

# Heart River Watershed Management Plan



## **Prepared for:**

Heart River Watershed Advisory Committee  
Northern Sunrise County, Alberta

## **Written by:**

Nico Wyngaarden, P.Eng.  
Jay S. White, M.Sc., P.Biol.  
Melissa Logan, B.Sc., P.Biol.

June, 2008

## **Acknowledgements**

Preparation of this plan would not have been possible without the partnership and collaboration of Alberta Environment (AENV), the Alberta Stewardship Network, Northern Sunrise County, the Village of Nampa, the MD of Smoky River No. 130, the MD of Big Lakes, the East Peace Water Co-op, Ducks Unlimited Canada, the Frank Lake Naturalists, Alberta Sustainable Resource Development (Public Lands Division), Smoky Applied Research & Demonstration Association (SARDA) and Alberta Environmentally Sustainable Agriculture (AESA). We would like to thank the following for their help: Audrey Gall, Northern Sunrise County; Michelle Petluk, Northern Sunrise County; Michelle Gray and Dr. Markus Thormann, Aquality Environmental Consulting Ltd.

Thank you to the public for their support, comments and attendance at the Heart River Open Houses. Finally, to all others who assisted in any way with the preparation of this plan, our thanks for your assistance.

## Contents

|   |                                     |
|---|-------------------------------------|
| Heart River Watershed Management Plan.....  | 0                                   |
| Acknowledgements.....   | 1                                   |
| Contents .....  | 2                                   |
| <br>  |                                     |
| Executive Summary .....   | 4                                   |
| 1.2 Heart River Watershed Advisory Committee.....   | 6                                   |
| 1.3 Scope of the Watershed Management Plan .....  | 6                                   |
| 1.4 Watershed Management Plan Objectives.....   | 7                                   |
| 1.5 Goals of the Watershed Management Plan .....  | 7                                   |
| 1.6 Timeline and Schedule for Review.....   | <b>Error! Bookmark not defined.</b> |
| 1.7 Information Gaps.....   | 8                                   |
| 1.8 Alignment with Provincial and Regional Strategies and Other Planning Initiatives.....                       | 9                                   |
| 1.9 Public Education and Outreach.....  | 10                                  |
| <br>  |                                     |
| 2.0 Authority .....   | 10                                  |
| <br>  |                                     |
| 3.0 Public Consultation.....  | 11                                  |
| <br>  |                                     |
| 4.0 Site Description.....   | 12                                  |
| 4.1 Heart River Watershed .....   | 12                                  |
| 4.2 Planning Area .....   | 13                                  |
| <br>  |                                     |
| 5.0 Assembled and Available Information .....   | 15                                  |
| 5.1 Hydrology .....   | 15                                  |
| 5.2 Water Quality.....  | 15                                  |
| <br>  |                                     |
| 6.0 Watershed Management Plan Implementation and Accountability.....  | 16                                  |
| <br>  |                                     |
| 7.0 Watershed Issues and Their Resolution.....  | 17                                  |
| 7.1 Quality of the Drinking Water Source .....  | 17                                  |
| 7.2 Riparian Area Health.....   | 18                                  |
| 7.3 Wetland Areas.....  | 20                                  |
| 7.4 Land Use and Storm Water Runoff Quality .....   | 21                                  |
| 7.5 Handling of Private Sewage Systems.....   | 23                                  |
| 7.6 Regulatory Support and Enforcement for Control of Pollutant Loading (Pesticides,<br>Sewage, Nutrients)..... | 24                                  |
| 7.7 First Nations .....   | 25                                  |
| 8.0 Overall Recommendations.....  | 26                                  |
| 9.0 Conclusions .....   | 27                                  |
| 10.0 Glossary of Terms.....   | 28                                  |
| <br>  |                                     |
| Appendix 1 – Heart River Watershed Management Plan Terms of Reference .....                                     | 30                                  |
| Appendix 2 – Alberta Parks, Tourism and Recreation Comments on Protecting Frank Lake .....                      | 30                                  |
| Appendix 3 – Public Feedback to the Heart River Watershed Management Plan .....                                 | 30                                  |



## **Executive Summary**

Northern Sunrise County is facing extensive development pressures from industry and agriculture and the source water quality in the Heart River watershed has suffered as a result. The County is committed to providing a safe, reliable source water supply for the residents in the area and for promoting healthy aquatic ecosystems. On November 01, 2005, the Heart River Watershed Advisory Committee was formed to direct the development and implementation of a watershed management plan for the Heart River Watershed.

The goals of the Watershed Management Plan are as follows:

- A. Improve source water quality in the Heart River watershed.
- B. Improve riparian health, wetland management and overall watershed health.
- C. Increase public awareness and engagement of land stewardship activities.
- D. Incorporation of the Watershed Management Plan recommendations into County and Municipal District planning documents, encourage compliance with guidelines and Best Management Practices, and enforce legislated requirements found in these important documents.

Implementation of this plan and the recommendations contained herein will assist in future land use and management planning decisions within the Heart River watershed and will ultimately help to improve the quality of the source water and the surrounding riparian and wetland environments for all residents.

## 1.0 Introduction

### 1.1 Background

The Heart River is the source of municipal and regional rural water supplies for Northern Sunrise County (County) and the Village of Nampa (Village). The Village provides the water supply, storage and treatment services. The County, through the East Peace Water Co-op, purchases treated water from the Village and distributes it to the regional system. The regional system provides the treated water to the Hamlets of St. Isidore, Marie Reine and Reno, as well as more than 350 other rural users.

Given the extensive development pressures from agriculture and industry within the Heart River watershed, Northern Sunrise County commissioned a study in the fall of 2002 to determine water quality impacts. In 2003, Aquality Environmental Consulting Ltd. (Aquality) sampled and analyzed the water of the Heart River at Nampa to identify any water quality issues. In 2004, the water quality monitoring program was expanded to include the North Heart River, Bearhead Creek, Myrtle Creek and Benjamin Creek. The results showed poor water quality throughout the watershed, with the poorest water quality in the Myrtle Creek sub-basin (White and Logan, 2006). The report recommended that Northern Sunrise County, in collaboration with the Village of Nampa, form a Watershed Advisory Committee to address the water quality issues in the Heart River watershed and that they develop a watershed management plan to address source water quality protection issues.

On November 01, 2005, the Heart River Watershed Advisory Committee (WAC) was formed to direct the development and implementation of a watershed management plan for the Heart River watershed. The WAC includes representatives from Northern Sunrise County, the Village of Nampa, the MD of Smoky River No. 130, the MD of Big Lakes, the East Peace Water Co-op, Ducks Unlimited Canada, the Frank Lake Naturalists, Alberta Sustainable Resource Development (Public Lands Division) and representatives from forestry, agriculture and local watershed residents.

Key regulatory agencies, such as Fisheries and Oceans Canada, Environment Canada, the Alberta Government – Environment, Sustainable Resource Development, Community Development and others, may also play a key role in the development and implementation of the watershed management plan.

A Watershed Management Plan (WMP) is a place-based, comprehensive tool that watershed groups, in collaboration with local municipalities and other entities, can use to achieve their stewardship goals. Government and other resource managers then use an approved WMP as a reference when making decisions that impact water within that watershed. The Government of Alberta has formalized a shared approach to water management planning in their *Framework for Water Management Planning (2001)*. The current planning approach is on a watershed scale and takes an integrated approach to resource based management using watershed boundaries and not jurisdictional boundaries. A watershed approach takes into account the influence of land use activities on water quality and quantity. A Watershed Management Plan is inclusive of all activities that potentially have an impact on the aquatic environment.

Water Management Plans may either be approved by Cabinet, or by a regional director, depending on the needs within the plan. Alberta Environment may approve a WMP if the proponent adequately presents: (a) a summary of the issues considered, (b) a description of the area in which the WMP applies, (c) a summary of the information assembled as part of the planning process, (d) the relationship of the WMP to regional strategies or other planning initiatives (e) the recommended options and strategies to address the issues and (f) a list of performance monitoring requirements.

The first step in the management planning process was the development of a comprehensive Terms of Reference to detail the goals and objectives of the plan. The development of the Terms of Reference was led by the Heart River Watershed Advisory Committee and guided by the *Framework for Water Management Planning* (Alberta Environment, 2001).

In April 2006, the Heart River Watershed Advisory Committee developed a draft Terms of Reference for the Heart River Watershed Management Plan based on the results of the water quality studies. After public comments were incorporated, the draft Terms of Reference were submitted to Alberta Environment and were approved on November 30, 2006. A copy of the approved Terms of Reference is included in Appendix 1.

### ***1.2 Heart River Watershed Advisory Committee***

The objectives of the Heart River Watershed Advisory Committee include:

- To identify water management issues in the Heart River watershed through a public consultation process;
- To develop and implement a Watershed Management Plan for the Heart River watershed;
- To develop alternatives for effective stewardship and management of agricultural lands, particularly within riparian areas, to improve water quality and watershed health;
- To restore altered or drained natural wetlands and protect existing wetlands where practical, through collaboration with landowners;
- To develop alternatives for effective management of sewage and wastewater and agricultural chemicals (pesticides/herbicides) to minimize potential impacts on the quality of the water in the watershed;
- To develop and encourage low impact alternatives for urban and rural housing developments;
- To encourage all stakeholders to manage all land uses, including industrial and resource development, to minimize stormwater runoff and groundwater impacts; and
- To increase public awareness of the linkage between land uses and development practices to water quality and watershed/ecosystem health.

### ***1.3 Scope of the Watershed Management Plan***

The primary scope of the Heart River Watershed Management Plan is to provide all levels of government and other resource managers a tool to maintain and enhance the quality of the source water in the Heart River. The plan will assist regulators to make informed land use and water management decisions, and will provide direction for other resource stewards, including local residents and agricultural producers, to make wise stewardship decisions. The following issues and concerns from the Terms of Reference will be addressed in the plan:

- Land use practices that may affect the quality of the source water in the Heart River;
- Disturbance and/or removal of riparian and wetland areas;
- Wildlife, fish and waterfowl conservation and management;
- Community health; and
- Agricultural, commercial and industrial developments.

### ***1.4 Watershed Management Plan Objectives***

The specific Watershed Management Plan objectives include:

1. Restore aquatic environment and improve source water quality
  - Establish a baseline target for water quality parameters;
  - Identify and restore key riparian areas; and
  - Reduce loading of contaminants such as nutrients, pesticides and fecal bacteria.
  
2. Ensuring Water Sustainability and Reliability
  - Identify water demand and balance with user needs;
  - Heart River water quantity information; and
  - Twenty-five year forecasting.
  
3. Minimize Land Use Impacts on Aquatic Environments
  - Identify and protect significant existing wetland and riparian areas;
  - Identify and develop techniques to restore significant drained wetland and altered riparian areas for protection of water quality, restoration of wildlife and fish habitat, buffers against flooding, filtering of silt and nutrients and other vital ecosystem functions; and
  - Development and implementation of best management practices for land use.

### ***1.5 Goals of the Watershed Management Plan***

The goals of the plan are as follows:

- A safe, sustainable and secure drinking water supply for the local residents and a healthy aquatic ecosystem within the Heart River watershed;
- Improve source water quality in the Heart River through a reduction in nutrient, bacteria and pesticide loadings to the river and its tributaries;
- Improve wildlife and fish habitat and the health of the aquatic environment through improving riparian health and wetland management;
- Increase public awareness and engagement of land stewardship activities by disseminating information regarding the impacts of land use practices on the water quality and wildlife habitat;
- The promotion of best management practices to minimize impacts to water quality and wildlife habitat;
- Incorporation of the plan into County and Municipal Land Use Bylaws, Municipal Development Plans and Inter-Municipal Development Plans and other planning documents; and
- Encourage and enforce compliance with guidelines and best management practices using the legislated requirements found in these planning documents.

### ***1.6 Timeline and Schedule for Review***

---

|                         |  |
|-------------------------|--|
| Winter 2007             | Public consultation and review of draft WMP                  |
| Winter 2007/Spring 2008 | Incorporation of public feedback and finalization of plan    |
| Spring 2008             | Completion of WMP and submittal of plan to AENV for approval |
| 2008                    | Plan implementation and 5-year incremental plan review       |

---

### ***1.7 Information Gaps***

#### Water Quality

The following information gaps were identified regarding water quality:

- Long term baseline water quality monitoring of the Heart River and its tributaries;
- Specific land use practices contributing to the water quality problems;
- The extent of the wetland and riparian areas disturbed and/or removed;
- Drained wetland inventory;
- Historical fish capability;
- Groundwater quality and location of recharge zones;
- Distance to water table in areas of concern; and
- Qualified Aquatic Environment Specialist assessments of major waterbodies to determine current and lost areas of fish habitat and spawning areas.

These information gaps should be addressed throughout the course of the watershed management plan implementation phase.

#### Water Sustainability

The following information gaps were identified regarding water sustainability:

- Lack of hydrometric data, particularly in the Heart River subwatersheds;
- Lack of climatological data within the Heart River watershed;
- A plan specifying how to optimize water availability during water-short periods (a drought-proofing plan); and
- In-stream flow needs for the Heart River.

#### Land Use

The following information gaps were identified regarding land use:

- Extent and health of riparian/wetland areas;
- Drained and existing wetland inventories;
- Mapping of the riparian/wetlands area;
- Funding options available for producers who wish to restore impaired or destroyed wetland or riparian areas; and
- Riparian/wetland landowners and their types of farming operations.

Performance Indicators:

- Nutrient budget and in stream flow needs report for Heart River;
- Drained and existing wetland inventory;
- Disturbed/missing riparian areas inventory;
- No net loss of existing (2007) riparian or wetland areas;
- Development of restoration techniques for disturbed or removed sites;
- Implementation plan for progressive reduction of pollutant loading and restoration of lost/altered wetland and riparian areas;
- Implementation of these restoration techniques;
- Gathering and summary of all missing watershed data; and
- Determination of groundwater interactions and groundwater quality.

### ***1.8 Alignment with Provincial and Regional Strategies and Other Planning Initiatives***

#### **a. Provincial Water Strategy**

Alberta Environment implemented the *Water for Life: Alberta's Strategy for Sustainability*, in 2003, to develop plans to effectively manage the quantity and quality of the Province's water supply and systems. The Strategy outlines three primary objectives: (1) a safe, secure drinking water supply, (2) a healthy aquatic environment, and (3) reliable, quality water supplies for a sustainable economy. The Heart River Watershed Management Plan intends to maintain and enhance the source water quality of the Heart River and, thereby, provide a safe, secure drinking water supply for the Village of Nampa and the East Peace Water Co-op. Restoring, improving or maintaining a healthy aquatic environment, including riparian areas and wetlands is integral to maintaining and enhancing the source water quality in the Heart River.

#### **b. Peace River Watershed Management Plan**

Currently, no initiative is underway to commence either a water management or a watershed management plan for the Peace River watershed. The Heart River Watershed Management Plan will provide direction to any future Peace River water management or watershed management plan. The Heart River Watershed Management Plan should be reviewed as the watershed management planning process is initiated for the Peace River. This document will serve as a reference document for the larger Peace River plan.

#### **c. Frank Lake Important Bird Area (IBA)**

Frank Lake is a small isolated lake surrounded by mixed forests, bogs and black spruce and poplar muskeg located about 20 km southeast of the Village of Nampa. The lake supports over 120 species of birds and is an important staging area for tundra swans and nesting area for trumpeter swans. No policies, guidelines or government regulations are in place to protect Frank Lake and its riparian area.

In the spring of 2001, Barry Himer, a local resident, developed a Conservation Plan for Frank Lake on behalf of the Frank Lake Important Bird Area (IBA) Stakeholders Committee. The goals and objectives of the Conservation Plan include awareness, research and monitoring, and enforcement and regulations to protect Frank Lake and its surrounding habitat area as an Important Bird Area.

Alberta Parks, Tourism and Recreation have provided a protection strategy for Frank Lake, which is included in Appendix 2.

d. Greene Valley Provincial Park Management Plan

Greene Valley Provincial Park is located along the Heart River extending from the Town of Peace River 26 km to just northwest of the Village of Nampa. It was designated a provincial park on June 06, 2000. In the spring of 2006, Alberta Community Development, Parks and Protected Areas released a draft management plan for the Greene Valley Provincial Park for public review. The purpose of the plan is to provide direction for the protection and use of the Park by continuing to protect the valley and its biodiversity while allowing the public to enjoy the natural environment through low impact recreation activities.

e. Integrate Watershed Management Plan with the municipal planning process and future planning documents

- The Heart River Watershed Management Plan follows the approach recommended in, and incorporates initiatives or directions emanating from Alberta Environment's Water For Life Strategy;
- Alignment of the Heart River Watershed Management Plan with the goals and objectives of the Frank Lake IBA Conservation Plan;
- Alignment of the Heart River Watershed Management Plan with the goals and objectives of the management plan for Greene Valley Provincial Park;
- Readily accessible library of watershed related resources available for consultation; and
- Updating of provincial and municipal plans (Municipal Development Plans, Land Use Bylaws, Area Structure Plan) to incorporate the recommendations of this Plan.

### ***1.9 Public Education and Outreach***

It is recommended to develop educational programs aimed at different age groups to maximize the success of such programs.

- Undertake public outreach and education to identify best management practices that promote healthy and functional ecosystems, including rivers, streams, wetlands and riparian areas; and
- Ensure knowledge and compliance with all regulations, guidelines and best management practices regarding management of agricultural lands, manure, sewage, pesticides and runoff.

Performance Indicators:

- Active websites, number of newsletters produced and distributed, number of articles in local newspapers, number of informational sessions and open houses.

## **2.0 Authority**

Federal, provincial and municipal acts and regulations that govern human activities that may impact the source water quality of the Heart River watershed include:

- *Federal Fisheries Act*;
- *Federal Navigable Waters Protection Act*;
- *Water Act (RSA 2000, c. W-3)*;
- *Environmental Protection and Enhancement Act (RSA 2000)*;
- *Forests Act (RSA 2000)*;
- *Public Lands Act (RSA 2000)*;
- *Wildlife Act (RSA 2000)*;
- *Fisheries Act (RSA 2000)*;
- *Provincial Parks Act and Wilderness Areas, Ecological Reserves and Natural Areas Act (ATPRC)*;
- *Safety Codes Act (Municipal Affairs)*
- *Regional Health Authorities Act (Alberta Health)*
- *Provincial Wetland Policy*
- *Municipal Government Act (RSA 2002)*;
- County, Municipal Districts and Village Municipal Development Plans;
- County, Municipal Districts and Village Municipal Land Use Bylaws;
- County, Municipal Districts and Village Municipal Area Structure Plans; and
- Inter-municipal Development Plans.

The authority of these acts and regulations, when properly implemented and enforced, will support the Heart River Watershed Management Plan goals and objectives. Applicable government agencies are responsible for approving and enforcing those provisions of the watershed management plan that fall under their legislated mandate.

### **3.0 Public Consultation**

Public consultation is an integral part of development of a Watershed Management Plan. Consultation helps in identification of local issues and concerns, generating support for the plan, and maintaining a constructive dialogue with stakeholders and residents in the watershed. Broad support from local communities is essential if the plan is to succeed.

Given the results of the 2003 and 2004 water quality monitoring program, the County organized a public workshop on April 07, 2005, to present the details of the water quality report to the watershed residents. The workshop was well attended with more than 120 people present. The public appeared reluctant to consider the possibility that their activities may have a direct impact on the quality of the source water of the Heart River watershed. They felt that improved water treatment facilities would be the solution to the water quality concerns. Therefore, the response to an invitation to serve on a watershed advisory committee was limited.

Consequently, during the summer of 2005, the County co-sponsored an agricultural tour that included riparian area management awareness. Cows and Fish staff attended the tour and demonstrated three sites in varying conditions of riparian health and explained how proper riparian area management can maintain and enhance the water quality in the Heart River watershed. About 40 to 50 producers, including some from the MD of Smoky River No. 130 and the MD of Big Lakes, attended the agricultural tour.

During the summer of 2005, the County scheduled personal meetings with watershed residents and agricultural producers. The purpose of the meetings was to discuss the results of the water quality monitoring program and other issues to create an awareness of riparian area management and to determine interest in and willingness to participate on a Heart River Watershed Advisory Committee. As

the Myrtle Creek sub-basin had the poorest water quality, visiting the landowners there was given priority. Of 16 visits made, 11 landowners were available to meet and eight expressed an interest in participating on a watershed advisory committee.

That same summer, the County prepared and mailed out a Heart River Watershed Newsletter to all the County ratepayers. The newsletter addressed watershed health and functionality, including water quality, nutrient loading and the potentially harmful waterborne organisms *Cryptosporidium*, *Giardia* and *E. coli*, land use practices and their effects on water quality.

To further develop an awareness of riparian area and wetland management, the County held an open house on November 02, 2005. Government departments and environmental agencies exhibited their programs and services available to assist producers in making their operations more environmentally sustainable which would subsequently protect and enhance the aquatic environment, including riparian and wetland areas. Between 20 and 30 people attended this open house.

A web page on the Northern Sunrise County website that included all the available background information for the Heart River watershed, the draft Terms of Reference and a response form. Through mail-outs and CBC radio ("Call of the Land" show), the watershed residents were invited to go to the Heart River Watershed webpage, review the Terms of Reference and submit their comments and concerns using the response form. To ensure everyone had the opportunity to review and comment, copies of the Terms of Reference and response form were mailed out to every watershed resident. Fifteen responses were received, as well as comments from Alberta Environment (Regional Services, Peace River) and Alberta Sustainable Resource Development (Forestry – Peace/Upper Hay Management Area). These comments were incorporated into the final draft version, which was then sent to Alberta Environment and participating partners for approval.

First Nations were initially approached in August 2007 to collaborate in the development and implementation of the Watershed Management Plan. The Duncan First Nation, the Woodland Cree First Nation and the Lubicon Lake Indian Nation were visited and provided with copies of the water quality reports, the approved Terms of Reference and the meeting notes of the three working groups (Land Use, Water Quality and Water Sustainability). They were asked to provide feedback and were invited to join the Watershed Advisory Committee and participate in the development and implementation of the watershed management plan.

Further public education and awareness, including a spring and fall newsletter is planned. The public will also be invited to review and comment on the draft Heart River Watershed Management Plan.

## **4.0 Site Description**

### ***4.1 Heart River Watershed***

The Heart River watershed is located in the boreal plains of northwestern Alberta. As shown in Figure 1, the Heart River is tributary to and drains into the Peace River at the Town of Peace River. The major tributaries to the Heart River are the North Heart River; Bearhead Creek including Benjamin Creek and an unnamed tributary, locally known as Myrtle Creek. The County's Nampa South Drainage Project is a tributary of Myrtle Creek.

The watershed includes extensive muskeg areas, particularly in the upper reaches, natural springs, and numerous lakes and wetlands providing abundant storage capacity to dampen flows. About 313 km<sup>2</sup> of

the watershed (16%) is agricultural (white area) lands and 1,602 km<sup>2</sup> (84%) is Crown (green area) lands. The white area is located primarily in the lower reaches of the watershed.

Municipalities located within the Heart River watershed include the Northern Sunrise County, the MD of Big Lakes, the MD of Smoky River No. 130, the Village of Nampa and, at the confluence with the Peace River, the Town of Peace River. The Duncan First Nation (William McKenzie Indian Reserve No. 151K) has some reserve area located within the Benjamin Creek sub-basin. The watershed also includes some traditional lands of the Woodland Cree First Nation and the Lubicon Lake Indian Nation, as well as the Cadotte Metis Nation Local 1994. There are two major parks located in the watershed; the Greene Valley Provincial Park located at the Town of Peace River and Harmon Valley Park located along the upper reaches of the North Heart River. Frank Lake, located in the upper reaches of Bearhead Creek, is an important staging and nesting area for tundra and trumpeter swans as well as many other waterfowl species.

#### ***4.2 Planning Area***

The planning area is defined by the drainage basin of the Heart River from the confluence with the Peace River, as shown in Figure 1. The watershed is divided into three major sub-basins: the North Heart River, which has a drainage area of about 830 km<sup>2</sup>; Bearhead Creek, which includes Benjamin Creek, and has a drainage area of about 773 km<sup>2</sup> and Myrtle Creek, which includes the Nampa South Drainage Project, and has a drainage area of 201 km<sup>2</sup>. Benjamin Creek has a drainage area of 205 km<sup>2</sup>; and the Nampa South Drainage Project has a drainage area of about 28 km<sup>2</sup>.

The planning area is located almost entirely within Northern Sunrise County; however, the headwaters of the Bearhead Creek are located within the MD of Big Lakes and the headwaters of Myrtle Creek are located within the MD of Smoky River No. 130.

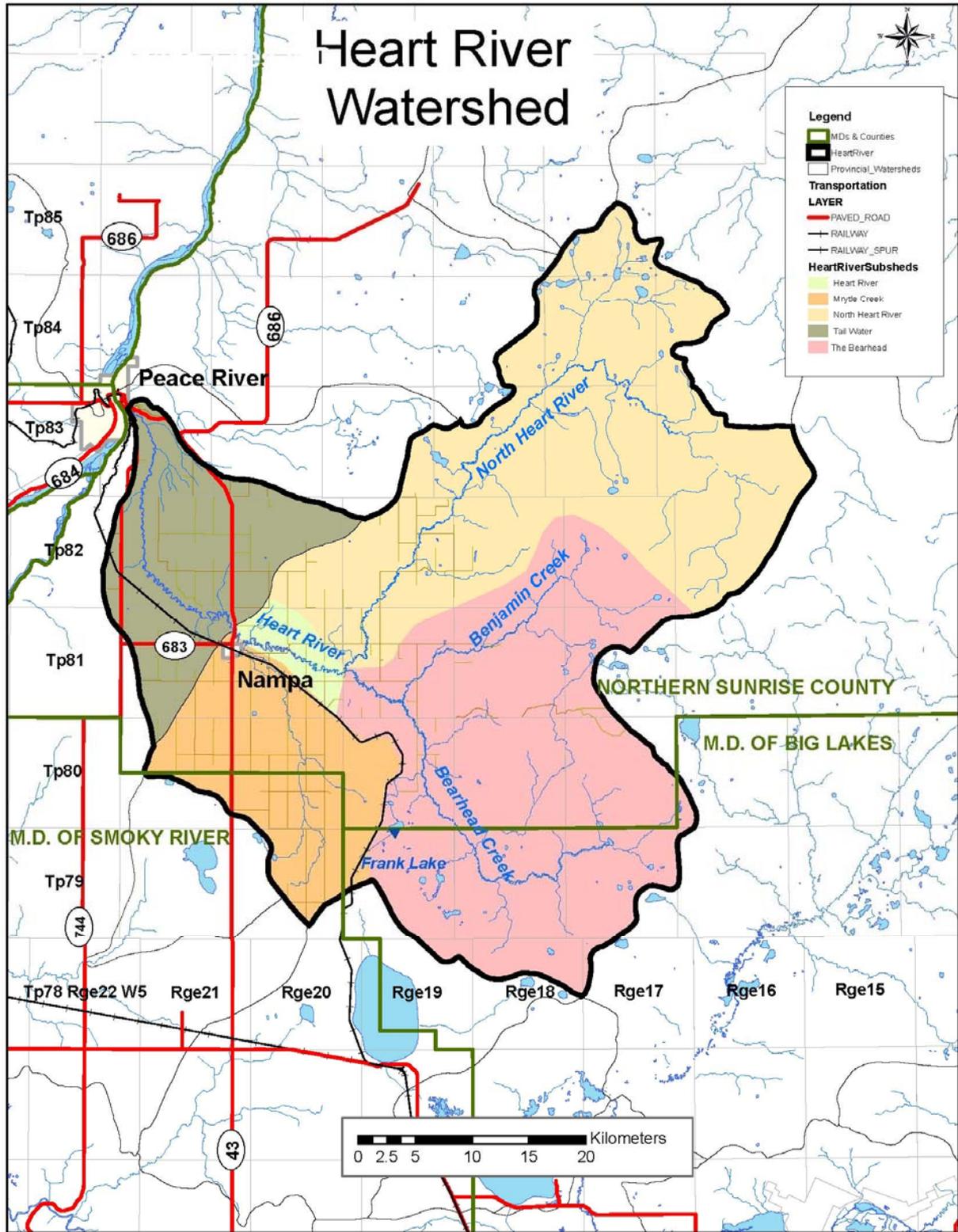


Figure 1: Heart River Watershed and Planning Area (figure provided by PFRA, 2007).

## 5.0 Assembled and Available Information

### 5.1 Hydrology

A number of sources of hydrologic data are available for the Heart River watershed. Environment Canada, Atmospheric Environment Service, has 147 stations in Alberta for which it records and publishes climate data. Alberta Sustainable Resource Development (Forestry) collects annual precipitation data at its fire towers for the fire season (generally from April to October).

The watershed has two hydrometric stations, the Heart River near Nampa, operated by Water Survey of Canada (WSC), which has flow data going back to 1963; and the Nampa (South) Drainage near Nampa, which has been operated by Alberta Environment since 1991. The contributing drainage area to the hydrometric station Heart River near Nampa is estimated to be 1,915 km<sup>2</sup> (NEW Water EnviroSolutions, 2004).

As part of the initial water quality study, a hydrology study was completed to determine what magnitude of rainfall event was required to trigger a runoff event on the Heart River at the WSC hydrometric station, Heart River near Nampa. The study concluded that a rainfall event of 25.4 mm within a 24-hour period would trigger a runoff event, and that the Forestry fire towers Cadotte Lookout and Kimiwan Lookout are the most representative of the Heart River runoff-producing rainfall events.

### 5.2 Water Quality

The water quality monitoring program initiated by the County in the fall of 2002 has continued through 2008, although modified from year to year to address areas of concern as they are discovered. The results of the 2003 and 2004 program showed poor water quality throughout the watershed, with the poorest water quality in the Myrtle Creek sub-basin (White and Logan, 2006). The 2005 water quality monitoring program placed special emphasis on Myrtle Creek and its tributaries, with the results showing that Myrtle Creek had the poorest water quality with the ability to significantly impair the Heart River water quality at the Nampa intake (White and Logan, 2006).

The 2006 water quality monitoring program was expanded to include headwater and tributary regions in the Myrtle Creek and Bearhead Creek subwatersheds in an attempt to identify if there were contributing factors further upstream. The sampling program included microbial source tracking using the parasites *Cryptosporidium* and *Giardia* to pinpoint the sources of fecal contamination to the watershed, an exercise that has not been undertaken in any water quality study in Alberta to date. The microbial source tracking revealed a number of possible sources of fecal contamination including humans, cattle, muskrats, canines and felines. The main species of concern are *C. parvum* (from humans and young cattle) and *C. hominis* (from humans only); these species can cause a severe gastrointestinal illness in humans known as cryptosporidiosis. This illness was responsible for the severe illness and death of many people in Milwaukee, Wisconsin in 1993, and the infection of over 7,000 people in North Battleford, Saskatchewan in 2001. Both of these infectious species of *Cryptosporidium* were found in the parasite samples taken in 2006, indicating human fecal contamination to the surface water.

The water chemistry results showed high nutrient levels, dissolved solids and conductivity during low flow (baseline) conditions, which may indicate possible shallow groundwater contamination. Phosphorus levels are high, and fecal coliform levels were well above the Canadian Council of the Minister of Environment (CCME) Guidelines for Irrigation Uses. This is not surprising considering the proven fecal contamination within the watershed, but poses a serious concern for any producers watering their cattle

from the surface water sources. Myrtle Creek Site E (headwaters) exhibited the poorest water quality with respect to nutrient loadings, indicating a problem (likely with respect to land use) in the southern portion of the watershed.

Pesticides are found consistently throughout the years of the water quality monitoring program and one site demonstrated tremendously high concentrations of glyphosate (Round Up) in 2006, which indicates a spill or extreme overuse. This detection led to a report being filed with Alberta Environment and a subsequent investigation into the matter. Follow-up sampling was completed at the spill site and at a few select sites downstream a couple of weeks after the event, but the results showed no traces of residual glyphosate.

With the 2007 program, a basic water quality monitoring program was developed which focused on the five primary sites of concern within the watershed. Continued annual water quality monitoring of these particular sites is required to assess the effectiveness of the Watershed Management Plan once it is implemented, although additional monitoring locations and/or parameters may be added as deemed necessary. Future studies should include the examination of shallow groundwater in the areas immediately around the sites of concern.

While it is evident that the Myrtle Creek sub-basin has the poorest water quality, its exact effect on the water quality in the Heart River *per se* remains unknown, because the sub-basin forms only a small component of the Heart River Watershed. Other sub-basins, with comparably lower concentrations of pesticides, bacteria, and/or nutrients than the Myrtle Creek sub-basin but contributing a comparably larger portion of the flow in the Heart River, may in fact be more detrimental to the quality of the water of the Heart River at the Nampa intake. These relationship need to be considered when implementing management plans or developing future water quality monitoring initiatives.

## **6.0 Watershed Management Plan Implementation and Accountability**

The success and effectiveness of the Heart River Watershed Management Plan depends on the implementation of the recommendations, the performance of the identified tasks, and the establishment and adherence to an accountability process. For the purposes of this plan, short-term recommendations should be completed within three years of implementation of this plan. The long-term recommendations will likely take more than three years to complete. Implementation of this plan should result in improved coordination and partnership with provincial and municipal governments. Councils, planners and administration from the Northern Sunrise County, the MDs of Big Lakes and Smoky River No. 130, the Village of Nampa and the provincial government must publicly endorse, support and enforce this plan in order to ensure its success.

### **Short Term Recommendations**

- As a recognized Watershed Stewardship Group (WSG) under the Provincial Water Strategy, the Heart River Watershed Advisory Committee should consider registering as a non-profit society in order to pursue additional funding opportunities.
- The Heart River Watershed Advisory Committee should enter into a partnership agreement (or agreements) with provincial, federal and local government agencies and conservation groups to assist with the implementation of the Heart River Watershed Management Plan.
- Ongoing communication and collaboration is required with environmental groups, First Nations, community groups, landowners and agriculture producers to address the issues identified in the plan.
- Finalize an annual action plan budget by November of each year.

### Long Term Recommendations

- The Heart River Watershed Advisory Committee should provide an annual progress report on implementation of the Watershed Management Plan, to the local governments, the public, all stakeholders and AENV.
- A comprehensive review of the plan should be conducted at minimum intervals of five years or as is otherwise deemed appropriate.
- The Heart River Watershed Advisory Committee should participate on any future watershed management planning that may be proposed for the Peace River Watershed under the Provincial Water Strategy.

### Performance Measures

- The Heart River Watershed Advisory Committee is registered as a non-profit society.
- Completion of annual reports and presentation of these reports to the respective governments, stakeholders and AENV.
- Minimum of one public open house per year in order to keep the public aware and involved with the WAC's activities.
- Partnerships and collaboration with other resource agencies.
- Number of completed reviews and revisions of the plan.
- Heart River Watershed Advisory Committee representation on a future Peace River Water Planning and Advisory Council.

## **7.0 Watershed Issues and Their Resolution**

### *7.1 Quality of the Drinking Water Source*

The Heart River is the drinking water source for the Village of Nampa and Northern Sunrise County. The water quality of the Heart River and its tributaries has been monitored since 2003. Several issues have emerged during the course of the monitoring program, including high nutrient levels, pesticide contamination (herbicide and insecticide), and fecal bacterial contamination along with the presence of associated parasites. All of these issues are of concern to the health of the residents of Nampa and Northern Sunrise County who obtain their domestic water supply from the Heart River. Many of the compounds detected, as well as the fecal parasites, cannot be removed using conventional water treatment methods. If source water quality in the watershed cannot be improved through education and best management practices, other options must be considered. The Village of Nampa is participating in a Regional Water Committee, which completed a Regional Water Feasibility Study in May 2006. Phase II of the implementation of this Study would see the decommissioning of the Nampa water treatment plant and the Peace River would replace the Heart River as the drinking water source.

### Short Term Recommendations

- Maintain or enhance the existing water quality monitoring program and establish a baseline for water quality parameters.
- Develop water quality indicators. Water quality improvements will be seen over time as restoration efforts are implemented.
- Groundwater quality testing and determination of groundwater and surface water interactions.

- Complete a loadings study on the major tributaries to the Heart River (North Heart River, Bearhead Creek, Benjamin Creek and Myrtle Creek).

#### Long Term Recommendations

- Continue water quality monitoring program and revise program based on long-term results.
- Switch to the Peace River as the drinking water source, as per the recommendations of the May 2006 Regional Water Feasibility Study.
- Quantify nutrient budget and nutrient loadings for the Heart River.
- Groundwater mapping should be performed in order to determine important discharge and recharge areas. Land use and development decisions could be based around the sensitivity of the groundwater source to contamination.

#### Performance Measures

- Annual surface and groundwater quality testing and reporting to measure parameters such as nutrients, bacteria and other parameters of interest to water quality.
- Decreases in the concentrations of fecal bacteria to below CCME Irrigation Guideline levels.
- Reduction in or elimination of parasite and pesticide detections.
- Reduced nutrient loading by 25% or more.
- Development of water quality indicators.
- Mapping of groundwater recharge and discharge areas and sensitivity to contamination.

#### Enabling Legislation and Policy

- *Water Act* (RSA 2000, c. W-3);
- *Environmental Protection and Enhancement Act* (RSA 2000);
- *Safety Codes Act* (Municipal Affairs); and
- *Regional Health Authorities Act* (Alberta Health).

### **7.2 Riparian Area Health**

Riparian areas are the green strips of vegetation adjacent to all streams, rivers, lakes and wetlands. They form the transition between the watercourse or waterbody and the surrounding terrestrial or upland area. They are created through the interaction of water, soil and vegetation and are some of the most productive and valuable of all landscapes. According to the Alberta Riparian Habitat Management Society (Cows and Fish), 80% of Alberta's wildlife depends in whole or in part on riparian areas to survive.

Healthy riparian areas trap sediment, build and maintain banks, reduce flood damage, store water, recharge groundwater, reduce water flow velocities, filter nutrients and contaminants, increase biodiversity, and provide water treatment, wildlife, waterfowl and fish habitat and other critical environmental functions. Current land use and development practices within the Heart River Watershed have resulted in incremental loss, damage and degradation of the riparian areas and critical wildlife/waterfowl/fish habitat. Only one assessment of the health of the riparian areas within the Heart River watershed has been undertaken; however, that assessment took place in 1981, and a new assessment should be conducted.

### Short Term Recommendations

- Collaborate with Cows and Fish (and other stakeholders) to:
  - initiate a comprehensive riparian health assessment of the Heart River watershed riparian areas with respect to improving watershed health and water quality;
  - establish riparian restoration projects and/or demonstration sites in critical areas within the watershed;
  - develop/enhance a riparian area management module to incorporate into the local school curriculum; and
  - develop and implement a riparian area management public awareness program.
- Require a minimum riparian setback along all watercourses and waterbodies within the Heart River watershed for developments and agricultural activities. Determination of setback distance should be backed by scientific research in order to provide the best riparian health and function possible and to be defensible in a legal setting, if required.

### Long Term Recommendations

- Complete the comprehensive riparian health assessment of the Heart River watershed riparian area, with respect to improving watershed health and water quality.
- Collaborate with local landowners and agricultural producers to remediate and reclaim existing impaired riparian areas.
- Develop and implement a program(s) to compensate landowners/producers for restoring key riparian areas.
- Place Protective Notations with conditions or other designations on critical wildlife/fish habitat areas, including the Frank Lake Important Bird Area.
- Use Conservation Easements on critical Municipal Reserve and Environmental Reserve parcels (for new developments).
- Enact land use bylaws restricting the clearing of vegetation within the riparian areas along all watercourses and waterbodies within the Heart River watershed.
- Enact bylaws prohibiting the operation of quads, snowmobiles and other off-road vehicles within the riparian areas of the Heart River Watershed.

### Performance Measures

- Municipal legislation in place for existing and future developments to protect, maintain and enhance riparian areas and protect critical wildlife/waterfowl/fish habitat within the Heart River watershed.
- Municipal legislation in place to prohibit the operation of quads, snowmobiles and other off-road vehicles within the riparian areas of the Heart River watershed.
- Riparian area restoration demonstration sites in key/critical areas within the watershed.
- Remediation, reclamation and enhancement of existing impaired riparian areas.
- Improvement in riparian health as determined by riparian health assessments.
- Improvement in the Heart River source water quality.
- Development/enhancement of riparian education module in local schools.
- Development and implementation of a public education program regarding riparian areas.
- Development and implementation of tool for scientific determination of riparian setback distances.
- Placement of Protective Notations.
- Increase in fish populations and habitat area.

## Enabling Legislation and Policy

The following legislation and policy should be considered when implementing recommendations for improving riparian area health:

- *Water Act;*
- *Municipal Government Act;*
- *Fisheries Act;*
- *Public Lands Act;*
- *Wildlife Act;*
- *Provincial Parks Act and Wilderness Areas, Ecological Reserves and Natural Areas Act;*
- *Provincial Wetlands Policy;* and
- Municipal land use bylaws, area structure plans and development plans.

## 7.3 Wetland Areas

Like riparian areas, wetland areas are critical components to the health of a watershed. Healthy wetland areas provide source water protection/treatment, flood and drought mitigation, erosion protection, wildlife/waterfowl habitat, recreation opportunities and other vital ecological functions. According to Ducks Unlimited Canada, up to 70% of the wetland areas have been lost in the settled (white) areas of Canada and more is lost with each passing day. The impact of the loss of these wetlands is profound on the contiguous watershed.

Wetlands comprise a significant portion of the Heart River watershed. However, the extent of historic wetland loss in the watershed is unknown. Therefore, a drained wetland inventory, which is an integral component for a complete land use inventory, must be undertaken. With the identification of lost wetlands areas, land managers can implement the required management plans to address the fundamental elements of source water protection and watershed function.

### Short Term Recommendations

- Collaborate with Ducks Unlimited Canada (DUC) and Alberta Environment to initiate a comprehensive wetland inventory, including drained wetlands, of the Heart River watershed.
- Develop a plan with targets for restoration of drained wetlands.
- Collaborate with DUC to establish wetland restoration/enhancement projects and/or demonstration sites in key/critical areas within the watershed.
- Collaborate with DUC and other stakeholders to develop/enhance a wetland ecology module in the local school curriculum.
- Collaborate with DUC and other stakeholders to develop and implement a wetlands public awareness program about the value of wetlands.
- Prevent or fully mitigate further wetland loss through a 'No Net Loss' Policy at all levels of government.

### Long Term Recommendations

- Collaborate with Ducks Unlimited Canada (DUC) and Alberta Environment to complete the comprehensive wetland inventory, including drained wetlands, of the Heart River watershed.
- Collaborate with DUC, local landowners and agricultural producers to restore lost critical wetland areas identified in the drained wetland inventory.

- Develop and implement a program(s) to compensate landowners/producers for restoring key wetland areas.
- Place Protective Notations with conditions or other designations on critical wetland areas, including the Frank Lake Important Bird Area.
- Protect Trumpeter Swan habitat, including Frank Lake, based on the Alberta Sustainable Resource Development, Fish and Wildlife, recommended land use guidelines for the protection of Trumpeter Swan habitat.
- Use Conservation Easements on critical Municipal Reserve and Environmental Reserve parcels for new developments.
- Preserve the surface connectivity between streams and wetlands to maintain the natural erosion protection function and habitat for aquatic biota.

#### Performance Measures

- Some lost critical wetlands reclaimed to functional wetlands.
- Increase in wildlife and waterfowl numbers and habitat areas.
- Completion of a comprehensive wetland inventory, including drained wetlands, of the Heart River watershed.
- Wetland restoration/enhancement projects and demonstration sites in key/critical areas within the watershed.
- The Frank Lake Important Bird Area protected from future developments.
- A public education and awareness program about the value of wetlands.
- Improvement in the Heart River watershed source water quality.

#### Enabling Legislation and Policy

The following legislation and policy should be considered when implementing recommendations for the preservation and restoration of wetlands:

- *Water Act*;
- *Municipal Government Act*;
- *Public Lands Act*;
- *Wildlife Act*;
- *Provincial Parks Act and Wilderness Areas, Ecological Reserves and Natural Areas Act*;
- *Provincial Wetlands Policy*; and
- Municipal land use bylaws, area structure plans and development plans.

### ***7.4 Land Use and Storm Water Runoff Quality***

Land use, particularly in combination with unhealthy riparian area and drained wetlands, is another critical factor to the quality of the source water in the Heart River watershed. Agriculture, whether it is cultivation or intensive livestock operations and its associated practices, private (rural) sewage systems, and urbanization all contribute to the deterioration of the source water quality in the Heart River watershed. Runoff can carry detrimental compounds such as nutrients, organic matter, metals, pesticides, bacteria and salts into surface waters. High runoff volumes typically occur after snowmelt and during high rainfall events.

### Short Term Recommendations

- Develop and implement a defensible system of determining setbacks for any new developments.
- Retain existing wetlands within the watershed and manage them to retain their ecological functionality. Properly functional wetlands treat runoff water before it enters the river, mitigate floods and release water in drought conditions.
- Implement a Land Use Bylaw requiring a stormwater management plan for all new developments.
- Develop and implement a municipal assistance program for landowners/producers to complete and implement Environmental Farm Plans.
- Identify point sources of contamination within the watershed and begin remediation efforts on these sites.
- Collaborate with Ducks Unlimited Canada to encourage landowners/producers to maintain and enhance existing wetlands by developing and implementing backflood projects.
- Develop and implement a public education and awareness program to encourage landowners/producers to implement best management practices, including off-site watering, creek and wetland fencing, and the use and disposal of farm chemicals and their containers etc.

### Long Term Recommendations

- Develop and implement legislation prohibiting the destruction of riparian and wetland areas.
- Develop and implement legislation requiring stormwater management plans, including stormwater treatment, for urban and rural residential areas.
- Make portable off-site watering equipment available to landowners/producers on a trial basis, to encourage them to implement off-site watering for their operations.
- Encourage use of natural and/or constructed wetlands to treat private sewage system effluent and intensive livestock operations sewage effluent.
- Track land cover and land use changes within the watershed.

### Performance Measures

- Reduction in the implementation of new drainage projects.
- Identification and quantification of point sources of pollution within the watershed.
- Reduced number of livestock in key watercourses, riparian areas and wetlands.
- Increase in number of wetlands or no net loss of wetlands.
- Wetlands restored in areas that are critical to preserving water quality in the Heart River.
- Implementation of a public education and awareness program about best management practices.
- Number of successfully implemented Environmental Farm Plans.
- Improvement in the Heart River watershed source water quality.

### Enabling Legislation and Policy

The following legislation and policy should be considered when implementing recommendations for land use and stormwater runoff quality:

- *Water Act (AENV);*
- *Environmental Protection and Enhancement Act (AENV);*

- *Agricultural Operations Practice Act;*
- *Municipal Government Act (AMAH);*
- *Safety Codes Act;*
- *Public Lands Act (ASRD);*
- *Provincial Parks Act and Wilderness Areas, Ecological Reserves and Natural Areas Act (ATPRC);*
- *Provincial Wetlands Policy;* and
- *Municipal land use bylaws, area structure plans and development plans.*

### **7.5 Handling of Private Sewage Systems**

Many residents in the watershed are still using septic tanks, tile systems or other methods of sewage disposal due to the lack of access to a regional system in all areas. It is important to ensure that private sewage systems are functioning properly and are not leaching into groundwater or surface water resources. Leaching of sewage wastes can create a form of biologically available nutrients, which can create public health risks.

Alberta Municipal Affairs regulates private sewage systems. The Private Sewage Disposal Systems Regulation 229/97 adopts the 1999 Alberta Private Sewage Systems Standard of Practice. The Standards set out design standards, installation standards and material requirements for on-site private sewage systems handling less than 25 cubic metres (5,500 Imperial gallons) sewage volume per day.

Municipalities may become designated as an accredited municipality to issue permits for and inspect private sewage systems. Currently, Northern Sunrise County is not accredited and Alberta Municipal Affairs provides those regulatory functions. By obtaining the accreditation, the County may be able to monitor and regulate (future) private sewage systems more closely and minimize the potential for improperly installed and operating systems.

#### **Short Term Recommendations**

- Education and awareness programs and incentives to encourage people to change or improve their septic systems.
- Obtain necessary accreditation for permitting and inspecting private sewage systems.

#### **Long Term Recommendations**

- Develop and implement a defensible system of determining setbacks for any new sewage disposal systems within the watershed or implement/expand a regional system. Distribute this information to all landowners.

#### **Performance Measures**

- County accredited to issue permits for and to inspect private sewage systems
- Substantial decrease or elimination of human fecal parasites and bacteria in the Heart River and its tributaries; and
- Reduction in nutrient loading.

## Enabling Legislation and Policy

The following legislation and policy should be considered when implementing recommendations for land use and stormwater runoff quality:

- *Water Act (AENV);*
- *Environmental Protection and Enhancement Act (AENV);*
- *Agricultural Operations Practice Act;*
- *Regional Health Authorities Act;*
- *Municipal Government Act (AMAH);*
- *Safety Codes Act;*
- *Public Lands Act (ASRD);*
- *Provincial Parks Act and Wilderness Areas, Ecological Reserves and Natural Areas Act (ATPRC);*
- *Provincial Wetlands Policy;* and
- *Municipal land use bylaws, area structure plans and development plans.*

## **7.6 Regulatory Support and Enforcement for Control of Pollutant Loading (Pesticides, Sewage, Nutrients)**

Agriculture is one of the main commercial activities in the watershed. Winter feeding areas for livestock, cattle watering using creeks, manure piles and land spreading and intensive feedlot operations along creeks and slopes that drain into creeks or the Heart River can add significant nutrient loads to the river. There may also be contributions from private septic systems contributing effluent to the river and groundwater. Enforcement of regulations is required to ensure isolation of these sites from watercourses; should contamination occur, there must be accountability and a timely method of remediation.

### Short Term Recommendations

- Implement a “Responsible Owner” program where residents can report spills or other environmental violations on their own property without retribution to a hotline set up by the County.
- Encourage Environmental Farm Planning (EFP) initiatives. Set a target number of EFP’s to be implemented per year in the watershed and provide information for pursuing funding and assistance.

### Long Term Recommendations

- Institute administrative penalties, creative sentencing, fines and mandatory educational seminars for offenders.
- Designate environmentally sensitive areas as environmental reserves or provincially protected areas.
- Meet with local producers (Agriculture Service Board, others) to identify issues and work together towards solutions to reduce agricultural pollutant loadings.
- Increase bylaw enforcement presence and visibility.

### Performance Measures

- Number of calls to hotline reporting environmental concerns or incidents.

- Development and implementation of bylaws.
- Increase in number of County bylaw enforcement officers.
- Development and implementation of an enforcement system and mandatory educational seminars.
- Assignment of environmental reserves and protected lands.
- Improved water quality in the watershed.

### Enabling Legislation and Policy

The following legislation and policy should be considered when implementing recommendations for regulatory support and enforcement:

- *Water Act (AENV);*
- *Environmental Protection and Enhancement Act (AENV);*
- *Agricultural Operations Practice Act;*
- *Fisheries Act;*
- *Regional Health Authorities Act;*
- *Municipal Government Act (AMAH);*
- *Safety Codes Act;*
- *Public Lands Act (ASRD);*
- *Provincial Parks Act and Wilderness Areas, Ecological Reserves and Natural Areas Act (ATPRC);*
- *Provincial Wetlands Policy;* and
- Municipal land use bylaws, area structure plans and development plans.

### **7.7 First Nations and Metis Nations**

First Nations have reserve land and traditional use lands within the Heart River watershed. They include the Lubicon Lake Indian Nation (453), the Woodland Cree First Nation (474) and the Duncan's First Nation (451). First Nations have been approached to collaborate in the development and implementation of the Watershed Management Plan, and discussions are ongoing. The First Nations feel they have limited capacity or technical expertise to participate in the development and implementation of the watershed management plan. Nevertheless, First Nations collaboration and participation in this watershed management plan is critical to its successful completion and implementation.

Only recently was the WAC made aware that the Cadotte Metis Nation Local 1994 also has traditional use lands within the Heart River Watershed. The same initiatives as made with the First Nations have to be made with the Cadotte Metis First Nation.

### Short Term Recommendations

- Continue to provide the First Nations and the Cadotte Metis Nation with regular updates and newsletters regarding the Heart River watershed and the progress with the Watershed Management Plan.
- Continue to invite the First Nations and the Cadotte Metis Nation to participate on the Watershed Advisory Committee, in the development and implementation of the Watershed Management Plan.

- If more formal consultation with the First and Metis Nations is required, collaborate with Alberta Environment and Fisheries and Oceans Canada to develop and implement a strategy. Alberta Environment would take the lead in dealing with First Nations issues.

#### Long Term Recommendations

- Incorporate First Nations and Cadotte Metis Nation land use practices and concerns into the Watershed Management Plan.

#### Performance Measures

- First Nations and Cadotte Metis Nation participation on the Heart River Watershed Advisory Committee.
- First Nations and Cadotte Metis Nation collaboration and participation in the successful completion and implementation of the watershed management plan.
- Incorporation of First Nations and Cadotte Metis Nation land use practices and concerns into the Watershed Management Plan.

## 8.0 Overall Recommendations

To avoid duplication of the information presented above, there are several short- and long-term recommendations that have appeared numerous times in this document. They are:

- Develop a public outreach and education program focused on the communicating the importance of the issues identified in the Heart River Watershed Management Plan. Newsletters, open houses, pamphlets, fact sheets and websites should all be considered. Regular updates on the water quality monitoring program and the implementation phase of the Management Plan should be provided. Some of the key issues to be addressed include land application of fertilizers and pesticides, sewage and manure management, environmental laws and environmental reserve laws, watershed management planning, the Water for Life strategy, wetland and riparian area function and conservation, restoration of damaged riparian and wetland areas, the Provincial Wetland Policy and the scientifically based system of determining appropriate riparian setbacks.
- Continued water quality monitoring within the watershed, particularly of the Heart River and tributaries contributing significant nutrient and bacteria loading to the Heart River.
- Addressing the identified information gaps, including drained and existing wetland inventory and riparian health assessments.
- Development of best management practices for land use and stormwater management.
- Development of an annual action plan and associated budgets.

## 9.0 Conclusions

Throughout this management plan, the recommendation regarding public outreach and education appears in many different sections. This should be the primary focus for the WAC and is essential to the success of this plan. The committee should continue with planning outreach activities and sending out newsletters and other suggested initiatives. These efforts will generate public support for the plan and will greatly assist in the implementation of the recommendations contained herein. This will lead to measurable improvements in the health and functionality of the Heart River watershed.

The County and surrounding municipalities in the watershed planning area should review their existing planning documents and land use bylaws and incorporate the recommendations listed in this Watershed Management Plan. An Inter-Municipal Development Plan between all parties involved should be considered. There are many tools available for protection of critical riparian and wetland areas, including Conservation Easements, Environmental Reserves, Protective Notations, purchasing land or land trades may be utilized to acquire critical habitat lands.

Appropriate enforcement measures will also be a vital component of the implementation of this plan. Individuals choosing to ignore environmental protection tools – such as best management practices, bylaws and guidelines – must be made aware of the importance of changing their perspectives and increasing their awareness of environmental issues in the Heart River watershed. Thoughtful and creative use of the tools recommended in this plan can bring about a marked improvement in the source water quality in the Heart River and in the general overall ecological health and functionality of the entire watershed.

## 10.0 Glossary of Terms

**Buffer** – A vegetation strip maintained along a stream or lake to mitigate the impacts of actions on adjacent lands.

**Riparian Area** – Of, pertaining to, situated or dwelling on the margin of a river or other waterbody. Also applies to areas adjacent to water bodies where sufficient soil moisture from the waterbody supports the growth of moisture-loving vegetation.

**Riparian Vegetation** – Vegetation growing on or near the banks of a stream or other water body that is more dependent on water than vegetation that is found further away.

**Runoff** – Natural drainage of water away from an area. Precipitation that flows overland before entering a defined stream channel.

**Water Bodies** – Locations where water flows or is present year round or intermittently. They include lakes, wetlands, creeks and sloughs.

**Wetland** – An area of land that shows a presence of shallow water or flooded soils (or saturated) for part of the growing season, has organisms adapted to this wet environment, and has soil indicators of this flooding, such as hydric soils.

## 11.0 Literature Cited

Alberta Riparian Habitat Management Association. 2007. Online at:  
<http://www.cowsandfish.org/riparian.html>

Greene Valley Provincial Park Draft Management Plan; Parks and Protected Areas, Alberta Community Development; 2006.

Northern Sunrise County Heart River Water Quality Hydrology Study, NEW Water EnviroSolutions & Associates Inc.; January 2004.

Stormwater Manager's Resource Center. Center for Watershed Protection, United States Environmental Protection Agency. Online at: [www.stormwatercenter.net](http://www.stormwatercenter.net)

White, J.S., M. Logan. 2006. Heart River Water Quality Report 2005. Report prepared for Northern Sunrise County. Aquality Environmental Consulting Ltd., Edmonton, Alberta.

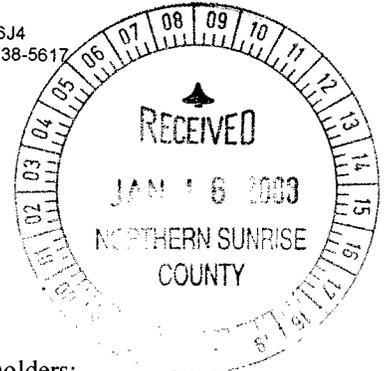
**Appendix 1**  
**Heart River Watershed Management Plan**  
**Approved Terms of Reference**

**Appendix 2**  
**Alberta Tourism, Parks and Recreation Comments on Protecting**  
**Frank Lake**

Harry Krawchuk - Chair  
Heart River Watershed Advisory Committee

c/o Northern Sunrise County

Bag 1300,  
Peace River, Alberta T8S 1Y9



Dear Mr. Krawchuk, Heart River Watershed Advisory Committee Members and Stakeholders;

Thank for the opportunity to review and comment on the Draft Heart River Watershed Management Plan dated November 27, 2007.

Alberta Tourism, Parks, Recreation and Culture commend the Heart River Watershed Advisory Committee, Northern Sunrise County, the Village of Nampa, other stakeholders and watershed residents on this vitally important watershed conservation initiative. A healthy functioning and sustainable Heart River is crucial to the viability and integrity of Greene Valley Provincial Park downstream of Nampa, Alberta centred on the Heart River. The Heart River Watershed Advisory Committee is recognized as a leader in watershed planning in the Peace River watershed.

Alberta TPRC - Parks and Protected Areas fully support the goals and objectives of the Heart River Watershed Management Plan, including:

- maintaining healthy functioning aquatic and riparian ecosystems within the entire watershed
- taking steps to enhance water quality, retain riparian buffers and restore wetlands to help trap nutrients and sediments which impair aquatic ecosystems and riparian habitats
- improving fish and wildlife habitats (arctic grayling were known to occur upstream in the Harmon Valley area on the Heart River)
- funding initiatives to restore and enhance wetlands, stream and riparian areas
- adoption of Best Management Practices for agricultural, commercial and industrial uses within the watershed including storm water management
- public education and awareness of watershed issues and how they relate to current, future and downstream residents
- promoting stewardship of land and natural resources and the retention of natural features, landscapes and Biodiversity
- adoption of land use bylaws which protect watershed values
- consultation with First Nations

Alberta TPRC – Parks and Protected Areas congratulate the Heart River Watershed Advisory Committee on their excellent work and on successful development of the Heart River Watershed Management Plan thus far and support the goals and recommendations proposed.

Sincerely,

Ken Zurfluh  
Northwest Area Manager

cc. Ray Gibson - District Team Leader  
Peace River District Office TPRC

## **Appendix 3**

# **Public Feedback to the Heart River Watershed Management Plan**

The following feedback was received in response to the Heart River Water Management Plan. These comments were edited for grammar and punctuation, but not for content.

Feedback 1:

The plan has good theory but gaining the cooperation of all stakeholders is going to be very difficult and may require the use of a baseball.

Feedback 2:

I found the presentation Mar. 26/'08 interesting in two ways. One, for the info presented and two, that Northern Sunrise County is in conflict to the WAC protocol in that they pour salt all over county roads all winter so it can enter our water systems in spring runoff. They also have a water and sewer project right behind the county office and yard, and adjacent the fish bearing Cecil Thompson Park that is in contradiction of the county's own setback rules let alone any other governing parties. The county seems to operate on do as we say not as we do system. I have trouble supporting an organization who is issuing rules and pointing the finger but fail to address where the other three fingers are pointing. [signed, but name withheld by authors of this report]

Feedback 3:

The Heart River is in sore need of some attention and really could be a jewel instead of a long narrow cesspool. It is my belief that before any meaningful progress can be made to repair this waterway very strong regulations (with teeth) must be put into place. I don't think that a simple education program will be enough to accomplish what needs to be done.