include a picnic shelter, a playground, toilets, water pump and a nearby sandy beach.

Pigeon Lake Provincial Park was established on the west side of the lake in 1967 (Alta. Rec. Parks n.d.). Alberta Tourism, Parks and Recreation acquired nearby Zeiner Park (formerly operated by Leduc County) in 1981 and incorporated it into the provincial park. There are 180 campsites in the main campground and 116 sites at Zeiner Campground; facilities include beaches, boat launches, change houses, docks, flush and vault toilets, picnic shelters, a concession, group camping, sewage disposal, tap water, walking trails, a telephone and playgrounds. The park offers camping from early May to mid-October, and is open for day-use activities year-round (Wilson 1988).

Additional public access points with boat launches, are available at Mulhurst Bay, Gilwood Beach and at the Summer Village of Ma-Me-O Beach. Commercial recreational facilities at the lake include two campgrounds located in the Indian reserve at either side of the summer village of Ma-Me-O Beach and five golf courses (Mulhurst, Willow Greens, Black Bull, Dorchester and Wicked Witch, all within the County of Wetaskiwin). As well, there are institutional facilities which consist of eight youth and church group camps situated along the lakeshore.

More intensive development has occurred around the lake in the form of 10 summer villages adjacent to the lake itself, two hamlets, and several subdivisions in Leduc and Wetaskiwin Counties.

#### Rundle’s Mission

In 1783, the North West Company was formed and began operations in what would later become central Alberta. In response to this new competition, the Hudson’s Bay Company (HBC) set up new posts to extend their influence and capture more of the fur trade. In that same year, HBC set up its first post at Pigeon Lake in an attempt to cater to the Stony band. For the next sixty years the post was intermittently active as a place of trade and a stopping point between Fort Edmonton and Rocky Mountain House.

In 1840, HBC made an arrangement with the Wesleyan Missionary Society to establish missions in its territory. Robert Rundle was assigned to Fort Edmonton and in 1847 was granted permission to set up a post outside the Fort. The site he chose was at Pigeon Lake. In 1848, Rundle returned to England but he was followed by others such as Benjamin Sinclair, George and John McDougal, Thomas Woolsey, Henry Steinhauer, Peter Erasmus and Peter Campbell. Pigeon Lake was the only mission in western Canada to be served by all the missionaries and assistants in the first 30 years.

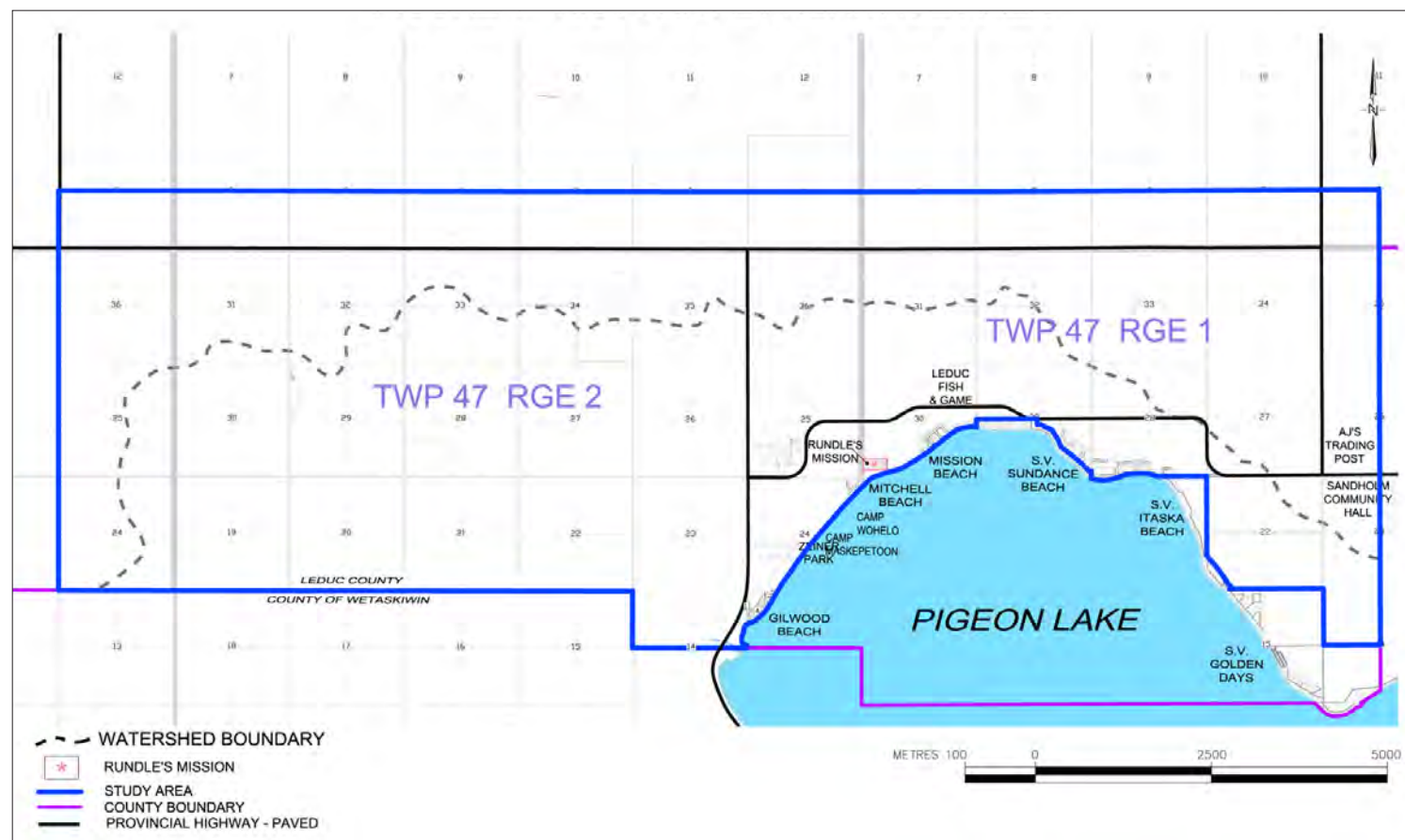
By the 1890's, the Mission's days were numbered due to the decline of Pigeon Lake as a fishery, the advent of reserves for the natives and the shift to goods and services coming from the south overland as opposed to via canoe on the North Saskatchewan River. In 1903, a plan of survey was filed in Ottawa which included lands upon which the Mission had sat. In 1906, a title was issued to John Henry Lee of Bonny Glen, Alberta making him the first owner of an estate in fee simple for the Mission site. In the same year the name of the Mission—Woodville—disappeared from the church records, terminating what one of the last missionaries, Rev. Nelson, had described as one of the oldest and most successful Indian Missions.

In 1956, the first meeting of the Rundle's Mission Society was convened leading to a building program and the management of a very important historical site on Pigeon Lake. The development of Mission Beach on Pigeon Lake is named after the historical use of the area.

### Heritage Resources Synopsis

Evidence has been found suggesting that the Pigeon Lake area was utilized by early man as a source for food. No significant archaeological sites have been located in the Study Area with the exception of the lands surrounding Rundle's Mission. Refer to Figure 4 – Historical/Heritage Area.

Figure 4: Historical/Heritage Area



## 4.0 Policy Context

The North Pigeon Lake Area Structure Plan has been prepared using development principles and objectives drawn from a number of policy directives established by the various levels of government, as well as those defined in the public engagement process. These directives provide a framework for the preparation of this Area Structure Plan.

### 4.1 Provincial Context

In the context of provincial policy, the Provincial Land Use Framework guides the planning for any new development and defines that new development should provide people friendly communities with ample recreational and cultural opportunities, respect the environment and support Alberta's land and natural resources. The purpose of these directives is to manage growth and to provide a sustainable pattern of growth, balancing social and environmental goals. This policy framework is based on principles of sustainability and environmental responsibility.

#### Desired Outcomes

To translate the vision into reality, three outcomes are identified. The actions taken to implement the Land Use Framework must contribute (directly or indirectly) to these outcomes. The outcomes are inter-related and of equal importance although trade-offs may be required.

- A healthy economy supported by our land and natural resources
- Healthy ecosystems and environment
- People-friendly communities with ample recreational and cultural opportunities

#### Guiding Principles of the Land Use Framework

The vision and the desired outcomes of the Land Use Framework define where Albertans want to be when it comes to land use. But to reach this destination, we will have to make many practical decisions—decisions involving competing interests, conflicting values and complicated tradeoffs. To help align these actions with the Framework's vision and desired outcomes, the province is adopting a set of guiding principles that will shape and inform its actions. In Alberta, land-use decisions will be:

- Sustainable
- Accountable and responsible
- Supported by a land stewardship ethic
- Collaborative and transparent
- Integrated
- Knowledge-based
- Responsive
- Fair, equitable and timely
- Respectful of private property rights
- Respectful of water needs



## 4.2 Regional Context

Regional policy directives exist in the form of the Capital Region Growth Plan (CRGP), which guides management of public and private lands and natural resources to achieve Alberta's long term economic, environmental and social goals.

Six Principles have been developed in the CRGP that the Capital Region Board and municipalities within the Capital Region will employ to guide future growth and development. The Land Use Principles are summarized as follows:

1. Protect the environment and resources
2. Minimize the development foot print
3. Strengthen communities
4. Increase transportation choice
5. Ensure efficient provision of choice
6. Support regional economic development

Some of the relevant policies that the CRB has adopted to actualize its vision include the following. To see a complete listing of principles and policies see the Capital Region Growth Plan, the Capital Region Land Use Plan, and the October and December 2009 addendums to the Growth Plan (available at <http://capitalregionboard.ab.ca/index.php/capital-region-growth-plan>).

- **Preserve and protect the environment**
  - I. Any development which may cause detrimental effects such as erosion or pollution to lakes, rivers, water bodies and shorelines shall be prohibited unless appropriate mitigation measures are implemented.
  - II. Any development which fragments contiguous natural features, function and habitat—such as water systems, moraines, forests, wetlands and wildlife habitat and corridors—shall be discouraged.
  - III. Support governmental environmental initiatives and seek opportunities for coordinated initiatives between municipalities.
  - IV. Manage regional watersheds to protect, restore and ensure the sustainability of natural water systems.
- **Allow growth outside of Priority Growth Areas if the following criteria are met:**
  - I. It is contiguous to existing development
  - II. It follows the principles and policies of the CRGP related to the form of development
  - III. The level of services provided is appropriate to the form of development
  - IV. Development in this area will not adversely affect the provision of regional infrastructure required to service the Priority Growth Areas (PGAs).

PGAs are defined in the CRGP. The NPLASP area is not included in any such designated area.
- **Support cluster country residential (CCRA) development**

While the NPLASP is not in a designated CCRA, the following policies pertaining to CCRA design will apply:

  - I. Country residential uses shall be allowed in designated areas in a clustered form in order to preserve environmental or open space features.
  - II. Such developments shall utilize municipal water and sanitary services.
  - III. Private communal services may be allowed at the discretion of the Municipality.
  - IV. Density targets are two units per gross hectare for CCRA's and a maximum of 50 lots per quarter section in areas outside CCRA's.
- **Strengthen communities**
  - I. Integrate uses with adjacent developments to improve connectivity and accessibility to local parks, open spaces, commercial and community services
  - II. Encourage co-location and/or shared use of compatible public service infrastructure such as education facilities, parks and civic services.
- **Support healthy communities**
  - I. Improve accessibility to community services by providing sidewalks and bicycle trails to encourage walking and cycling and locate these services within proximity to transit where possible.

- II. CRB municipalities will work together to define and prioritize the need for, and if required, the future form, function, and location of a system of regional parks, open spaces and greenways that will preserve important environmental and natural features for public purposes.

## 4.3 County Context

### Leduc County Municipal Development Plan (2004)

The Leduc County Municipal Development Plan (MDP) outlines policies that govern the subdivision and development of land in the County for the benefit of its present and future residents and their quality of life.

The land encompassed by the NPLASP is designated in the MDP as Agricultural Area B. The purpose for this designation is to “conserve and protect extensive areas of land for agricultural uses; to encourage and accommodate a broad range of agriculturally related pursuits; and to retain and enhance the County’s agricultural community.” Planning policies, both general and specific, pertaining to development in Agricultural Area B are outlined in Section 3 of the current MDP. Among the policies for country residential development relevant to the NPLASP are the following:

- Country residential uses shall only be allowed on low capability agricultural land
- The density of country residential development shall not exceed 35 lots per quarter section, or 50 bareland condominium lots per quarter section
- The minimum lot size of country residential development shall be one ha (2.5 acre) except where an Area Structure Plan or Outline Plan specifies smaller lots with communal or municipal water and sewer services.
- When country residential subdivision is proposed on slopes of 15 per cent or greater, a geotechnical study must be undertaken to determine slope stability.
- Where country residential subdivision is proposed adjacent to a water course, lake or waterbody, the County shall require the landowner to dedicate municipal reserve, environmental reserve or environmental reserve easement to accommodate an appropriate development setback.
- New or expansion of existing lakeshore resort areas may be allowed only when adequate study has been undertaken to prove that there will not be any land-use conflict with the existing development nor any adverse impact on the aesthetics or natural environment of the lakeshore area including water quality and wildlife or fishery habitats.

Section 6 of the MDP addresses recreation development and community services. Among the policies, which are relevant to the NPLASP, are the following:

- A recreation development may be allowed on low capability agricultural land where the development does not exert an adverse impact on neighbouring land uses or environmentally sensitive areas.
- Where a recreational development involves a large scale facility, the County shall require the proponent to submit a complete plan showing the proposed land use pattern, servicing system and transportation network as well as a detailed design of the key components of the project and environmental impact.
- The bareland condominium development technique must be used where the recreational development is or contains a residential subdivision.
- Community services may locate in any land use area where the use does not exert an adverse impact on neighbouring land uses or environmentally sensitive areas.

Section 8 of the MDP addresses environmental protection. Among the policies which are relevant to the NPLASP are the following:

- The subdivision of lands within the one in 100 year floodplain shall not be permitted unless adequate flood proofing measures are undertaken.
- The County encourages landowners to maintain tree cover and natural vegetation in environmentally sensitive areas and on land with steep or unstable slopes.
- Where public ownership is desired, environmental reserve (ER) may be acquired at the time of subdivision.

## Leduc County Land Use Bylaw 7-08

The Leduc County Land Use Bylaw (Bylaw 7-08) regulates the use of lands in order to achieve orderly development in the County consistent with the provisions of the MDP and other statutory plans. All land uses within the County are regulated by the LUB. The NPLASP is comprised of lands designated as Country Residential District (RC), Resort Residential District (RR), Lake Watershed District (LW), Acreage Residential District (RA) and Agricultural District (AG).

Within the watershed, most lands are districted as Lake Watershed (LW). Generally, this designation is focused specifically on minimizing environmental impacts and protecting the integrity of the lake, watershed, and tree cover, while still “allowing for minimal development of recreational, residential and agricultural uses.” Outside the watershed area, lands are districted Agricultural (AG), which focuses on agricultural land uses with residential and other uses taking on a secondary role.

## Pigeon Lake Management Plan (2000)

The Pigeon Lake Management Plan (2000) was adopted by Leduc County and other municipalities around the lake in 2000. Supporting studies for the plan identified the following risks to the water quality of Pigeon Lake:

- Increases in phosphorus will cause increases in aquatic plant growth. The most likely cause of increased phosphorus is the conversion of forest land to agriculture, especially livestock operations. Residential development also has an effect, but a small one (currently, there are no confined feeding operations in the plan area).
- As private sewage systems age, they could lose effectiveness, resulting in more fecal coliforms and plant nutrients reaching the lake.
- Aquatic plant production could increase dramatically through positive feedback if available phosphorus reaches a critical level, but we do not know what that level is.

Planning principles and policies contained in the document are summarized as follows:

1. Recognize the rights of the farming community – changes to agricultural practices must be achieved by education and/or incentives, not compulsion.
2. Maintain water quality – the following recommendations were made:
  - a) Ensure that private sewer systems are functioning properly
  - b) Eliminate grey water systems
  - c) Work towards a municipal sewer system
  - d) Eliminate the use of lawn fertilizer on lakeshore property
  - e) Examine the effect of golf courses
  - f) Review existing animal operations
  - g) Control new animal operations
  - h) Consider the effect of new residential subdivision
  - i) Preserve tree cover
  - j) Actively monitor the lake
  - k) Enforce anti-pollution rules
3. Protect groundwater flows – multi-lot subdivisions should require proof of adequate sustainable groundwater supply through a pump and recovery test prior to approval. Low and wet areas should be taken by municipalities as environmental reserve, or placed under environmental or conservation easement.
4. Maintain public access to the lake – lakeshore municipal or environmental reserves should not be closed or made inaccessible. Lake access must be addressed in any area structure plan for a proposed development. Each lot under one acre within 400m of the lakeshore should have the use of at least 10 feet of reserve frontage for lake access. The bulk of public access to Pigeon Lake must be through the provincial parks.
5. Protect the fishery – proposals to develop previously undeveloped shoreline must take into account the need to preserve offshore rooted vegetation. Municipalities should consider the effects on fish habitat before approving any changes to land use.
6. Allow properly planned new development – future development in the drainage area should be managed through area structure plans. These plans would be required before any land is rezoned to allow multi-lot subdivision or major development. Area structure plans must address impacts on lake access, water quality

and costs imposed on adjacent municipalities and how these should be recovered from the developer. Any new subdivisions should have road access directly off main county roads instead of using lakeshore roads.

7. Keep open communication on development proposals – municipalities should agree to refer planning and development matters for each other's review and comment. These referrals must allow three weeks for response. If a subdivision or development imposes bona fide offsite costs to a second municipality, this municipality should be invited to submit its recommendations to the municipality having jurisdiction.

### Leduc County Transportation Master Plan (2001)

The Leduc County Transportation Master Plan (TMP) lays out the functional road hierarchy for the County as a whole. The NPLASP is consistent with the current TMP in maintaining the continuity and connectivity of the transportation corridors. However, the TMP is currently undergoing a comprehensive review. It is not known at this time whether changes to the North Pigeon Lake Area Structure Plan will be required as a result.

### Pigeon Lake Regional Wastewater Strategy and Master Plan (2007)

Regional wastewater master plans have been completed by Associated Engineering (2007) and Sameng (2009) that provide direction to the future regional servicing of the study area. The Sameng report identified four potential options for providing sewer servicing to the north side of Pigeon Lake. Following this, a preliminary design exercise was undertaken. These studies have been considered in the NPLASP. The preferred option as per the Strategy and pre-design has been incorporated into the NPLASP.

### Leduc County Parks and Open Spaces Master Plan (2006)

The Leduc County Parks and Open Spaces Master Plan provides policy directions and guides the future management of the County's parks and open spaces. The NPLASP has taken direction from this policy document in addressing pedestrian trails and linkages of open spaces.

The Master Plan confirms a trend toward leisure recreation and identifies the need for improved park quality and the quality of facilities, more park space, trails and enhancement of the natural environment. Identified below are a few of the key considerations outlined in the Master Plan for Leduc County and the future direction for outdoor recreation and parks within the County:



- The population is aging which influences the choice of recreation activities (i.e. preference for less strenuous activities like walking rather than baseball).
- The children of baby boomers will start having children in about 2005, peaking in 2010-2012. Demand for facilities for young families may re-surge (i.e. family campgrounds).
- Increasing flexibility in work times and school times will create the need for more flexible recreation opportunities. Recreation pursuits that are more spontaneous, individual and less structured may become more popular.
- The Province of Alberta is limiting its involvement in providing outdoor recreation facilities like campgrounds and boat launches.
- The attraction of urbanites to rural areas is bringing a new set of values to regions surrounding urban areas. People moving from the city to country residential subdivisions may demand more and different recreation services. For example, interest in recreation trails, off-leash dog walking areas, and natural parklands may increase.
- Recent spikes in gasoline prices may change holiday patterns. Local holidays close to home may become popular as the cost of traveling to distant attractions becomes higher.

### Parks Objectives

- Provide a variety of outdoor recreation opportunities to meet the needs of County residents on a year-round basis.
- Provide regional outdoor recreation opportunities to support economic development or tourism.
- Ensure public access is available to all major lakes and rivers within the County.
- Direct major outdoor recreation facilities to be located in attractive natural settings in areas of population concentration in the County.
- Protect environmentally sensitive areas and provide a sustainable and biologically diverse open space system that represents the natural environments of Leduc County.
- Work cooperatively with other agencies, organizations and landowners to protect the natural environment.

### Priorities for Pigeon Lake facilities

- Mission Beach day use park – the boat launch has been closed in recent years due to low lake levels. Its future must be addressed. Currently, the boat launch is used as an equipment access site to help private operators locate boat hoists.
- Mission Beach Campground – has been closed since 2001 and is in extremely poor condition. Opportunities may exist in the future to rehabilitate this facility. In 2007 this facility was sold.
- Gilwood Boat Launch – already congested, the traffic conditions at this launch confirm a need for more such facilities in the future. In 2007 a new dock and parking lot was constructed at this location.

## 4.4 Watershed Planning Reports and Tools

### Pigeon Lake State of the Watershed Report (2008)

Prepared by Aquality Environmental Consulting, the State of the Watershed report was an initiative of the Pigeon Lake Watershed Association. The purpose of the report was “to summarize available current and historic information on the Pigeon Lake watershed,” so as to “provide a benchmark against which the effectiveness of future stewardship activities and best management practices aimed at improving watershed health can be assessed.”

Recommendations from the Report for municipalities are as follows:

- “Enforcement of environmental bylaws and increased bylaw presence;
- Creation of environmentally conscious Area Structure Plans and Municipal Development Plans with adequate environmental reserves;
- Harmonizing development bylaws with surrounding municipalities and ensuring the highest standards are used;
- Regular and scheduled review and revision of bylaws as required;
- Support watershed management planning activities, including staffing resources, establishing / maintaining rate-payer buy-in, continued education and awareness programs, newsletters and newspaper articles, and establishing a progressive approach with developers and realtors;

- Consider wider environmental reserves, municipal reserves, and minimum setbacks from water bodies where possible;
- Stormwater management and Low Impact Development initiatives for new developments, retrofitting options for older developments;
- Control/prohibit development in sloped areas due to the potential for stormwater runoff;
- Encouraging the use of Environmental Farm Plans and Homesite Assessments; and
- Begin private sewage inspections.”

In addition, the report made the following comments directed at municipalities in the Pigeon Lake watershed:

“Planning initiatives with the two Counties and all Summer Villages should be undertaken to harmonize legislation to protect watershed health. Outreach and education programs should focus on nutrient management best management practices for the agricultural and recreational cottage communities. Several data gaps should be filled, as listed above. Environmental Farm Planning should be undertaken on a large scale and this will likely involve a significant commitment from County agricultural fieldmen. The watershed management plan for Pigeon Lake should be linked with the larger planning initiatives in the Battle River Basin in order to ensure consistency and harmony among plans.”

### Riparian Setback Matrix Model

Leduc County engaged Aquality Environmental Consulting in spring 2010 to develop a Riparian Setback Matrix Model to determine appropriate environmental setbacks in the NPLASP. The model is a performance-based measure for determining environmental reserves in wet areas, adjacent to creeks and streams and on the shores of ponds and lakes. The model utilizes science in determining the amount of buffer required to reduce nutrient and pollutant levels in runoff water leaving the land and entering a pond, lake or creek. Several factors are considered including slope, vegetation, height of bank and depth to the water table.

On a particular site, an assessment is completed at regular intervals along the edge of the pond, lake, creek or wetland. A series of calculations are then made based on each factor in the model; the environmental reserve is thus determined for that particular assessment point. The setbacks are then linked up from one assessment point to the next to determine an environmental reserve area. The model is intended to ensure that between 70 and 80 per cent of excess nutrients are removed from water draining from a site into a creek, stream, wetland, or lake. Setbacks will vary between six and 30 metres.

### Template of Land Use Bylaw Regulations for the Protection of Natural Environment Features and Water Resources including Wetlands, Riparian Lands and Reserve Lands

This report was prepared for the Bow River Basin Council and submitted in spring, 2008. While it focuses on sample environmental regulations for insertion into municipal land use bylaws, some of the recommended direction to developers may be of use in the North Pigeon Lake Area Structure Plan. Among these directions are the following:

- a) The requirement of municipal environmental impact statements, construction management plans, and stormwater site implementation plans
- b) Regulations governing stripping, grading, placing or removal of fill within natural areas
- c) Uses for lands in riparian areas, wetland areas and floodways
- d) Contents of a stormwater management plan
- e) Use and development of reserve lands
- f) Landscaping requirements
- g) Building setbacks

### Other Federal, Provincial, & Non-Profit group resources

A number of other resources were accessed for policy direction and/or best practices in the course of preparing the North Pigeon Lake Area Structure Plan. These are summarized below:

- Global Forest Watch – Where land and waters meet: Understanding and protecting riparian areas in Canada’s forests

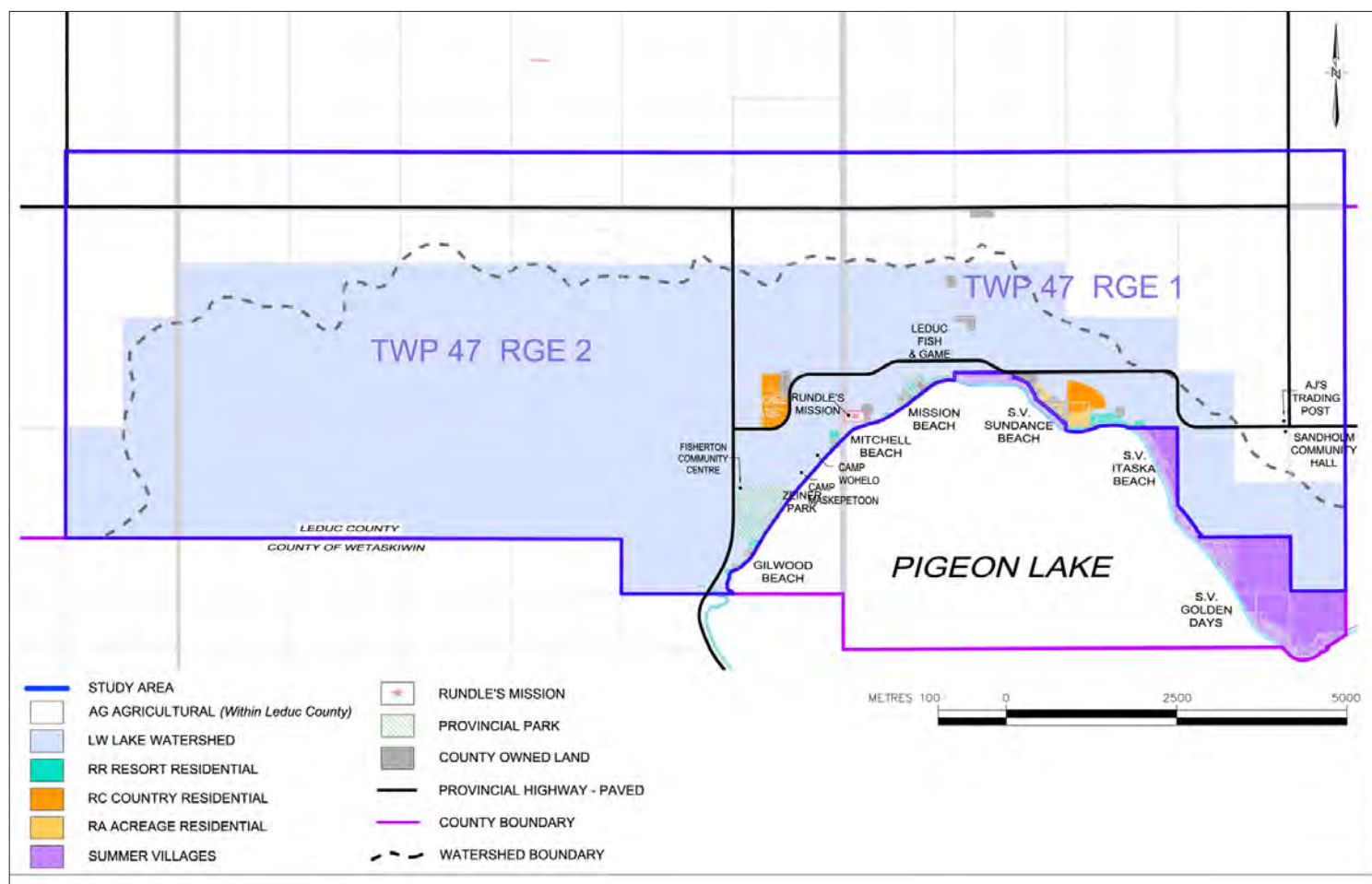
- Alberta Conservation Association – Caring for Shoreline Properties
- Alberta Habitat Management Society (Cows and Fish) – Caring for the Green Zone: Riparian Areas and Grazing Management
- Federation of Alberta Naturalists & Fisheries and Oceans Canada – The Living by Water Project
- North Saskatchewan Watershed Alliance – Municipal Guide: Planning for a Healthy and Sustainable North Saskatchewan River Watershed
- Prairie Farm Rehabilitation Administration – Getting to Know Your Local Watershed
- Ontario Ministry of the Environment – Stormwater Pollution Prevention Handbook
- Land Stewardship Centre of Canada – Green Communities Guide

## 5.0 Existing Conditions Analysis

### 5.1 Existing Districting

Lands within the NPLASP area fall under one of five districts as defined under the Leduc County Land Use Bylaw (LUB) (see Figures 5 and 5A, Existing Land Uses). The predominant district in the study area is LW - Lake Watershed. Within this district land uses include agriculture, detached dwellings, and potential for certain discretionary uses. Within 1.6 km (one mile) of the lakeshore lie areas governed by three other land use districts: RR - Resort Residential, RA - Acreage Residential and RC - Country Residential. The RC - Country Residential developments are known as Iron Horse and Kerr Cape Estates. RR - Resort Residential developments include Gilwood Beach, Mitchell Beach, Mission Beach and Moonlight Bay. The last district which applies in the NPLASP is the AG - Agricultural district. Lands

Figure 5: Existing Land Uses



outside of the watershed are governed by the regulations of this district.

Currently, some 50 per cent of the LW – Lake Watershed area is cleared. The remainder is primarily in perennial forage production. In the AG – Agricultural districted area, roughly 65 per cent of the land cover is cleared. While some cropping is being done, the majority of land in this area is also in forage production.

The highest Farmland Assessment Rating (FAR) found in the plan area is 43 per cent. Leduc County considers land below a FAR of 41 per cent to be low capability land.

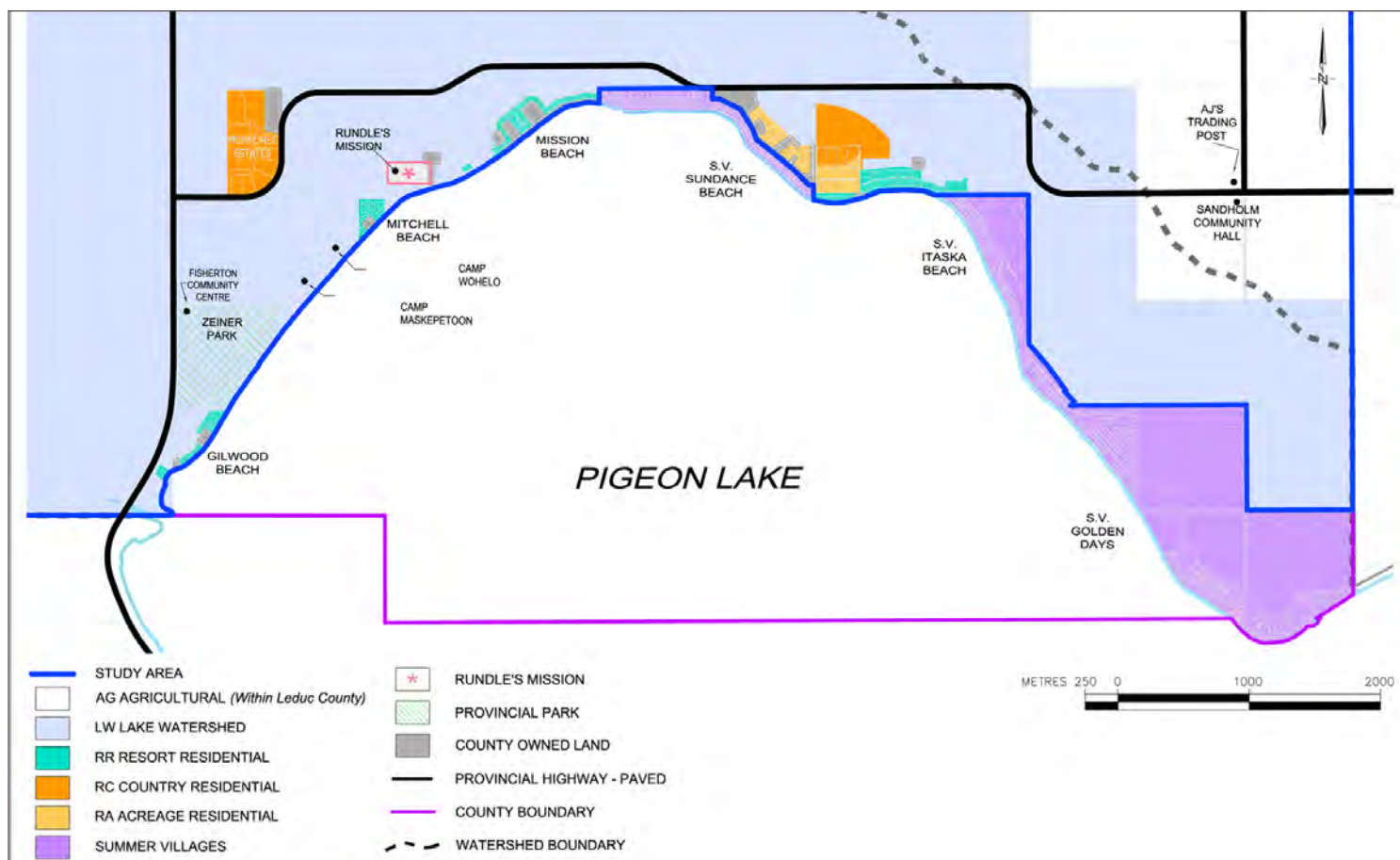
Between the east half of the NPLASP Study Area and the lake are three Summer Villages; Sundance Beach, Itaska Beach and Golden Days.

One provincial park is included in the study area: Zeiner Park. Two church camps are also included: Camp Maskepetoon, owned and operated by the United Church of Canada and Camp Wohelo, sponsored and operated by Canadian Girls in Training. A third parcel is owned by the Catholic Hungarian Society and functions as a hybrid camp and cottage subdivision.

One of the most significant and historical resources in Leduc County is contained in the NPLASP: Rundles Mission Conference Centre, its adjacent cemetery and spring are located on Crown Land as shown in Figure 4. These are noteworthy resources with roots in the fur trade era, as described in Section 3.0.

Fisherton Community Centre served for a time as a venue for card parties and other events. Mission Beach and its adjacent municipal park and shoreline are important public lake access resources. Sandholm Community Hall is an active community centre serving the easterly portion of the plan area. The only commercial entity operating in the plan

Figure 5A: Existing Land Uses





area is AJ's General Store (formerly the Sandholm General Store and gas bar).

## 5.2 Natural Environment

### 5.2.1 Ecological Setting

Pigeon Lake lies in the dry mixed wood sub-region of Alberta, as defined by Alberta Environment (AB Environment 1998). This region is known for trembling aspen, balsam poplar and jack pine as well as significant peat deposits. A variety of native shrub species including wild rose, assorted berry and small fruit bearing bushes and grasses can also be found in the area.

### 5.2.2 Geology and Soils

The subsurface stratigraphy of the plan area is varied. The underlying bedrock belongs to the Lacombe member of the Paskapoo formation and has alternating shale, sandstone and coal deposits.

The lake's terrain is generally a morainal landform overlying till and bedrock. Soils are typically orthic gray luvisols with some organics in this area. Bogs and fens are common throughout the watershed (Hydrogeological Consultants Ltd., 1999).

The soils in the plan area, particularly those in the west and north-west portions of the plan area, are generally classified as Class 3, according to the Canada Land Inventory (CLI) rating system. Class 3 soils have moderately severe limitations for agricultural uses. As such, pastureland is typical for the area. Leduc County's Municipal Development Plan considers wooded and/or unimproved land with a CLI rating of Class 1,2 or 3 as high capability agricultural land.

Leduc County also uses the provincial Farmland Assessment Rating (FAR) as part of its land assessment process. FAR is rated as a percentage figure, with higher percentage FAR equating to more productive soils. Leduc County's Municipal Development Plan considers a FAR rating of 41 per cent or higher to be high capability agricultural land. Most of the NPLASP exhibits a FAR below 40 per cent. No parcel is rated higher than 43 per cent FAR.

### 5.2.3 Surface Water

Pigeon Lake lies within the Battle River watershed, which is part of the North Saskatchewan River basin. The majority of the plan area drains toward Pigeon Lake, although some areas drain north to the North Saskatchewan River. The main outflow for Pigeon Lake is south into Battle River.

Previous studies have determined that Pigeon Lake has a surface area of 96.7 km<sup>2</sup> (37.3 sq. miles) while its watershed is a further 187 km<sup>2</sup> (72.2 sq. miles) (Mitchell and Prepas, 1990). Pigeon Lake thus represents approximately 34 per cent of the total watershed area. The watershed area of the lake is, therefore, considered relatively small, such that activities taking place on any particular

parcel of land in the watershed may have a greater and more direct impact on Pigeon Lake.

The watershed area of Pigeon Lake that is situated within Leduc County and the adjacent three summer villages is 57 km<sup>2</sup> (22 sq. miles). This represents approximately 30.5 per cent of the total watershed land area of Pigeon Lake.

The shoreline length of Pigeon Lake is approximately 46 km (28.75 miles) (Mitchell and Prepas, 1990) and the shoreline within Leduc County and the three Summer Villages is 12.4 km (7.75 miles) and represents somewhat less than 27 per cent of the total shoreline.

Pigeon Lake has a long water detention time and is considered shallow. Therefore, it can produce problematically high levels of algae. This condition is brought about by high nutrient levels and the penetration of sunlight, which allows microscopic botanical life to flourish. This problem exists in many shallow lakes in Alberta.

Tide Creek drains a large portion of the northwest ASP lands to Pigeon Lake. Sunnybrook and Strawberry Creeks drain the northwest region of the ASP to the North Saskatchewan River, and Weed Creek drains the northeast portion of the ASP to the North Saskatchewan River. Marshy areas and naturally occurring ponds are relatively rare within the ASP area due to its elevation and topography, although beaver damming along the creeks and natural drainage channels has created some vegetated wetlands.

Surface water issues on Pigeon Lake include the loss of riparian and wetland habitats, as well as nutrients and fecal coliform deposition into the lake and local groundwater aquifers (Pigeon Lake State of the Watershed Report, 2008).

### 5.2.4 Groundwater

The Pigeon Lake ASP is underlain by two main aquifers: the Upper and the Lower Lacombe members (Grasby et al, 2008).

The southernmost parts of the North Pigeon Lake Area Structure Plan—adjacent to the lakeshore—are at risk to potentially contaminate the groundwater due to the fact that they are located in an area of high water tables—a groundwater recharge zone. These areas can potentially contaminate the groundwater via leaking lagoons, improperly installed or maintained septic tanks or fields, landfills, pipeline breaks, or from the spreading of manure, fertilizer and pesticides. Areas adjacent to wet areas such as peatlands present similar risks.

### 5.2.5 Natural Setting

Other than current developed areas, the NPLASP lands include five general types of vegetation communities, as described in the Environmental Assessment prepared by Bruce Thompson:

- Agricultural pasture and cultivated fields
- Mainly deciduous forest
- Mainly coniferous forest
- Peatland (bog/fen)
- Marsh/pond wetland/riparian area

The distribution of these vegetation communities is largely based on the topography and surface flow patterns of the region. The Thompson report includes mapping which identifies the general locations of each of these vegetative communities.

Vegetation sites along the wetlands and watercourses, as well as along the shoreline of Pigeon Lake, tend to be more ecologically diverse and/or sensitive to disturbances or changes in the water balance.

Non-native invading plants, such as the Himalayan Balsam, have been observed along the Pigeon Lake shoreline and at Zeiner Park campground.

### 5.2.6 Wildlife and Wildlife Habitat

The Pigeon Lake area provides moderately good waterfowl nesting and rearing habitat (Handy Associates Ltd. 1983). Gulls, terns and even great blue herons have been reported nesting in the region. The lake is also used as a staging area during fall migration (Aquality, 2008).

The wooded regions of the ASP present a variety of habitats for many songbird species, as well as some raptor species. For a complete list of bird species that might be expected to frequent or breed in the NPLASP area, please refer to Table 3.3 of the NPLASP Environmental Assessment produced by Bruce Thompson & Associates Ltd, 2009.

White-tailed deer are common in the area. Signs of mule deer, moose, elk, cougar and black bear have also been documented within the region. Many smaller species including foxes, raccoons, beavers, squirrels, porcupines and others can be expected to inhabit the area as well.

Linkages between the various habitat patches are important for wildlife to have corridors to move through. An increase in human traffic through these corridors creates more resistance for these species to disperse through, and among, the habitat patches.



*Photo taken by Sitra Luten  
Leduc County Amateur Photo Contest 2010*

## 5.2.7 Fish and Aquatic Systems

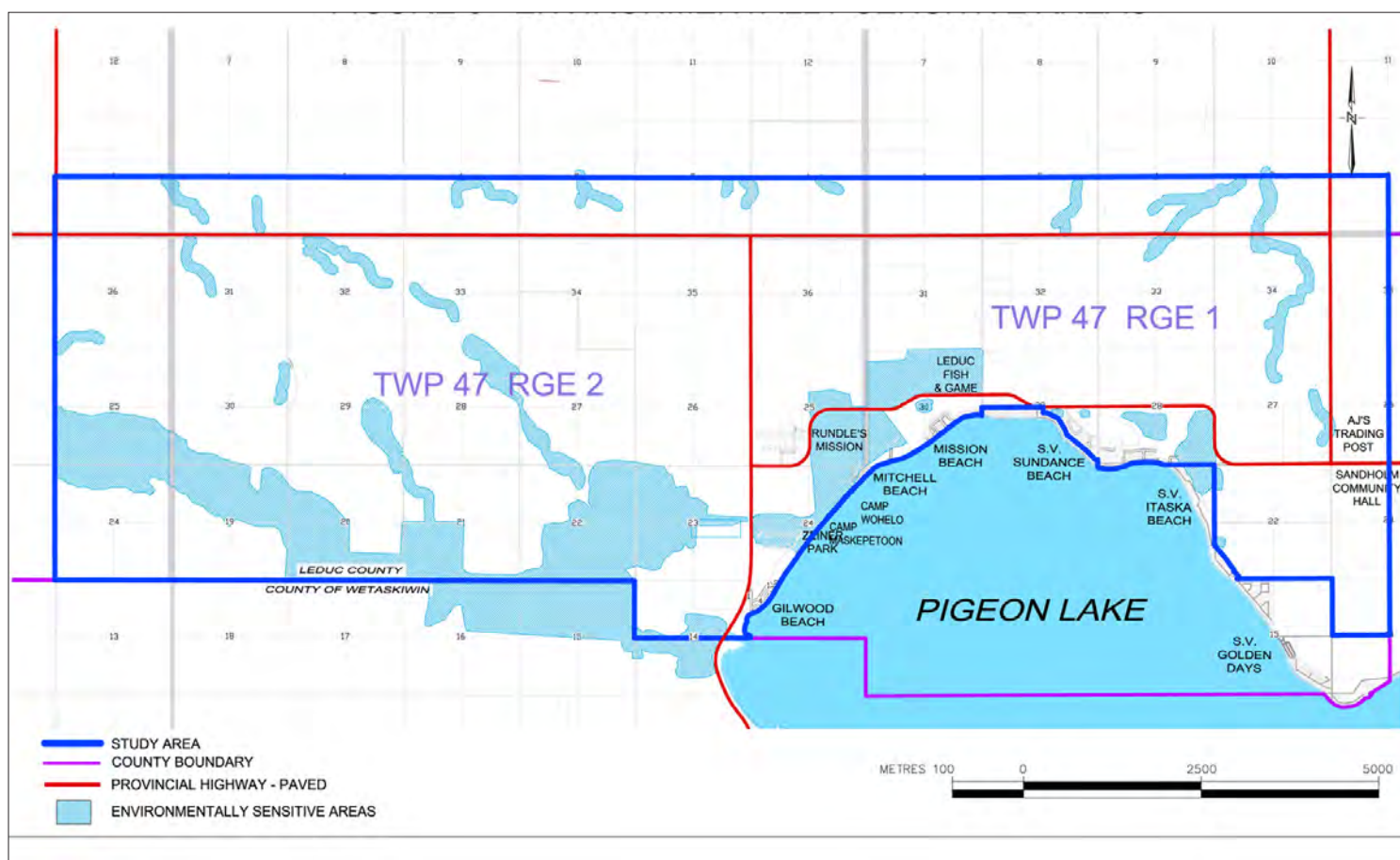
Fish species and populations have fluctuated dramatically over the years (Mitchell & Prepas, 1990). This is largely due to shoreline developments, over-fishing, vegetation removal and shoreline modification, which affect fish bedding habitats. The introduction of nutrients from leaking septic tanks, as well as fertilizers and manure transferred via sediment, erosion and poor land management practices result in prolific growth of weeds and algae (Pigeon Lake State of the Watershed Report, 2008). Walleye, northern pike and suckers have good spawning habitats within regions of Tide Creek—the only creek in the ASP to contain any significant fish population.

## 5.2.8 Environmental Reserves, Parks and Trails

Provincial, regional and municipal policy directs that environmentally sensitive areas be set aside for preservation. The sensitive areas have been identified in Figure 6 Environmentally Sensitive Areas. A more detailed delineation of these areas will be undertaken in certain areas at the Local Area Structure Plan (LASP) preparation stage. In other areas, delineation of sensitive lands will occur at the subdivision and development stage. A detailed description of these areas is as follows:

- The riparian areas along Tide Creek and associated wetlands and peatlands
- The riparian areas and associated peatlands of tributaries of Tide Creek that drain into the creek from the north
- Deciduous forest and wetland at Leduc Fish and Game Association lot NE 30-047-01-W5M
- Deciduous forest, spruce bog and wetland and Hutchinson/Conservation Easement Lot is highlighted as well, because of the opportunity of affording ecological connectivity, and the creation of a larger, continuous block of forested area
- Peatlands in Section 23-47-02-W5M north of Tide Creek which extend from the Lakeshore, west across Hwy 771, and further west across Range Road 22

Figure 6: Environmentally Sensitive Areas





- Fen/bog habitat in SE 28-47-01-W5M and the land immediately to the south (north of Itaska Beach), part of which is owned by the Itaska Audubon Society
- The deciduous forest and coniferous forest within the Strawberry Creek Natural Area in the south half of the Section 29-47-02-W5M

The existing inventory of parks and community spaces in the NPLASP study area is as follows:

- Zeiner Park, a popular camp ground in the western part of the Lakeshore, is owned and operated as part of Pigeon Lake Provincial Park. The Provincial Park was established in 1967 and is a recreation destination for boating, water skiing, swimming and many other recreational activities.
- The south half of NE 14-47-2-W5, which includes the mouth of Tide Creek, is provincially owned and intended to be left as a natural area.
- The George and Joan Mitchell Memorial Property (an AGFA property) is located immediately to the east of Range Road 22, in NW 14 47-2-W5. Tide Creek runs through the south parts of both these properties.
- Mission Beach is a small municipal park located north of the Mission Beach shoreline. The site provides a swimming area, picnicking area, a children's playground and a County operated equipment access point to the lake.
- A small municipal reserve area at Gilwood Beach incorporates a boat launch and small parking lot.
- Strawberry Creek Natural Area is a half section of provincially owned land, comprising the south half of Section 29-47-2-W5.
- The Hutchinson lot north of Lakeshore Road and south of Twp Road 474 has been set aside as a Conservation Easement under the Nature Conservancy of Canada (NCC). The NCC is a conservation agency interested in the protection of lands of high conservation value. The intent of this easement is to protect the creek watersheds in the northwest corner of the lake, as they influence the water quality and fishery of Pigeon Lake.
- The Leduc Fish and Game Association has purchased a 49 hectare (122 acre) plot of land in NE 30-47-1-W5, immediately north of Twp Road 474A (Secondary Highway 616X), for conservation purposes.
- A 62 acre conservation easement north and east of Kerr Cape Estates at Pt. SW 30-47-1-W5.

A historical trail called the Kiskayo Trail is located within the NPLASP area. This trail is part of the Trans-Canada Trail and commemorates the contribution of aboriginal peoples to the development of the area around Pigeon Lake. The trail can be accessed at Rundle's Mission and is popular with pedestrians and cyclists.

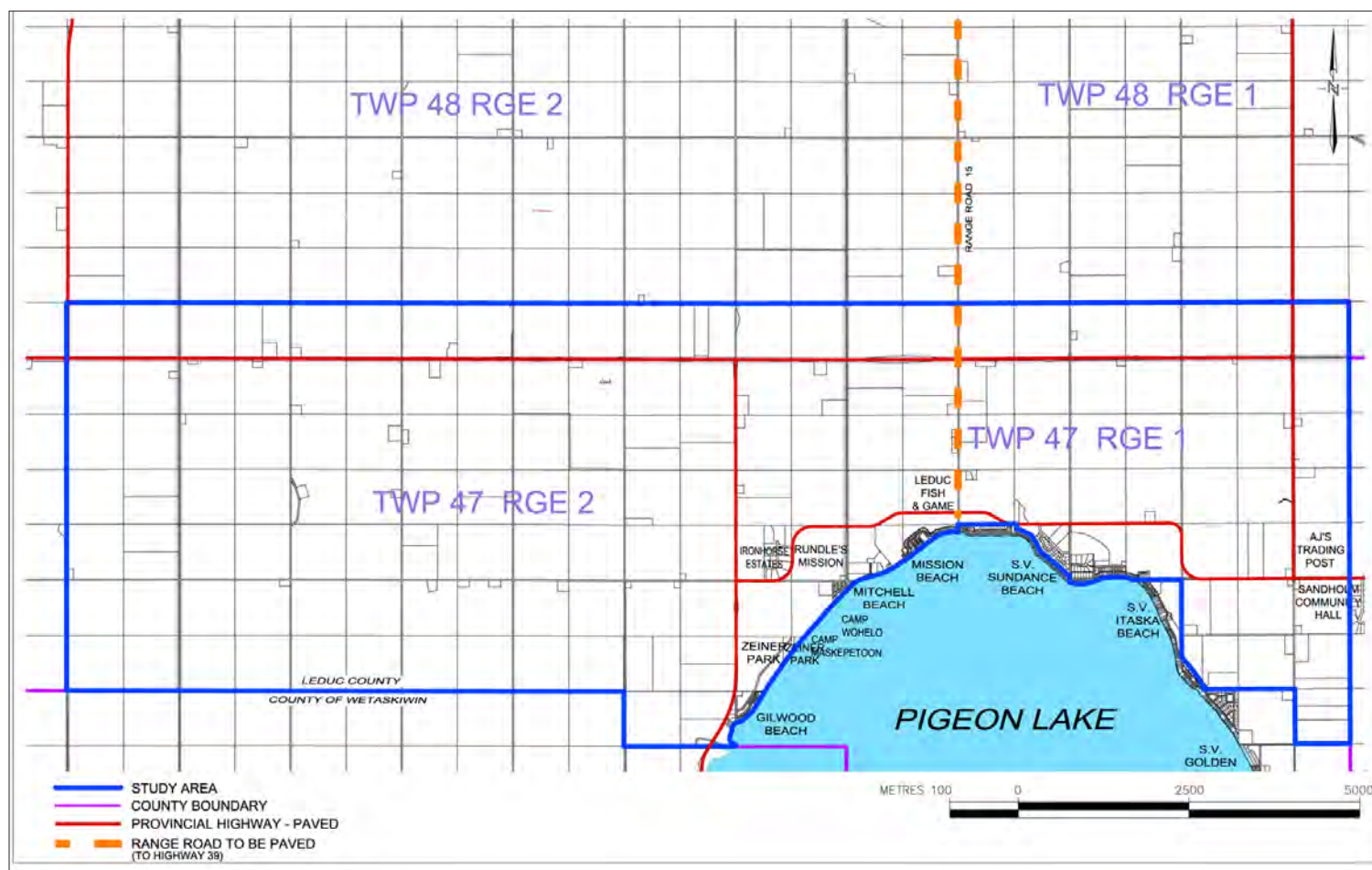
### 5.3 Transportation

The Plan Area is well serviced with provincial highways 616, 616X, 771 and 778 providing excellent accessibility and connections to the nearby Villages of Breton, Warburg and Thorsby and, via Highways 39, 613 or 616 to the major provincial trade corridor, the Queen Elizabeth II Highway (Highway 2). (Figure 7 Existing Major Transportation Routes) Supplemental to the Highways, a County all weather (gravel) road grid system provides additional connectivity in the Plan Area. The current transportation corridors in the NPLASP area include:

- North-south traffic is accommodated by Highway 778 linking north to the Village of Thorsby and south to the Summer Villages of Golden Days and Itaska Beach.

- Highway 771 links south to Pigeon Lake Provincial Park and Highway 613 on the south side of the Lake, and north to the Genesee area.
- Range Road 15 is also an important north–south linkage road, providing access to the lake and the summer village of Sundance Beach.
- Highway 616 and 616X provides excellent access west to Highway 22 and the Village of Breton and east to the Hamlet of Mulhurst Bay around the north side of Pigeon Lake.
- Several Range Roads provide linkages between Highway 616 and the southern part of the plan area.

Figure 7: Existing Major Transportation Routes



## 5.4 Geotechnical and Hydrogeological

The geology of the area is described as generally thin glacial clay on fill deposits overlaying bedrock of the Paskapoo Formation. Alluvial deposits are associated with drainage channels generally in the lower elevations and in particular, the discharge area of Tide Creek (Grasby et al., 2008).

The main groundwater aquifers are the thicker and/or fractured sandstone units in the Lacombe Member of the Paskapoo Formation. Hydrogeological findings indicate that generally the uplands are groundwater recharge areas and local groundwater recharge areas are associated with the natural drainage channels. Shallow water tables are generally prevalent in wetlands and lower elevations of intermittent streams, as well as Tide Creek.

Geotechnical review of the watershed area indicates that the till and bedrock units are expected to have moderate to high bearing capacity, imparting few if any constraints to development.

There are no historical slope stability indicators but setbacks are required alongside deeper and steeper drainage channel features. Detailed assessment as to setbacks shall be carried out at the Local Area Structure Plan and/or the subdivision stage.

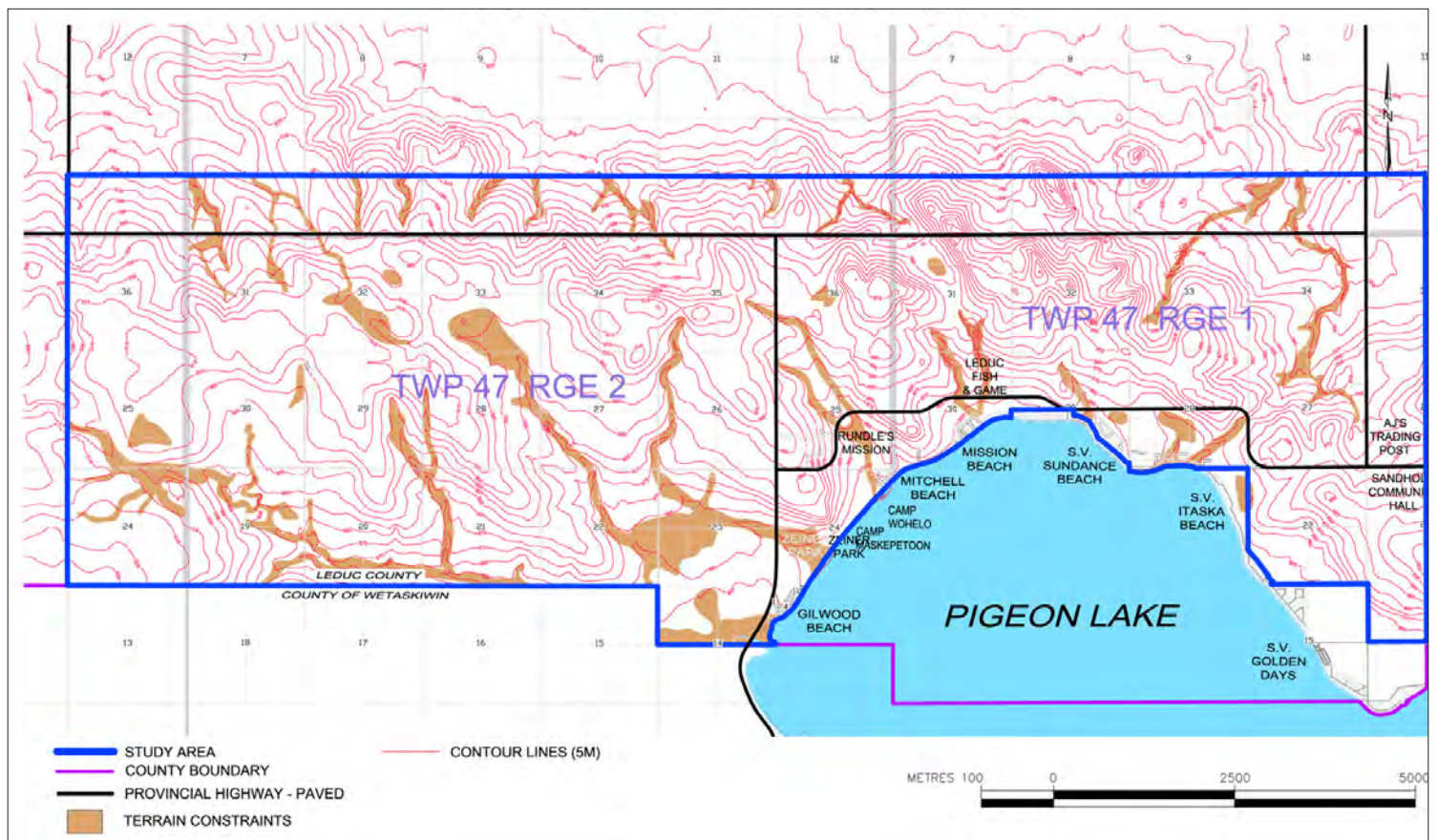
Areas associated with potential terrain constraints have been mapped and represent areas of steeper slopes, seasonal groundwater discharge and/or near surface water table conditions together with soft/compressible soils (Figure 8, Terrain Constraints). The nature of the soil and the discontinuous nature of the glacial deposits impose limitations on effective septic field performance and these should be discouraged throughout the NPLASP area. Alternate methods of managing wastewater should be considered.

## 5.5 Agriculture

The assessment of land use and agricultural practices, carried out as a component of the NPLASP (Agricultural Assessment by Douglas Penney, P.Ag), showed the dominant agricultural land use was perennial forage crops for hay and pasture with low fertilizer inputs. Therefore, the potential contribution of agriculture to nutrient enrichment of the lake is considered to be low as compared to areas of more intensive agriculture. One site specific situation demonstrates the need for smaller livestock farming operations in close proximity to the Lake to be more sensitive towards their potential impact on the lake. Effluent from heavily used winter pastures and pens easily moves directly to the lake during the spring thaw. This needs to be addressed as it is not adequately covered under the Agriculture Operation Practices Act (AOPA).

The preliminary examination of the Pigeon Lake watershed outside the study area identified areas of higher land capability (soil type and topography) than in the study area. This generally corresponds to more intensive agriculture and to the potential for higher nutrient concentrations in run-off. An assessment of land use and management practices is thus recommended for the entire watershed (all around the lake) to more fully evaluate the impact of agriculture on the

Figure 8: Terrain Constraints



water quality of the lake. Considering that the watershed in the NPLASP comprises 30.5 per cent of the total watershed area of the lake, the following conclusions were arrived at:

1. The contribution of agriculture in the Leduc County portion of the watershed to nutrient inflow to Pigeon Lake is relatively low.
2. Changes in agricultural land use in this part of the watershed do not account for recent increases in the nutrient levels of the lake.

## 6.0 Constraints

The various constraints which must be taken into account during the planning process at any scale, whether it is a regional development plan or a Local Area Structure Plan, are discussed below:

### Environmentally Sensitive Areas

As discussed in the Environmental Assessment Study for the NPLASP, there are areas which need stewardship and preservation. Any development in these areas shall provide an appropriate analysis of potential impacts, as well as a strategy for mitigating those impacts. In general, development within environmentally sensitive areas is strongly discouraged and prohibited in riparian areas. (see Fig. 6, Environmentally Sensitive Areas).

### Major Transportation Routes

Major transportation corridors are usually viewed as a constraint to the pattern of development. In other words, development patterns are affected by the physical location of the existing major roads and their design revolves around these corridors. In the case of the NPLASP area, the major transportation routes (Fig 7, Major Transportation Routes) do not appear to be much of a constraint to the development patterns, as they are generally not high speed or high volume roadways.

### Terrain Constraints

Any ground more than 15 per cent (8.30) in slope is erosion prone and special consideration must be given in the physical design of roads, surfaces and landscaping. This poses a constraint to development. In the same way, there may be areas of problem soils, easily erodible soils, drainage channels or steep slopes that are recognized as constraints. These areas are to be avoided. Figure 8 Terrain Constraints shows all the areas in the NPLASP potentially affected by this constraint, as revealed through desktop analysis.

### Existing pipelines, gas wells, and rights-of-way

As can be seen from Figure 9, Pipeline Right-of-ways and Well sites, a significantly large area of the NPLASP is impacted by the petroleum industry, particularly in the northwest portion of the study area. Any development will have to be cognizant of the presence of this constraint. There are setbacks required from well sites and pipelines, which vary according to pipeline size, pressure and what materials are being transported through the pipeline. As well, crossing the pipelines with municipal infrastructure such as water mains and sewer mains is subject to specific crossing requirements and approvals due to public liability and safety considerations.

### Combined Constraints

Figure 10, Combined Constraints has been provided to show all areas affected by environmental and terrain constraints.

### Existing and Closed Landfills

A number of landfill sites have been identified in the NPLASP, which will affect development of surrounding lands. Alberta Regulation 44/2002 Subdivision and Development Regulation governs development setbacks from landfills. In total, five landfill sites were identified, of which one remains in operation as the County's waste transfer station on Highway 616.

Figure 9: Pipeline Right-of-Ways and Wellsites

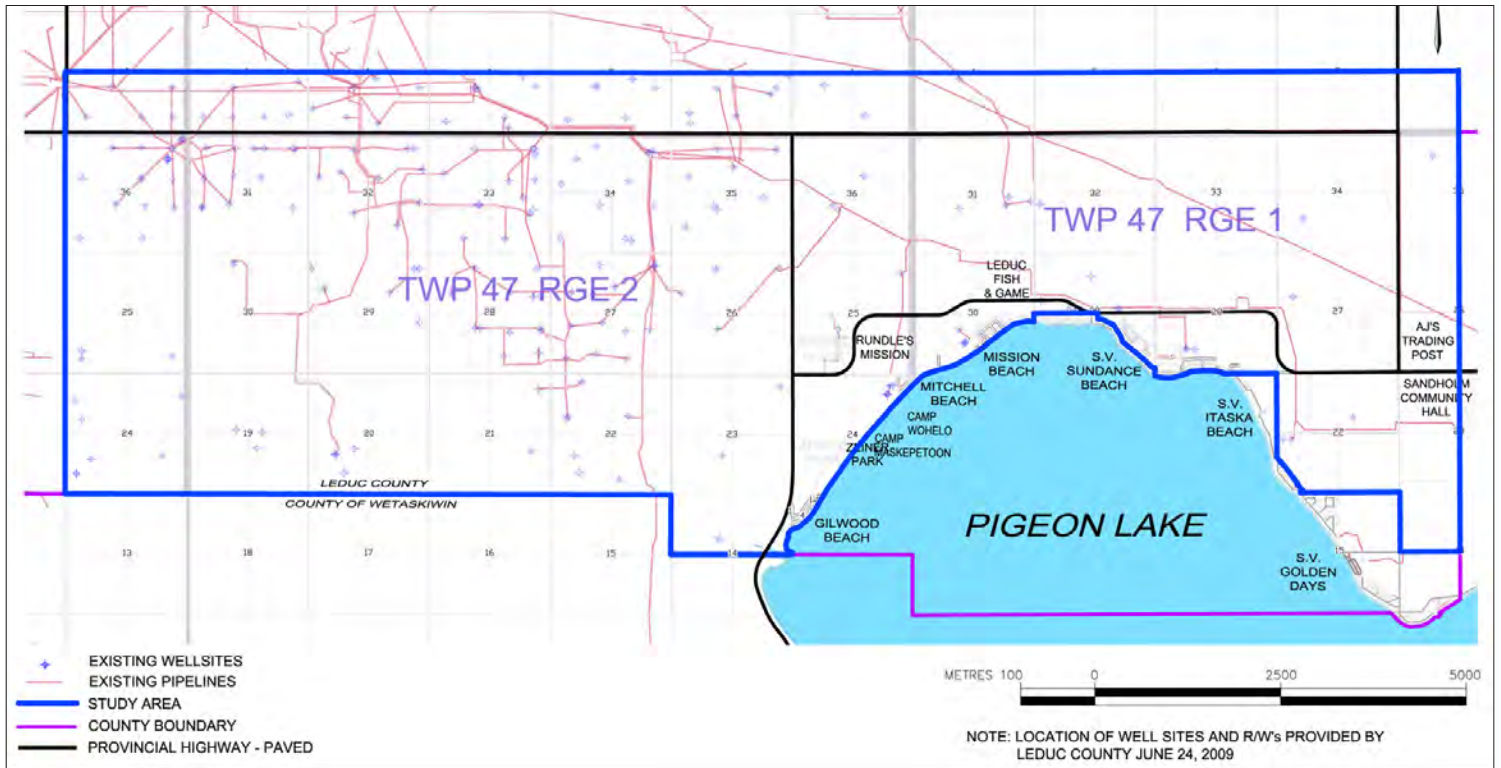
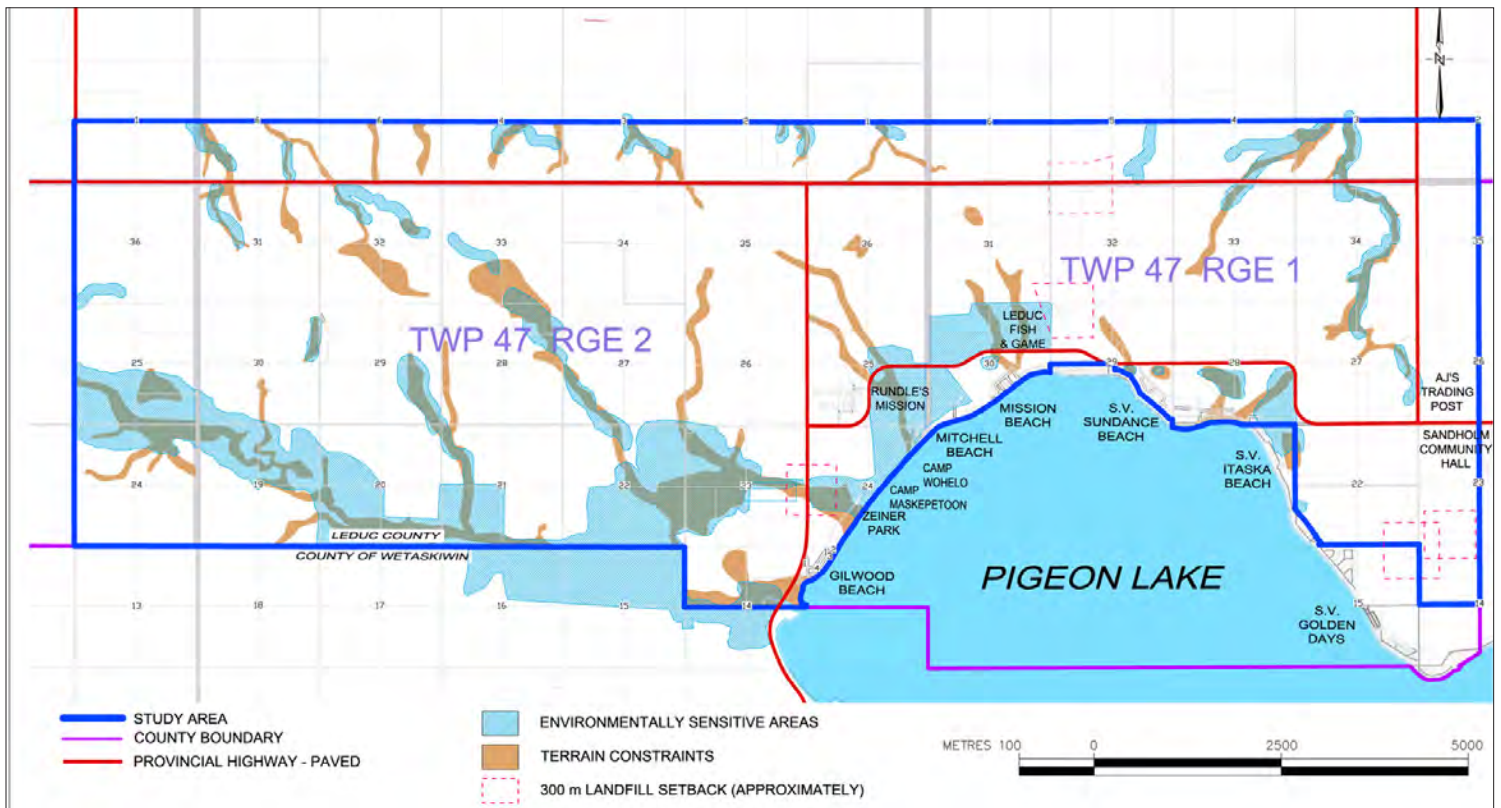


Figure 10: Combined Constraints



# Part B: The Plan

## 7.0 Vision

Pigeon Lake is a strong community whose priorities are to celebrate the natural heritage of the area, maintain the health of the lake, honour the land and those who work it and create a sustainable future for all. At the heart of the North Pigeon Lake Area Structure Plan vision are the following goals:

- The health of Pigeon Lake is too important to be left to chance. Proper management of the land around the lake can improve the quality of water leaving the land and entering the lake.
- The essence of environmental land management is to recognize those areas critical to the local ecology, restore the land to its natural state when opportunities present themselves, refocus human activity to areas that will have less impact on the lake and reduce the cumulative impact of new development through conservation design and clustered lots.
- Farming continues to be the dominant land use in the Pigeon Lake watershed. This important part of the Pigeon Lake community not only makes a special contribution to the beauty of the lake area, but also has special needs which must be respected.
- Pigeon Lake is a destination for cottagers, campers and tourists. If the community is to benefit from development related to tourism and recreation, it is critical that such development be strategically located, adequately serviced and sensitively designed such that it positively contributes to the social, economic and environmental fabric of the lake area.
- We are all in this together. The fate of the lake is in the hands of provincial agencies, municipalities, community groups, residents, farmers, developers and visitors. Each of us can make a difference.



## 8.0 Planning Principles

The following principles guide the approving authority as it reviews potential ecological impacts of development proposals. Any proposed development should:

### Recognize

1. Improve the health of Pigeon Lake by identifying how and where water enters the lake and ensuring those areas are protected.
2. Protect riparian areas of natural drainage channels through a site specific, performance based setback configured to remove pollutants leaving adjacent lands.
3. Maintain, protect and enhance the biodiversity of the watershed while integrating human activities.
4. Recognize the importance of Tide Creek as the most consistent contributor of flowing water to the lake.
5. Farming is a valued part of the Pigeon Lake cultural heritage and is important to everyone's survival.
6. Recognize that past ways of developing and maintaining recreational properties have negatively impacted Pigeon Lake.
7. Recognize that some agricultural practices may negatively impact Pigeon Lake.



### Restore

8. Restoration of natural areas can be compatible with development.
9. Explore opportunities to reforest previously cleared reserve and open space lands on new developments through the reintroduction of indigenous species of trees, shrubs and grasses.
10. Enhance the percolation of storm water into ground water by managing surface runoff as close to its source as possible and directing excess to natural recharge areas.
11. Ensure the integrity of existing tree stands.
12. Not allow surface water run-off to access Pigeon Lake directly without first passing through a holding pond or other wetland (filtering) area (natural or constructed).

### Refocus

13. Concentrate new human residential activity away from the lakeshore.
14. Give higher priority to protection of lands which govern the quality of water entering the lake than to development.
15. Design new subdivisions using ecologically sensitive design practices and low impact development principles.

### Reduce

16. Minimize disturbances to natural or sensitive areas.
17. Reduce the human footprint in terms of space taken by individual building sites, thus maximizing the amount of open space available for habitat preservation and watershed restoration.
18. Limit and, in places, prohibit development to ensure water entering Pigeon Lake has an opportunity to filter slowly through wetlands and Tide Creek.

## 9.0 The Concept

The concept for the North Pigeon Lake Area Structure Plan is based on the twin realizations that a large part of repairing past damage done to the lake can be accomplished by bringing municipal services to the lake area, and that the feasibility of doing so is intimately tied to development.

The demand for dwelling units in the NPLASP is almost entirely for second 'recreational' homes. Thus, the addition of housing stock in the vicinity of Pigeon Lake is not considered to be 'growth' as defined by the Capital Region Growth Plan.

The concept for the evolution of the NPLASP, however, is based on providing additional dwelling units in a manner which is consistent with and guided by the principles for development as defined by the Land Use Framework and the Capital Region Growth Plan.

Several geographical areas are identified in the NPLASP which have similar physical characteristics within themselves but are of distinctly different character from each other. Some of these areas are capable of supporting more development, with certain conditions specifically designed to accommodate the variability of the area, and some are capable of supporting only limited development. In addition, an area which is largely undevelopable due to environmental sensitivity has also been identified.

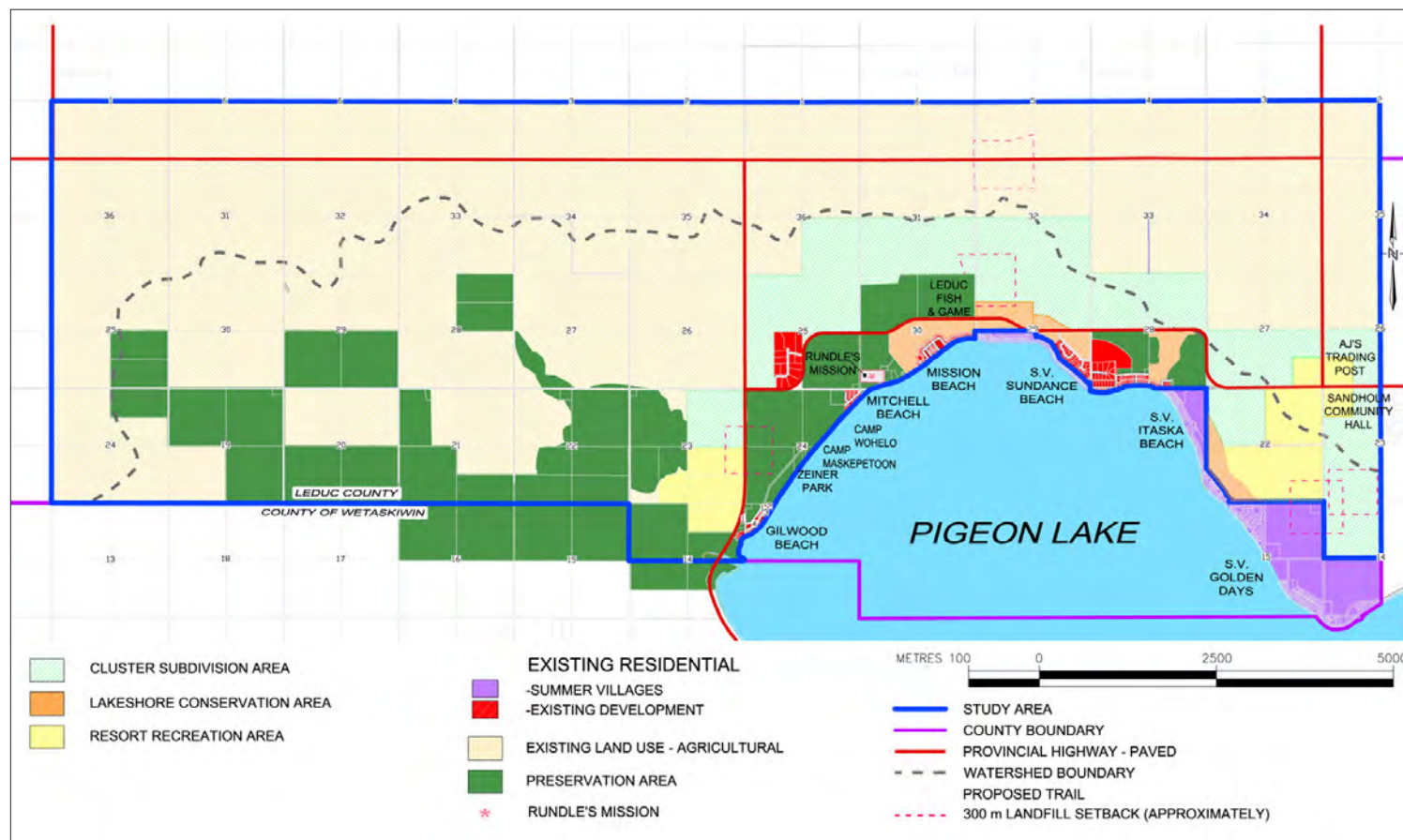
These areas of similarity have been amalgamated into Feature Areas through consideration of natural elements, site and area influences, topography, development capability, and the type and phasing of development. The Feature Areas are (see Figure 11 Concept):

- Cluster Subdivision Area: where country residential development is clustered and large residual parcels are left in a natural state
- Lakeshore Conservation Area: where most existing development is located, but where new residential development is limited
- Resort Recreation Area: where most new development will be located, and which will include a variety of different types of activities
- Preservation Area: where development is largely restricted
- Agricultural Area: where a rural agricultural way of life is prioritized

Within most of these feature areas lie natural drainage channels or wetlands. The precise location and extent of these sensitive areas will be determined in further detail through later stages of planning as well as through the subdivision process. At that time, environmentally sensitive areas as well as a buffer area will be protected as Environmental Reserves (ER) or Environmental Reserve Easement (ERE). If no ER is required under the Municipal Government Act, then such lands shall be dedicated by other legal instruments such as Environmental Reserve Easements, Conservation Easements, restrictive covenant on title, or via a caveat on title. One very large natural wetland system centers around Tide Creek. Its bed, shore and adjacent upland are designated as part of the Preservation Area.

The following sections present each feature area and their associated policies.

Figure 11: Concept



See end of document for larger version of this figure.

## 9.1 Cluster Subdivision Area

Lands located on the upper slopes of the watershed are relatively uniform in geographic character. The cluster subdivision area contains two types of lands capable of supporting development. Some have a predominance of woodlands and have not been cleared. Others contain lands with similar geomorphology but have been cleared of trees and shrubs. Technical studies done as part of the plan (see NPLASP Environmental Assessment by Bruce Thompson & Associates and Agricultural Assessment and Impact Analysis by Douglas C. Penney) have identified forested areas as being important filters to keep nutrients and particulates from entering the lake (see Figure 12 Cluster Subdivision Area). As well, trees and shrubs reduce the amount of dust generated in the watershed. In the cluster subdivision area, any trees removed during development shall be replaced elsewhere in the development. However, as a rule, the removal of trees should be kept to an absolute minimum.

Contrasting the forested area, some of these lands have been cleared by previous or current land owners, generally for agricultural purposes. On these lands, when development occurs, proponents will be required to re-forest many of the slopes. The result of such re-forestation techniques is an expected improvement in the quality of water leaving these lands, increased percolation into ground water and a reduction in soil erosion, dust and other airborne particles.

The hillside or bank slopes within the watershed range from 1.5 per cent to 3.5 per cent and depend largely on the distance from the lake to the watershed divide (see Surface Water Management by Harry S. Zuzak). There are steeper localized gradients but these are generally associated with banks of some of the natural drainage channels as well as the odd hillock and promontory feature. Slopes like these are well within developable standards.

Development in this feature area will be clustered, in that lots will be small and a maximum of 50 lots will be permitted on any quarter section. The remainder of lands will be preserved as environmental reserve or covered by a conservation or environmental reserve easement. In the case of partially cleared parcels, easement lands will include the treed areas of the parcel. In the case of fully cleared parcels, easements will require a naturalization plan or a land management plan if they are to remain in agricultural use.

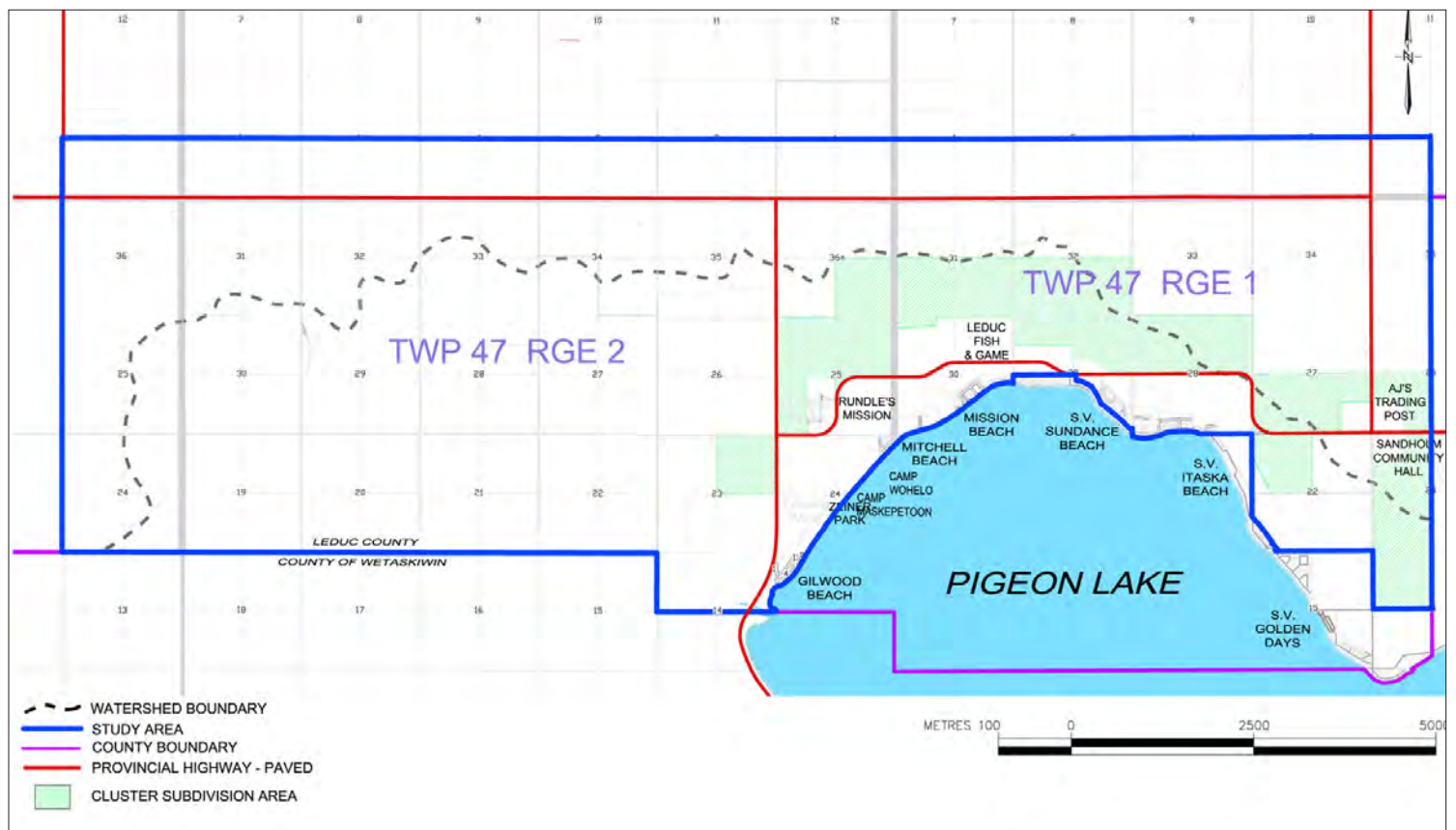
Policies for cluster subdivision area:

- a) Development of a clustered subdivision shall be preceded by, and subject to, an approved Outline Plan. Outline plans shall detail, among other requirements, interim and final servicing, an open space strategy, architectural and design guidelines, recreational opportunities assessment and the configuration of all proposed lots, public utility lots, municipal and environmental reserves.
- b) All multi-lot developments shall be constructed with piped water and sewer.
- c) All multi-lot developments shall be clustered in the cluster subdivision area.
- d) Overall density per quarter section in clustered subdivisions shall not exceed 0.77 dwelling units per gross developable hectare (0.31 units per acre).
- e) Lots in clustered subdivisions shall be sized between 0.4 hectares (1.0 acre) and 0.8 hectares (2.0 acres).
- f) Notwithstanding the above, agricultural smallholdings are permitted in the cluster subdivision area. Smallholdings lots shall be consistent with policies regarding same in the Leduc County Municipal Development Plan and shall be a minimum 16.2 hectares (40 acres) in size.
- g) A maximum of 35 clustered lots/units per quarter section may be created if serviced communally.
- h) Developments may expand to a maximum of 50 clustered lots/units per quarter section if all clustered lots are connected to municipal water and sewer systems.
- i) The maximum number of lots permitted on a parcel smaller than one quarter section shall be determined through a ratio such that a parcel 50 per cent the size of a quarter section shall be allowed 50 per cent of the maximum number of lots for the quarter section.
- j) The maximum number of unclustered lots on any quarter section in the cluster subdivision area shall be four.
- k) Developments on parcels adjacent to existing developments in the Clustered Subdivision Area shall be oriented such that they integrate with the existing cluster.
- l) Residual lands in excess of that required for municipal reserve and/or environmental reserve:
  1. May be acquired through dedication, purchase acquisition, caveat registration or donation if the land is in the ownership of a municipality.
  2. May be protected through a conservation easement, a condominium title, restrictive covenant, etc.
  3. May serve passive recreation uses (i.e. pedestrian trails, benches, viewing areas, but not landscaped parks).
  4. May on previously cleared lands serve active recreation uses (i.e. playing fields, landscaped parks, golf courses) provided that no adverse environmental impacts result.
  5. May protect natural features, such as trees and wetlands, permanent or seasonal water bodies and drainage courses and other environmentally sensitive features.
  6. May maintain some form of agricultural production.
  7. May be used to preserve and enhance lake access and views.
- m) The residual land on a clustered parcel shall be subject to one of the following legal instruments in order to prevent further subdivision of the residual parcel:
  1. Ownership by a condominium or residents association of the owners of dwelling units within the development with restrictive covenants on the open space.

2. Ownership by a condominium or residents association of the owners of dwelling units within the development with a conservation easement granted to Leduc County or a recognized conservation organization.
  3. The transfer of the open space, with permanent restrictions, to a land trust or other recognized conservation organization acceptable to Leduc County.
  4. The registering on title of an environmental reserve easement or conservation easement pertaining to the open space portion of the title area is to be governed by an agreement with Leduc County.
- n) In the case of a bareland condominium, at least 50 per cent of the plan area shall be dedicated as natural areas. The natural areas shall include any treed portions of the plan area.
  - o) On parcels more than 40 per cent cleared, all existing tree stands shall be retained unless determined by an environmental professional to be diseased and beyond rehabilitation.
  - p) No lots in a clustered subdivision shall be accessed directly from a range or township road.
  - q) Trees removed as part of a multi-lot development in the clustered subdivision area shall be replaced elsewhere in the development.
  - r) Road right-of-ways should be narrow and shall avoid tree removal in all possible cases.
  - s) The number and length of internal roads shall be minimized in the cluster subdivision area.
  - t) Permitted land uses on residual lands in the clustered subdivision area include:
    1. Permitted uses listed under the Agricultural District of the Leduc County Land Use Bylaw.
    2. Only discretionary uses listed under the Agricultural District that existed and were approved prior to the date of adoption of this ASP. Additions to this include a greenhouse and plant nursery and a riding and boarding stable.
    3. Passive recreational uses such as pedestrian pathways/trails and benches/rest nodes/viewing areas.
  - u) Notwithstanding the above, recreational land uses may be permitted as a discretionary use on the basis of the contribution they make to the Pigeon Lake community. An environmental review shall accompany any proposed recreational land use on a residual parcel in a clustered subdivision.

## 9.2 Lakeshore Conservation Area

Figure 12: Cluster Subdivision Area



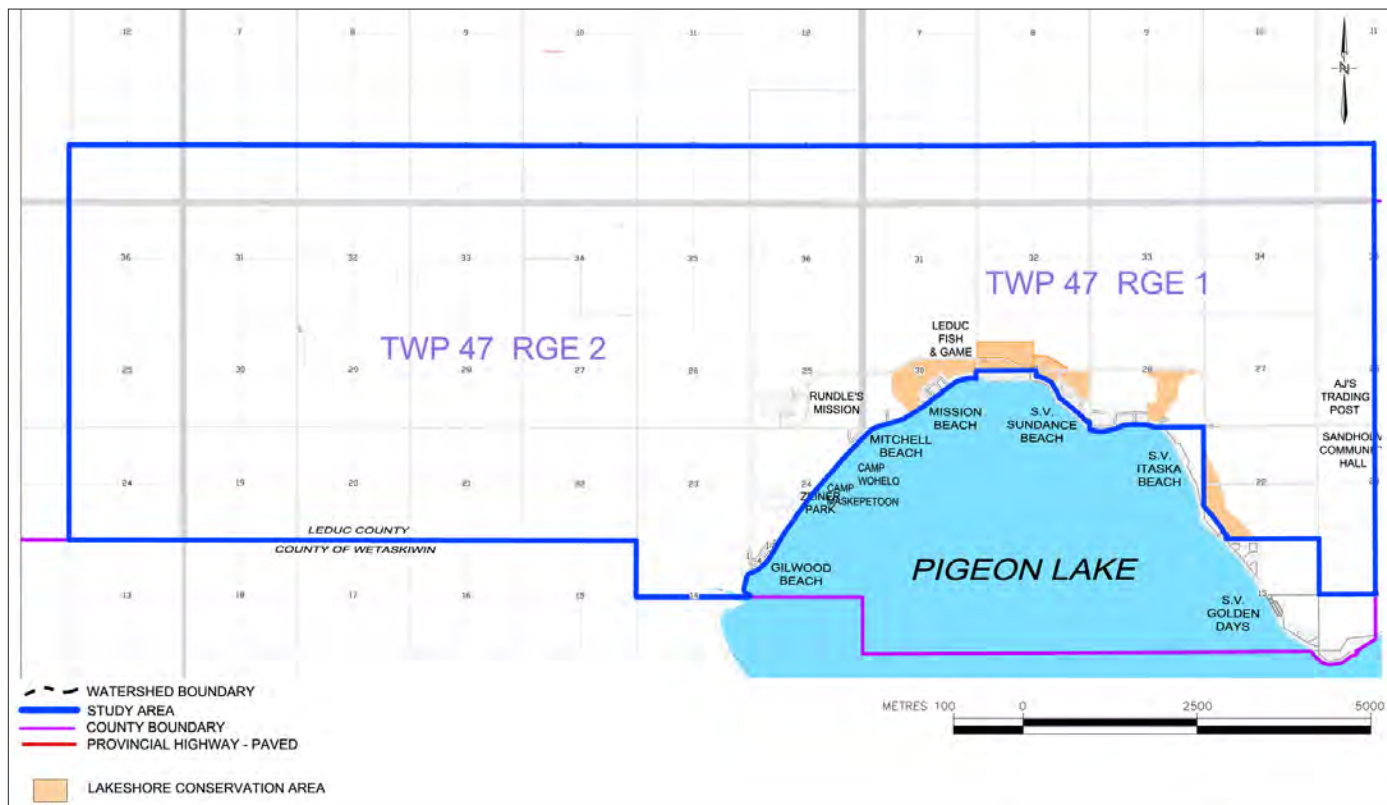
The lakeshore conservation area encompasses lands within 400m of Pigeon Lake which are not within a Summer Village or the Preservation Area, as well as adjacent functionally related land (see Figure 13 Lakeshore Conservation Area). These lands contain nearly all of the existing recreational development in the plan area. While they may exhibit some potential for development, they are primarily identified as containing some of the best locations in the plan area for storm water storage and settling.

#### Policies Governing Lakeshore Conservation Area:

- New residential lots shall be a minimum of two hectares (five acres) in size within 400m of the lakeshore.
- Multi-lot developments more than 400m of the lakeshore shall be clustered and shall have lots between 0.4 hectares (1.0 acre) and 0.8 hectares (2.0 acres) in size.
- All clustered multi-lot developments shall be configured to be able to connect to future regional water and sewer systems.
- Any multi-lot developments shall have a maximum of 35 communally serviced lots/units or 50 municipally serviced lots/units per quarter section.
- Buffering of existing development shall occur through the use of a minimum nine metre wide natural area which will include a pedestrian/cyclist trail designed to Leduc County standards.
- Storm water management facilities designed with Low Impact Development principles shall be encouraged in this feature area.
- On forested lots within 400m of the lakeshore and subject to the requirements of the FireSmart Manual, no more than 0.4 hectares (one acre) shall be cleared for all development.
- Subdivision of parcels which are more than 50 per cent cleared, or developments of more than 65 m<sup>2</sup> (700 sq. ft.) on such parcels, shall include as part of the application a landscaping plan which identifies areas of the site that will be returned to a natural state, the methods by which the naturalizing will take place and the timing and/or phasing of such naturalization.
- In the case of a bareland condominium, at least 50 per cent of the plan area shall be dedicated as natural areas. The natural areas shall include any treed portions of the plan area.

## 9.3 Resort Recreation Area

Figure 13: Lakeshore Conservation Area



The vision for the NPLASP is one that integrates innovative development with the natural environment. The form of development in the watershed is intended to facilitate a leisure lifestyle with emphasis on recreational pursuits and surrounding amenities to support such use. Lands identified as having high potential for the construction of active and/or programmed recreation amenities as well as recreational residential uses, which are located with access to upgraded transportation linkages, and which exhibit large areas of cleared land, are designated for more intensive development. These are as follows;

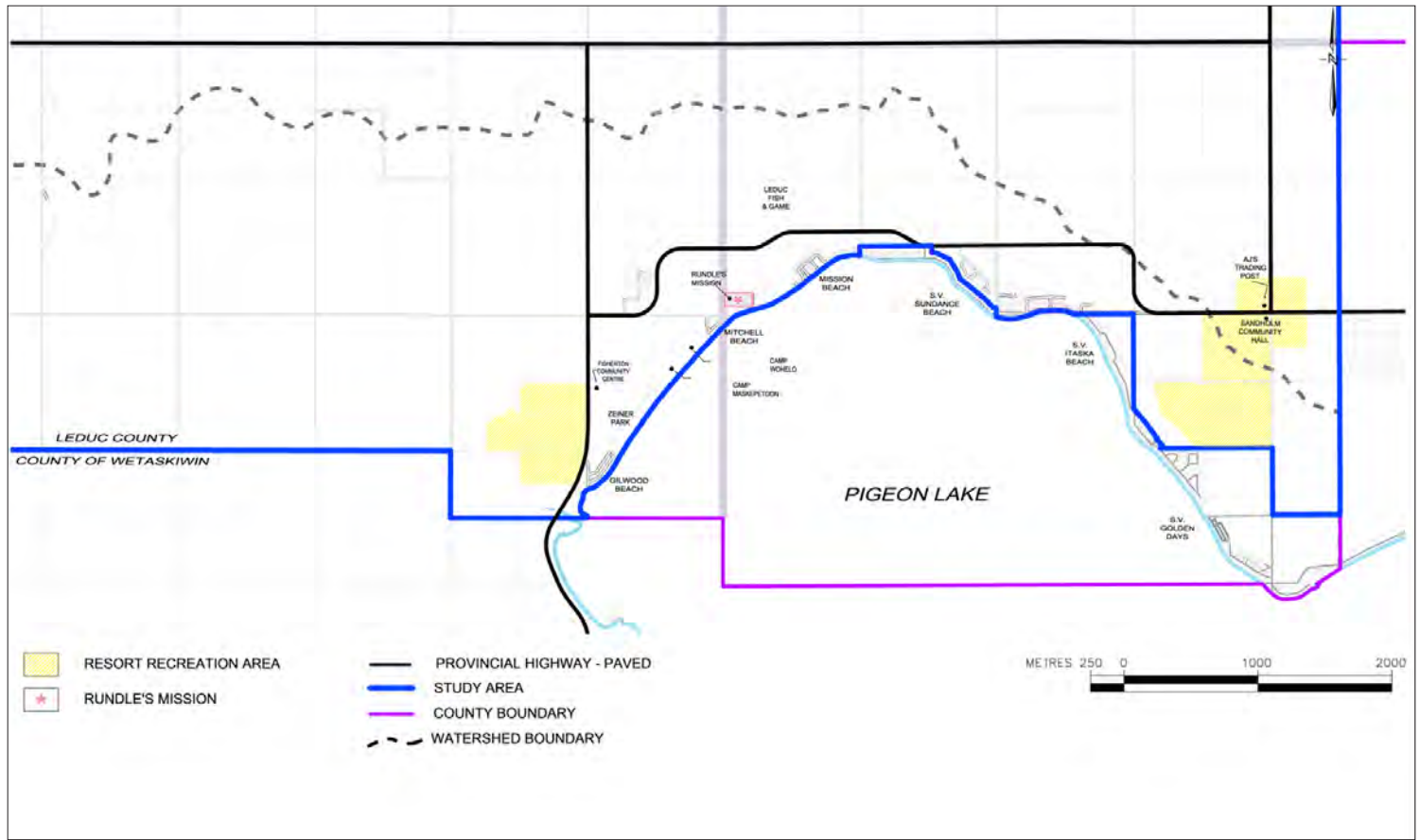
- SE23-47-2-W5; Pt. E½ SW 23-47-2-W5; and Pt. N½ NE14-47-2-W5
- Pt. SW22-47-1-W5; SE22-47-1-W5; NE22-47-1-W5; Pt. E½ SE27-47-1-W5; Pt. SW26-47-1-W5; and Pt. NW23-47-1-W5

The Resort Recreation Area (as shown in Figure 14 Resort Recreation Area) will be designed to accentuate the relationship between dwelling spaces and recreational spaces and will explicitly facilitate a leisure lifestyle based on seasonal occupation. The Area will include amenities and services aimed at providing home owners and visitors with a high quality experience comparable to those available in other resort areas across Alberta and Canada.

#### Policies Governing Resort Recreation Area:

- a) Development in a Resort Recreation Area shall be preceded by, and subject to, an approved Local Area Structure Plan. Such Local Area Structure Plans shall be subject to the requirements outlined in Section 11.6 of this plan.
- b) Overall density in a Resort Recreation Area shall be a maximum of 9.4 dwelling units per gross developable hectare (3.8 units per acre).
- c) All developments shall be serviced with piped water and sewer and able to connect to regional municipal water and sewer systems when they become available. All developments shall connect to these regional systems when they become available.
- d) New individual septic fields or mounds are not permitted in the Resort Recreation Area. Existing fields and mounds shall be removed prior to development in a Resort Recreation Area.
- e) A Local Area Structure Plan shall determine the capacity of communal water and wastewater systems to support development and the point beyond which further development must be serviced by municipal water and sewer servicing. No development shall occur in a Resort Recreation Area which cannot be supported by a communal system unless it is serviced by a municipal water delivery or transmission system.
- f) All existing tree stands shall be retained unless determined by an environmental professional to be diseased and beyond rehabilitation.
- g) All wetlands including, but not limited to, springs, creeks, and sloughs shall be identified and protected, as well as an associated Environmental Reserve setback, in accordance with the Riparian Setback Matrix Model and County policy.
- h) In any development on a parcel that, upon adoption of this plan, was larger than 8.0 hectares (19.8 acres), the provision of a variety of recreation facilities and housing forms shall be required.
- i) The design of man-made structures shall integrate architecturally and functionally with the natural environment and reflect the rural character of the Pigeon Lake area.
- j) In the case of a bareland condominium, natural areas shall be dedicated. The natural areas shall include any treed portions of the plan area.
- k) Low lying areas within a Resort Recreation Area shall include storm water management facilities and development buffer of at least 20 m between the area and adjacent low lying areas.
- l) Developments in the Resort Recreation Area may include retail and/or service commercial uses, including but not limited to resorts, spas, hotels, bed-and-breakfasts, and food and beverage premises.
- m) Subject to future growth and further planning, enhanced community services may be required in the North Pigeon Lake Area Structure Plan. These services shall be located within the Resort Recreation Area.
- n) Developments in the Resort Recreation Area shall not cause undue nuisance to adjacent land uses.
- o) Each Resort Recreation Area shall include a publically accessible day use area which provides a range of recreational activities incorporating at least four different passive and active recreation activities.

Figure 14: Resort Recreation Area



## 9.4 Preservation Area

Tide Creek provides the largest running water input into Pigeon Lake. Because of its relatively low grade, much of the Tide Creek valley floor is composed of natural wet lands. Some clearing in this drainage basin has taken place, but there continue to be larger tracts of forest cover. Several beaver dams exist which impound water, allowing for greater percolation into the ground water and ensuring that water entering the lake has had a long journey through marshy areas to cleanse it of excess nutrients and nutrient-laden sediments. There is evidence of systematic beaver dam destruction, which is counterproductive to the natural process of improving water quality that such dams bring about. Additionally, Tide Creek is one of the most active wildlife corridors in the watershed providing linkages to the Battle Lake watershed as well as being a gateway to other parts of the Pigeon Lake watershed (see Figure 15 Preservation Area).

As a result of the above, it is important that the role of Tide Creek in improving the water quality of Pigeon Lake be recognized. In response, the creek's drainage way as well as adjacent areas identified as environmentally sensitive (see Figure 6 Environmentally Sensitive Areas) have been protected from future development. One land owner in the drainage area has already committed their land to the Nature Conservancy of Canada, a viable option for other landowners in the area.

There are eight other titled parcels in six areas of the NPLASP that are also valuable natural assets and currently have some form of preservation designation. They are also included in the Preservation Feature Area with some policy considerations present. These include:

- Deciduous forest and wetland at Leduc Fish and Game Association lot NE 30-47-01-W5M.
- The Hutchinson lot north of Lakeshore Road and south of Twp Road 474 has been set aside as a Conservation Easement under the Nature Conservancy of Canada (NCC). Deciduous forest, spruce bog and wetland and Hutchinson/Conservation Easement lot is highlighted as well because of the opportunity of affording ecological

connectivity, and the creation of a larger, continuous block of forested area.

- Fen/bog habitat in SE 28-47-01-W5M and the land immediately to the south (and north of Itaska Beach) part of which is owned by the Itaska Audubon Society.
- The deciduous forest and coniferous forest within the provincially owned Strawberry Creek Natural Area in the south half of the section 29-47-02-W5M.
- An Alberta Fish and Game Association property, named the George and Joan Mitchell Memorial Property, is located immediately to the east of Range Road 22, in NW14-47-2-W5. Tide Creek runs through the south parts of both these properties.
- The provincially owned mouth of Tide Creek at SH NE 14-47-W5.
- Lands behind Kerr Cape Estates on the northeast portion of SW 28 47-01-W5 have a conservation easement in place.

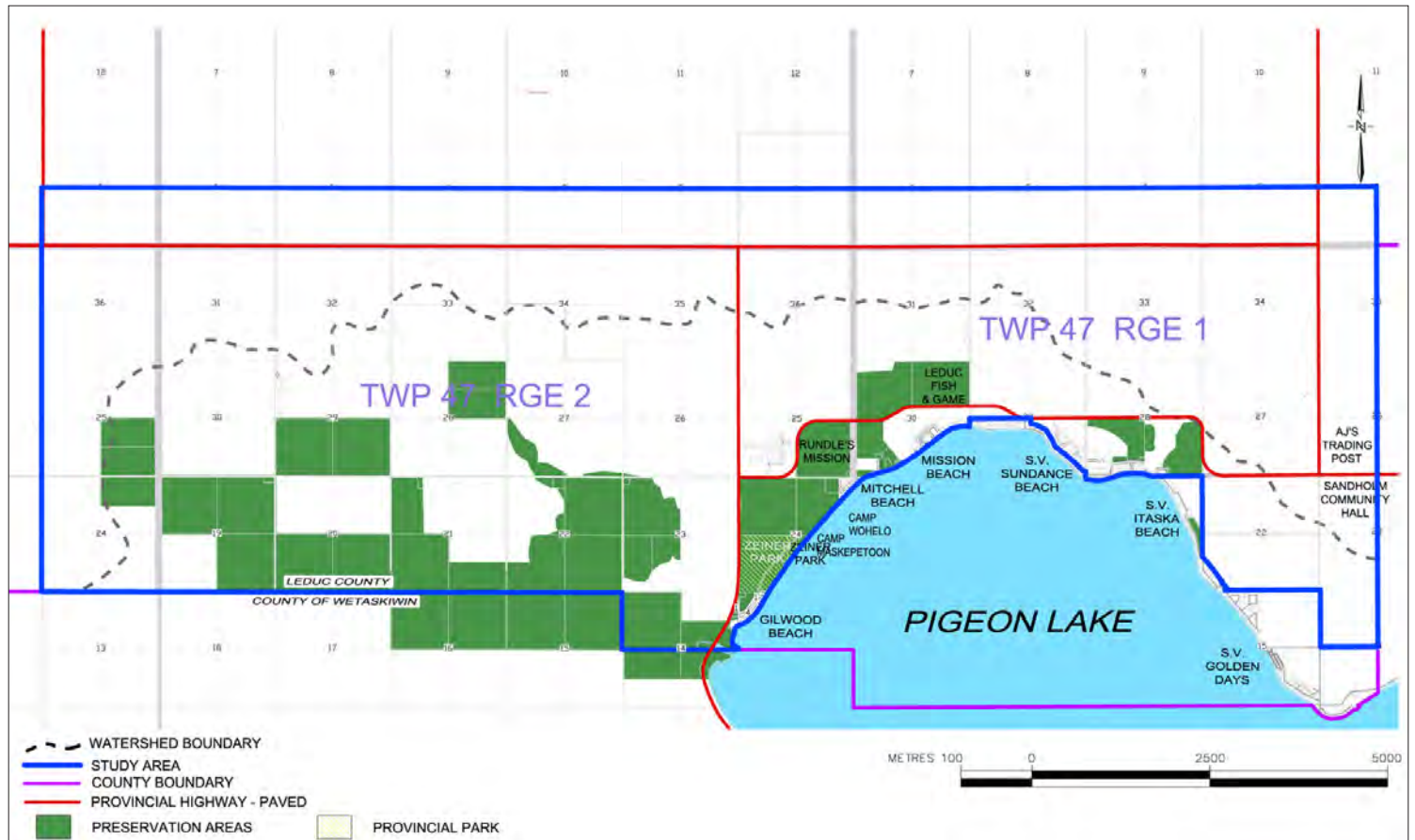
Finally, parts of several privately owned parcels have been identified through desktop analysis of aerial photographs in Figure 5 Environmentally Sensitive Areas as important to the ecological integrity of the Pigeon Lake watershed. These lands contain wet areas, fens and/or bogs or peatlands which contribute to the filtration cleansing of runoff from all areas in the watershed. They have likewise been included in the Preservation Area, with some policy considerations. These lands are:

- Parts of SE 28 47-01-W5
- Most of that part of NW 30 47-01-W5 which lies north of Highway 616X
- NW 24 47-02-W5 and lands in NE 24 47-02-W5 operated by Christian Youth Camps Inc.
- Pt. SW 30 47-02-W5
- Much of NW 23 47-02-W5
- Much of SW 23 47-02-W5
- NE 22 47-02-W5
- SE 22 47-02-W5
- SW 22 47-02-W5

#### Policies Governing Preservation Area:

- a) Additional environmental study shall be required to show lands are able to support development. This study shall identify building envelopes and any mitigation required and shall be prepared by the applicant in support of an application for subdivision or developments more than 65 m<sup>2</sup> (700 sq. ft.) in size.
- b) No multi-lot residential development may occur in the Preservation Area.
- c) A total of four lots may be created in a designated Preservation Area on any quarter section. Development on such lots shall be located on the periphery of the designated Preservation Area.
- d) Development on any lot 2 hectares (5 acres) in size or smaller within the Preservation Area shall be limited to one principal home, and accessory buildings.
- e) Subject to the requirements of the FireSmart Manual, no more than 0.4 ha (1.0 acre) on any lot in the Preservation Area may be cleared for all buildings, driveways and manicured yards.
- f) On partially cleared lots in the Preservation Area, further tree removal shall be avoided wherever possible.
- g) Walking paths, trails and boardwalks, where appropriate, will be permitted on publicly and non-governmental organization (NGO) owned lands, particularly if they emphasize the natural interpretation of the Preservation Area.
- h) Interpretive installations, signage, trailhead centres and other community services such as an association clubhouse or facilities consistent with a church camp shall be treated as discretionary uses in the Preservation Area.
- i) No motor vehicle activity will be permitted off roads on publicly owned lands, excepting powered wheelchairs, and maintenance vehicles.
- j) No stormwater from development or agricultural operations will be permitted to enter Tide Creek without first passing through a storm water management facility.
- k) Leduc County may pursue with the County of Wetaskiwin the designation of those parts of the Tide Creek drainage basin which fall within that County as a Preservation Area.
- l) Previously cleared lands in the Preservation Area are encouraged to be returned to a natural state.

Figure 15: Preservation Areas



## 9.5 Agricultural Area

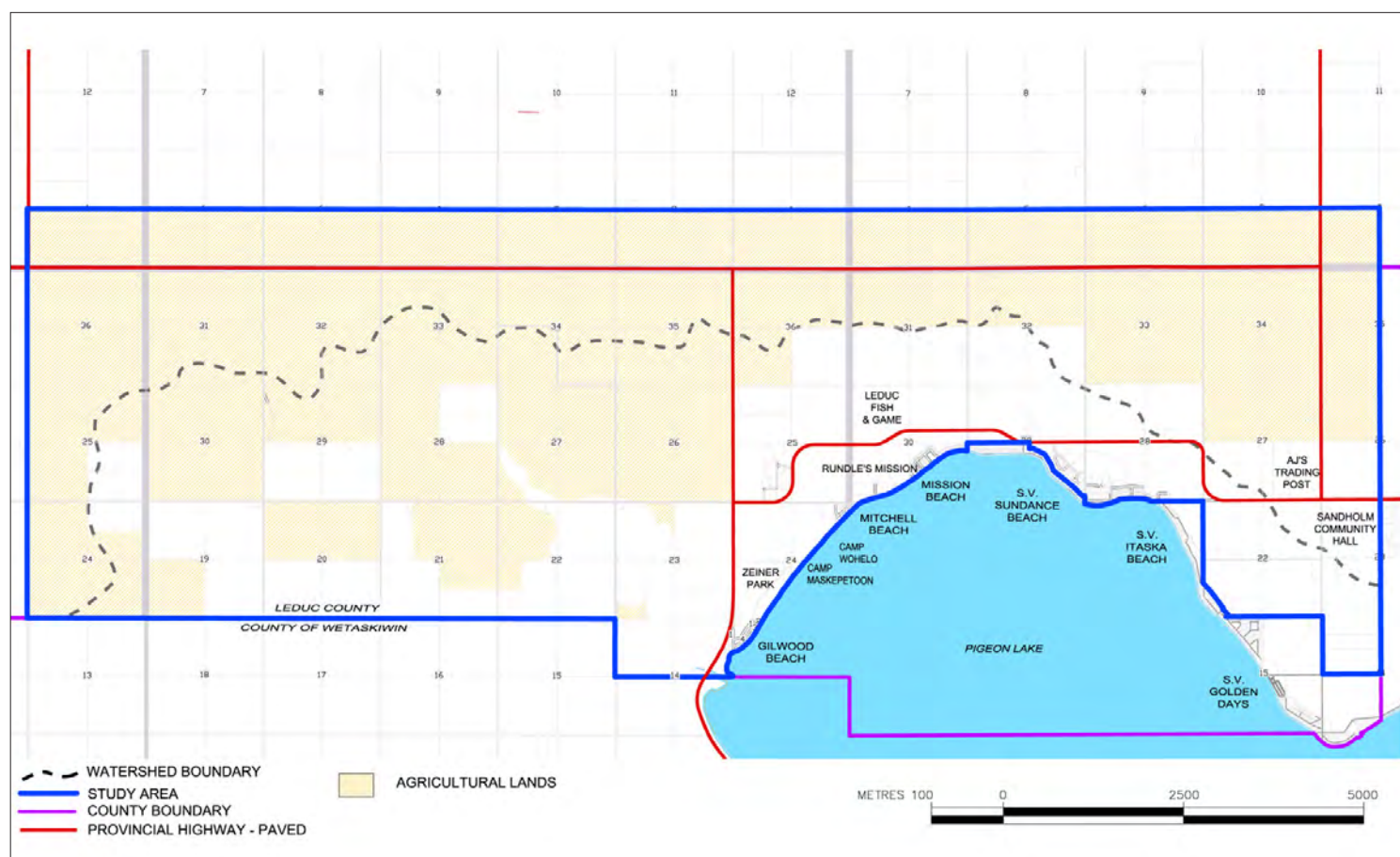
Much of the north and western parts of the NPLASP lie outside of the influence of Pigeon Lake. These lands are too far away from the lake for developments to truly be associated with recreational residential property development. Many parcels are farmed. Others are forested or impacted by the oil and gas industry. Most quarter sections are unsubdivided other than for a farmstead property.

Based on past development activity, very little new development is expected in the Agricultural Area over the next twenty to thirty years. Figure 16 Agricultural Area identifies all those lands in the NPLASP which fall into this feature area.

Policies Governing Agricultural Area:

- Multi-lot residential development is not permitted in the Agricultural Area.
- Recreational development may be permitted as a discretionary use in the Agricultural Area.
- New or expanded confined feeding operations (CFO) shall be prohibited within the watershed, appreciating that the Natural Resources Conservation Board (NRCB) will formally determine any applications for CFO's.
- Important vistas or views of Pigeon Lake found in the Agricultural Area should be preserved and recognized.

Figure 16: Lands Retaining Existing Land Use Districting



## 9.6 General Plan and Development Policies

The following policies shall apply to all developments in the North Pigeon Lake Area Structure Plan.

- a) Development shall occur in an orderly manner as per Leduc County policy and the policies of this plan.
- b) Prior to the availability of a municipal sewer system, Leduc County may permit developments within the North Pigeon Lake Area Structure Plan to use new technologies for wastewater management if the following conditions can be met:
  1. The system meets all Province of Alberta Safety Codes requirements.
  2. The new technology poses no risk to adjacent landowners or the County.
  3. The property owner(s) assumes all maintenance and liability if the service is solely onsite.
  4. A contingency plan is provided to and approved by the County.
  5. If more than one property is to be served by the alternative wastewater management system, a comprehensive plan that illustrates the functionality of the system is to be provided to and approved by the County.
  6. The proponent enters into a development agreement with the County. The development agreement shall stipulate that should the new technology fail, the proponent shall, at their own cost, provide an alternative method of wastewater management, which shall be to the satisfaction of the County. A security deposit may be required at the County's discretion.
  7. Right-of-way is permitted for future municipal wastewater management through the proponent's land in order to service surrounding lands in a Resort Recreation Area, Lakeshore Conservation Area or Cluster Subdivision Area.
  8. The quality of treated wastewater is demonstrated to achieve Alberta Environment standards for non-potable surface water.
  9. A strategy for appropriate and acceptable disposal of treated wastewater is provided to and approved by the County, which outlines what volumes of treated wastewater are expected with each phase of development and to where the treated wastewater will be discharged, including any potential downstream impacts of the discharge and any mitigation measures required.
- c) All interim servicing options must meet Alberta Environment and/or Alberta Municipal Affairs and Alberta Safety Code standards.
- d) All developments with interim servicing must agree, through development agreements, to connect to services, at their cost, when the County indicates that such services are available.
- e) Contributions towards a regional municipal water transmission system shall be a required condition of subdivision and development approvals in the Lakeshore Conservation, Cluster Subdivision, and Resort Recreation Areas.
- f) No water shall be pumped from Pigeon Lake to service any development.
- g) No water shall be pumped to service any development from the shallow aquifer underlying the Pigeon Lake watershed.
- h) Multi-lot developments proposing to use groundwater shall provide evidence that the use will not significantly impact well water levels elsewhere.
- i) Environmental setbacks for all developments in the North Pigeon Lake Area Structure Plan shall be determined by the Leduc County Riparian Setback Matrix Model. Environmental setbacks shall be taken in all wet or unstable areas including, but not limited to, lakes, streams, creeks, springs, peatlands and steep or unstable slopes.
- j) Notwithstanding 9.6.i), a stormwater management facility may be constructed in a wet area. Such stormwater management facilities, including all associated overflow or flood areas, shall be placed within a Public Utility Lot.
- k) Road surfaces constructed to a rural cross-section shall be in compliance with Leduc County Design Standards.



- l) Roadway configuration shall not include new direct access from the Lakeshore Conservation Area to existing cottage lot developments (including Summer Villages) but rather will utilise municipal road access from one Feature Area to another.
- m) Road right-of-ways should be narrow and shall avoid if possible the removal of existing trees on parcels more than 50 per cent forested.
- n) Road right-of-ways shall avoid existing tree stands on parcels less than 50 per cent forested.
- o) No lots in a multi-lot development shall be accessed directly from a Range or Township road in the North Pigeon Lake Area Structure Plan.
- p) Stormwater management facilities shall be designed in accordance with the principles of low impact development (LID). The major categories of LID strategies are outlined as follows:
  - 1. Bio-Retention Systems: include a high filtration rate, engineered soil and plants that process and filter pollutants. The systems can be designed as conveyance, detention, or retention systems.
  - 2. Filtering Technologies: designs used to trap or treat pollution by controlling the flow of water.
  - 3. Permeable Pavements: pavement systems that include a permeable surface and subsurface to infiltrate runoff and are capable, if required, of supporting cars and trucks.
  - 4. Site Design Strategies: strategies that minimize the change in how water moves over the land through clustering of development, flow path disconnection, surface change, and lengthening.
  - 5. Soil Amendments: addition of organic and other materials to soil and mechanical methods that help restore the infiltration capacity of the soil.
  - 6. Vegetative Systems: planting of vegetation or creating vegetated buffers to filter or absorb rainfall and runoff.
  - 7. Water Conservation/Reuse: the capture and storage of runoff for secondary uses such as irrigation, cooling, and other potable and non-potable uses.
- q) Post development stormwater discharge from any development shall not exceed pre development discharge.
- r) All multi-lot development proposals shall include a landscaping strategy as part of a municipal and environmental reserves strategy outlining how the reintroduction of indigenous species of trees, shrubs and grasses will be carried out in cleared areas. These plans will be required as part of the subdivision and development permit process.
- s) Shelterbelts are encouraged as part of landscaping plans for projects abutting agricultural areas.
- t) Any proposed multi-unit residential development and all commercial developments shall ensure at least 50 per cent of all required landscaped areas are planted with indigenous vegetation in conjunction with absorbent landscaping including permeable or pervious surfacing materials.
- u) At the time of development or subdivision application, costing shall be provided for proposed landscaping and/or naturalization of all developments in the Clustered Subdivision and Resort Recreation Areas, including any residual land parcels. Costing shall contain tendered or, if unavailable, estimated costs of plant material, supplies, labour and applicable taxes. At a minimum, 100 per cent of the costs for the execution of landscaping and/or naturalization on the subject lands shall be deposited (no interest to be gained) with the County as security in the form of an irrevocable letter of credit. Upon completion of the landscaping and/or naturalization as well as approval by Leduc County, the irrevocable letter of credit shall be released. The contents of this policy shall be addressed in a development agreement that shall be an approval requirement of the development or subdivision application.
- v) No stripping, grading, placing or removal of fill of any kind, whether originating on a site in the North Pigeon Lake Area Structure Plan or elsewhere, shall be permitted within any identified municipal reserve, environmental reserve, environmental reserve easement or conservation easement without an environmental scan to review potential impacts and identify mitigation measures for such activity.
- w) All new multi-lot developments shall incorporate water saving features such low flow toilets, water saving shower heads, water efficient appliances, and rain barrels.
- x) Developments which incorporate green technologies shall be encouraged through 'front of the line' or streamlined approvals.
- y) All multi-lot developments shall be subject to the provisions of subsections 6.7.3 to 6.7.8 of the Leduc County Land Use Bylaw (outdoor lighting).

## 9.7 Existing Development and Market Analysis

### Existing Development

The existing housing, farmstead, and cottage stock for the entire North Pigeon Lake Area Structure Plan area is itemized in Table 1 below. For the purposes of assessing impacts to local roads as well as planning future municipal servicing, the Summer Villages and campground at Zeiner Park have been included in this table. With the exception of Iron Horse Estates, currently there are no multi-lot developments more than 400m from the lakeshore.

**Table 1: Inventory of Existing Development**

Existing Developments	Dwellings or Campsites
Gilwood/Fisher Home	41
Iron Horse Estates	13
Mitchell Beach	26
Mission Beach	87
Sundance Beach	174
Sundance Subdivision	34
Moonlight Bay	45
Kerr Cape Estates	26
Itaska Beach	102
Golden Days	290
Catholic Hungarian Assn.	18
Other Homes	118
<b>Total Existing Homes</b>	<b>974</b>
Zeiner Campground	110
<b>Total Homes and Campsites</b>	<b>1084</b>

### Market Analysis

Every year, Royal LePage and Remax conduct a recreational property report. These reports assess recreational property markets and reveal year over year trends. The most recent reports were released in June, 2009. Among the highlights are the following:

- According to Royal LePage, “64 per cent of Canadians view cottage ownership as a sound investment. 55 per cent of Canadians would be willing to make compromises with regards to their financial or lifestyle choices such as purchasing a property with family and friends, renting out their cottage, making a cottage their primary residence, buying a fixer-upper, or moving into a smaller principal home in the city.”
- As a whole, Canadians believe that the three most important features of a recreational property are peace and quiet (58 per cent), access to utilities (50 per cent) and four-season use (39 per cent). Other highly rated features include access to boating and fishing (23 per cent), proximity to amenities (18 per cent), ecologically friendly or ‘green’ sites (17 per cent) and year-round activities (16 per cent).
- For Albertans, the three most important features of a cottage or recreational property are access to utilities (60 per cent), peace and quiet (51 per cent), and four-season use (33 per cent). Access to boating and fishing (28 per cent) and proximity to amenities (22 per cent) also ranked high for Albertans.
- 60 per cent of Albertans said a cottage on a lake would be their first choice, but 11 per cent would choose a resort condominium and another 11 per cent would choose a property in the woods—both significantly higher than the national average.

- “At 62 per cent, Albertans are among the most willing in the country to make changes to their finances or life-style in order to own a cottage.”
- Demand for recreational properties from generation X has overtaken that from the baby boomers in 74 per cent of vacation home markets in Canada, compared to 40 per cent in 2008.
- The dip in prices and demand for recreational properties in 2008 and 2009 was the first in nearly 30 years.
- The REMAX Recreational Property Report (2008) found that a substantial increase in the supply of recreational properties listed for sale, combined with fewer buyers overall, characterized most recreational markets in that year.
- Following a reduction in sales in the latter half of 2008 and over the winter; in 2009, the recreational market was showing signs of renewed interest and activity. Concerns about the recession and increasing inventories had eased demand and helped alleviate a chronic supply shortage.
- In 2009, prices decreased about 25 per cent from 2008 as a result of shrinking demand, and there was a larger inventory on the market.
- Pigeon Lake is listed as “a popular, high-profile resort area” in the Royal LePage report.

Some significant trends are revealed by the above. First, although the global economic situation had impacted recreational property markets, in general, Canadians and Albertans, in particular, still dream of a recreational get-away. Second, only one quarter of Albertans rated access to the water for boating and fishing as their highest priority. Third, a significant segment of the market is looking for non-traditional recreational properties such as condominiums, timeshares and properties without lake access. Finally, the composition of the market is changing, with generation X increasingly driving demand. Although it is well known that the values of generation Xers are distinct from their baby boomer predecessors, at this time it is unknown how the demographic shift will impact recreational property use and land use in recreational property areas.

An analysis of the North Pigeon Lake ASP area over the past 60 years reveals the following growth pattern. For this analysis, property assessment data was reviewed, rather than subdivision activity. It is reasoned that the impacts of growth are only apparent once new homes are built and their occupants have moved in, rather than when a new lot is created through subdivision. The developments of Mission Beach, Moonlight Beach, Gilwood Beach, Iron Horse Estates and Kerr Cape created multiple new lots in Leduc County, but growth in the area was only felt by the community when new homes were built on these lots. Table 2 tallies new single family, cottage and mobile homes built or installed in Leduc County, the County of Wetaskiwin and the Summer Villages.

**Table 2: Past Growth Trends in the Pigeon Lake Watershed**

Decade	Number of New Homes Built in Leduc County	Number of New Homes Built in the County of Wetaskiwin	Total Homes Built in the Two Counties	Average Number of New Homes in Summer Villages*	Total New Homes at Pigeon Lake
1950's	40	69	109	144	253
1960's	58	69	127	283	410
1970's	90	124	214	319	533
1980's	77	127	204	355	559
1990's	63	146	209	355	564
2000's	57	179	236	355	591
<b>Total Homes Built 1950 - 2010</b>	<b>385</b>	<b>714</b>	<b>1,099</b>	<b>1,811</b>	<b>2,910</b>

*\*Year over year data for the Summer Villages is unavailable, although the total number of assessed properties is known to be 1811. For this table, a straight line average is assumed for each decade and weighted to reflect that in the 1950s only four Summer Villages existed, in the 1960s there were eight, and one additional village was created in each of the 1970s and 1980s.*

Generally, the speed of absorption (new lots being sold) is directly related to demand, tempered by economic conditions. In 'good times' there are a greater number of recreational properties purchased and new cottages constructed, and in 'poorer times' there are fewer. This relationship is impacted by how much inventory is available at any one time in the market. Each new multi-lot subdivision created in the Pigeon Lake area added new inventory to the market, which arrived all at once in a lump sum. As a result, levels of inventory have fluctuated significantly over time. Table 2 above reduces the effect of inventory variations by only displaying building activity rather than the creation of new lots.

In a sharp departure from past development activity, the NPLASP contemplates several different forms of recreational property development including clustered subdivisions, resort and spa type developments, timeshares, condominiums, as well as traditional fee simple vacation homes. Currently, non-traditional recreational property options are extremely limited in the Pigeon Lake area.

It is anticipated that the provision of a wider array of recreational property options in the North Pigeon Lake ASP area will generate increased market activity in market segments previously absent. If one assumes that non-traditional market activity reflects the Royal LePage Recreational Property Report (2009) as noted above, 22 per cent more properties could be absorbed over the traditional demand (reflecting 11 per cent of purchasers who would buy a resort condominium and another 11 per cent who would buy a property in the woods).

The overall pattern revealed in Table 2 shows a large increase in the pace of development between the 1950s and 1960s, with that rate levelling off over the past 40 years. However, the last ten years have seen an upswing in new home building. During this time the Summer Villages have become largely built out and new home construction in the Counties has begun to accelerate, particularly in the County of Wetaskiwin. The overall 40 year growth rate has been 0.25 per cent annually.

As the new regional sewer line comes onstream, it is anticipated that development pressure in the Pigeon Lake area will increase. Furthermore, since the Summer Villages are mostly built out and thus not expected to grow significantly in the future, nearly all of this development pressure will shift to the two counties. Finally, with municipal water service expected to become available in the medium term future, the north end of Pigeon Lake will become more attractive for environmentally responsible development.

A table of projected growth is displayed below as Table 3. The first row of numbers is calculated as follows. Growth which had previously occurred in the Summer Villages is allocated to each county with 70 per cent of that growth allocated to the County of Wetaskiwin and 30 per cent allocated to Leduc County. This reflects the fact that three of 10 Summer Villages border Leduc County and seven border the County of Wetaskiwin. Once allocated, each County's projected new unit construction is multiplied by 1.025 for each year of projection to reflect the 40 year growth trend in the watershed. Finally, the growth rate in Leduc County is increased by 22 per cent of the overall projected development in the watershed, reflecting the demand for alternative recreational property options identified by Royal LePage in its 2009 survey, and which will be met by new developments in the Resort Recreational Area. For subsequent decades, the historic growth rate of 0.25 per cent annually is applied.

**Table 3: Projected Future Growth**

Decade	Projected New Units in NPLASP	Potential New Units in the County of Wetaskiwin	Total Potential New Units in Pigeon Lake Watershed
2010s	304	435	739
2020s	312	445	757
2030s	320	456	776
2040s	328	468	796
<b>Total Units Built 2010 - 2050</b>	<b>1,264</b>	<b>1,804</b>	<b>3,068</b>

One can see from Table 3 that even with the shift of growth pressure from the Summer Villages to the counties, as well as the inclusion of new forms of development, the overall impact of the NPLASP will be some 32 new units each year. Nearly 80 per cent of this growth is expected to occur in the Resort Recreation Area, with a further 17 per cent expected in the Cluster Subdivision Area. To reach the full potential build out of the plan area, it will take considerably longer than the 25 year time horizon of this plan, if it were ever to be reached at all.

## 9.8 Development Potential

### Development Potential

The North Pigeon Lake Area Structure Plan contemplates a much wider array of land uses than currently exist at the lake, as well as alternate forms of development, each of which will result in a smaller development footprint than that of traditional forms. The number of dwelling units and resulting potential peak weekend population that are projected in this section are based on the ultimate number of dwelling units which could be constructed in all feature areas. It is unlikely that all lands, particularly those in the Cluster Subdivision Area, will be developed. However, this exercise serves to assess cumulative impacts in the plan area and provides the basis for the engineering of transportation and servicing infrastructure.

The North Pigeon Lake ASP could create an ultimate potential for 3,824 units in all plan areas at full build-out. Most of these units would be concentrated into the Resort Recreation Area, where 3,089 units could possibly be created. A further 576 units are possible in the Cluster Subdivision Area. Development potential in the Lakeshore Conservation Area, Preservation Area and Agricultural Area is 61, 62 and 36 respectively. Assuming an average of 2.2 persons per residential unit, the total potential population at full build-out of the plan area would be 8,413 persons. It is important to note that much of this population would not constitute new permanent residents, but would rather represent a peak weekend population.

The Pigeon Lake Regional Wastewater System Master Plan study completed in 2007 by Associated Engineering estimated that between 25 and 30 per cent of residences in the lake area are lived in on a permanent basis. Assuming an average 27.5 per cent permanency, the potential new permanent population in the NPLASP could be 2,313.

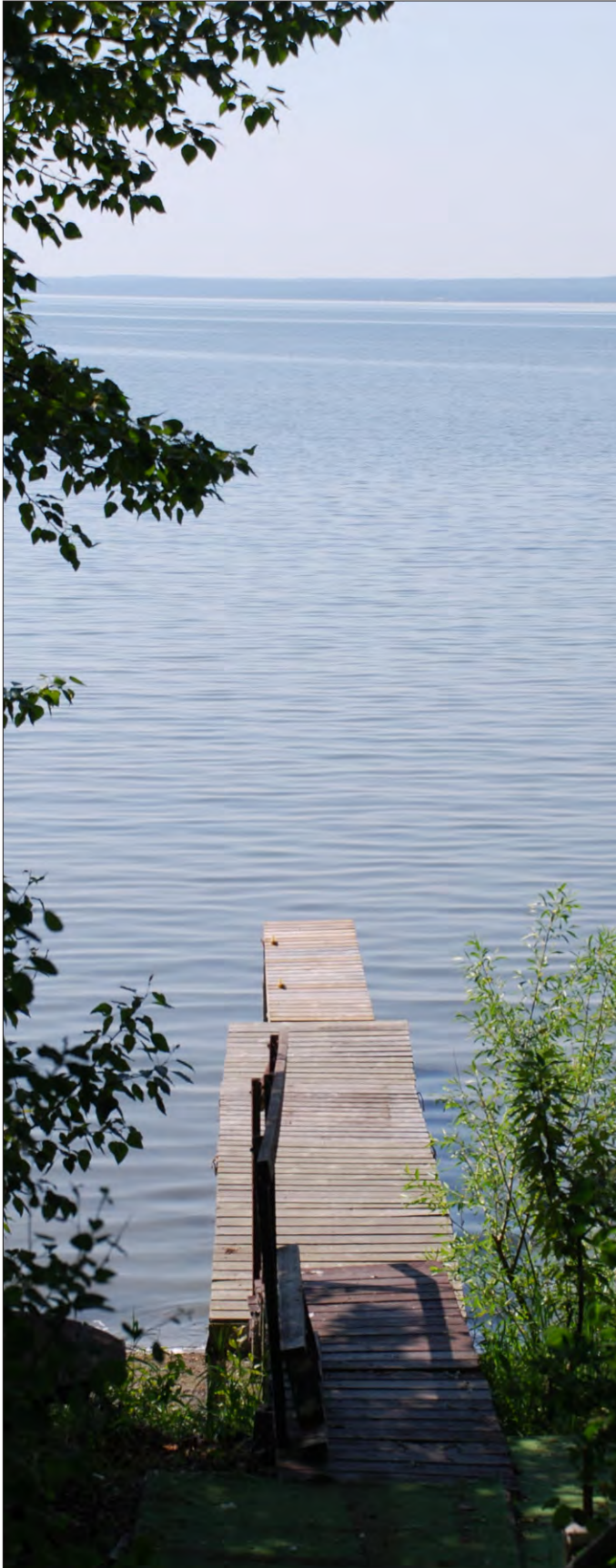
## 10.0 Reserves, Lake Access, Agriculture, Transportation, Utilities & Fire Protection

### 10.1 Municipal and Environmental Reserve

The Alberta Municipal Government Act in Section 661 allocates the right to require the dedication of both environmental reserves and municipal reserves to a subdivision authority. The Act, in Section 664 (1), sets out the parameters defining lands that would be designated environmental reserve (ER). In Section 666 (2), parameters are outlined to calculate the amount of land that the subdivision authority can request for municipal reserve (MR).

Policy direction from the Capital Region Board for the design of rural subdivisions indicates a preference for clustered lot developments. The NPLASP places a limit on the size of each lot in the Clustered Subdivision Area. A result of this lot size limit is that a large residual parcel will be created through multi-lot development. This parcel may be left as a single privately held lot with further subdivision or development restricted. Alternatively, the residual may be dedicated to the County as MR, or placed in permanent conservation as a Conservation Easement. These easements may be placed in the care of a Non-Governmental Organization (NGO) to be held as conservation lands in perpetuity.

MR is expected to be primarily utilized for recreational amenity development, public access and circulation via trails through a particular development and between developments. Trail corridors have been proposed in the NPLASP. As well, walking and cycling trails are recommended throughout the NPLASP and MR provides the basis for this use. MR may also be utilized to protect open spaces.



Environmental reserves will be requested by the Subdivision Authority as per the direction provided by the Act and County policy, as determined through the Riparian Setback Matrix Model. Some ER and MR, particularly in the Tide Creek area and in the vicinity of Rundle's Mission, is potentially useable for nature interpretation purposes.

School reserves are not expected to be required in the NPLASP, since the purpose of the plan is to accommodate recreational property demand rather than permanent new residents. Nevertheless, it is recognized that some property owners will choose to live permanently at Pigeon Lake. To keep such residency to a minimum, it is recommended that public school services continue to be provided regionally through the Village of Thorsby. Should a private educational provider wish to offer services in the NPLASP area, these operations should be located in the Resort Recreation Area.

### Municipal Reserve Policies:

- a) Municipal reserve shall be taken in the form of land in all multi-lot subdivisions.
- b) Municipal reserve dedication shall be used, where possible, to complement environmental reserve as well as public utility lots for such purposes as stormwater management facilities.
- c) Any lands required for future regional municipal water and/or wastewater systems shall not be included in any municipal reserve dedication.
- d) Public utility lot lands adjacent to municipal reserves shall not be counted toward the fulfillment of the required amount of municipal reserve dedication.
- e) Municipal reserve lands may be used for both active and passive recreational uses.
- f) Municipal reserve lands should be configured such that they provide opportunities to develop a regional trail system.

## 10.2 Lake Access

Since much of the Pigeon Lake shoreline has already been developed with private cottages, lake access is a significant issue for the North Pigeon Lake Area Structure Plan. Past cottage development has severely constrained public lake access opportunities. As a result, new developments in the NPLASP will not be able to provide direct access to the lake. In response, the NPLASP proposes to address lake access in three ways.

1. Resort Recreation Area developments will be required to provide day use areas with a range (at least four passive or active activities) of recreation activities.
2. Cluster Subdivision Area developments will each have a large residual parcel of land available for the recreation purposes of the development.
3. A levy will be applied to all multi-lot developments, which is specifically targeted towards improving facilities currently in place at the lake as well as providing new facilities.

Nearly all of the potential development in the plan area will not be directly related to the lake. It is expected that many of the visitors to these developments will take advantage of non lake-related recreation activities as required to be provided in the Resort Recreation Area, as well as other activities offered in the Cluster Subdivision Area. However, for those who wish to access the lake directly, steps have been taken in the form of a levy to enhance existing and provide new lake access facilities.

### Lake Access Policies:

- a) A lake access levy as determined by Leduc County Council shall be a required condition of subdivision or development approvals for all multi-lot developments to provide for the enhancement of public access facilities at the lakeshore of Pigeon Lake.
- b) Leduc County will work with the Rundles Mission Society to explore and capture opportunities to provide upgraded and expanded public facilities including lake access. Such a joint venture shall occur through a partnership arrangement.
- c) Leduc County will continue to work with Alberta Tourism, Parks and Recreation to discuss the future ownership and operation of Zeiner Park, and will explore opportunities to upgrade and expand day use and campground areas including lake access.

## 10.3 Agriculture

Farming has a long and rich history in the Pigeon Lake area. It remains a vital part of the regional economy and a dominant element in the rural lifestyle and culture of the watershed. Farmers own the vast majority of lands in the NPLASP area and they continue to be wise stewards of those lands.

Over the years, new techniques and practices have emerged in the agricultural industry that have been demonstrated to improve the quality of runoff leaving a parcel of land by reducing the amount of nutrient transfer and loss of topsoil to erosion. Some of these practices include:

1. Limiting the clearing of land, particularly in riparian areas.
2. Developing incentives such as shelterbelt programs for landowners to retain or replant trees.
3. Regulation of livestock operations in environmentally sensitive areas of the watershed.
4. Preparation of environmental farm plans, as outlined through the Growing Forward initiative of Agriculture Canada.
5. Avoiding the destruction of beaver dams and resultant draining of wetlands created by beaver colonies, particularly in the Preservation Area.
6. The use of no till or zero tillage practices for annual croplands, which may reduce wind erosion topsoil as well as fertilizer requirements.
7. Not spreading manure in riparian areas.
8. Avoiding the spraying of chemical pesticides and herbicides within 50m of riparian areas or the lake.



## 10.4 Transportation

The proposed development pattern in the North Pigeon Lake Area Structure Plan area is such that the existing collectors (Hwy 778, 771, 616, and 616X) adequately provide the transportation needs for the area into the foreseeable future. However, at certain population thresholds, there may need to be upgrades to certain intersections, the provision of signalization, or upgrades to a portion of roadway to accommodate more lanes. These needs have been outlined in the Transportation Study appended to this plan.

All future multi-lot subdivisions will be required to submit a Transportation Impact Assessment as part of a Local Area Structure Plan or Outline Plan, identifying the traffic generation in the particular proposed development and its effect on nearby intersections with the collector and arterial roads and/or highways. This analysis will consider turning movements and delay times, intersection configuration and signalization in accordance with Alberta Transportation and TAC (Transportation Association of Canada) Standards.

Local transportation patterns within future developments will be based on a system of road hierarchy; from trails and pathways, to laneways, local, collector and arterial roads, and highways, with cross-sections, rights of way, and streetscapes as per Leduc County Standards. Should narrower than the prescribed rights-of-way be proposed in efforts to reduce the footprint of a development, the locations and separations of all utilities, roadside ditches and trails will be as per Leduc County standards.

There are several lake access points in the NPLASP. Zeiner Park and Mission Beach represent the two largest points to access the water's edge. In addition to these, several reserves are located within the cottage developments and the Summer Villages. Those under the jurisdiction of Leduc County are all available to the public at large. Those in Summer Villages may not be made fully available to visitors from outside the Summer Village as local taxpayers are responsible for maintenance. This is an issue to which there is no clear solution and requires additional work by Leduc County and the Summer Villages so that all public access points on Pigeon Lake are available to the general public.

Some road right-of-ways may provide for a variety of modes of transportation in the plan area. Walking for pleasure and cycling may both be accommodated on roadways throughout the NPLASP through the use of Resort Recreation Area pathways separated from the vehicular travel lanes by boulevards, barriers, or ditches. Currently, there are few trails or other linkages to accommodate these very popular leisure pursuits. The concept for the NPLASP contains two major trail linkages. One trail alignment is proposed to be implemented between the existing cottage lot developments and new developments in the Lakeshore Conservation Feature Area. The lands surrounding this trail will be part of the new development area and will serve as a buffer to existing development. Trail construction will be part of the subdivision or development process and included as part of a development agreement between the developer and Leduc County. Trail location and design standard shall be determined at the Local Area Structure Plan or Outline Plan stage.



The second trail alignment generally follows the watershed divide at the highest local elevations. This “skyline” trail would be implemented when developments proceed on these parcels.

However, many sections of trails will be on land that will not be developed. These may be connected by volunteer efforts of trail organizations that currently exist in the Pigeon Lake area, depending on the landowner’s permission.

## 10.5 Utilities

The following Area Structure Plan servicing guidelines are based on the land use concepts within the study area. Existing studies that were referenced include the following documents listed below. Further clarification of the servicing strategy will be provided at later stages of the planning process including the Local Area Structure Plan and subdivision stages.

- Pigeon Lake Regional Wastewater Steering Committee - Pigeon Lake Wastewater Strategy and Master Plan Study, Associated Engineering Alberta Ltd., October 2007
- Leduc County - Pigeon and Wizard Lakes Wastewater Assessment, Sameng Inc., June 2009
- Leduc County - Regional Groundwater Assessment, Hydrogeological Consultants Ltd., February 1999
- Agriculture and Agri-Food Canada/County of Wetaskiwin - Regional Groundwater Assessment, Hydrogeological Consultants Ltd., March 2008
- Leduc County – draft Wizard Lake Area Structure Plan, Office for Urbanism, MMM Group Ltd., Thurber Engineering Ltd., Fiera Biological Consulting Ltd.
- Leduc County Public Works and Engineering: Technical Memorandum - Pigeon Lake Regional Servicing Concepts Overview - Leduc County, Public Works and Engineering in conjunction with Sameng Inc., June 2009

As previously stated, all multi-lot and resort developments within the Plan Area are ultimately to be provided with piped sanitary sewerage and water supply, and stormwater management facilities designed in accordance with the principles of low impact development. The servicing concepts are discussed below:

### 10.5.1 Water Supply

The servicing concept for water supply and distribution is based on the premise that all multi-lot developments within the plan area will eventually be serviced with piped or municipal potable water. The water distribution system will also be able to provide fire flows.

It is understood that the Village of Thorsby is currently considering upgrading its infrastructure, and has the potential to increase capacity to provide a potable water supply to the study area. At this time, it is assumed that the Village of Thorsby upgrades would include consideration for future storage and pumping requirements to service the development areas being considered in the North Pigeon Lake Area Structure Plan.

To provide a pressure distribution system to future developments in the NPLASP area, it will be necessary to construct a pumping and reservoir facility. It is recommended that the location for the reservoir facility be as shown in Figure 17: Water Servicing. This location has been strategically selected as it provides the highest potential elevation within the ASP area (895 m) and is located near major road networks. This proposed location, positioned at the high point in the subject area, is an attempt to create as effective and efficient a water distribution system, from an operational and cost perspective, as is possible.

As development occurs within the NPLASP area, existing developments and acreage properties should be connected to the regional system as it becomes available to those properties. Similarly, and as the proposed distribution system is expanded over time within the NPLASP areas, the existing local Summer Villages may wish to consider future connections to the water system as these connections present a potentially cost-effective and reliable water supply.

Individual cluster multi-lot developments may be located such that they would be cost prohibitive to directly connect to the regional distribution system, until such time as the system is in place. For these isolated cluster developments,

a feasible initial solution could be to service these developments via communal deep aquifer wells and local reservoir systems with pumping sized to accommodate peak and fire flows. Over time, as the distribution system is expanded, the local cluster development wells would be decommissioned as the opportunity arises to directly connect to a regional water distribution system.

Connection to the regional system is mandated in this plan when it becomes available to developments. The mechanism by which this is ensured is a development agreement registered to the developer. Security may be required to ensure connection, which will be at the cost of the developer.

Developments proposing to use an interim well system shall be required to produce a hydrological study to ascertain the well's potential impact on adjacent developments and on Pigeon Lake. Interim wells shall utilize deep aquifer water, thus reducing potential impacts on Pigeon Lake, which relies on shallow aquifer inflows to maintain lake levels during the dry season.

Figure 17: Water Servicing



### 10.5.2 Sanitary Servicing

Due to the proximity and sensitivity of Pigeon Lake, it is recommended that private septic fields or mounds and private trucked sanitary holding tanks not be considered for future multi-lot developments with the NPLASP area. At this time, it is our understanding that the Pigeon Lake Regional Wastewater Steering Committee (PLRWSC), in conjunction with the Northeast Pigeon Lake Regional Services Committee (NEPL), is considering a regional sanitary infrastructure system that would service the study area of this ASP.

Based on the findings of the Pigeon Lake Wastewater Strategy and Master Plan Study commissioned by the PLR-WSC and authored by Associated Engineering (Associated), the Mulhurst Treatment Facility is identified as the preferred future location for a regional wastewater treatment lagoon. The recommendations found within this NPLASP are based on the Associated Engineering Servicing Option 1, as outlined within the Master Plan.

Option 1, the recommended option within the Master Plan, recommends an expansion of the existing Mulhurst facility to accommodate future sanitary treatment needs for the general Pigeon Lake region. In the future, Option 1 would incorporate upgrades to the aerated lagoon system to provide additional capacity and potentially incorporate future conventional mechanical upgrades. The NPLASP proposes a straightforward extension to the proposed Option 1 collection and transmission system to provide servicing coverage to the NPLASP study area.

Due to terrain and topographical constraints, the entire NPLASP study area cannot be directly serviced by gravity sewer infrastructure. It is therefore proposed that, where feasible, areas be serviced by a combination of low pressure piped collection systems and gravity sewers. These shall direct sanitary flows to a primary lift station, which shall be located at the strategic low point in the overall development area. This selected location is directly southwest of the Gilwood Beach area, as illustrated in Figure 18: Sanitary Servicing. This area is the ideal position for the pumping system, as it accommodates the greatest amount of potential gravity servicing, due to the natural slope of surrounding lands.

The proposed sanitary lift station shall transmit sewage effluent through a force main which shall extend north and eastward through the NPLASP lands, ultimately connecting to the proposed Option 1 transmission system at the proposed Kerr Cape lift station. Refer to Figure 18: Sanitary Servicing.

For some existing acreage style residences, the continued use of sewage holding tanks and septic fields may continue to be the only feasible option. Consideration should be given in the future to connecting these existing residences to a future communal or municipal system as the system evolves and comes within reasonable proximity of the residences.

As discussed in Section 9.8, the ultimate anticipated development associated with full development of the NPLASP lands is approximately 3,824 dwelling units. The PLRWSC regional master plan, which was commissioned prior to this structure plan, assumed an ultimate population in NPLASP study area section of Pigeon Lake which is less than what is contemplated by this study.

This has two potential ramifications, one being the ultimate treatment capacity at the Mulhurst Facility, and the second being effluent transmission to the Mulhurst facility itself. Potential remedies, such as off peak pumping with additional system storage of effluent associated with the NPLASP lands, should be considered. The Pigeon Lake Regional Wastewater Steering Committee should consider an allowance for the potential future effluent flows associated with the NPLASP development within the ultimate design of the treatment capacity at the Mulhurst facility.

Future funding of the system could include a levy for the newly subdivided areas, which would provide an equitable share of the potential future cost of expanding the capacity of the Mulhurst facility.

As a general recommendation, future developments should incorporate a combination of low pressure sewer and the Septic Tank Effluent Pumping System (STEP). The septic tank removes most of the grease and larger suspended solids, making the use of smaller, less expensive and more efficient pumps to move the effluent from the homeowner's septic tank into the pressure sewer collection system possible. Each service has a pump and float switch that pump septic tank effluent into the collection system on an "as-required" basis. STEP services are equipped with an alarm system to signal failure. The septic tank has up to 12 hours of 'built-in' storage to allow time to replace a failed pump.

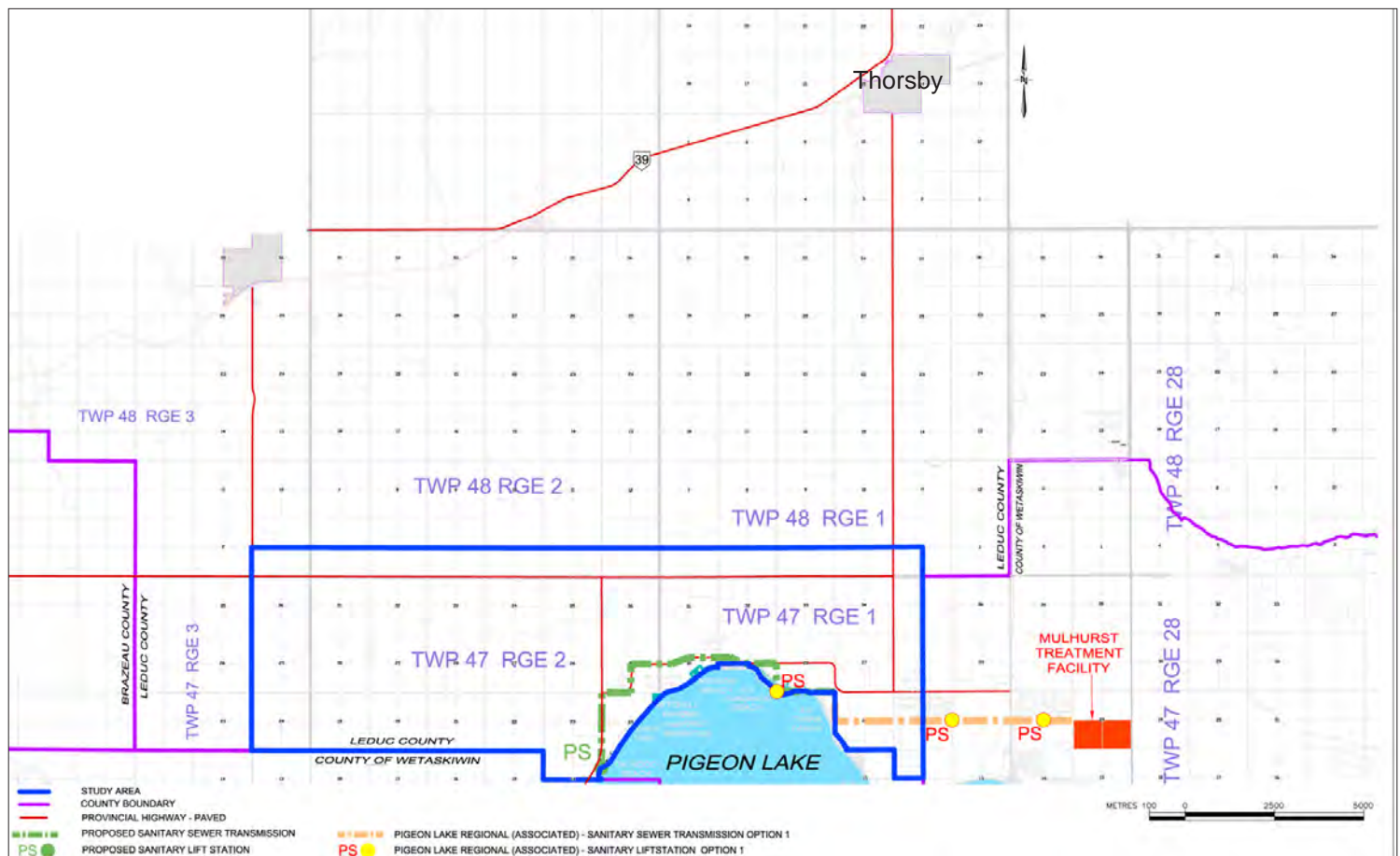
Effluent from the septic tank effluent pumps is discharged into the pressure collection system. A typical pressure collection system consists of relatively small diameter PVC (polyvinyl chloride) or HDPE (high density polyethylene) pipe, buried with enough cover to protect the pipe from surface damage and freezing. For subdivisions of up to 100 homes,

most of the pipe would be 50 mm to 100 mm in diameter. Because the collection pipe used is plastic pressure pipe, it is inherently watertight preventing any infiltration of groundwater. The size of the treatment facilities can be reduced, when compared with conventional gravity systems that typically experience infiltration and inflow of ground and surface water.

During the initial stages of development of multi-lot subdivision developments, it may not be practical or feasible to provide a connection to a regional system. On an interim basis, the use of modular treatment and disposal systems should be allowed for developments. Systems must be based on proven technology, approved by Alberta Environment and meet all provincial safety codes. The systems shall be operated, maintained and serviced by licensed personnel at the expense of a homeowner's association. These interim systems should be required to connect to the local collection system when it comes within reasonable proximity, as the collection system is expanded. The timing and requirement for connection to the regional system would be identified under individual development agreement conditions for the particular development.

Further, as a general recommendation, future developments should be encouraged to explore the use of waste water reducing methods. Such methods could incorporate the use of low flow fixtures, water efficient appliances, restricting the use of kitchen garburators, and encouraging the capture and use of rain water for local irrigation. Any potential capture and reuse of so-called 'grey water' (water already used once for washing and bathing) will require provincial approval in principle.

Figure 18: Sanitary Servicing



### 10.5.3 Storm Water Management

All multi-lot and resort developments shall provide storm water management facilities to limit the quantity of runoff to pre-development flows, as well as to reduce nutrient loads before the runoff reaches the lake. The use of bio-swales, wet detention ponds, constructed wetlands and aerated decorative ponds will be encouraged as all multi-lot developments shall be in accordance with the principles of low impact development. Dry detention ponds may be used only in specific situations where other means of stormwater management is not feasible. The minimum sizes, depths, shore slopes and freeboard of all stormwater management facilities will be as per the Alberta Environment Storm Water Management Guidelines.

Stormwater management facilities will be bordered by landscaped or naturalized municipal or environmental reserves, depending on whether natural or man-made facilities are used. Developments shall provide trails and benches in these reserves, and may provide lighting, picnic tables, viewing platforms or other amenities.

### 10.5.4 Franchise Utilities

Developers shall be responsible for providing their developments with gas, power and phone through the utility companies that service the area. Individual utility companies have been approached and have expressed interest in servicing the study area. The utility companies acknowledged their desire to meet the requirements needed for future servicing. Each of the utility providers also indicated that future upgrades or expansion of their existing infrastructure would be required, and that this would be done in the future to meet demands as they arise.

Details of the future utilities, including the use of geothermal systems for heating, shall be provided to Leduc County in Local Area Structure Plans for individual developments.

## 10.6 Fire Protection

Currently, fire response services are provided to the plan area from Thorsby and Mulhurst Bay. Due to low lake levels in recent years, fire services cannot access the lake for its water needs. The only option has been to truck in required water from whatever source can be accessed.

As the NPLASP proposes developments using communal water supply systems, as well as a future municipal water supply, opportunities thus exist to significantly improve fire services in the northwest area of Pigeon Lake.

#### Fire Protection Policies:

- a) As part of an application for multi-lot/unit development, developers shall provide a fire protection plan to Leduc County that is prepared in accordance with the Alberta Building Code and FireSmart Manual.
- b) Fire hydrants shall be required as part of major multi-lot/unit developments in the Resort Recreation Area.
- c) Communal water supply systems for multi-lot developments in the Cluster Subdivision Area shall have a reservoir of sufficient capacity and design to provide the required volume, pressure, level of service, and fire flow protection to the proposed development as deemed appropriate by Leduc County and Alberta Environment.
- d) A developer shall include FireSmart guidelines within any architectural guidelines noted on restrictive covenants on title.

# Part C: Implementation & Monitoring

## 11.0 Implementation, Monitoring, & Plan Management Strategy

The following sections of this plan outline how the NPLASP will operate to realize the vision articulated in Section 7. Initial sections describe how the plan impacts other planning documents in Leduc County. Next, provisions are made for periodic plan review and plan amendment.

For development in the Resort Recreation Area, a further level of planning will be required and will include a public engagement process. For multi-lot developments in the Cluster Subdivision Area, an Outline Plan will be required. For smaller subdivision and development permit applications, normal County planning processes apply.

The North Pigeon Lake Area Structure Plan helps guide environmentally responsible decision making, promotes sustainable development patterns and densities, enhances stewardship of the lake environment and supports the Pigeon Lake area as a liveable, healthy and sustainable recreational community.

### 11.1 Amendments to the MDP

Upon adoption of the North Pigeon Lake Area Structure Plan, the Municipal Development Plan of the County (last amended October 12, 2004) will need to be amended, to reflect the new policy area of the NPLASP. Amendments to the MDP will recognize the role of Pigeon Lake as a provincially important recreational area, as well as the potential for economic development which is associated with this role. As well, a mapping change will be required.

### 11.2 Amendments to the Land Use Bylaw

The Leduc County Land Use Bylaw will need to be amended to reflect new land uses and/or districts proposed in this document. A new district will be created to enable Cluster Subdivision form development. New districts may also be required in the Resort Recreation Areas, and will be developed at the Local Area Structure Plan stage. Any new districts will be consistent with the Feature Areas established in this ASP, and will prescribe appropriate lot sizes, setbacks, design standards and other regulations, based in part on the policies laid out in this document.

### 11.3 Plan Review

The North Pigeon Lake Area Structure Plan is intended to be a living document. That is, the plan will evolve and respond to events that take place both within and outside of the plan area in Leduc County, which may affect the plan. To do so, the plan must be reviewed from time to time to ensure that it remains relevant and still reflects the vision and priorities of the Pigeon Lake community. A review of the NPLASP may be triggered by any of the following:

1. Significant changes to the Capital Region Growth Plan.
2. Major changes to the health and/or water levels in Pigeon Lake due to such factors as climate change.
3. Dramatic changes to energy consumption patterns, such as those which may result from fossil fuel shortages and high pricing or the mass marketing of alternative energy sources.
4. Major changes in land use brought on by the exhaustion of fossil fuel resources in the Pigeon Lake area and resulting abandonment of wells and pipelines.
5. Major changes to demand for recreational properties as a result of any of the above.
6. Major changes in land use precipitated by climate change.
7. Major changes in provincial legislation governing municipalities or land use planning.
8. Potential future joint planning with the County of Wetaskiwin, the Association of Pigeon Lake Municipalities, Alberta First Nations and/or other entities active in the Pigeon Lake area.
9. At the discretion of Leduc County Council.

Any review of this plan will involve opportunities for public engagement. The anticipated form of such engagement will be outlined at the time of a formal launch of a plan review.

## 11.4 Plan Monitoring

When proposing development related to a major environmental feature such as a lake, it is crucial to monitor the progress of the plan and ensure that development does not negatively impact the environment. In the NPLASP, the highest priority is the water quality of Pigeon Lake. To monitor potential impacts of development and identify issues early, the NPLASP will proceed in phases with periodic pauses at which time assessments of impacts will be carried out and the policies of this plan reviewed. The first such pause and review period will occur within five years from the adoption of the plan. If, at any time, Leduc County Council is of the opinion that further development will seriously degrade Pigeon Lake, it may impose a moratorium on development and initiate a full review of this plan. Results of this review may include mitigative measures imposed on existing developments and additional controls on any new development.

During an assessment and review period, Leduc County may undertake any or all of the following:

1. Full lake water quality evaluation as recommended by Alberta Environment.
2. Survey of County and summer village residents to determine their experiences.
3. Survey of boat owners to determine their experiences.
4. Review of emergency service availability.
5. Any other studies or assessments that Leduc County Council deems necessary.
6. Public meeting to hear resident/visitor input
7. Consultation with relevant government agencies

### Policies for Plan Monitoring:

- a) Leduc County shall conduct a full assessment of the impacts of the North Pigeon Lake Area Structure Plan on Pigeon Lake and its watershed within five years of the adoption of the North Pigeon Lake Area Structure Plan.
- b) Leduc County shall conduct periodic assessment of the impacts of the North Pigeon Lake Area Structure Plan on Pigeon Lake and its watershed at intervals of no more than five years over the life of this plan.
- c) Leduc County Council reserves the right at any time to suspend development in the North Pigeon Lake Area Structure Plan.

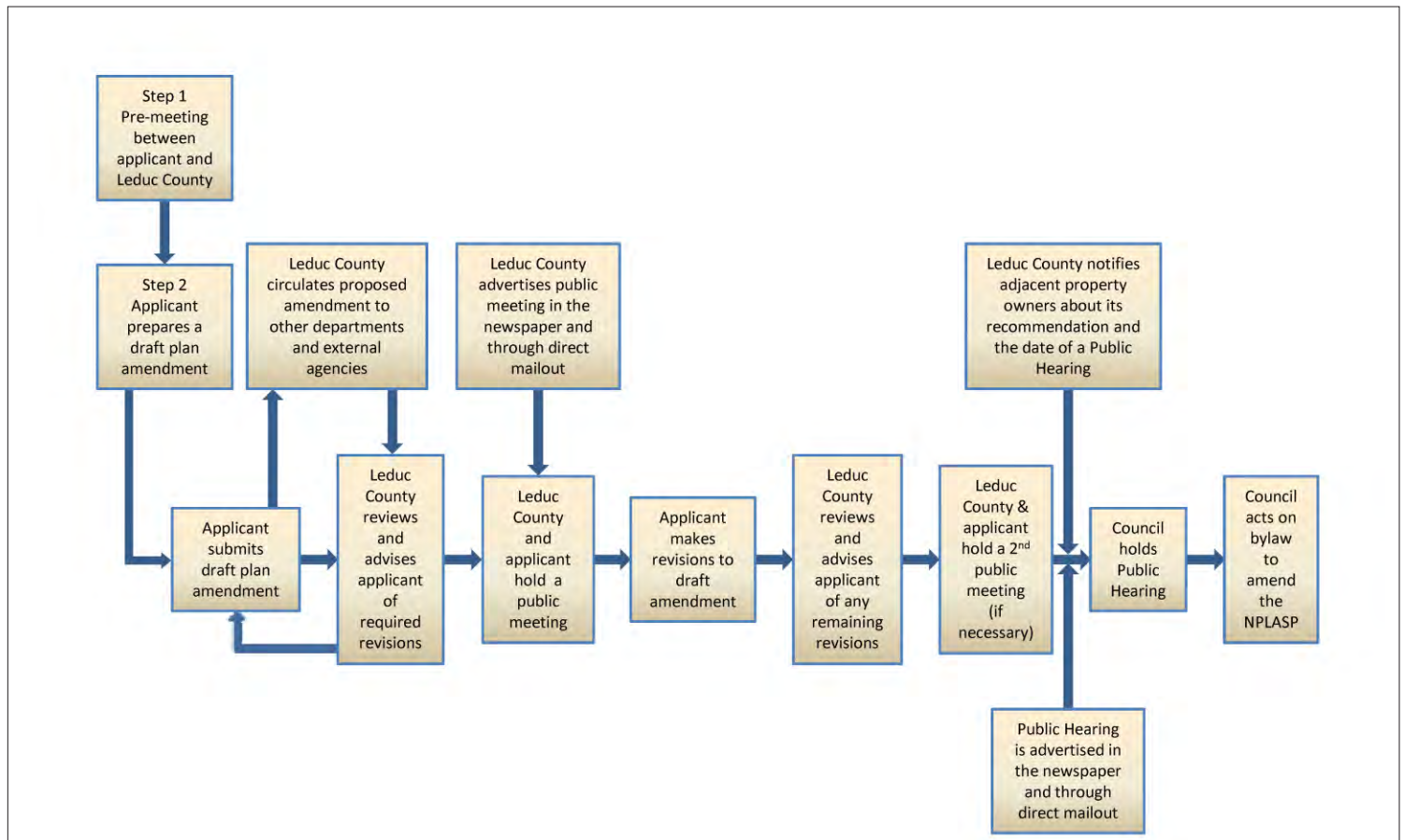
## 11.5 Plan Amendment

Occasionally, an amendment may be proposed to this plan. Amendments to the NPLASP will be subject to the process outlined in the flow diagram below. This begins with a pre-meeting between the applicant and Leduc County Planning and Development. At this meeting, the proposed amendment and the amendment process will be discussed. Following the meeting, Leduc County will notify the applicant in writing of the requirements of the amendment submission. Once the submission is tendered to the County, a review and revision process will begin which may involve several iterations of the submission before a public meeting is scheduled. If the proposed amendment is minor or technical in nature, the amendment may be made without holding a public meeting.

Following the public meeting, a further period of revision will take place, followed by a review by Leduc County administration and a possible second public meeting. Whether a second meeting is required will depend on the nature and extent of changes to the proposed amendment following the first public meeting.

Once all concerns have been addressed to the satisfaction of Leduc County administration and all supporting studies and material have been finalized, a public hearing date will be set and advertised. At the hearing, County administration will make a recommendation to County Council, who will also listen to final public comments, including any made by the applicant. Council will then vote on a bylaw to accept the amendment.

Figure 19: Amendment Process



## 11.6 Local Area Structure Plans

Developers in the Resort Recreation Area will be required to prepare Local Area Structure Plans (LASPs) in support of their proposed developments. The LASPs will establish compliance with the policies laid out in this document, and provide final details of the planning and engineering, land uses, design and servicing arrangements of the development.

An LASP will adhere to all policies in the Capital Region Growth Plan, the Municipal Development Plan, the North Pigeon Lake Area Structure Plan, and the Leduc County Land Use Bylaw. Acceptance and adoption of the LASP will lead to the redistricting of lands in the local plan area. Following this stage of development, applicants may begin the subdivision process.

A Local Area Structure Plan prepared under the North Pigeon Lake Area Structure Plan must, at a minimum, include the following:

- A Phase 1 Environmental Site Assessment on the subject parcels. This study will determine whether a Phase 2 Assessment is required.
- A description of site characteristics, topography, existing infrastructure and buildings, soil conditions and vegetation.
- A hydrogeological assessment identifying water movement characteristics both above and below ground level and including a groundwater contamination risk assessment and identification of the one in 100 year flood flow.
- The location and configuration of proposed land use districts, arterial and collector roads, public utility lots, trails and/or pathways, environmental, school and municipal reserves and open space.
- A description of how development is intended to be sequenced.

- f) A recreation, parks and environmental reserve strategy indicating the location of amenity areas, open spaces and a pathway and trail network linking these areas with other amenity areas, residential areas, commercial areas and adjacent developments. This strategy will include a description of any proposed improvements to the amenity areas.
- g) A landscaping strategy outlining areas which are intended to be formally or informally landscaped, those areas which are targeted for naturalization or reclamation to a natural state, the timing of landscaping, the conceptual look of landscaped and open space areas, the estimated cost of landscaping, and the methods and species proposed to accomplish the landscaping.
- h) A servicing strategy detailing how the proposed development will be serviced. This will include a schedule showing the location and sizing of all water, sewer and storm sewer lines. The strategy will also contain an analysis of any oversizing required to service adjacent lands efficiently. Finally, the strategy will outline interim as well as final servicing arrangements, including any identified development horizons resulting from this exercise.
- i) Streetscape diagrams for all classes of proposed roads, pathways, trails and lanes indicating their relationship to adjacent buildings, the width and placement of sidewalks or paths, configuration of street lighting, location of street trees, any proposed street furniture, boulevard treatments, stormwater management elements, and the location of utilities.
- j) A stormwater management strategy modelled on low impact development principles, strategies and tools. This strategy shall include:
  1. Inventory of existing natural drainage courses, any overland flow routes and other water bodies.
  2. Recommendations on best management practices and low impact development initiatives, an implementation plan and post-development monitoring plan for erosion and sediment control.
  3. Recommendations and an implementation plan to achieve 25 per cent pervious surfaces in developed areas for each lot and for total subdivision area.
  4. Recommendations and an implementation plan for a naturescaping component of a minimum 25 per cent of all required landscaped areas post development.
  5. Recommendation of most appropriate streetscapes, stormwater retention ponds and landscapes to achieve zero net increases in the volume and rate of post development flow off-site.
  6. Recommendations to minimize soil compaction during stripping, grading, servicing and during development.
  7. Post-development maintenance plans, including but not limited to action plans, goals and strategies for monitoring, maintaining and funding stormwater management facilities and structures, best management practices and low impact development initiatives for post-development conditions.
- k) A report and schedule indicating the location and extent of any environmental reserves as determined through the Riparian Setback Matrix Model.
- l) A public engagement strategy outlining how input from the Pigeon Lake community will be integrated into the design and implementation of the Local Area Structure Plan.
- m) A community development strategy indicating how the proposed development will integrate with and enhance the Pigeon Lake community.
- n) A report detailing how and where residents in the plan area will access Pigeon Lake, what improvements may be required outside of the plan area, the timing of these improvements and by what mechanisms they will be paid for.

## 11.7 Subdivision and Development

Applications for subdivisions and/or development permits must meet all Leduc County requirements as set out in the Leduc County Land Use Bylaw and other documents.





## North Pigeon Lake Area Structure Plan – Bylaw Amendments

**LEDUC COUNTY**

[illegible]

**BYLAW NO. 19-11**

**LEDUC COUNTY**

**A BYLAW OF LEDUC COUNTY, IN THE PROVINCE OF ALBERTA, TO AMEND THE NORTH PIGEON LAKE AREA STRUCTURE PLAN BYLAW NO. 19-10.**

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**WHEREAS**

The Council of Leduc County deems it to be in the public interest to amend the Leduc County North Pigeon Lake Area Structure Plan Bylaw No. 19-10;

**NOW THEREFORE**

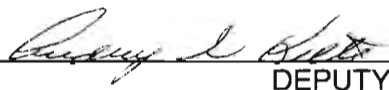
be it resolved that the Council of Leduc County, duly assembled, hereby enacts that Bylaw No. 19-10 be amended as follows:

1. To delete the redundant word "of" from between the words "Reduce" and "the" in Principle 17 of Section 8.0 Planning Principles.
2. To delete the following from Section 9.0 The Concept:
  - Future Resort Recreation Area where development will only begin when the Resort Recreation Area is mostly built and when municipal servicing is available.
3. To delete Policy 9.1.t and renumber the subsequent two policies of Section 9.1.
4. To replace a reference to Section 11.5 Plan Amendment in Policy 9.3.a with a reference to Section 11.6 Local Area Structure Plans.
5. To delete the redundant word "below" in paragraph six of page 50.
6. To reformat the final bullet of Section 10.5 as regular text.
7. To replace a reference to Section 9.9 (which no longer exists) in paragraph six on page 57 with a reference to Section 9.8 Development Potential; to replace the word "population" in the same sentence of that paragraph with the word "development"; to replace the number 2,171 with 3,824.
8. To delete the words "Future Resort Recreation Area" from the following:
  - 1) Policy 9.6.e
  - 2) Policy 9.6.u
  - 3) Policy 10.6.b
  - 4) Section 11.0
  - 5) Section 11.2

This Bylaw shall take effect on the date of the third reading and signing.

Read a first time this 26<sup>th</sup> day of April, AD, 2011.

Read a second time this 26<sup>th</sup> day of April, AD, 2011.

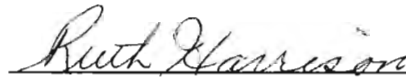
  
DEPUTY MAYOR


  
COUNTY MANAGER

**BYLAW NO. 19-11**

**- 2 -**

Read a third time and finally passed this 3<sup>rd</sup> day of May, AD, 2011.

  
DEPUTY MAYOR

  
COUNTY MANAGER