



# North Saskatchewan Watershed Alliance



## INTEGRATED WATERSHED MANAGEMENT PLAN FOR THE NORTH SASKATCHEWAN RIVER WATERSHED IN ALBERTA

### TERMS OF REFERENCE



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## 1.0 INTRODUCTION

This document presents the Terms of Reference (TOR) for the North Saskatchewan River Watershed Integrated Watershed Management Plan (IWMP). While the *Framework for Water Management Planning* (AENV no date) provides broad guidelines for the planning process, these TOR are intended to deal with more specific details related to the preparation of the IWMP.

The *Framework for Water Management Planning* outlines that, at a minimum, the TOR include:

- An overview of current conditions and an initial description of issues (Section 2);
- A geographic description of the planning area (Section 2);
- The intended objectives of the planning process (Section 4);
- The roles, responsibilities and accountability of those who will be involved (Section 4);
- The potential linkages with Regional Strategies (Section 4);
- The proposed public consultation process (Sections 4 and 5);
- A work plan (Section 5);
- Information requirements (Section 5); and
- A proposed schedule for the planning process (Section 5).

In addition to these components, a review of the policy and legislative context will also be provided (Section 3).

The North Saskatchewan Watershed Alliance (NSWA) will oversee and guide the preparation of the IWMP. The goal of the IWMP is to provide a plan that will guide the protection, the maintenance and restoration of the North Saskatchewan watershed that balances environmental, social and economic needs particular to each of the sub-watershed regions and that follows the *Framework for Water Management Planning* (AENV no date).

Through submission of this Terms of Reference to the Director(s) for authorization, a required step, a decision is made on the intended outcome of the planning process. The Director(s) will decide whether it is appropriate to proceed with a Water Management Plan, or an Approved Water Management Plan and whether they shall contain Water Conservation Objectives, or other tools under the *Water Act*. Also, other matters and factors deemed relevant by the Director(s) may be added to the Terms of Reference, and therefore be contained in the plan, at this time.

The key difference between a Water Management Plan and an Approved Water Management Plan is as follows. A Water Management Plan *should* be considered by AENV when making day-to day decisions concerning the physical area that the plan covers. An Approved Water Management Plan requires approval by the Lieutenant Governor in Council, or by the Minister if authorized by the Lieutenant Governor in Council and it *must* be considered when making licencing and approval decisions.



It is the desire of NSWA to have a comprehensive integrated watershed management plan that ideally would be expressed in an Approved Water Management Plan, but most of the NSWA objectives could be met in a Water Management Plan.

The objectives of the IWMP are to:

1. Allow development of strategies that sustain our drinking water, aquatic ecosystems, and economies for future generations.
2. Identify land use practices that could positively or negatively impact water resources and develop strategies to reduce negative impacts.
3. Identify critical gaps in watershed knowledge and identify agencies or programs that will address these gaps.
4. Be prepared in consultation with watershed stakeholders and the public so that the plan meets economic, social, health and environmental needs.

This Terms of Reference is organized as follows. Section 2 provides background information compiled to date by the NSWA including current conditions and key issues derived from the *State of the North Saskatchewan Watershed Report (Aquality et al., 2005)*. Section 3.0 provides a summary of the relevant policies and legislation that affect the IWMP process. Section 4.0 broadly outlines the goals, objectives and approach to the planning process. The consultation approach and the roles/responsibilities of those involved are also included. Finally, Section 5.0 gives details of each phase of the planning process including purpose, objectives, and key activities.

## 1.1 HISTORY OF NSWA

The NSWA was initiated in 1997 by EPCOR and Trout Unlimited Canada (TUC) with their funding partners Prairie Farm Rehabilitation Administration (PFRA); TransAlta; and the City of Edmonton Drainage Services Planning Branch and others. The NSWA provides a forum for sharing information and experience about issues affecting the North Saskatchewan River watershed in Alberta, and supports and initiates activities that positively impact the watershed. The NSWA is a grass-roots organization comprised of approximately 170 (as of September 2004) stakeholders resident or with interest in the North Saskatchewan watershed in Alberta including organizations representing municipalities, aboriginal communities, industry, environment and conservation, agriculture, recreation, culture, federal and provincial governments, tourism, education and research groups and individual citizens (Member List in Appendix A).



## **2.0 BACKGROUND INFORMATION**

### **2.1 PLANNING AREA AND WATERSHED CHARACTERISTICS**

The North Saskatchewan River watershed occupies a portion of central Alberta extending from the Rocky Mountains on the west across the Alberta plains and parkland and into Saskatchewan east to the confluence with the South Saskatchewan River. The total drainage area of the North Saskatchewan River watershed within Alberta (Figure 1) is about 80 000 km<sup>2</sup> or approximately 12.5 percent of Alberta's total land area. The headwaters are located in the icefields of Banff and Jasper National Parks and the river flows in an easterly direction to the Alberta-Saskatchewan border. The watershed is part of the Nelson River basin, which drains into the Hudson Bay. The NSWA has divided the North Saskatchewan watershed into 18 "sub-watersheds" based on first order tributaries including: the Clearwater River, Ram River, Cline River, Brazeau River, Modeste Creek, Strawberry Creek, Sturgeon River, Vermilion River, Beaverhill Creek, Monnery Creek, Frog Lake, White Earth Creek and the Blackfoot Creek watersheds.

The North Saskatchewan watershed is a source of water for rural and urban domestic and municipal users, agriculture, forestry, the oil and gas industry, fishing, recreation and tourism. The watershed includes parts of five major Natural Regions or Ecological Land Classifications and supports recreational, aesthetic, culture and heritage values. There are two dams on the North Saskatchewan River: the Brazeau and Big Horn dams. The Big Horn Dam creates Lake Abraham. The Brazeau Dam creates the Brazeau Reservoir, located on the Brazeau River. The mean annual discharge from the watershed in Alberta into Saskatchewan is over seven billion m<sup>3</sup> (Alberta Environment website, accessed August 2004). The study area for development of this plan will extend from the headwaters in the west to the Alberta-Saskatchewan border. A detailed review of the 18 sub-watersheds is provided in the *State of the North Saskatchewan Watershed Report* (Aquality et. al, 2005).





## **2.2.1 Land Use and Cover**

Major development trends in the watershed reflect changes in land use patterns, such as forested lands converted to agriculture and agricultural lands lost to urban sprawl. These land use changes and subsequent land management practices will impact both the quantity and quality of water within the both the urbanized and rural North Saskatchewan watershed. Land cover including riparian areas, wetlands and those types included in the PFRA land cover inventory, and land uses such as agriculture (through livestock densities) and linear development are summarized in this section.

The IWMP will need to be cognizant of the different planning and implementation processes employed to make management improvements on both public and private lands.

### **2.2.1.1 Riparian Health**

Riparian areas are the important transition zone between uplands and surface water bodies. These areas perform several critical watershed functions and benefits such as trap sediments and filter nutrients and pollutants, provide fish and wildlife habitat, aid in erosion control, provide forage and hay production, improve water quality and store and slowly release water. Riparian areas in Alberta make up only 4% of the province's total area, but approximately 80% of fish and wildlife species depend on riparian areas for reproduction, food and cover (Cows and Fish, 2004).

There have been no comprehensive assessments done for riparian habitat in any sub-watershed within the North Saskatchewan watershed; although small-scale assessments have been done in several lakes, streams and creeks. To gain a better understanding of the impact that linear developments and agriculture and municipal land uses may have on a sub-watershed, comprehensive assessments of riparian health are needed.

Cows and Fish have completed riparian health assessments on 1,085 sites in Alberta including sites in the North Saskatchewan River watershed. Of all the riparian areas assessed in Alberta, 18% are considered "healthy," 52% considered "healthy but at risk," and 30% considered "unhealthy." Cows and Fish conduct riparian health assessments at the request of a community, watershed organization or individual and these sites are not randomly chosen.

Industrial use of riparian areas is managed by provincially set guidelines. Guidelines for industrial use are provided to prevent "silt and sediment from affecting fish spawning activities, recreate lost fish habitat and rebuild embankments to prevent erosion. Vegetation cover should also be restored and protected from grazing until it's established" (Alberta Sustainable Resource Development Fact Sheet, 2004). Forestry practices to protect riparian areas are specified in the *Alberta Timber Harvest Planning and Operating Ground Rules* (1994). This document specifies management practices for forestry harvest planning, operating and facility development within watersheds and specifies set-backs from streams and waterbodies depending on their classification (Alberta Environmental Protection, 1994).



### **2.2.1.2 Linear Development**

Quantifying linear development may identify areas where potential changes in water quality and fish and wildlife populations might result from resource extraction practices that involve roadway, trail, seismic and other linear development. For example, wildlife corridors can be altered by roads and watersheds can have their drainage patterns and water quality altered by increases in compacted surfaces.

The least amount of linear development occurs in the headwater sub-watersheds of the Cline (0.1%), Brazeau (1.4%) and the Ram (1.6%). There is also relatively little linear disturbance in the Sounding sub-watershed (1.0%).

The greatest amount of linear development occurs in some of the foothills sub-watersheds. Four percent of the area of the Strawberry sub-watershed has been affected by linear developments and 3.5% of the Modeste sub-watershed.

The type of disturbance varies among the sub-watersheds. In the Brazeau and Sounding sub-watersheds the majority of the disturbance is due to cutlines and roadways. In the Cline and Sounding sub-watersheds, the majority of the disturbance is due to roads. In the Modeste and Strawberry sub-watersheds, sub-watersheds with the greatest amount of linear disturbance, pipelines and roads account for most of the disturbance. The Capital region is within the Sturgeon, Strawberry and Beaverhill sub-watersheds and has a large concentration of linear disturbance associated with urban development.

### 2.2.1.3 Land Cover Inventory

The land cover inventory information is based on the PFRA Land Classification as well as information related to forest management agreements and protected areas. As one progresses from west to east, more land is in agricultural land uses and less in forests. Table 1 shows the percentage within each sub-watershed of each of the land cover inventory types.

**Table 1: Proportion of Land Cover Inventory Types in North Saskatchewan River Sub- watersheds**

Sub-watershed	Total Hectares	Grassland (%)	Cropland (%)	Forage (%)	Well sites, urban development and reserve lands (%)	Trees (%)	Other Lands (%)
Brazeau *	689,198	1	>1	>1	>1	88	10
Cline	Not assessed				>1		
Ram*	197,064	6		8	2	1	>1
Clearwater*	90,567	10	>1	30		60	>1
Modeste*	445,340	24	1	43		21	2
Sturgeon	331,761	22	31	25	68	11	4
Strawberry	299,662	10	23	54	15	3	8
Big Stone	727,142	21	31	37		3	>1
White Earth	649,481	28	38	11		20	
Beaverhill	440,544	24	27	10		20	7
Paintearth*	455,110	56	39	6		>1	>1
Vermillion	782,642	46	51	>1		>1	>1
Frog	562,619	41	28	28	12	18	>1
Iron	556,001	50	44	4		31	>1
Sounding	1,096,608	62	31	4		>1	>1
Ribstone	374,156	64	29	2		1	>1
Blackfoot	434,140	55	41	2		>1	>1
Monnery	125,049	44	37	>1		11	2

Source: PFRA (2003).

\*Based on less than 100% of the watershed area:

- Brazeau: 15%
- Clearwater: 28%
- Modeste: 92%
- Paintearth: 96%
- Ram: 31%

Grasslands mainly cover several sub-watersheds but most notably in Paintearth, 55% of the land area; Blackfoot, 55%; Sounding, 61% and Ribstone, 65%. Cropland covers more than half of the land area of the following sub-watersheds: Vermillion, 51%; and almost half in the Iron, 44%, and Blackfoot, 41%. In the central part of the North Saskatchewan watershed, forage is more dominant with 54% of Strawberry sub-watershed being in forage, 43% of the Modeste sub-watershed and 37% of the Bigstone sub-watershed.



In addition to the linear disturbances noted above, the sub-watersheds with the most disturbance in the form of well sites and other facilities, urban development and Indian Reserve lands (as classified by PFRA) are the Sturgeon sub-watershed, 68%; which is affected mainly by urban development in and around Edmonton; the Strawberry sub-watershed, 15%, and the Frog sub-watershed, 12.3%. The sub-watersheds with the least amount of land disturbance are the Cline, no disturbance noted; Brazeau, 0.2%; and the Ram, 2.3%.

#### **2.2.1.4 Livestock Density**

Areas of higher livestock density within a subwatershed can have greater impacts on downstream aquatic systems. Results from a recent study by Alberta Environment show that streams that drain land farmed with high intensity have higher nutrient concentrations, dissolved nutrients, mass loads, fecal bacteria and total dissolved phosphorus than streams that drain land farmed at medium or low intensity (Anderson *et al.*, 1998). Alberta Agriculture Food and Rural Development studies have shown that surface water in watersheds with high agricultural activities are more susceptible to enrichment from phosphorus and contamination from pesticides and fecal coliforms (CAESA, 1998).

Manure production was used as a surrogate for livestock density. Manure production information was available only on the basis of soil polygons. These polygons provide only a rough estimate of manure production in a sub-watershed area.

Based on the available information, livestock densities were greatest in the Bigstone, Beaverhill and Sturgeon sub-watersheds and least in the Cline, Ram and Brazeau sub-watersheds.

#### **2.2.1.5 Wetland Inventory**

Wetlands serve many important functions in the natural landscape including water storage, flood attenuation, evaporation, provision of habitat for wildlife, groundwater recharge and general water quality improvement. The loss of wetlands to development can have negative impacts on water quantity and quality to downstream users. Healthy riparian areas and wetlands store water for later release into the environment.

The most complete information on wetlands is that provided by Ducks Unlimited Canada. Based on that information, the sub-watersheds with the largest percentage of the land area covered in wetlands are Strawberry, 23.5%; Ribstone, 12.9%; Sounding, 8.5%; and Beaverhill, 8.5%.



## 2.2.2 Water Quality

Changes in water quality may indicate a deterioration of or improvement in, the state of the watershed and indicate areas that may require further attention. Changes in water quality may be brought about by changes in land use or land management practices, landscape disturbance, and natural events. The major impacts on water quality result from logging, mining, wetland drainage, dredging, dam construction, urbanization, agricultural runoff, industrial wastes, municipal wastes and run-off, land erosion, road construction and land development. Mitigation of significant deleterious impacts is possible with increased attention to and adoption of beneficial management practices, respecting seasonal variations and influences over time. Beneficial management practices focus on controlling run-off, preventing bare ground and optimizing inputs for sustainable use.

### 2.2.2.1 Alberta Surface Water Quality Index

The Alberta Surface Water Quality Index was developed to mathematically combine a number of variables into one easily understood rating system. The Alberta Surface Water Quality Index currently in use in Alberta is gaining nation-wide acceptance. The Index summarizes chemical, biological, and physical data into a simple composite descriptor of water quality. Results can be used to compare water quality conditions at multiple locations and over time at a particular location. The Index is not meant to replace the conventional scientific process of analyzing and interpreting water quality data, but does provide a simple "snap-shot" of yearly water quality conditions in various areas of the province.

Data on the Surface Water Quality Index (SWQI) calculated at sites on the North Saskatchewan River, was available for two sub-watersheds, the Strawberry – calculated at Devon upstream of Edmonton – and the Beaverhill – calculated at the Pakan Bridge downstream of Edmonton. The index shows the impact of inputs to the river from the Capital Region including residential, industrial and wastewater effects.

In general, water quality for metals was rated as “excellent” to “good” at Devon and “excellent” to “fair” at Pakan. For nutrients, the index was “good” to “fair” at Devon and “fair” at Pakan. For bacteria, the index was “excellent” to “good” at Devon and “good” to “poor” at Pakan. The index for pesticides was “excellent” to “good” at Devon and “good” to “fair” at Pakan. The impact of the Capital Region’s population, wastewater, stormwater, development and land practices all contribute to the degradation of water quality seen downstream of Edmonton.

### 2.2.2.2 Escherichia coli (*E. coli*)

*E.coli* is one of three bacteria commonly used to measure the direct contamination of water by human or other mammal wastes. These are a group of bacteria associated with the feces of warm-blooded animals. Environmental quality guidelines exist for *E.coli* in drinking, agricultural and recreational water and for aesthetic purposes.



Little information was found for *E. coli* counts in the watershed. The Tomahawk Creek (in an area of moderate agricultural intensity) in the Modeste sub-watershed was found to have very high coliform counts (CAESA, 1998). This result was typical of other moderate intensity agricultural sites. It is not known why moderate agricultural intensity streams have higher fecal coliform counts than high agricultural intensity streams. The North Saskatchewan River downstream of Edmonton also has elevated fecal coliform counts, the result of treated wastewater and untreated stormwater runoff inputs (Alberta Environment, 2004b). Coliform counts have been reduced since the addition of UV treatment at the Gold Bar Wastewater Treatment Plant (City of Edmonton, 2003).

### **2.2.2.3 *Cryptosporidium* spp. and *Giardia* spp.**

The pathogenic protozoa *Cryptosporidium* spp. are ubiquitous in the North Saskatchewan River watershed waters and are of particular concern to human and livestock health due to their resistance to environmental stresses and water treatment processes (Cooke *et al.*, 2002). The latter is evidenced by the *Cryptosporidium parvum* outbreak in North Battleford, Saskatchewan, in April 2001, a downstream North Saskatchewan River water user.

A study conducted by Cooke, *et al.* (2002) addressed the relationship between beef production and waterborne parasites (*Cryptosporidium* spp. and *Giardia* spp.) in the portion of the North Saskatchewan River watershed from Rocky Mountain House to Edmonton. The study found that these parasites are ubiquitous in this portion of the watershed and are found in feces of livestock and wildlife as well as in raw municipal sewage. Based on the relatively high prevalence and concentration of cryptosporidium and giardia in livestock feces; the higher concentrations and loads of parasites in agricultural streams compared with non-agricultural streams; and the correlations between numbers of parasites in streams and livestock land-use factors, it appears that livestock (including beef and dairy cattle, ranched elk and bison) are a major source of parasites to the river. The study also found that areas of the watershed with high run-off potential contributed more of these parasites than areas of lower run-off potential and that livestock are a major source of protozoan parasites to the river (Cooke *et al.*, 2002). Due to the lack of data regularly collected in other areas of the watershed on these parasites, these were not chosen as indicators of watershed health for the *State of the North Saskatchewan Watershed Report*.

### **2.2.2.4 Phosphorus**

Phosphorus concentrations can have a significant impact on water quality. Phosphorus is a nutrient required for the growth and development of animals and plants. In aquatic systems, phosphorus is typically the limiting nutrient and when added into aquatic systems, typically enriches productivity. Changing conditions including increased macrophyte (aquatic vegetation) growth, algal blooms, decreasing water clarity and fish kills may result from excessive phosphorus inputs to aquatic systems. Environmental quality guidelines exist for phosphorus to protect aquatic life, recreation and livestock drinking water.



Data on phosphorus concentrations were found for several lakes but only for a few rivers, streams and creeks in the North Saskatchewan watershed. High phosphorus concentrations are a problem at several lakes within the North Saskatchewan watershed (Alberta Lake Management Society, 2004). Work by Alberta Agriculture Food and Rural Development on a few specific streams continues to demonstrate the link between intensity of agriculture and phosphorus concentrations in Alberta streams in agricultural watersheds (Anderson et. al., 1998, Anderson, 1998; Anderson, 2000; Carle, 2001; Donahue, 2001; Depoe and Westbrook, 2003). In addition, streams with higher agricultural intensity increased peak, median and flow weighted mean phosphorus concentrations, and had higher frequencies and degree of non-compliance with phosphorus guidelines. In the Strawberry sub-watershed and downstream, Edmonton storm water is a major source of phosphorus and other nutrients into the North Saskatchewan River.

### **2.2.2.5 Pesticides**

Pesticides are a group of chemicals including herbicides, insecticides, rodenticides and fungicides. These are used for many purposes including pest control and aesthetics in urban areas, golf courses, in forestry and agricultural production and rural roadside vegetation control. A common contaminant of streams and dugouts in high intensity agricultural areas of Alberta are pesticides (CAESA, 1998). Pesticides can be linked to land use, land use activities and land management.

Data on pesticides were available for two sub-watersheds; the Strawberry – measured in the North Saskatchewan River at Devon upstream of Edmonton – and the Beaverhill – measured at the Pakan Bridge on the North Saskatchewan River downstream of Edmonton. The Surface Water Quality Index for pesticides was “excellent” to “good” at Devon and “good” to “fair” at Pakan.

### **2.2.3 Water Quantity**

Water quantity is important for the maintenance of stream flows including: requirements for aquatic habitat; functions related to water quality; and is essential for the treatment and provision of drinking water. Irrigation, industry, livestock and crop production are all highly dependent on water. Water quantity is necessary for many recreational activities, and the public is quick to react in the absence of expected quantities of water in the environment and for their personal use.

### 2.2.3.1 Surface Water Allocation by Sector

The ten largest surface allocations in the North Saskatchewan watershed are for uses by TransAlta Utilities Corporation, ATCO Electric Ltd., EPCOR, and the City of Edmonton (Table 2). With the exception of the City of Edmonton, the water is used for cooling or hydropower generation. Edmonton's allocation is for municipal use.

**Table 2: The Ten Largest Surface Water Allocations in the North Saskatchewan Watershed**

Priority	Applicant	Project	Allocation (dam <sup>3</sup> )	Source
1914	TransAlta Utilities Corporation	Keephills/Industrial	73023	North Saskatchewan River
1937	EPCOR Generation Inc.	Edmonton Power Inc.	215859	North Saskatchewan River
1954	TransAlta Utilities Corporation	Keephills/Industrial	234568	Wabamun Lake
1954	EPCOR Generation Inc.	Edmonton Power Inc.	234361	North Saskatchewan River
1954	EPCOR Generation Inc.	Edmonton Power Inc.	149382	North Saskatchewan River
1967	City of Edmonton	Edmonton/Municipal	112562	North Saskatchewan River
1973	ATCO Electric Ltd.	Alta Power Ltd.	234373	Battle River
1975	ATCO Electric Ltd.	Alta Power Ltd.	456388	Battle River
1998	TransAlta Utilities Corporation	Keephills/Industrial	660190	Wabamun Lake
1998	EPCOR Generation Inc.	Edmonton/Power	53017	North Saskatchewan River

### 2.2.3.2 Groundwater Extraction by Sector

The ten largest ground water allocations in the North Saskatchewan watershed are held by Lafarge Construction Materials, the Town of Stony Plain, Petro-Canada, the Town of Lacombe and the City of Edmonton (Table 3). The water is used primarily for drainage, well injection or municipal use (Town of Lacombe).

**Table 3: The Ten Largest Active Groundwater Allocations in the North Saskatchewan Watershed as of January 8, 2004**

Priority	Applicant	Project	Use	Allocation (m3)
1988	Lafarge Construction Materials	Lafarge Construction Materials	Drainage	986790
1977	Town of Stony Plain	Town of Stony Plain	Drainage	954720
1984	Lafarge Construction Materials	Lafarge Canada Inc.	Drainage	740090
1977	Town of Stony Plain	Town of Stony Plain	Drainage	595770
1977	Town of Stony Plain	Town of Stony Plain	Drainage	595770
2001	Town of Lacombe	Lacombe/Municipal	Urban	534050
2001	Town of Lacombe	Lacombe/Municipal	Urban	534050
1979	City of Edmonton	City of Edmonton	Drainage	431720
1979	Town of Vermilion	Town of Vermilion	Urban	339210
1980	Town of Ponoka	Town of Ponoka	Urban	336740

## 2.2.4 Biological Indicators

Biological indicators are species on which the persistence of a large number of other species in the ecosystem depends. Biological indicator species activities are therefore critical to the structure of the ecological community in which they live.

### 2.2.4.1 Aquatic Macrophytes

Aquatic macrophytes are large aquatic plants, which can be rooted, submerged, emergent or sessile. Their growth is directly related to the availability of phosphorus available for growth in aquatic systems. Excessive macrophyte growth may indicate decreased water quality and may have detrimental impacts on other aquatic organisms. A systematic examination of aquatic macrophytes and changes in their populations and distribution has not been done in any sub-watershed in the North Saskatchewan watershed.

Inventories in lakes in the Modeste sub-watershed found that the main species of emergent vegetation were greater bulrush, common cattail, reed grass, sedge, and arrowhead. The most abundant submerged macrophytes were northern watermilfoil, Richardson pondweed, stonewort, large-sheath pondweed, and sago pondweed.

Inventories in lakes in the Sturgeon sub-watershed found similar species. Greater bulrush, common cattail, reed grass, sedge, and arrowhead were the most abundant emergent species. Northern watermilfoil, Richardson pondweed, stonewort, large-sheath pondweed, sago pondweed, and coontail were the most abundant submergent species.



#### **2.2.4.2 Fish Population Estimates**

Inventories of selected fish populations may show increases or declines through introductions or changes in environmental conditions. Indicator species that are sensitive to point and non point environmental pollution may show areas of concern with their absence, while others may show areas of concern with their presence. A systematic estimate of fish populations has not been done in any sub-watershed in the North Saskatchewan watershed. However, in general, the most abundant fish species change from cold water and cool water species in the more western, higher elevation sub-watersheds to cool water and warm water species as one proceeds to sub-watersheds downstream where the water is warmer and, in the case of flowing water, generally slower moving.

Fish species occurring in the watershed include mountain whitefish, bull trout, cutthroat trout, rainbow trout, brook trout, lake trout, brown trout, lake whitefish, northern pike, yellow perch, walleye, sauger, goldeye, mooneye, lake sturgeon, longnose sucker, white sucker, Northern redhorse sucker and burbot (Nelson and Paetz, 1992).

#### **2.2.4.3 Vegetation Types**

Inventory of flora populations may show increases or declines through introductions or changes in environmental conditions. Indicator species that are sensitive to environmental pollution may show areas of concern with their absence, while others with their presence.

In general terms, coniferous forests of white spruce, lodgepole pine and, in poorly drained areas, black spruce dominate the vegetation in watershed at higher elevations found in the Rocky Mountains. Lodgepole pine and white spruce are dominant in the foothills region of the watershed. As one moves eastward in the watershed, the forest cover is characterized by those species found in aspen parkland and boreal forest natural regions. Trembling aspen and balsam poplar dominate the forests found in the eastern and central regions of the watershed (Alberta Land Reference Manual found in Perrin, 2001).

#### **2.2.4.4 Benthic Invertebrates**

There has been no systematic assessment of benthic invertebrates in the watershed. Benthic invertebrates have been studied in specific locations. For example, Alberta Environment (then Alberta Environmental Protection) surveyed benthic invertebrates in the North Saskatchewan River between 1973 and 1977 (Reynoldson and Exner, 1978). The study found changes in the main invertebrate groups between sites sampled upstream of Edmonton and those sampled downstream. The main invertebrate groups upstream of Edmonton were Chironomidae, Ephemeroptera and Plecoptera. Downstream of Edmonton, there was a major increase in numbers and a decline of species diversity. At sites downstream of Edmonton, Oligochaeta and Chironomidae were the most abundant groups of benthic invertebrates. The nature of the change in the benthic invertebrate communities suggested the major impact was due to organic



rather than inorganic or toxic effluents. Stormwater management and wastewater treatment in the City of Edmonton have been improved significantly since the study was conducted.

A benthic invertebrate survey was conducted in Wabamun Lake in November 2002. The results indicated some effects in the areas of the wastewater and power plant discharges when compared to background areas in the lake. Overall the differences were slight; however, signs of mild enrichment were apparent.

## 2.3 SUMMARY OF STAKEHOLDER AND PUBLIC ISSUES

Since 1997, the NSWA has conducted stakeholder meetings, workshops and a public consultation process throughout the watershed. As part of the *State of the North Saskatchewan Watershed* project, there were opportunities to share information about the NSWA and the project, and to gather watershed issues from the public and regional stakeholders. The issues shared during this process are briefly described below in alphabetical order. A more detailed description of the current watershed issues are contained in the *State of the North Saskatchewan Watershed Report*.

**Agriculture** – Concerns related to the impacts on water quality from confined livestock operations and pesticides.

**Future Trends** - Several comments were made that the state of the watershed [*State of the North Saskatchewan Watershed Report*] should look to historical data to better identify/anticipate trends.

**Forestry** - Stakeholders felt that forested areas near water flow areas need to be regulated and monitored.

**Historic Resources and Cultural Values** - There are culturally and historically sensitive areas near/around water bodies that should be recognized. In addition, the identification of Aboriginal cultural and historical resources should be included in the management plan.

**Impact of North Saskatchewan Watershed Plan on Industry** - Concerns were raised that the watershed plan might be too restraining on industrial activities.

**Land Management** - Many stakeholders felt that the Athabasca watershed is an ideal model of how industries can work together.

**Municipal Land Use** – There were concerns about the impact on the North Saskatchewan watershed from Edmonton, commercial and residential development on the Cooking Lake/Moraine area of Strathcona County.



**Public Understanding** - There was a call for increased awareness among individuals and the role they play in the preservation of waterways.

**Quality of Life** - The considerable improvement in water quality over the last 20 years was mentioned as a positive issue. It was suggested that the Alberta government look to the Norwegian oil and gas sector as an example for water management that may enhance the economic standard of living.

**Quality of Water** – Assured water quality and polluted run off were among the most commonly reported issues.

**Quantity of Water** - Stakeholders expressed numerous concerns regarding the quantity of water. Among those were the future availability of water considering fluctuating water levels due to drought and reduced water flows.

**Riparian Areas and Vegetation** – Concern was raised over the need for continued health of trees and other vegetation within watershed regions, the lack of re-planting in high erosion areas and the vicinity of dumping sites in relation to the North Saskatchewan River.

**Recreation Use** – There was concern regarding recreation watercraft and the effects they may have on waterfowl and floodplains.

**Use and Management of Water** - Issues of water management included municipal wastewater, government regulation of the sale and export of water, industrial use of and discharge into the North Saskatchewan River and the potential impact of river diversions.

### 3.0 POLICY AND LEGISLATIVE CONTEXT

The following is a description of the policy and legislative context as was provided in the *DRAFT Terms of Reference Battle River Watershed Management Planning Process – Phase One (AENV, 2004a)*. These policies are also applicable to the NSWA's IWMP.

In Alberta, a *Water Act* (Province of Alberta, 1999) and the *Framework for Water Management Planning* (AENV no date) provide the legislative and policy context for the design and development of watershed management plans. This TOR adheres to the legislative and policy requirements as outlined in the above documents. The IWMP will reflect current legislation, policy, principles and objectives of *Alberta's Commitment to Sustainable Resource and Environmental Management* (ASRD, 1999), the *Water Act* (Province of Alberta, 1999), the *Framework for Water Management Planning* (AENV no date) and *Water For Life: Alberta's Strategy for Sustainability* (AENV, 2003).



### 3.1 THE WATER ACT (1999)

In 1999, the Alberta Government replaced the *Water Resources Act* with the new *Water Act*. The objective was to bring the province's water management legislation and policy up to date so it could more effectively address current water management demands and challenges. The new *Water Act* focuses on managing and protecting Alberta's water and streamlining administrative processes.

The following *Water Act* highlights are particularly relevant to the IWMP process:

- Existing licences that are in good standing are protected (and will be respected in this process);
- A limited amount of water can be used on an owners land base without licence, if the owner had legal ownership prior to 1999. The importance of "household uses" of water are recognized and provided with a statutory right that has priority over all other uses;
- The *Framework for Water Management Planning* was a *Water Act* requirement and is designed to provide direction for the development of water management plans and to ensure the sustainable management of Alberta's water resources;
- The *Water Act* requires that a strategy for protection of the aquatic environment be part of the provincial water management planning framework;
- Through the water allocation transfer mechanism, the *Water Act* allows for flexible water management in areas where all reliable water available is already allocated; and
- The *Water Act* requires that Albertans have the opportunity to provide advice on and understand water management.

### 3.2 MUNICIPAL GOVERNMENT ACT (1995)

Under this Act, municipalities may plan for the development and use of land, and maintain and improve the quality of the physical environment. They therefore have the responsibility of determining land use practices, which can impact water quality.

### 3.3 PUBLIC LANDS ACT (2000a)

The province of Alberta owns the bed and shore of all permanent and naturally occurring water bodies. Bed is defined as the land on which the water sits and the shore is defined as the part of the bed that is exposed when water levels are below their normal fullest level. Use or disturbance of the bed and shore requires prior authorization under this legislation.



### **3.4 ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT (1994)**

This is provincial legislation that takes an integrated approach to the protection of Alberta's air, land and water. One of the *Act's* cornerstones is the guarantee of public participation in decisions affecting the environment. This public involvement includes increased access to information, participation in the Environmental Assessment and Approval Processes and the right, when directly affected, to appeal certain decisions.

### **3.5 THE ALBERTA SOIL CONSERVATION ACT (1988)**

This Act is enabling legislation, which allows for the sustainment of the agricultural land resource by discouraging practices that cause soil degradation.

### **3.6 FISHERIES LEGISLATION**

Alberta's Fisheries are managed through the *Alberta Fisheries Act* (ASRD, 2000b) while fish habitat in Alberta is managed and protected through the federal *Fisheries Act* (Canada). Through these two important pieces of legislation, the overall management and protection of the fisheries resource in Alberta is guided by the *Fish Conservation Strategy* (AENV, 1998). Its guiding principles include: no net loss of the productive capacity of fish habitat and the biological diversity of fish fauna is to be maintained.

### **3.7 WETLAND POLICY**

In Alberta, wetland management decisions have been guided by the *Wetland Management in the Settled Area of Alberta - An Interim Policy* (Alberta Water Resources Commission, 1994). This policy calls for the conservation of slough/marsh wetlands in a natural state, to mitigate degradation or loss of slough/marsh wetland benefits as near to the site of disturbance as possible and to enhance, restore or create slough/marsh wetlands in areas where wetlands have been depleted or degraded. Alberta's *Water Act* (Province of Alberta, 1999) regulates activities that might interfere with a wetland such as draining or filling. Alberta is presently developing a new wetland policy (which exists in draft form) and supporting action plan to achieve sustainable wetlands in the province, based on a no net loss strategy. The use of inventories and mitigation will lead to significant progress toward achieving the principle of "no net loss". Currently, *Water for Life: Alberta's Strategy for Sustainability* (AENV, 2003) suggests that wetland objectives be set as part of the watershed planning process. The NSWA will be supportive of those conducting wetland inventories and other activities that would enhance watershed function through wetland initiatives since Alberta Environment is revising the Wetland Policy for the province, the IWMP will be inclusive of the recommendations resulting from the revised Wetland Policy.



### **3.8 EXISTING LEGAL COMMITMENTS**

#### **3.8.1 Current Licences and Registrations**

The IWMP process will respect the rights of existing licences and licence-holders, consistent with the *Water Act*.

#### **3.8.2 The Apportionment Agreement**

The planning process will respect the *Master Agreement on Apportionment* (1969), including Schedule E, which deals with water quality requirements. The apportionment agreement entitles Saskatchewan to approximately 50% of the natural flow of the North Saskatchewan and Battle Rivers.

#### **3.8.3 The North Red Deer Water Authorization Act**

On December 4, 2002, Bill 33, the *North Red Deer Water Authorization Act*, was passed in the Alberta Legislature. This Act authorizes a diversion of treated water from the Red Deer River, using the City of Red Deer water treatment plant, to the towns of Blackfalds, Ponoka and Lacombe. When completed, this part of the North Saskatchewan watershed will result in treated wastewater "return" flows being released into the Battle River (part of the North Saskatchewan watershed) rather than back into the Red Deer River.

### **3.9 PROVINCIAL VISION AND PRINCIPLES FOR WATER MANAGEMENT PLANNING**

*The Framework for Water Management Planning* (AENV no date) outlines a vision and set of principles to guide water planning. The vision and principles were developed through consultation with Albertans and adopted by the Government of Alberta when creating the *Water Act* (Province of Alberta, 1999). This planning process will adhere to the vision and principles as outlined in the *Framework* (pp. 5 & 6) as well as the vision of the NSWA: "a watershed where ecological integrity is the foundation for environmental, cultural, social and economic decision-making. Actions taken and policies followed will result in the wise use and management of the North Saskatchewan watershed in Alberta".



### **3.10 STRATEGY FOR THE PROTECTION OF THE AQUATIC ENVIRONMENT**

The planning process will include the development of a Strategy for the Protection of the Aquatic Environment as defined in the *Water Act* (Province of Alberta, 1999) and *The Framework for Water Management Planning* (AENV no date). The strategy will include determining flows required to remain in the river for maintaining aquatic health. Future water management options and decisions will have inevitable impacts on ecology of the North Saskatchewan River watershed. Requirements for maintaining aquatic health will, therefore, be considered along with social and economic needs, when determining Water Conservation Objectives (WCO's).

From the *Water Act*: “*water conservation objective*” means the amount and quality of water established by the Director under Part 2, based on information available to the Director, to be necessary for the

- protection of a natural water body or its aquatic environment, or any part of them,
- protection of tourism, recreational, transportation or waste assimilation uses of water, or
- management of fish or wildlife.

and may include water necessary for the rate of flow of water or water level requirements.

Riparian ecosystems are considered part of the aquatic environment and issues related to riparian health will be addressed in this planning process. Recommendations may include water and land management strategies required to preserve or enhance riparian health.

### **3.11 WATER FOR LIFE: ALBERTA'S STRATEGY FOR SUSTAINABILITY**

Alberta's provincial water strategy was finalized in November, 2003 and promotes a watershed approach for water management, planning and decision-making. The strategy was developed on the basis of extensive provincial consultation and outlines key directions, strategies and actions to manage Alberta's water resources into the future.

Two key principles of the strategy are:

- Alberta's water resources must be managed within the capacity of individual watersheds; and
- Citizens, communities, industry and government must share responsibility for water management in Alberta and work together to improve conditions in their local watershed.

The IWMP process will be adaptive and flexible to ensure that it maintains congruence with the provincial water strategy as it is implemented.



### **3.12 THE WATER ALLOCATION TRANSFER MECHANISM**

The *Water for Life* Strategy (2003) proposes that the *Water Act* (Province of Alberta, 1999) provision for the transfer of water allocations between users (Section 82) be approved for provincial implementation. The transfer mechanism is an important tool for enabling a market-based means of re-allocating licensed water within a watershed.

To meet the requirements of the *Framework for Water Management Planning* (AENV no date), an “*Approved Water Management Plan must include...the matters or factors that must be considered in deciding whether...to approve a transfer of an allocation of water under a licence in the area of the province to which the Approved Water Management Plan applies.*”

## **4.0 PLANNING PROCESS**

### **4.1 IWMP GOAL AND OBJECTIVES**

The goal of the IWMP is to provide a plan that will guide the protection, the maintenance and the restoration of the North Saskatchewan watershed that balances environmental, social and economic needs particular to each of the sub-watersheds and that follows the Framework for Water Management Planning (AENV no date) and vision of NSWA.

The objectives of the IWMP are to:

1. Allow development of strategies that sustain our drinking water, aquatic ecosystems, and economies for future generations.
2. Identify land use practices that could positively or negatively impact water resources and develop strategies to reduce negative impacts.
3. Identify critical gaps in watershed knowledge and identify agencies or programs that will address these gaps.
4. Be prepared in consultation with watershed stakeholders and the public so that the plan meets economic, social, health and environmental needs.



## **4.2 APPROACH AND SCOPE**

The IWMP will address and balance the overall needs of the watershed and the issues within the regions. The IWMP process will include three phases (Figure 2):

Phase 1: Watershed characterization and IWMP initiation

Phase 2: Plan preparation and approval

Phase 3: Implementation, monitoring and evaluation

The NSWA was established to lead, support and coordinate programs and initiatives that improve the overall health and function of the North Saskatchewan watershed in Alberta. Following this direction, the NSWA will lead all phases of IWMP process, with direction and advice from Regional Advisory Committees and Technical Advisory Committees. The first phase of the planning process will focus on:

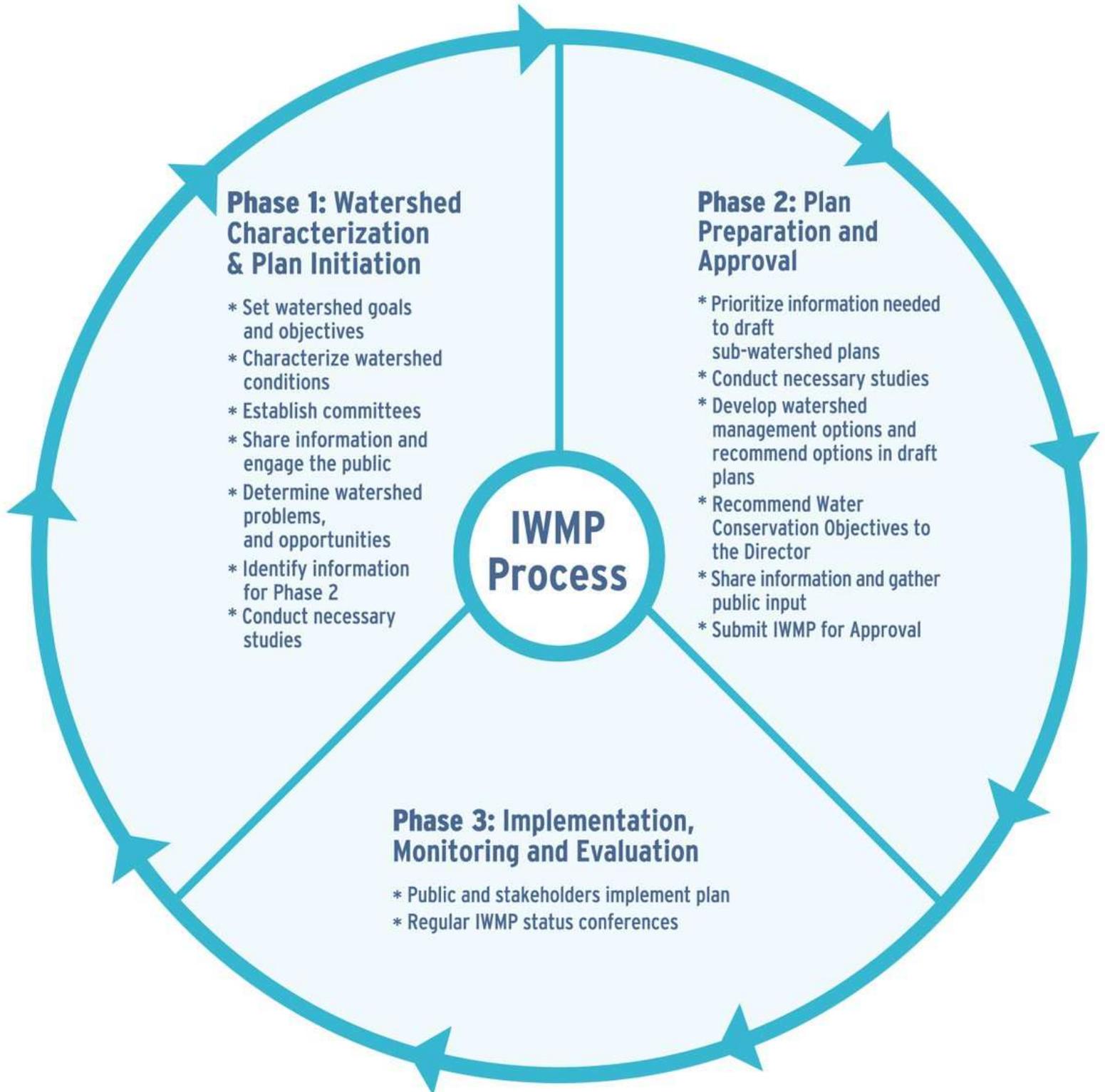
1. Public education and awareness of the planning process and the NSWA.
2. Gathering regional watershed issues.
3. Completion and public presentation of the State of the North Saskatchewan Watershed Report.
4. Establishing the various steering and working committees who will participate in the IWMP process.
5. Conducting any further baseline studies required for the IWMP.

The second phase of the process will focus on the preparation and approval of the IWMP that will provide objectives and management recommendations at the watershed and sub-watershed scale. The third phase of the planning process will focus on implementation, monitoring and evaluation of the IWMP. In this phase it will be important that all watershed stakeholders are involved in the plan's implementation.

The planning process is iterative so that Phase 3 is followed by a re-evaluation of watershed conditions and of the watershed goals and objectives. The process should therefore repeat every 8 – 10 years.



**Figure 2: Watershed Management Process**





### 4.3 PUBLIC AND STAKEHOLDER CONSULTATION

Section 7(3) of the *Water Act* states, “The Minister must, in a form and manner that the Minister considers appropriate, consult with the public during the development of the framework for water management planning.” Section 9(1) makes provision for the Minister to delegate development of a water management plan to a Director. Section 9(2)(f) states, “The Director or other person developing a water management plan must engage in public consultation that the Minister considers appropriate during the development of the water management plan.” Given this direction, the NSWA is responsible for the consultation activities that will support the preparation of the IWMP.

The *Framework For Water Management Planning* states:

*“As outlined in the water management principles, public consultation is essential to the planning exercise. During water management planning, Albertans must have an opportunity to understand the current state of the resource and provide input. Therefore, the process by which public consultation will occur needs to be clearly identified in the Terms of Reference to ensure that communication is open and information is shared.”*

Public consultation is essential to a successful planning process. The public must have the opportunity to understand the current state of the watershed, provide input and be encouraged to become effective stewards of the watershed. The goal is to create and maintain dialogue with regional stakeholders and the general public and to develop a multi-stakeholder decision-making framework that will ensure long-term viability of the IWMP.

The North Saskatchewan River watershed is a large and complex area with many diverse land uses, hydrological systems and ecological regions. As the public has varying levels of understanding about watersheds, their impact on the watershed and its management, education in these areas will be the key to meaningful consultation about the watershed and the IWMP.

The objectives of IWMP consultation are:

- To facilitate the understanding of watershed residents and stakeholders about watershed issues and best management practices;
- To obtain guidance from stakeholders and the public during all phases of plan development;
- To incorporate community and stakeholder values in addition to technical and scientific information in making decisions about the management of the watershed; and
- To promote effective communication among all participants in the IWMP process so that mutually acceptable solutions are found to address watershed issues.



The overall strategy for public and stakeholder consultation for the three phases of the IWMP is:

*Phase 1 – Watershed characterization and IWMP initiation:* the public and stakeholders will be engaged to collect information that will confirm, revise and assist in prioritization of issues while educating them about watersheds and watershed management. The public and stakeholders will have opportunities to participate in the various committees participating in the IWMP process and/or participate in other education and public consultation activities.

*Phase 2 – Plan preparation and approval:* the public and stakeholders will be engaged in the review of proposed vision, goals and objectives for the plan. This is followed by the review of the management alternatives designed to address the issues identified in Phase 1. The public will also be asked to provide comment on the draft water conservation objectives and the IWMP.

*Phase 3 – Implementation, monitoring and evaluation:* during this long-term phase, key stakeholders and the public will be engaged in the review of the progress and outcomes of the plan through the dissemination of status updates which will be made available in a variety of forms. The public and stakeholders may also be involved in implementing initiatives for their sub-watershed region and monitoring their results.

Following these directives the NSWA will consult with the public throughout the IWMP process. The consultation process will be guided by the following principles:

- **Early participation:** Information about the planning process will be provided to stakeholders in a timely manner to facilitate the stakeholder engagement process;
- **Honest, open and transparent communication:** All pertinent information about the project will be shared with stakeholders. Stakeholder input will be sought and their input will be documented in the final plan;
- **Accessibility:** A variety of stakeholder engagement methods will be utilized to distribute information about the project and to gather stakeholder feedback; and
- **Flexibility:** Feedback on the stakeholder engagement process will be sought from stakeholders to ensure that meaningful opportunities for input are provided. Changes will be made to the consultation strategy as necessary to reflect stakeholder needs.

A list of key individuals and stakeholder groups actively involved in the NSWA is maintained by the Manager of the NSWA and includes approximately 170 organizations and individuals. The groups represent non-government organizations, First Nations, Métis, and private industry resident or operating in the North Saskatchewan River Watershed in Alberta and municipal, provincial and federal government agencies and departments. Throughout the consultation process additional stakeholder groups and individuals will be identified and added to the NSWA members list (Appendix A).

Details about the target audiences, key messages, education and consultation activities for each Phase of the IWMP process are included in the Planning Phases (Section 5.0).



#### **4.4 ROLES, RESPONSIBILITIES AND ACCOUNTABILITY OF PARTICIPANTS**

The organizational structure of the participants is shown on Figure 4 and their roles, responsibilities and accountability are discussed below.

##### **4.4.1 Cabinet**

Under the *Water Act* (11(1)), Cabinet's authorization is required if the outcome of the proposed plan is an approved water management plan. Approved water management plans are required when transferring a water allocation under a license (Sec. 82) and if holding back up to 10% of that allocation is deemed in the public interest for protection of the aquatic environment (Sec. 83).

##### **4.4.2 Water Act Director, Alberta Environment Central and Northern Regions**

As identified in the *Water Act* and the *Framework for Water Management Planning*, the Director will approve the Terms of Reference as the Director responsible for water management in the Region. He/she will determine the most appropriate outcome of the planning process: an "approved water management plan," a "water management plan," or a "water conservation objective." Each product has its own specific authority and effect on resource management under the *Water Act*. The Director of Central Region is responsible for final approval of the document and ensuring its implementation in consultation with the Director of Northern Region.

##### **4.4.3 Other Government Departments and First Nations**

Federal, provincial, municipal government agencies and Aboriginal organizations who are tasked with land and resource management within the North Saskatchewan watershed in Alberta will be consulted to determine and articulate the desired outcomes of the watershed and to gain their support for the preparation and implementation of the IWMP.

##### **4.4.4 NSWA Board of Directors**

The NSWA Board of Directors is a 10-member committee who are elected from the NSWA membership at the NSWA Annual General Meeting (AGM) and normally commit to a year of service from the date of the AGM. The NSWA Board of Directors meet bi-monthly. The NSWA Board of Directors will be responsible for reviewing and submitting the IWMP to the Director, Central Region and for providing the resources necessary to support the IWMP planning process.

##### **4.4.5 IWMP Steering Committee**

The IWMP Steering Committee will consist of no more than 20 NSWA members who represent a broad range of stakeholders within the watershed. The IWMP Steering Committee will be accountable to the NSWA membership. The IWMP Steering Committee will provide direction to



the IWMP Coordinator, Regional Advisory Committees and Technical Advisory Committees on all matters pertaining to the IWMP process. The IWMP Steering Committee is responsible for advancing the recommended final draft of the IWMP for approval by the NSWA Board of Directors.

**4.4.6 Regional Advisory Committees**

The Regional Advisory Committees (RAC's) are multi-stakeholder groups that will provide advice and direction to the NSWA in the preparation and implementation of the IWMP. RAC's will support the public consultation process within their sub-watershed regions. RACs will include representation from a broad range of interest groups residing or with jurisdiction for their respective sub-watershed region including: industry, agriculture, municipal, provincial and federal governments, local watershed stewardship groups, Métis and First Nations communities, recreation groups, education and research organizations, public health and other groups and organizations with an interest in their watershed. Similar to the Stakeholder Advisory Group being formed with the Battle River Watershed Management Planning process, the RAC's multi-stakeholder membership will promote dialogue and collaborative learning to make recommendations for consideration throughout the planning process. The RAC's will be accountable to the organizations and sectors that they represent.

Terms of reference for the RAC's will be established early in the IWMP process and ensure consistency in their structure and operation throughout the North Saskatchewan River watershed. The IWMP Steering Committee, Working Group and Technical Advisory Committees will support the RAC's in their mandate.

Three RAC's are proposed based on the geographic regions within the North Saskatchewan watershed in Alberta:

<b>Regional Advisory Committee</b>	<b>Sub-watersheds Represented</b>
Headwaters RAC	Cline, Clearwater, Ram, Brazeau, Modeste
Central RAC	Sturgeon, Strawberry, White Earth, Beaverhill
Lakeland RAC	Frog, Vermilion, Monnery, Blackfoot

The Battle River Watershed Management Planning process has formed a Stakeholder Advisory Group (SAG) in the first phase of their planning process that will result in a Water Management Plan. The SAG is envisioned to develop into a Watershed Planning Advisory Council (WPAC). This is a separate planning process in which the NSWA is involved, but which may result in a watershed management plan separate from the IWMP. The geographic boundaries of each RAC are shown in Figure 3.

It was determined by Alberta Environment that the Sounding sub-watershed is not included in the Battle River Watershed Management Planning process nor in the North Saskatchewan IWMP due to geographic distance and watershed characteristics.



#### **4.4.7 Technical Advisory Committees**

Technical experts including government, academic, industry and private sector staff with knowledge in different aspects of water, land and resource management will be available to advise the various committees involved in the planning process. The Technical Advisory Committees (TAC's) may be responsible for developing terms of reference for specific studies and for conducting studies that will assist in the preparation of the IWMP based on the needs of the RAC's, IWMP Steering Committee or Working Group. TAC's are accountable to the committees who require their expertise. TAC's that could be formed include:

- Surface or Groundwater;
- Geographic Information Systems;
- Socio-economics;
- Land Use Planning;
- Wastewater Treatment;
- Fisheries Biology;
- Cultural Resources; and
- Drinking Water.

TAC's will be formed as needed and based on the needs identified in the various sub-watershed regions.





#### 4.4.8 Working Group

The working group will consist of those responsible for day-to-day coordination and implementation of planning process and will include the NSWA Manager, Project Coordinator, Aboriginal Liaison (and other stakeholder liaisons as needed), Public Communications Expert and RAC Meeting Facilitators. The working group will be accountable to the RAC's and the IWMP Steering Committee.

**NSWA Manager** – responsible for overseeing the planning process and supporting activities undertaken by the Coordinator and other members of the working group.

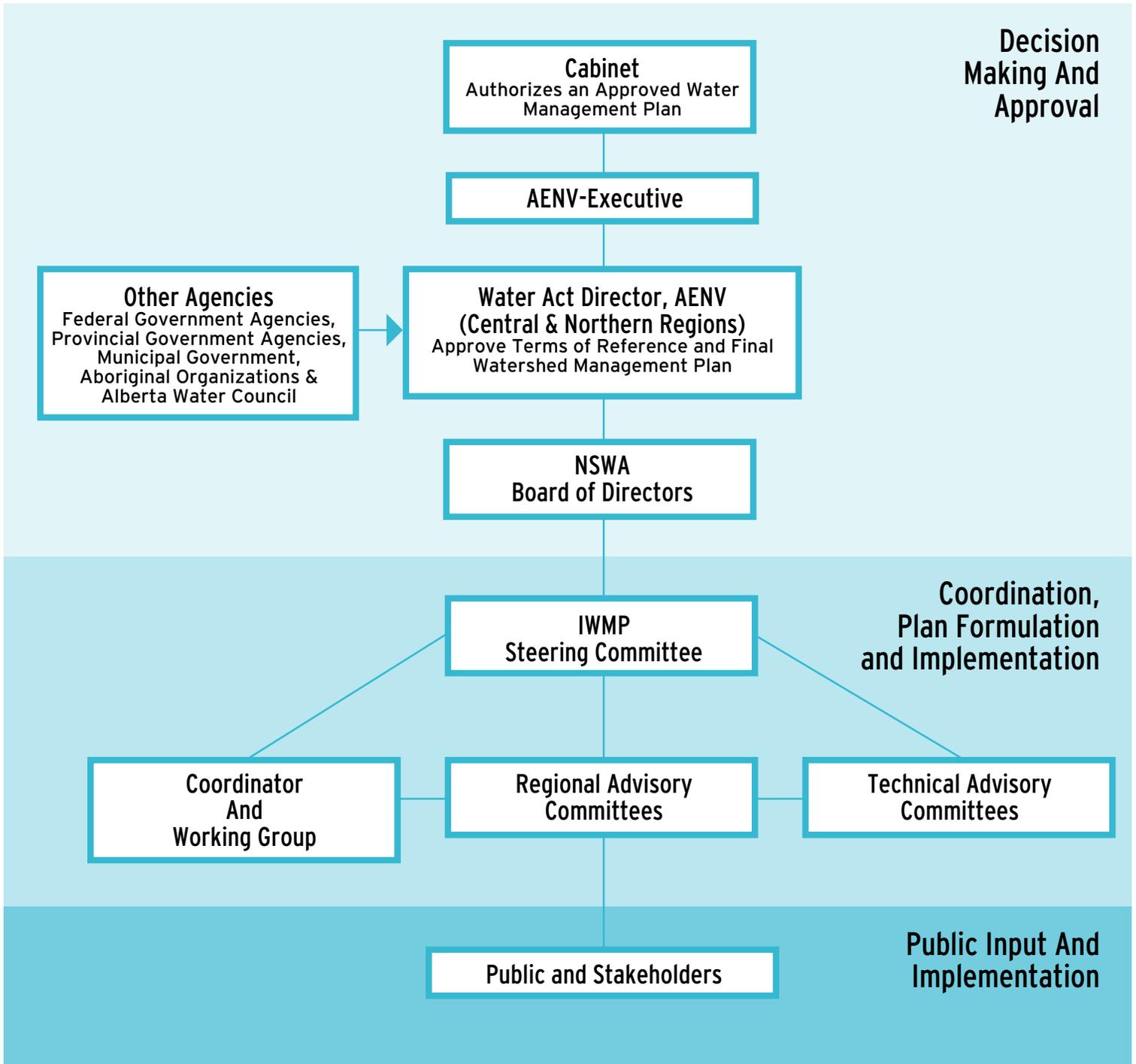
**Project Coordinator** – ensures the work in all sub-watershed regions is proceeding in a consistent, unified and coordinated fashion; ensures adherence to these terms of reference; responsible for developing the TOR for the IWMP Steering Committee and RAC's; liaison between the various committees participating in the IWMP process.

**Aboriginal Stakeholder Liaison** – responsible for meeting with aboriginal (First Nations and Métis) communities and organizations about the IWMP. This will include facilitating their involvement in the various committees participating in the IWMP process, and providing advice to the project coordinator and other participating committees about aboriginal involvement in the process.

**Public Communications Expert** – responsible for developing a public consultation plan, coordinating consultation activities and developing communication materials that will support the planning process. Communication materials may include: media releases, newsletters, public venue displays, project website, mail outs, etc.

**RAC Meeting Facilitators** – resident within the respective sub-watershed region, the RAC facilitators are responsible for RAC meeting logistics, calling RAC meetings, assisting the Coordinator in drafting the TOR for the RAC's, and facilitating RAC meetings throughout the planning process.

## ROLES



## ORGANIZATIONAL STRUCTURE



#### **4.5 IWMP LINKAGES WITH REGIONAL STRATEGIES AND PLANS**

The NSWA through the IWMP process will, where appropriate, support and coordinate efforts with the responsible authorities for existing regional strategies and planning processes. Regional strategies deal with numerous resources and a suite of issues in a region. It is not the intention of the IWMP to replace existing plans, but rather to enhance or support them. Consultation with the responsible authorities through the IWMP planning processes will assist in defining how coordination and enhancements may occur.

Recognizing regional resource management challenges, and their interconnection within a watershed, may require issues arising from the regional sustainable development strategies to be incorporated into the IWMP and conversely issues arising out of IWMP may need to be included in regional strategies. Some of the regional strategies that may be coordinated with the IWMP include:

- Battle River Watershed Management Plan;
- Northern East Slopes Sustainable Resource & Environmental Strategy;
- Regional Framework for Ducks Unlimited Canada's Participation in Watershed Management Strategies on the Prairies;
- Alberta's Commitment to Sustainable Resource and Environmental Management;
- North American Waterfowl Management Plan (NAWMP);
- Agricultural Policy Framework;
- Joint Capital Region Loadings and Water Quality Studies;
- North Saskatchewan River Water Quality Task Force;
- Capital Region Water and Wastewater Commissions Planning;
- Municipal "Green" Plans;
- Municipal Development Plans and Land Use Bylaws;
- Big Lake Management Plan;
- Beaverhills Partnership Initiative;
- Canadian Heritage Rivers process;
- Water utility source water protection plans;
- City of Edmonton Total Maximum Loading Limit River Impact Study;
- Vermillion Watershed Initiative;
- Wabamun Lake water quality studies; and
- Sturgeon Watershed Management initiatives.

In 2003, Alberta Environment initiated, with the support of the NSWA, a watershed management planning process for the Battle River watershed that includes the Bigstone, Paintearth, Iron, Blackfoot, and Ribstone sub-watersheds. The NSWA will continue to participate in the Battle River watershed planning process and consider the resulting Plan part of the overarching IWMP. Similarly AENV has initiated a water management plan for the Sturgeon sub-watershed. The NSWA will consult with AENV and stakeholders involved in this planning process to determine the most effective way of coordinating these planning processes with the IWMP.



## 5.0 PLANNING PHASES

### 5.1 PHASE 1 – WATERSHED CHARACTERIZATION AND PLAN INITIATION

#### 5.1.1 Purpose and Objectives

In 2001, the NSWA initiated the *State of the North Saskatchewan Watershed* project with an objective to gather electronic spatial data and other secondary sources of data to describe the current conditions of the watershed. Watershed health was assessed using various indicators including; water quality, water quantity, land use and biological diversity. Phase 1 of the plan will use this information to initially determine what issues and data gaps need to be addressed through the process.

Figure 2 in Section 4.0 shows phases in the IWMP planning process. In the first phase, setting watershed goals and objectives, and characterizing watershed conditions have been partially completed through the *State of the North Saskatchewan Watershed* project. The project findings will help the NSWA refine their overall watershed goal and will help the RAC's develop watershed objectives that address individual sub-watershed region and overall watershed needs to meet the IWMP goal.

The objectives of Phase 1 will be to:

1. Establish and provide watershed information to the committees that will participate in the IWMP process.
2. Share information with the public and key stakeholders about the IWMP process and the *State of the North Saskatchewan Watershed Report*.
3. Gather information about land and water issues that need to be addressed in the IWMP.
4. Initiate studies (such as Instream Flow Needs) that will be needed to set Water Conservation Objectives for the IWMP.
5. Determine what additional information is required to move into Phase 2 of the IWMP process.

Key deliverables for this phase will be:

1. Committees ToRs, meeting minutes and recommendations.
2. Issues summary report.
3. Study RFPs, contracts and reports.
4. Data deficiency report.

Key activities, who will be responsible for initiating the activities is shown on Table 4. The schedule of activities in Phase 1 and 2 is shown on Figure 5.



**Table 4: Phase 1 Key Activities**

#	Key Activity	Responsibility
1	Establish the IWMP Steering Committee from the NSWA membership.	Coordinator
2	Establish Regional Advisory Committees.	Coordinator, NSWA Manager, RAC Facilitators
3	Establish Technical Advisory Committees.	Steering Committee, RAC's, NSWA members, Coordinator, NSWA Manager
4	Share information with local watershed groups, stakeholders, NSWA members, and other stakeholders about the IWMP process.	Coordinator with Public Communications Expert
5	Gather watershed concerns specific to the sub-watersheds from the public and key stakeholders.	Coordinator with Public Communications Expert
6	Consult with local watershed groups, integrated resource management planners, municipal Councils and their administration to determine the most effective ways to work together through the IWMP process and to identify ways that the IWMP will support and/or enhance existing plans and initiatives occurring in the watershed.	Coordinator, Public Communications Expert
7	Meet with aboriginal organizations (First Nations Band Councils, Métis Zones) about their involvement in the IWMP process.	Aboriginal Stakeholder Liaison
8	Conduct studies (such as Instream Flow Needs) that will be needed to set Water Conservation Objectives for the IWMP.	IWMP Steering Committee
9	Determine what additional information is required to move into Phase 2 of the IWMP process	RAC's with assistance from TAC's (as required)



**5.1.2 Public and Stakeholder Consultation**

The objectives of public and stakeholder consultation in Phase 1 is to raise awareness about the IWMP process, gather sub-watershed issues that should be addressed in the IWMP and encourage participation in the Regional Advisory Committees or Technical Advisory Committees.

Key Messages for Phase 1 will be:

1. The main goal of the IWMP is to provide a framework to protect, maintain and restore a healthy natural watershed system that will balance environmental, social and economic needs.
2. Understanding watershed issues and watershed management in the North Saskatchewan River watershed will be the key to enabling long-term sustainability of this resource.
3. It is important to involve a wide range of local stakeholders and experts to identify issues specific to each sub-watershed region in order to develop strategies for addressing these problems effectively:

To meet the consultation objectives for Phase 1, the activities/materials, and target audience are shown in Table 5. A proposed schedule for the activities is shown in Figure 5.

**Table 5: Phase 1 Consultation Activities\***

<b>Activity/Materials</b>	<b>Description</b>	<b>Target Audience</b>
Fact Sheet	Produce a fact sheet that reviews water issues and water management in the watershed (partly summarized from Community Watershed Toolkit) emphasizing need for an IWMP. Post fact sheet on NSWA and Partner web sites, distribute via partners and use as basis for display.	Adult audience with non-technical background
Displays	Develop a free-standing floor display that provides a very brief summary of the information contained in the fact sheet for use at workshops/open houses, trade shows, community events, etc.	Adult audience



# North Saskatchewan Watershed Alliance

Integrated Watershed Management Plan

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<b>Activity/Materials</b>	<b>Description</b>	<b>Target Audience</b>
Newspaper/newsletter Articles	“Tales of the North Saskatchewan”: Write a series of stories/articles (perhaps extension from River Guide) that feature the natural and human history of the North Saskatchewan River (with an emphasis on understanding water issues and water management) for distribution on speculation to print media and partner newsletters.	Adult audience with non-technical background
School/Classroom Kit	Develop a “North Saskatchewan River Watershed Explorer’s Kit” for distribution to teachers in the watershed. The kit would include “classroom ready” activities that cover the concepts of water issues and water management. Tie activities to a “Kids Area” on the web site.	Grade 7 – 9 classrooms
Website	Enhance the website to explore water issues and water management in the watershed. Also add a “Kid’s Area” in support of the classroom materials listed above.	Adult audience and Grade 7-9 students
Workshops/Open Houses	In an effort to educate stakeholders, collect their issues/comments and provide feedback hold workshops and open houses in each of the 4 sub-watershed regions .	All watershed stakeholders and residents
Direct Mail-outs/Questionnaires	Use direct mail-outs to contact primary audience including the fact sheet and a questionnaire for issues identification.	NSWA Members
Media Releases/Public Service Announcements	Use media releases/public service announcements to announce all aspects of the workshops/open houses prior to their occurrence.	All watershed stakeholders and residents



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Activity/Materials	Description	Target Audience
Announcement Ads (newspapers/radio)	As deemed appropriate for the area arrange for advertising to appear prior to the workshops/open house outlining dates/times/locations/expectations as listed above.	All watershed stakeholders and residents
Announcement Ads (newsletters/enews/web sites)	As deemed appropriate for the area arrange for notices to appear prior to the workshops/open house as listed above in/on partner group newsletters/enews/website publications.	NSWA Member Groups and the Public
Personal Meetings	If needed, meet directly with stakeholder groups whose interests are not being reflected in the workshops/open houses or direct mail-outs.	Stakeholders
Member Meetings	Use member meetings as opportunities to update the membership on status of the project.	NSWA Members
Website	Establish a web page for the project and renew frequently with updates on the project including announcements of workshops/open houses. Also provide opportunities for feedback during all phases of the project through the website.	All watershed stakeholders and residents.
Stakeholder Database	To support the strategy, maintain a stakeholder database to document, track and report on issues throughout the process.	Stakeholders involved in the process

\* Consultation and communication activities are subject to change will be evaluated and planned on a year-to-year basis by the IWMP Working Group and be approved by the IWMP Steering Committee and NSWA Board of Directors.

**Figure 5: IWMP Schedule\***

<b>Key Activity - Phase 1</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Establish Steering Committee	█						
Establish RAC's		█	█				
Establish TACs		█	█	█			
Share information about IWMP process		█	█	█			
Gather watershed issues		█	█	█			
Consult re: coordination with existing plans/initiatives		█	█	█			
Meet with aboriginal organizations	█	█					
Conduct necessary studies to set objectives		█	█	█			
Determine additional information needs		█	█	█			
<b>Key Activity - Phase 2</b>							
Prioritize information needs		█			█		
Conduct additional studies					█	█	
Develop watershed management options and WCO's						█	
Public review of management options and WCO's						█	
Prepare draft IWMP							█
Public review of draft IWMP							█
Submit IWMP for approval							█
Approval of IWMP							█
<b>Consultation Activities Phases 1 &amp; 2</b>							
Fact Sheets	█	█	█	█	█	█	█
Displays	█	█	█	█	█	█	█
Newspaper/newsletter articles	█	█	█	█	█	█	█
School Classroom Kit	█	█	█	█	█	█	█
Website - education	█	█	█	█	█	█	█
Workshops/Open Houses	█	█	█	█	█	█	█
Direct Mail-outs/Questionnaires	█	█	█	█	█	█	█
Media Releases/PSAs	█	█	█	█	█	█	█
Announcement Ads (newspapers/radio)	█	█	█	█	█	█	█
Announcement Ads (newsletters/eneews/websites)	█	█	█	█	█	█	█
Personal Meetings	█	█	█	█	█	█	█
Member Meetings	█	█	█	█	█	█	█
Website - consultation	█	█	█	█	█	█	█
Stakeholder Database	█	█	█	█	█	█	█

\* Suggested schedule - subject to changes



## **5.2 PHASE 2 – PLAN PREPARATION AND APPROVAL**

### **5.2.1 Purpose and Objectives**

The objective of Phase 2 (Figure 2, Section 4.0) is to prepare and approve the IWMP. The NSWA will lead this phase with the support of the RAC's and TAC's. The NSWA with the support and advice of the RAC's will be responsible for preparing the draft and final IWMP. To prepare the plan, additional baseline information may be required and any studies or initiatives needed to move ahead with the planning process will be prioritized and conducted. Baseline information needs may differ depending on the needs of the sub-watershed region. Once the needed information has been gathered, the NSWA in collaboration with the RAC's and TAC's will develop and assess alternative watershed management strategies that address their specific management issues. The public and stakeholders will review and comment on alternative watershed management strategies. Their feedback will be considered in the preparation of the draft watershed management plan document. Following final public review, the IWMP will be submitted to the NSWA Board of Directors for approval. They will then submit the IWMP to the Water Act Director, Central and Northern Regions and Cabinet for approval. Key activities for Phase 2 are shown in Table 6 and a Phase 2 schedule in Figure 5.

Key deliverables for this phase will include but not be limited to:

1. Instream Flow Needs report (including incremental analysis).
2. Natural flow needs report
3. Water resource management model
4. Water quality model
5. Economic water use and projections report.
6. Land use/stewardship strategy report.
7. Water Conservation Objective recommendation report.
8. Draft IWMP.

**Table 6: Phase 2 Key activities**

#	Key Activity	Responsibility
1	Prioritize information needs	RAC's
2	Conduct studies as needed for each sub-watershed	TAC's
4	Develop watershed management options and draft water conservation objectives	RAC's with assistance from TAC's
5	Present for review watershed management options and draft water conservation objectives at public open houses/workshops	RAC's based on TAC and public input
6	Prepare DRAFT IWMP document that incorporates best management options and water conservation objectives to address watershed and sub-watershed needs	Working Group with assistance from RAC's
7	Present DRAFT watershed plan document the public and stakeholders	Coordinator with RAC's, Public Communication Expert
8	Submit IWMP Document and for approval	Working Group/Coordinator
9	Plan Approval	Cabinet/Director

### 5.2.2 Public and Stakeholder Consultation

The main objective of public and stakeholder consultation in Phase 2 will be to involve key stakeholders resident in the sub-watershed regions through participation in the RAC's and open houses/workshops in the preparation and review of the IWMP.

Key Messages for Phase 2 will be:

1. The main goal of the IWMP is to provide a framework to protect, maintain and restore a healthy natural watershed system that will balance environmental, social and economic needs.
2. It is important to the development and implementation of the IWMP that local and regional stakeholders are involved so that the IWMP is cognizant of and meets local needs.
3. It is important that the public resident in the sub-watershed regions for which the plan is being prepared be involved in the review of the water conservation objectives, management alternatives, and the draft management plan.

To meet the objectives of Phase 2 consultation, the following activities/materials and their target audience are proposed and outlined on Table 7. The proposed schedule for Phase 2 activities is shown in Figure 5.



**Table 7: Phase 2 Consultation Activities\***

<b>Activity/Materials</b>	<b>Description</b>	<b>Target Audience</b>
Fact Sheet	Produce a fact sheet that provides status on the IWMP process to date. Post fact sheet on web site, distribute via partners and use as basis for display.	Adult audience with non-technical background
Displays	Develop a free-standing floor display that provides a very brief summary of the information contained in the fact sheet for use at workshops/open houses, trade shows, community events, etc.	Adult audience
Newspaper/newsletter Articles	"Tales of the North Saskatchewan": Write a series of stories/articles (perhaps extension from River Guide) that feature the natural and human history of the North Saskatchewan River (with an emphasis on understanding water issues and water management) for distribution on speculation to print media and partner newsletters.	Adult audience with non-technical background
Workshops/Open Houses	Hold 3 rounds of workshops and/or open houses in each of the 4 grouped sub-watersheds to (1) provide an opportunity to review and comment on water conservation objectives and alternative management options to address sub-watershed issues; (2) to provide an opportunity to review and comment on the draft watershed plan and (3) present the final plan.	All watershed stakeholders and residents
Direct Mail-outs / Questionnaires	Use direct mail-outs to contact primary audience including the fact sheet and a questionnaire to (1) provide an opportunity to review and comment on alternative management options to address sub-watershed issues, and (2) review draft watershed plan.	NSWA members



<b>Activity/Materials</b>	<b>Description</b>	<b>Target Audience</b>
Media Releases/PSAs	Use media releases/public service announcements to announce all aspects of the workshops/open houses prior to their occurrence.	All watershed stakeholders and residents
Announcement Ads (newspapers/radio)	As deemed appropriate for the area arrange for paid advertising to appear prior to the workshops/open house outlining dates, times, locations and expectations as listed above.	All watershed stakeholders and residents
Announcement Ads (newsletters/enews/web sites)	As deemed appropriate for the area arrange for notices to appear prior to the workshops/open house as listed above in/on partner group newsletters/enews/web site publications.	Membership of partner groups
Personal Meetings	If needed, meet directly with stakeholder groups whose interests are not being reflected in the workshops/open houses or direct mail-outs.	Stakeholders
Member Meetings	Use member meetings as opportunities to update the membership on status of the project.	NSWA Members– June (Annual General Meetings), Fall and Spring (Member meetings)
Website	Establish a web page for the project and renew frequently with updates on the project including announcements of workshops/open houses. Also provide opportunities for feedback during all phases of the project through the website.	All watershed stakeholders and residents
Stakeholder Database	To support the strategy, maintain a stakeholder database to document, track and report on issues throughout the process.	Stakeholders involved in the process

\* Consultation and communication activities are subject to change will be evaluated and planned on a year-to-year basis by the IWMP Working Group and be approved by the IWMP Steering Committee and NSWA Board of Directors.



### **5.3 PHASE 3 – WATERSHED PLAN IMPLEMENTATION, MONITORING & EVALUATION**

#### **5.3.1 Purpose and Objectives**

The objective of this phase will be to implement aspects of the management plan and to determine, through monitoring and evaluation, how well the plan meets the overall goal of the IWMP. Each aspect of the plan will need to be evaluated and monitored for its success, its performance and compliance with existing legislation, policy and regulations. Throughout this phase there will be regular communication between the stakeholders in the region who will be implementing various plan aspects and the NSWA Board of Directors. Annual conferences could be held to share accomplishments and best management practices. These conferences provide an opportunity to re-focus efforts and re-affirm the process. These may be held in conjunction with the NSWA Annual General Meetings. At the end of this phase, the planning process begins again with a re-evaluation of current conditions to see if improvements have been made and the original goal of the IWMP has been met. It is envisioned that the entire process will be 10 years. Key activities for Phase 3 are shown in Table 8.

Key deliverables for this phase will be:

1. IWMP Recommendations Implementation Plan.
2. Communications Strategy for Implementation Plan.

**Table 8: Phase 3 Key Activities, Responsibility and Timeline**

<b>#</b>	<b>Key Activity</b>	<b>Responsibility</b>	<b>Timeline*</b>
1	Implement IWMP	NSWA Board of Directors, Public, Stakeholders	2010 – 2020
2	Host IWMP Status Update workshops/conferences	NSWA Board of Directors	Annually

\*Suggested only - subject to change

#### **5.3.2 Public and Stakeholder Consultation**

The consultation objectives of Phase 3 are to encourage stakeholders and other residents of the watershed to implement the plans. To do so, on-going information sharing will be the focus of the activities including annual updates to public consultation materials and an annual conference concurrent with the NSWA Annual General Meeting to showcase successes in plan implementation, and provide a forum to discuss progress.



Key messages of this phase will be:

1. The main goal of the IWMP is to provide a framework to protect, maintain and restore a healthy natural watershed system that will balance environmental, social and economic needs.
2. It is important that the public resident in the sub-watershed regions are involved in the implementation of best management practices.

To meet the objectives of Phase 3 consultation, Table 9 shows the activities/materials and their target audience.

**Table 9: Phase 3 Consultation Activities**

<b>Activity/Materials</b>	<b>Description</b>	<b>Target Audience/Timing*</b>
Fact Sheet	Produce a fact sheet that provides status on the IWMP implementation successes and progress to date. Post fact sheet on web site, distribute via partners and use as basis for display.	Target: Adult audience with non-technical background  Timing: Annually
Displays	Develop a free-standing floor display that provides a very brief summary of the information contained in the fact sheet for use at workshops/open houses, trade shows, community events, etc.	Target: Adult audience  Timing: Annually
IWMP Conferences	Host IWMP conferences concurrent with the NSWA AGM to re-focus efforts, re-engage stakeholders and provide a forum to showcase successes and discuss implementation issues.	Target: All watershed stakeholders and residents  Timing: Annually with NSWA AGM in June
Website	Establish a web page for the project and renew frequently with updates on the plan implementation including announcements of conferences and sub-watershed meetings.  Post information on best management practices.	Target: All watershed stakeholders, residents and beyond  Timing: Update semi-annually

\*Suggested timelines - subject to change



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Terms of Reference

May 2005

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**APPENDIX A**

**NSWA Member List**

**NORTH SASKATCHEWAN WATERSHED ALLIANCE  
MEMBER/PARTNER LIST – SEPTEMBER 2004****NON GOVERNMENT ORGANIZATIONS**

1. Alberta Conservation Association
2. Alberta Ecotrust
3. Alberta Lake Management Society
4. Alberta League for Environmentally Responsible Tourism (ALERT)
5. Bow River Basin Council
6. Bow River Project
7. Butte Action Committee for the Environment
8. Capital Health Authority
9. Cows & Fish Program
10. Ducks Unlimited Canada
11. East Central Regional Health Authority
12. Energy Efficiency Association
13. Environmental Law Centre
14. Environmental Resource Centre
15. Federation of Alberta Naturalists
16. Lakeland Regional Health Authority
17. Land Stewardship Centre of Canada
18. Legacy Lands Conservation Society
19. Northeast Alberta Water Management Coalition
20. Parkland Residents Association
21. Partners FOR the Saskatchewan River Basin
22. Pembina Institute for Appropriate Development
23. Rocky & Nordegg Cooperative Fisheries Inventory Program
24. Rocky Riparian Group
25. Rossdale Community League
26. Saskatchewan Watershed Authority
27. Sierra Club, Prairie Chapter
28. The Living by Water Project
29. TOPSOIL
30. Toxics Watch Society of Alberta
31. Tri-town Environmental Society
32. Trout Unlimited Canada
33. Vermilion River Naturalist Club
34. Wonder of Water

**RESEARCH/EDUCATION**

35. Alberta Research Council
36. Edmonton Catholic Schools
37. Edmonton Science Outreach Network
38. Inside Education
39. Riverwatch
40. The King's University College
41. University of Alberta, Kinsella Research Station
42. University of Alberta, Renewable Resources Department
43. Water Institute for Semi-arid Ecosystems
44. YoWoChAs

**CULTURE/RECREATION/TOURISM**

53. Alberta Fish & Game Association
54. Alberta Recreation Canoe Association
55. Alberta Sport, Recreation, Parks and Wildlife Foundation
56. Alberta Trailnet Society
57. Banff National Park
58. Dickson Fish & Game Association
59. Elk Island National Park
60. Kalyna Country
61. Midwest Tourism
62. Northeast Edmonton Heritage Conservation Initiative
63. Northwest Voyageurs Canoe and Kayak Club
93. River Valley Alliance
64. Riverland Recreational Trail Society
63. The Iron Horse Trail
64. Thorsby Fish & Game Association
65. Voyageur Ventures

**AGRICULTURE**

68. Alberta Beef Producers
69. Canadian National Committee for Irrigation Drainage
70. Grey Wooded Forage Association
71. Intensive Livestock Working Group
72. Restorative Ecological Agriculture Projects Society
73. St. Mary's Irrigation District
74. St. Paul Grazing Reserve

**ABORIGINAL COMMUNITIES**

75. Enoch First Nation
76. First Nations Technical Services Advisory Group (Alberta)
77. Métis Nation of Alberta
78. Paul First Nation
79. Saddle Lake Tribal Administration

**INDUSTRY**

80. Alberta Capital Region Wastewater Commission
81. Alberta's Industrial Heartland
82. AMEC Earth & Environmental
83. Aquality Environmental Consulting
84. Aquascience
85. Dillon Consulting Ltd.
86. EBA Engineering Consultants Ltd.
87. ECL Environmental Services Limited
88. EduTransfer Design Association Inc.
89. Elk Point Chamber of Commerce
90. EnviroMak
91. EPCOR Water Services

92. Golder and Associates
93. Komex International
94. Noble Resource Management Ltd.
95. Northeast Capital Industrial Association
96. Nova Chemicals Corporation
97. Parkland Stone Landscaping
98. Petro-Canada
99. Shell Canada Ltd.
100. Strathcona Industrial Association
101. Sunpine Forest Products
102. The Canadian Salt Company Limited
103. Top Draw
104. TransAlta Utilities
105. Weyerhaeuser

## GOVERNMENT

### Federal

106. Agriculture & Agri-Food Canada; Prairie Farm Rehabilitation Administration
107. Canadian Heritage Parks Canada
108. Fisheries and Oceans Canada
109. Department of Indian & Northern Affairs

### Provincial

110. Alberta Agriculture, Food & Rural Development
111. Alberta Community Development
112. Alberta Energy and Utilities Board
113. Alberta Environment
114. Alberta Environmentally Sustainable Agriculture
115. Alberta Health and Wellness
116. Alberta Sustainable Resource Development

### Municipal

117. Alberta Urban Municipalities Association
118. City of Camrose
119. City of Edmonton, Community Services
120. City of Edmonton, Drainage Services
121. City of Edmonton, Planning & Development
122. City of Leduc, Environmental Advisory Board
123. City of Spruce Grove
124. City of St. Albert
125. North West Alliance Conservation Initiative
126. Town of Bruderheim
127. Town of Devon
128. Town of Drayton Valley
129. Town of Elk Point
130. Town of Gibbons
131. Town of Rocky Mountain House
132. Town of Smoky Lake
133. Town of Tofield
134. Village of Marwayne

## Counties & MD's

135. Beaver
136. Camrose
137. Clearwater
138. Flagstaff
139. Lac Ste Anne
140. Lacombe
141. Lamont
142. Leduc
143. Minburn #27
144. Paintearth #18
145. Parkland
146. Red Deer
147. Smoky Lake
148. St. Paul #19
149. Strathcona County: Engineering and Environmental Planning; Environmental Operations
150. Sturgeon County
151. Two Hills #21
152. Vermilion River #24
153. Wetaskiwin #10
154. M. D. Brazeau
155. M..D. of Wainwright No. 61

## CITIZEN MEMBERS

156. Adele Mandryk
157. Ann Lockwood
158. Alex Nagy
159. A.R. Marshall
160. Adam Farr
161. Charles Labatiuk
162. Don Ruzicka
163. Ed Davidson
164. Elke Blodgett
165. Fred Bentley
166. Gary Luck
167. Jan den Dulk
168. Lyndon Gyurek
169. Martha Kostuch
170. Michael Solomons
171. Ruth Harrison

## WATERSHED STEWARDSHIP GROUPS

172. Battle Lake Watershed Enhancement Association
173. Beaverhill Watershed Initiative
174. Big Lake Environment Support Society
175. Bonnie Lake Sustainability Association
176. Devon Watershed Alliance
177. Friends of Lily Lake
178. Iron Creek Watershed Improvement Society
179. Vermilion Watershed Initiative