Northern Voices, Northern Waters

NWT **Water** Stewardship Strategy

DRAFT, November 2009

The **waters** of the Northwest Territories will remain **clean**, abundant and **productive** for all time.

Cover photos: D. Livingstone

Table of Contents

1.0 NWT Water Stewardship Strategy - Summary

Freshwater is fundamental to life and essential to the social, cultural and economic well-being of Northwest Territories (NWT) residents.

The Government of the Northwest Territories (GNWT), Indian and Northern Affairs Canada (INAC) and Aboriginal Governments have developed the draft NWT Water Stewardship Strategy (the Strategy) to ensure the waters of the NWT remain clean, abundant and productive for all time. The draft Strategy will be finalized during the winter of 2009-2010 following input from the public.

The Strategy does not alter existing water responsibilities. It respects Aboriginal and treaty rights as well as rights and processes set out in settled lands, resources and self-government agreements.

The draft Strategy is designed to improve decision-making processes, information sharing, and communication among all parties or water partners involved in water stewardship in the NWT.

Improved water stewardship in the NWT will require:

- Applying integrated watershed management and ecosystem-based management practices.
- Applying concepts of water valuation and sustainability accounting.
- Using decision-making processes that consider the effects of all past, present and future activities on the watershed and all interests in the water resource.
- Basing decisions that may affect water on the best available scientific, traditional and local knowledge.
- Increasing interaction among water partners.

The draft Strategy promotes an ecosystem-based approach to integrated watershed management in order to improve water stewardship in the NWT. Integrated watershed management is the practice of working with multiple agencies to make decisions and take action after considering the entire watershed, its land and water and all values in the watershed. An ecosystem-based approach to watershed management places economic considerations within the context of the entire ecosystem.

Two key elements of the draft Strategy are water valuation and sustainability accounting. The issue of water valuation in the NWT is controversial. Understanding and clarifying the values associated with water and the landscape in the NWT is essential to making informed water stewardship decisions.

Values are reflected in the services that NWT waters or wetland features provide. These include water filtration, flood regulation, wildlife habitat, recreation, transportation, commercial fishing, cultural sites, sacred sites and domestic and industrial uses of water. Once these values are determined, some could be described as “accounts” for the purpose of measuring changes to these values and how these changes might affect the NWT.

There are four main components of the draft Strategy. These include planning and environmental programs; environmental assessment and regulation; administration, coordination and communication; and audit and evaluation. Keys to success outlined for each component will guide the implementation of the Strategy.

Photo credit: D. Livingstone

Planning and Environmental Programs

Land use plans, protected areas networks and community conservation areas set the context for planning and decision-making for stewardship actions. Completion of land use plans for the NWT, as well as the development of a network of protected areas within the next 10 years, will provide the environmental data, information and knowledge needed to strengthen stewardship and resource management decisions in the NWT, including these related to water.

Effective and comprehensive monitoring and research programs provide improved knowledge and understanding of the physical, ecological, economic and social influences and relationships affecting NWT's water. Identifying gaps in monitoring and research programs allows for the development of effective and coordinated monitoring programs on a community level and the ability to address specific aspects of water management. This work will lead to more precise, accurate and reliable information needed for water stewardship actions.

Environmental Assessment and Regulation

The implementation of the Strategy should strengthen the capacity and capabilities of the various regulatory boards and agencies in the NWT. The provision and sharing of more accurate and reliable information to boards and agencies should provide clarity to regulators, developers and communities. The Strategy will support improvements to the regulatory system.

Administration, Coordination and Communication

Successful implementation of the Strategy requires cooperation between all water partners in the NWT and neighbouring jurisdictions.

Effective communication and coordinated efforts should result in more effective water stewardship results. This can be achieved through sharing the best traditional, local and scientific knowledge and data among water partners and jurisdictions. Mechanisms to manage and incorporate new information into decision-making on an on-going basis will improve water stewardship.

Clarifying the roles and responsibilities of water partners is also required. This can be achieved through on-going engagement, regular conferences with water partners in the NWT and by reporting achievements in water stewardship. In the short-term, this may help address some of the capacity issues in the NWT.

Audit and Evaluation

The success of the Strategy depends on the active involvement of all water partners in promoting and determining water stewardship objectives and actions. Residents of the NWT should be advised on a regular basis of the effectiveness of water stewardship actions. Publishing an annual overview of research and monitoring results, as well as summaries of water uses within the NWT and neighbouring jurisdictions, can assist in keeping communities informed. Audits of the Strategy and water stewardship actions can help identify areas for improvement.

2.0 Introduction

"The waters of the Northwest Territories will remain clean, abundant and productive for all time."

Draft NWT Water Stewardship Strategy Vision

Freshwater is fundamental to life. Clean and abundant freshwaters ensure healthy, productive ecosystems. These are essential to social, cultural and economic well-being of people, particularly the residents of the Northwest Territories (NWT). The rivers, lakes, streams and ponds of the NWT are an essential part of northern life and traditional Aboriginal cultures. The draft NWT Water Stewardship Strategy (the Strategy) supports the stewardship of freshwater resources to make sure these waters will remain clean, abundant and productive for all time.

Generally, freshwaters and ecosystems in the NWT are very healthy. Water quality in some local areas may be under stress but most of the waters of the NWT are clean, abundant and productive.

Settled land claim and self-government agreements as well as current legislation, policies and programs provide many of the tools needed to establish effective and sound stewardship of our water resources.

All populations require water to develop and prosper. All economies require water to produce goods and services. Growing populations and increasing economic development require more and more water, both within and outside of the NWT. Climate change will affect water availability, quality and quantity. The effects from climate change and the impacts of growth and development have consequences for waters, ecosystems and residents the NWT.

Pressures on waters throughout the NWT and in neighbouring jurisdictions continue to increase.

NWT residents know better water stewardship is essential. Current pressures and lessons learned from past decisions show the need for better water stewardship within the NWT, in upstream jurisdictions such as Alberta and British Columbia, and in downstream jurisdictions such as Nunavut.

The residents of the NWT want to show strong leadership in water stewardship by setting high standards to hold ourselves and others responsible and accountable. We take our water stewardship responsibilities seriously. We want to do more to ensure future generations have the resources and opportunities we treasure today.

The deeply held values of Aboriginal people brought water issues to the forefront in the NWT. Their views have been echoed and reinforced by participants at various gatherings, including the Keepers of the Water conferences (2006 to 2009), WaterWise (2007) and the National Environment and Water Summit hosted by the Dene Nation (2008).

In 2007, the 15th Legislative Assembly of the NWT declared that "all peoples have a fundamental human right to water that must be recognized nationally and internationally, including the development of appropriate institutional mechanisms to ensure that these rights are implemented."

Photo credit: INAC

In 2008, the Government of the Northwest Territories (GNWT) and Indian and Northern Affairs Canada (INAC) started working with Aboriginal governments to develop a draft NWT Water Stewardship Strategy entitled ***Northern Voices, Northern Waters: Northwest Territories Water Stewardship Strategy***.

The Strategy reflects the deep and fundamental relationship between NWT residents and the waters of the NWT. It was developed, in partnership, by Aboriginal, territorial and federal governments and in close cooperation with other organizations, agencies and individuals involved in water stewardship activities in the NWT.

The Strategy is a living document. It respects related initiatives to support responsible economic development within a sound environmental context. The Strategy will be updated regularly and progress in achieving its goals will be measured continuously.

This document includes a brief description of the context and framework for the Strategy. It also identifies gaps and weaknesses in the current approach to water stewardship in the NWT and plans to address them.

Other documents will be developed to support the Strategy and its implementation.

Aboriginal Rights

The draft NWT Water Stewardship Strategy is founded on a collaborative partnership approach. The partners include water stewards such as the Government of Canada, the Government of Northwest Territories, Aboriginal governments, regulatory boards and agencies, environmental organizations, industry and academic institutions.

The Strategy is not intended to alter existing water management responsibilities. It does not affect or infringe upon existing or asserted Aboriginal rights, treaty rights or lands, resource and self-government agreements. In the case of any inconsistency between the Strategy and an existing or future treaty or lands, resources and self-government agreement, the provisions of the treaties and agreements shall prevail.

The Strategy is intended to support existing rights and to improve the decision-making processes of all parties involved in water stewardship in the NWT by increasing information sharing and communication, enhancing knowledgebases and encouraging greater cooperation.

The Strategy addresses gaps and weaknesses in collective water stewardship capacity and capability at all levels. It is intended to help make the best use of our current capacity and to build capacity where it is lacking.

2.1 The Importance of Water in the NWT

People of the NWT rely on water for a number of reasons including transportation, recreation and sustenance. Water is essential for the physical, cultural, spiritual and economic well-being of the people of the NWT. We all need water to survive, drink, cook with and maintain our health. We use water to dispose of industrial and domestic waste. We also have other uses for water besides basic survival. Lakes, rivers, and streams provide recreational places where people relax, fish, hunt, canoe and enjoy the natural environment.

Aboriginal people in the NWT have a long and intimate relationship with the land and water. They draw their spiritual and cultural integrity and their strength from the land and water (or ecosystem). Aboriginal people interact with the ecosystem and all its components in ways which maintain ecosystem health, including the health of their communities. Their traditional knowledge results from a deep understanding of the land and water. It is an important part of their relationship with the natural environment. Today, all residents and visitors benefit from this legacy and rely on the waters of the NWT for their needs.

Aboriginal people make up about 48 percent of the total population of the NWT. About 80 percent of the population outside Yellowknife is Aboriginal and 90 percent of the population in smaller communities is Aboriginal. They expect their traditional ways of life and cultures to be maintained. Many places and features associated with water have important cultural, spiritual or historical meaning and are highly valued by Aboriginal people. A cornerstone of the Strategy is to protect, respect and maintain these sites and access to them.

Aboriginal people fully expect to be directly involved in all aspects of the Strategy. They expect their traditional knowledge to be used in all water stewardship activities and decisions. The appropriate use of traditional knowledge is an integral part of the Strategy.

The natural environment is one of the NWT's most valued features and its water resources are particularly significant. The NWT is home to huge water bodies. Fifteen percent of the surface of the NWT is water.

The Mackenzie River Basin is Canada's largest river basin. It covers 1.8 million square kilometres (km²). The Mackenzie River is Canada's largest river at 1802 km long. The entire Mackenzie River system, including tributaries, is 4241 km long.

Great Bear Lake is the largest lake found entirely within Canada and the third largest after Lake Superior and Lake Huron. It is the last pristine lake of its size in the world. Great Slave Lake is Canada's fourth largest and Dubawnt Lake, found partially within the NWT, is the 15th largest in the country.

Water-related features in the NWT are extensive and include karst topography, widespread permafrost, many deltas, internationally important wetlands for waterfowl and other wildlife and a multitude of lakes, rivers, streams and ponds.

The Mackenzie Delta is Canada's largest freshwater delta, the 12th largest in the world. It is about 210 km long with an average width of 62 km and an area of 13,500 km². Water has shaped and continues to shape the face and culture of the NWT.

Map of Watersheds in the NWT

The lakes and rivers of the NWT ensure the survival of fish species, other animals including waterfowl, furbearers, moose and caribou, and plants, which fish, wildlife and humans need to survive. The continued sustainability of the NWT's natural environment is dependent on its waters.

The waters of the NWT also support the economic well-being of residents and other Canadians. The NWT has important commercial and domestic fisheries. Fishing lodges and outfitter camps play an important role in the economy of the NWT and rely on water for their activities.

Rivers provide energy to create electrical power. There are 14 dams on the tributaries of the Mackenzie River, including 11 hydropower stations with six of them located in the Great Slave Sub-basin. These stations provide 41 per cent of the overall power generation in the NWT.

There is increased interest in developing the hydroelectric potential of the NWT further to offset or eliminate diesel-fired power generators and provide power to industrial developments such as mining.

The NWT economy is very dependent on mining. There are three producing diamond mines with more in the planning stages. Several other mines, including gold, polymetallic, base metal, rare earth, are also in the planning stages. All mines require substantial amounts of water for processing and other purposes. All mines discharge water into the environment. Some mines have created open pits where lakes once stood. All the mines use existing water bodies to store tailings and process water for treatment before discharging it into the environment.

There are oil and gas developments in the NWT with more developments proposed. The pressure on water resources grows as drilling, production and down-hole discharge of drilling wastewater and fluids increase. Water crossings present challenges for pipeline construction.

Water-related issues will increase as oil and gas development proceeds in the NWT. Upstream developments in neighbouring jurisdictions, including oil sands operations in northern Alberta, have implications for NWT waters. These are major concerns for NWT residents.

The waters of the NWT are important for the efficient transport of goods, services and people in the winter (ice roads) and summer (barge and other boat traffic). Residents also rely on these waters for personal travel to hunting areas, cultural sites and other communities. Aboriginal people in the NWT have always travelled on water and their lifestyles continue to depend on travel along the rivers, streams and lakes. They travel by water, often for special occasions. For example, many Tłı̨chǫ residents travel to assemblies by canoe, honouring and celebrating their ties to their traditional heritage. Life in the NWT would be extremely difficult without the transportation corridors provided by the rivers and lakes.

The waters of the NWT are also a world-wide resource. The Mackenzie River Basin's natural water-ice-climate system helps stabilize the Earth's climate. There could be ecological and water-related implications for the entire continent if the Mackenzie River Basin system changes too much. Climate change experts are forecasting the Mackenzie Valley to experience the greatest increases in temperature in the world during the coming decades.

Water is a living thing to residents of the NWT. It is not just a commodity, something to be traded or used and thoughtlessly discarded. It brings life and it is life. As residents of the NWT, we have an obligation to protect and steward our water resources for ourselves, for future generations and for all living things that rely on water.

The Right to Water: Motion 20-15(5)

In March 2007, the 15th Legislative Assembly of the Northwest Territories unanimously passed the following motion:

WHEREAS water is essential to life, and constitutes a fundamental human right;

AND WHEREAS this right includes access to water bodies for purposes of harvesting, travel and navigation, and mechanisms to prevent or seek redress for any action that may affect these rights;

AND WHEREAS this right extends to water as part of a healthy environment and recognizes spiritual and cultural values, taking into consideration the needs of the most disadvantaged and of future generations;

AND WHEREAS on September 7, 2006, in Fort Simpson, representatives of the peoples residing in the vast basin including Lake Athabasca, the Slave River, Great Slave Lake and the Mackenzie River issued the Keepers of the Water Declaration which asserts fundamental human rights with respect to water;

AND WHEREAS the United Nations Committee on Economic, Social and Cultural Rights adopted, on November 26, 2002, the General Comment on the Right to Water, which states that "Water is a limited natural resource and a public good fundamental for life and health. The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights;"

AND WHEREAS climate change and the expansion of industrial activity are diminishing the quantity and quality of water in the Mackenzie Basin;

NOW THEREFORE I move...that this Legislative Assembly recognizes that all peoples have a fundamental human right to water that must be recognized nationally and internationally, including the development of appropriate institutional mechanisms to ensure that these rights are implemented;

AND FURTHER that this Legislative Assembly recognizes that this right includes access to water bodies for purposes of harvesting, travel and navigation, and mechanisms to prevent or seek redress for any action that may affect these rights;

AND FURTHERMORE that this Legislative Assembly recognizes that this right must take precedence over the use of water for industrial and commercial purposes;

AND FURTHERMORE that this Legislative Assembly endorses the application of the precautionary approach in all management decisions or actions that may affect the quality, quantity or natural rate of flow of water within the basin;

AND FURTHERMORE that this Legislative Assembly urges all parties to complete and implement comprehensive watershed management and land use plans as soon as possible in order to safeguard water sources and maintain ecosystem integrity across the basin.

March 5, 2007 Northwest Territories Hansard Page 1168-9

2.2 Goals and Benefits of the NWT Water Stewardship Strategy

Water is important to all aspects of our lives. Effective stewardship of our water resources can ensure clean, abundant and productive waters for our use today and into the future.

Successful implementation of the Strategy will ensure that:

- residents of the NWT have clean, plentiful and affordable drinking water at all times;
- water quality, quantity, and ecological productivity will not be degraded and will be restored and enhanced where degradation has occurred;
- economic development will proceed in ways that do not compromise water quality, quantity and productivity or ecosystem integrity;
- residents of the NWT will be knowledgeable about water issues and will be engaged in decisions about water at all levels;
- decision-making will be transparent and accountable, use the best available knowledge and involve well-informed communities;
- use of water resources to meet the needs of the present generation will not compromise the ability of future generations to meet their own needs;
- residents of the NWT will continue to have the opportunity to pursue their choice of a traditional lifestyle, the wage economy or a combination of the two; and,
- transboundary agreements with our upstream neighbors will reflect the views and aspirations of residents of the NWT.

The benefits of improved water stewardship are clear. As stated by the Rosenberg International Forum on Water Policy:

"These benefits include the opportunity to minimize the human impacts on aquatic systems; to strengthen water quality standards; to establish more reliable key indicators and thresholds of water use and quality; to develop better database protocols and data outputs; to slow or moderate climate change impacts; to recognize different cultural perspectives and – the biggest prize of them all – to manage water resources on a watershed basis in support of sustainable ecosystems, water usage and local culture." [1]

Another important benefit is the enhanced relationships between, and among, Aboriginal, territorial and federal governments – and other parties through the Strategy.

In 1997, the Mackenzie River Basin Board was created by the *Mackenzie River Basin Transboundary Waters Master Agreement*. This agreement was signed by the provincial, territorial and federal jurisdictions sharing responsibility for the Mackenzie River Basin, including the NWT.

1. The Rosenberg International Forum on Water Policy facilitates the exchange of information and experience in management of water resources among scholars and senior water managers based on the theme: reducing conflict in the management of transboundary water resources. The Forum was created in 1996 in honour of Richard Rosenberg, retired Chairman of the Bank of America, as an endowment gift to the University of California. It meets biennially at different locations around the globe. Past Forums have been held in San Francisco, CA, USA; Barcelona, Spain; Canberra, Australia; Ankara, Turkey; Banff, Canada; Zaragoza, Spain; and, most recently, Yellowknife, Canada. http://rosenberg.ucanr.org/.

Photo credit: S. Yee

The *Mackenzie River Basin Transboundary Waters Master Agreement* commits these jurisdictions to the following principles:

- manage the water resources in a manner consistent with the maintenance of the ecological integrity of the aquatic ecosystem;
- manage the use of the water resources in a sustainable manner for present and future generations;
- allow each Party to the agreement to use or manage the use of water resources within its jurisdiction, provided such use does not unreasonably harm the ecological integrity in any other jurisdiction;
- provide for early and effective consultation, notification and sharing of information on developments and activities that might affect the ecological integrity of the aquatic ecosystem in another jurisdiction; and,
- resolve issues in a cooperative and harmonious manner.

Under the agreement, neighbouring jurisdictions can negotiate bilateral water management agreements to address water issues at jurisdictional boundaries on transboundary streams and to provide parameters on the quality, quantity and flow of water.

The only bilateral agreement signed to date is between the NWT and Yukon. The Strategy provides a mandate for negotiations with upstream jurisdictions where activities can affect the quality and quantity of water entering the NWT. Negotiations between the NWT and Alberta are expected to begin in 2010.

3.0 Stewardship Context

Stewardship recognizes that people are part of the environment and means that we have a duty to manage and care for the entire natural environment. Some Aboriginal groups consider that water is a steward of people. Both definitions recognize the importance of the environment.

Promoting good environmental stewardship can be achieved by safeguarding our water and soil, as well as other natural resources. It requires the cooperation of individuals, governments, organizations, communities and others to be successful.

The Strategy promotes stewardship. The well-being of NWT residents requires a healthy ecosystem. The well-being of the ecosystem requires clean, abundant and productive waters. Maintaining the legacy of clean, abundant and productive waters requires vigilant and effective stewardship.

Photo credit: J. Skelton

NWT Environmental Stewardship Framework

The NWT Environmental Stewardship Framework (ESF) was established in 2002. It was created at the direction of the Ministers of Indian and Northern Affairs Canada, Environment Canada, Natural Resources Canada and the Government of the Northwest Territories' Department of Resources, Wildlife and Economic Development following the environmental assessment of the Diavik Diamond Mine. Both levels of government recognized the cumulative environmental effects of development in the NWT, particularly diamond mining, were becoming a significant concern. They also recognized the need for all parties to play a role in minimizing or eliminating the potential adverse effects of development. Representatives of Aboriginal, territorial and federal governments, the mining industry, the oil and gas industry and environmental organizations worked together to develop an environmental framework that allows for responsible economic development. The ESF consists of the Framework document, a Blueprint (implementation plan) and region-specific action plans.

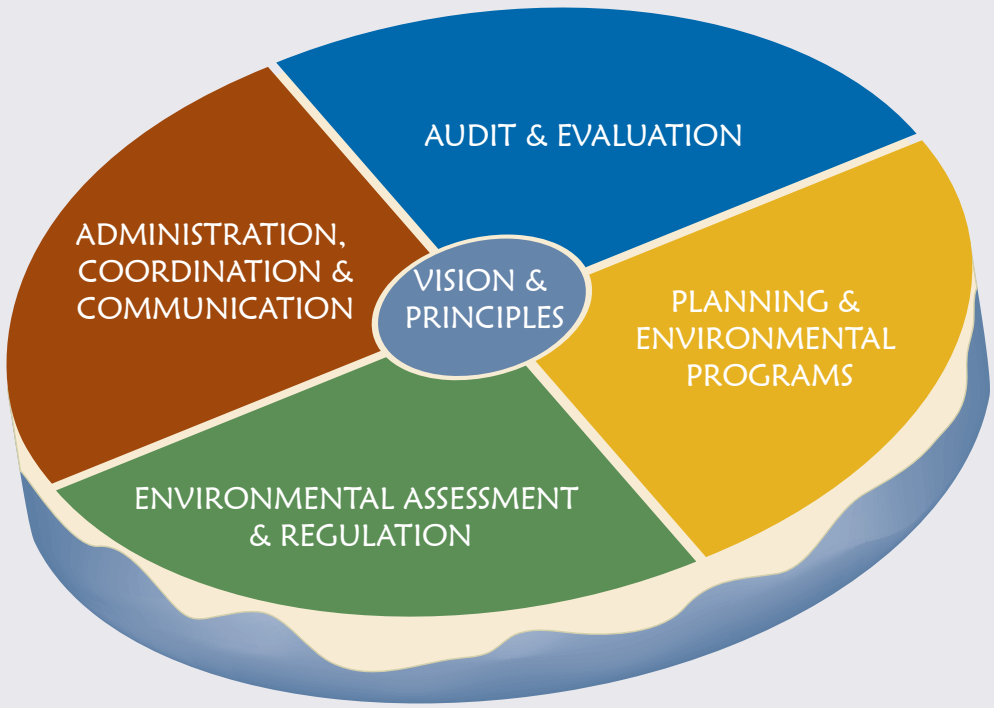
The ESF is a "toolkit" of interlinked programs, policies and legislation intended to allow development to proceed with minimal environmental harm and maximum benefit to NWT residents. Each component supports and informs the others.

The Vision and Objectives component guides the overall Framework. The Planning and Environmental Programs component provides data, information and context for the Assessment and Regulatory component. The Assessment and Regulation component feeds back into the Planning and Environmental Programs component and confirms the Vision and Objectives component. Administration underlies and supports all components. The Audit and Reporting component provides the "check and balance" function.

Water Stewardship Framework

The Strategy is an "action plan" for water. It relies on collective actions at the watershed level to achieve its goals. Actions must take into account the key elements of the watershed, including ecosystem components and their inter-relationships, natural changes and changes resulting from human activity and human uses within, and adjacent to, the watershed. Sound stewardship is informed, measured and responsive.

The Water Stewardship Framework (WSF) draws on the structure and intent of the Environmental Stewardship Framework; however it focuses specifically on water. It outlines a toolkit for improving water stewardship activities, including management actions. The four quadrants of the WSF contain the bulk of the work that must be done to ensure the Strategy is effective and achieves its goals.



Water Stewardship Framework

Improved stewardship of the NWT's water resources requires:

- the application of integrated watershed management and ecosystem-based management practices;
- the application of the concepts of water valuation and sustainability accounting;
- decision-making processes that take into account the effects of all activities on the watershed – past, present, and those likely to occur in the future;
- transparent and inclusive management decisions based on the best available knowledge, information and technology;
- decision-making that considers all interests in the water resource; and,
- enhanced interaction among water partners.

The Strategy outlines how current practices, processes and programs can be strengthened and incorporated into improved water stewardship in the NWT. It offers a number of actions or keys to success to help achieve the vision set out in the Strategy.

The keys to success in this document were identified through an on-going engagement process. Some keys to success may be the responsibility of a single party while others, such as land use planning, are shared among a number of parties. Some of the keys to success are subject to a number of influences, which may be outside the control of the lead party or in some cases any party.

The keys to success are important to the overall success of the Strategy. All directly involved parties are being asked to comment on the keys to success during development of the final Strategy.

There are other, broader keys to success that will facilitate the implementation of the Strategy. First is the settlement of outstanding lands, resources and self-government agreements in the NWT. The broad context for water stewardship remains incomplete while there are unsettled land claims in the NWT.

Integrated Watershed Management

A watershed, also called a drainage basin, is an area of land that drains water through a network of pathways both under and on the surface. As they flow downstream, these pathways converge into progressively larger streams, rivers, lakes and oceans.

Water stewardship considerations can be applied in a manageable, ecologically sound and consistent manner in a watershed. Decisions on the management of water cannot be made in isolation. Stewardship is a shared responsibility where all parties in a basin or watershed have a vested interested in protecting their waters.

Integrated watershed management means decisions, and subsequent actions, are made after considering the entire watershed, its land and water and all values in the watershed. It is the process of managing human activities and natural resources together within a watershed. This approach allows for the protection of the water environment while addressing critical issues such as the current and future impacts of rapid development and climate change.

For example, responsible authorities must take into account ecosystem considerations, economic considerations, recreational considerations and traditional lifestyles before determining if a particular development or conservation initiative can proceed.

The Strategy provides the technical and organizational foundation for implementing integrated watershed management in the NWT.

Key Elements of an Ecosystem-Based Approach to Integrated Watershed Management

In January 2008, the Norwegian Minister of Petroleum and Energy told the Arctic Frontiers Conference in Tromsø, Norway: "...if we have learned nothing else, we have learned that we must put the environment first".

This statement highlights the importance of putting the environment first and taking an ecosystem-based approach to integrated watershed management.

The ecosystem-based approach to watershed management is holistic and places economic considerations in the context of ecosystem considerations. It emphasizes the following key elements:

- people are an integral component of ecosystems;
- ecological, social, and economic goals are integrated;
- political and ecological boundaries are considered together, with the watershed as the basic unit;
- natural processes and social systems are considered in all their complexity and an adaptive and precautionary approach is adopted;
- multiple parties are collaboratively engaged in defining problems and in finding solutions that are anticipatory, ecologically sound and ethical;
- understanding of ecosystem structure, function and processes and their responses to environmental disturbances are incorporated in decisions; and,
- ecological integrity and the sustainability of human and ecological systems are of fundamental importance.

3.1 Stewardship Tools: Water Valuation and Sustainability Accounting

The quality, quantity and productivity of NWT waters are fundamentally important. The use of the resources and the value of their uses are not necessarily equal or even comparable. For example, fishing may be more or less important than hydroelectricity in a particular instance. In some cases, cultural and traditional values may outweigh any possible commercial value and the two uses cannot be compared directly.

The Strategy maintains that management decisions need to be determined by the values, interests and needs of residents to ensure they are wise decisions. One of the largest gaps in achieving this goal is the challenge of valuing water, water resources and landscape features such as wetlands which provide water-related goods and services, as well as moving from the notion of natural capital through water valuation to sustainability accounting. A larger challenge could be the incorporation of cultural values in a way that honours these values.

Water valuation and sustainability accounting stewardship tools are relatively new concepts to the NWT and require more research and understanding before full implementation. These concepts are described in more detail in this section.

3.1.1 Water Valuation

Water is one component of the wealth and value of the natural environment to people. This endowment or wealth is reflected in the economic notion of natural capital. A comparable analogy was used by the residents of Kugluktuk during the Diavik Diamond Mine environmental assessment. Kugluktuk residents described the waters of Lac de Gras as the community's "water tank" and the Coppermine River as its "water line". Other communities often refer to the land as their "bank".

Water management decisions can be challenging. They often require decision-makers to address many diverse interests and understand the values and desires associated with them. Providing clarity regarding the values and respective weightings interested parties associate with water and water resources is essential to setting the stage for better informed stewardship activities, including management decisions.

Economic measures form only one reference point for making decisions. Many of the values held by NWT residents regarding water cannot be measured in economic terms. It is difficult to account for these values and to weigh the advantages and disadvantages of alternatives when they are not measured in the same, comparative manner. When these values are expressed in economic terms, there is often no consensus on the value attributed to a specific interest or use. In the end, decision-makers must be able to communicate the reasons for their decisions clearly and convincingly.

The issue of water valuation in the NWT is controversial and often emotional. Many people argue cultural values should not be, or cannot be, measured in purely economic terms and to do so diminish the cultural value in favor of economic interests. The reverse may also be true. Many cultural values may outweigh any possible economic value.

The reality that cultural values cannot be transformed easily, if at all, into economic values further complicates the situation.

In 2009, a study commissioned by the Canadian Boreal Initiative (*The Real Wealth of the Mackenzie Region – Assessing the Natural Capital Values of a Northern Boreal Ecosystem*) indicated the region's ecological goods and services are worth $570.6 billion per year if left undisturbed. This far outweighs its non-renewable resource potential. Clearly, much more work needs to be done in this area.

Collectively, we must come to a better consensus on various values we attribute to water, water resources, landscape features and water uses. A consensus on values means decision-making is better informed, more transparent, accountable and strongly supported.

Identifying information needs and improved valuation methodologies are required to develop a consensus. Associated management support systems need to be developed so values and their respective weightings can be applied in an efficient and transparent manner in the decision-making processes. Decision-makers must be able to fairly and objectively address the relative importance of these values and the consequences of water management alternatives for various interests.

The Real Wealth of the Mackenzie Region – Assessing the Natural Capital Values of a Northern Boreal Ecosystem

A study commissioned by the Canadian Boreal Initiative highlights the real wealth of the Mackenzie Region. It is the first watershed-based natural capital review done in Canada.

The study states the Mackenzie watershed, 1.7 million square kilometres or 170 million hectares, rivals the size and flow rates of many of the world's greatest river basins. These include the Nile, Yangtze and Amazon.

The Mackenzie watershed is rich in resources. It has vast deposits of conventional oil, oil sands, natural gas, timber and minerals. The economic value of the services provided by nature such as clean water, carbon storage and wildlife habitat does not appear on the balance sheet or contribute to Canada's gross domestic product (GDP).

The study provides a natural capital accounting for the Mackenzie watershed. It includes a total economic valuation of the market and non-market benefits of the watershed's natural capital.

Natural capital is the ecological goods and services provided by nature. Goods include water, timber and non-renewable resources such oil and natural gas. Services include water filtration, carbon storage, climate regulation, pest control, cultural benefits, recreational benefits and opportunities for a wide range of land uses.

The key findings of the study are:

- The market value of the Mackenzie watershed, assessed as the region's GDP, is estimated at $41.9 billion per year, an average of $245 per hectare.

Photo credit: D. Livingstone

- The non-market value of the watershed, assessed as the potential value of 17 ecosystem services produced by the region, is estimated at $570.6 billion per year, an average of $3,426 per hectare.
- The ecological goods and services provided by nature (e.g., carbon storage, water filtration, water supply) in the Mackenzie contribute over 13.5 times more societal economic value than the GDP generated by natural capital extraction industries. This evaluation is not intended to undervalue the resource potential, but rather to temper its value in a broader sustainability context.
- The industrial footprint in the region covers 25.6 million hectares and the estimated cost of natural capital degradation from development is likely to be in the billions of dollars. This does not suggest that natural capital extraction should cease, but rather that there be a more prudent approach to future natural capital stewardship, so that valuable ecosystem services can be maintained while meeting human needs and economic development objectives.
- The stored carbon and annual carbon absorbed by forests, peatlands, wetlands and tundra are valued at an estimated $339 billion in 2005, or 60 percent of the total estimated nonmarket value of ecosystem services.

The Canadian Boreal Initiative (CBI) commissioned this study to help decision makers—federal, territorial, provincial and First Nations governments— make informed stewardship decisions that balance broader ecosystem and cultural values with sustainable economic growth.

Natural Capital in the Context of Integrated Watershed Management

Natural capital is a way of expressing, in economic or monetary terms, the direct and indirect value of "services" provided by natural ecosystems and their components to people. For example, the value the Mackenzie River provides as a barge transportation route can be measured in economic terms. This cost can be compared to the cost of transportation without the river such as air transport. It is clear the natural capital value of the Mackenzie River just for transportation purposes is enormous.

The natural capital valuation for transportation is only one element of the total natural capital valuation of the Mackenzie River Basin. Fisheries, recreation, drinking water sources, wetlands for water purification, flood control, carbon storage and wildlife habitat are just some other elements of the total natural capital valuation of the Mackenzie River Basin. There are also the enormous and valuable cultural values associated with the basin.

Integrated watershed management ensures ecological goods and services supplied by a watershed are sustained so the overall natural capital asset of the watershed is maintained or increased over time.

Clear and consistent accounting of the natural capital of watersheds is needed to make sure the values are conserved and strengthened where appropriate. Trends over time in watershed natural capital provide important indicators as to the success of integrated watershed management.

Photo credit: S. Bohnet

Keys to Success

Activity	Timeframe
Develop methodologies regarding economic valuation of ecosystem services in partnership with knowledgeable researchers and communities.	Immediate
Conduct community-level sessions to determine, and complete, collective priority values assigned to water resources by community members.	December 2011
Update information management systems, sustainability accounts and other decision support tools to reflect community-level findings.	On-going
Share all findings with water partners.	On-going
Continue to engage with NWT residents, monitor changing water values and update management support systems as required.	On-going

3.1.2 Sustainability Accounting

Implementation of the Strategy can help ensure the long-term health and productivity of NWT waters. Clear and sound measures of sustainability are needed to make sure water stewardship activities are contributing positively and yielding benefits for NWT residents.

A comprehensive set of water resources sustainability accounts, based on the values given to water resources and water uses, are also needed. Sustainability accounts must include all elements NWT residents consider important about water resources. These accounts should also include value-based indices as well as economic and ecological indices.

Sustainability accounts should provide a sustainability index or index of well-being when weighted and measured. Accounts could include recreation uses, transportation uses, wildlife habitat, commercial fisheries, cultural sites and activities, domestic and industrial uses. It is possible to measure changes and understand the affects of the changes on NWT water resources if values are described as accounts.

Water partners, including both upstream and downstream users of shared water resources, are accountable for ensuring sustainability indices remain positive.

Understanding Sustainability Accounting

Sustainability accounting is based on the principles of accounting. Sustainability accounting, like financial accounting, consists of standards and procedures to determine the 'value' of an item and if the 'value' is increasing (more profitable) or decreasing (less profitable) over time. This information is provided in the balance sheet.

In the case of a company, the balance sheet is reviewed and used by the company and shareholders to make decisions. If the company is making a profit, shareholders might want to continue the same course of action or take steps to increase the profits. If the company is losing money, the shareholders may recommend ways the company can improve its practices and reduce losses.

Sustainability accounting follows a similar process. Sustainability accounting does not include a number of economic values. Instead, it includes many less conventional measures of well-being such as cultural values.

Sustainability accounting can capture the broad spectrum of water resources values determined by NWT residents and translate them into a comprehensive sustainability index of well-being.

Keys to Success

Activity	Timeframe
Establish a comprehensive set of sustainability indicators and accounts for water resources.	December 2010
Conduct monitoring and applied research to populate and maintain sustainability accounts.	On-going
Release annual public sustainability accounting reports.	December 2011 and on-going
Work with water partners and other organizations to collect water resources statistics for shared water resources and produce annual sustainability accounting reports for shared watersheds.	On-going
Ensure sustainability accounts are factored into decision-making processes.	On-going

4.0 NWT Water Stewardship Framework

The success of the Strategy is based on the Water Stewardship Framework (WSF) and its components. It outlines key current activities and the major gaps and challenges that must be addressed to meet the goals of the Strategy. The heart of the WSF is the Vision and Guiding Principles component. It is supported by the following four additional components:

- Planning and Environmental Programs;
- Environmental Assessment and Regulation;
- Administration Coordination and Communication; and,
- Audit and Evaluation.

4.1 Vision and Guiding Principles

The vision for the NWT Water Stewardship Strategy is: "*the waters of the Northwest Territories will remain clean, abundant and productive for all time*".

The vision reflects the desire of NWT residents to safeguard our water resources for current and future generations. Residents must be collectively and individually committed to achieving this vision. There are serious challenges on the horizon that must be addressed to make sure this vision can be achieved.

Photo credit: S. Bohnet

Guiding Principles

Respect

- Clean, abundant and bountiful water is a fundamental human right and is essential for the maintenance of ecological integrity.
- Water stewardship and related decisions incorporate values held by residents of the NWT including spiritual, cultural, recreational, economic and ecological values.
- The Strategy respects and integrates Aboriginal rights or treaties including land claim and self-government agreements.

Responsibility

- Water stewardship is a collective responsibility. No one agency or individual has sole responsibility and no one agency or individual is without responsibility.

Knowledge

- The best available local, traditional and scientific knowledge will be acquired and applied in decision-making.

Adaptive Management

- Knowledge evolves and stewardship will evolve accordingly, responding to feedback and integrating new information.

Sustainability

- Decisions made by the current generation should not compromise the choices of future generations.
- Where there are threats of serious or irreversible damage to the ecosystem, lack of full scientific certainty shall not be used as a reason for postponing effective measures to avert the threatened damage.

Accountability

- Water stewardship decisions will be made in an informed, transparent, accountable and participatory manner.
- Decisions will be made in the context of integrated water management concepts and processes, including economic considerations.

Adaptive Management

Adaptive management is the process of continually incorporating new knowledge or information into decision-making. The approach is designed to maintain ecosystem functions and to avoid going beyond ecological thresholds.

Adaptive management plays an important role in managing risk to the environment and human health. It relies on on-going monitoring and feedback. For example, a strong monitoring program at an industrial or municipal development could detect significant alteration in receiving water quality and point to changes to water treatment processes. Follow-up monitoring can confirm whether additional changes are needed.

Ecological Thresholds

Ecological thresholds are the points where there is an abrupt change in an ecosystem quality, property or phenomenon or where small changes in an environmental driver produce large responses in the ecosystem. Ecological thresholds can be considered the breaking points of ecosystems or the points where the pressures lead to abrupt changes in the ecosystem. These points are also referred to as critical load, regime shift or tipping point.

Resilience refers to the ability of the ecosystem component to absorb pressures without change or the ability to quickly return to its original state after disturbance.

An example of a threshold or tipping point is the effect of climate change on the nature and extent of sea ice. It appears warming in the Arctic region has reduced sea ice coverage to the point where an abrupt "regime shift" may have begun and summer ice cover over the Arctic Ocean may disappear by 2015. This is not a gradual response to reduced reflection by white surfaces of sunlight back to the atmosphere or albedo but is an abrupt change when albedo has been reduced to a critical point.

Sustainability

Sustainability is the capacity to endure. In ecology, sustainability describes how biological systems remain diverse and productive over time. For humans, it is the potential for long-term maintenance of needs or well-being of current and future generations, which depends on the well-being of the natural world and the responsible use of natural resources.

Pristine wetlands and forests are examples of sustainable biological systems. Invisible chemical cycles redistribute water, oxygen, nitrogen and carbon through the world's living and non-living systems and have sustained life for millions of years. As the earth's human population increases, natural ecosystems decline. Changes in the balance of natural cycles have a negative impact on both humans and other living systems.

Aboriginal cultures have always recognized the strong link between land, water and people. The sustainability of Aboriginal cultures depends on the sustainability of the ecosystem and the recognition that aquatic and terrestrial ecosystems are tied to each other and to Aboriginal people.

4.2 Planning and Environmental Programs

Planning and environmental programs includes a range of programs and initiatives. These include land use planning; community conservation area planning; the NWT Protected Areas Strategy; research and monitoring activities such as the NWT Cumulative Impact Monitoring Program and others conducted by academia, communities, industry and government agencies; environmental threshold and carrying capacity studies; and, agreements such as transboundary agreements.

These programs and initiatives guide and inform other components of the Water Stewardship Framework. For example, land use plans set the context for resource management decisions. Monitoring programs are often required by regulators. The results of monitoring programs provide valuable information to land use planning boards that can be use the information during reviews of their land use plans.

Many NWT programs focusing on gathering water-related data and information are listed on the following page. Many of the programs include significant involvement by Aboriginal governments, organizations and communities.

Many other programs, policies and guidelines set a context for water stewardship in the NWT. Many specific activities currently underway in the NWT support the Strategy directly or indirectly. These programs and activities include:

- NWT Protected Area Strategy (PAS);
- Canadian Heritage Rivers Program;
- Land use plans including regional land use plans developed pursuant to land claims agreements, the Great Bear Lake Watershed Management Plan, the proposed Marion Lake Watershed Plan and Inuvialuit community conservation plans;
- Managing Drinking Water Quality in the NWT: A Preventative Framework and Strategy (and associated action plans);
- Mackenzie River Basin Transboundary Waters Master Agreement;
- NWT Greenhouse Gas Strategy;
- Federal Policy on Wetland Conservation;
- Ducks Unlimited and Canadian Wetland Inventory work on wetlands classification in the NWT;
- Northwest Territories Power Corporation's Hydroelectric Policy;
- 2007 NWT Energy Plan;
- Energy Priorities Framework (2007);
- Research, mapping and planning activities undertaken by communities, academia, industry, environmental non-government organizations and other non-government agencies;
- GNWT Traditional Knowledge Implementation Framework; and,
- ENR Traditional Knowledge Implementation Plan.

Programs and Initiatives Contributing to Water-related Knowledge

- Long-term programs for the collection of baseline water quality data on northern river systems. Includes 25 NWT sites operated by Environment Canada, some located on proposed pipeline routes and at transboundary locations, and 12 water quality sites operated by Indian and Northern Affairs Canada.
- The National Hydrometric Network operated by the Water Survey of Canada, in partnership with Indian and Northern Affairs Canada and others. Provides near real-time water level data from 85 stations in the NWT. Data used to calculate stream flow and analyze trends and flooding. Some sites also collect water quality data.
- The NWT Snow Survey Network operated by Indian and Northern Affairs Canada in partnership with the NWT Power Corporation, and the Weather Station Network operated by Indian and Northern Affairs Canada in partnership with Government of the Northwest Territories - Environment and Natural Resources, collects evaporation data from sites in the NWT.
- The Buffalo River Environmental Monitoring Program supported by the NWT Métis Nation and Fisheries and Oceans Canada collects a range of biophysical information.
- The CABIN program samples benthic invertebrates as an indicator of water quality. Includes 16 sites operated by Environment Canada and some operated by other parties such as Parks Canada and Fisheries and Oceans Canada.
- The NWT Cumulative Impact Monitoring Program (CIMP) is designed to monitor cumulative impacts of land and water uses in the NWT. CIMP uses both traditional knowledge and western science and places emphasis on valued components of the environment both biophysical and human. CIMP has supported a number of projects and programs but it has not been fully implemented yet.
- Studies conducted by NWT monitoring agencies, such as the Environmental Monitoring Advisory Board, provide an opportunity to link western science and traditional knowledge.
- Reports by northern regulatory boards such as the Mackenzie Valley Land and Water Board (MVLWB). This includes annual reports which track water use and waste amounts and geotechnical assessments. It also includes results from the Surveillance Network Program (SNP) and aquatic effects monitoring programs (AEMPs), which may include aquatic ecosystem parameters.
- NWT Drinking Water Quality Database.
- Water and sediment quality sites at four transboundary rivers entering the NWT (Slave, Hay, Liard and Peel Rivers).

Current and accurate information is a crucial requirement for the successful implementation of the Strategy. Good monitoring programs help with understanding water processes and changes to the ecosystem and allow for better planning of current and future water uses. The best available information supplied by monitoring programs should be used to support other planning and environmental programs. All these programs can also identify gaps and the steps needed to address them.

Results of monitoring and research programs contribute to continuous improvement of available information and assist in making wise decisions. Monitoring programs track, measure and evaluate the physical, ecological, economic and social influences affecting water resources.

Research programs, combined with effective monitoring, can improve the precision and reliability of the information used to make management decisions. They can also identify critical ecological thresholds for activities or contaminants level. These thresholds can be used by regulators and other decision-makers and be factored into land use plans. More research and monitoring programs are required to determine and verify thresholds. The knowledge gained through monitoring and research programs can be more broadly used in land use planning and become important factors in periodic land use plan reviews and updates.

Some community-based monitoring initiatives are currently underway in the NWT. Two good examples are the NWT Métis Nation water quality monitoring program at the mouth of the Little Buffalo River and the Aboriginal Aquatic Resource and Ocean Management (AAROM) initiative lead by Fisheries and Oceans Canada and Akaitcho Territory Government. There are obvious advantages to community-based monitoring programs. They are cost-effective and use the knowledge of residents who know the land best.

Land use plans, protected area networks and community conservation plans can set the context for subsequent planning and decisions. The Great Bear Lake Watershed Management Plan and the proposed Marion Lake Watershed Plan are important initiatives. Both plans focus on sound stewardship of waters particularly significant to people in those regions.

The protected areas network and land use plans for all areas of the NWT have not been completed yet, which could affect other stewardship activities. The context for stewardship activities is incomplete without these programs and plans.

Guidelines for monitoring and other programs are also required. Guidelines for aquatic effects monitoring program can help ensure monitoring programs implemented by mining companies across the NWT are consistent and provide sound, comparable data.

The Canadian Council of Ministers of the Environment (CCME) is developing Canada-wide guidelines for municipal waste water discharge. Mine site remediation guidelines help ensure water-related elements of mine site remediation programs are consistent and well-founded.

Co-operative agreements among resource management boards currently exist. These include the NWT-Nunavut Water Board Co-operation Agreement; the Nunavut Impact Review Board-Mackenzie Valley Environmental Impact Review Board Cooperation Agreement; and, the Environment Canada-Indian and Northern Affairs Canada Hydrometric Monitoring Agreement.

Bilateral or multilateral transboundary water management agreements, as stipulated in the Mackenzie River Basin Transboundary Waters Master Agreement, are required among the jurisdictions within the Mackenzie River Basin. The Strategy is intended to inform these and other negotiations.

While there are a number of programs, processes and legislation in the NWT related to water stewardship and water management, more work must be done to strengthen existing programs, address gaps and improve program integration.

Photo credit: GNWT

4.3 Environmental Assessment and Regulation

The *Mackenzie Valley Resource Management Act*, the Inuvialuit Final Agreement and the *NWT Waters Act* provide the legislative framework for environmental assessments and regulatory approvals in the Mackenzie Valley and the Inuvialuit Settlement Region.

Various federal government departments, including Indian and Northern Affairs Canada, Fisheries and Oceans Canada and Environment Canada enforce the terms and conditions of permits issued by regulatory boards and government agencies. Other legislation such as the *Fisheries Act*, *Canadian Environmental Protection Act* and *Canadian Environmental Assessment Act* are also important in environmental assessment and regulation processes.

Under the current regulatory process, an application for a water licence is determined through the following steps:

- Screening and review of the proposed use or activity to ensure consistency with approved land use plans and minimization of negative effects.
- Drafting strategies to further address the impact of the use, as appropriate.
- Setting licence terms and conditions to ensure that the proponent manages its activities appropriately.
- Conducting monitoring and enforcement activities to ensure the terms and conditions are upheld and changes made where necessary (adaptive management).

Some activities involving water use and discharge of water into water bodies within the NWT fall below legislative thresholds and do not require a water licence. Other activities occurring in neighbouring jurisdictions can affect NWT waters but are not subject to the direct jurisdiction of the NWT. All these activities can affect NWT waters independently and cumulatively.

Stewardship of the NWT requires an accounting of all uses of water, including those licensed within the NWT, those licensed in neighbouring jurisdictions and unlicensed activities, which can individually and collectively affect water resources.

Policies, guidelines, programs and strategies are in place, or under development, to ensure industry and other water users are aware of agency and community expectations before undertaking activities involving the use of water or the discharge of waste into water.

Existing and proposed guidelines and policies include:

- Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the NWT (2009);
- Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories (1992);
- Mine Site Reclamation Guidelines (2006);
- Effluent Discharge Guidelines (Municipal Wastewater Guidelines 1992);
- Canada-wide Municipal Wastewater Effluent Strategy;
- National water quality objectives (Canadian Council of Ministers of the Environment); and,
- Water and effluent quality management policy for the NWT.

There are also gaps and weaknesses within existing legislation. The application of existing legislation may negatively affect our collective ability to make sure water resources of the NWT are adequately protected. This includes requirements for security deposits, water use fees, down-hole discharge of waste waters and groundwater management. There is also limited capacity to enforce the legislative and/or licence requirements in some circumstances. More work is needed in this area.

There are various initiatives underway to improve regulatory efficiencies and processes in the NWT. The Strategy is intended to support improved water stewardship in the NWT and complements these initiatives.

4.4 Administration, Coordination and Communication

Sound administration, effective coordination and good communication is needed for successful water stewardship in the NWT. Water managers require a sound information base for their decisions. A lot this information is not currently available or shared due to a number of factors. Water partners may have limited capacity. They are not always aware of each others' roles, responsibilities and needs because data management and sharing is inadequate.

Stronger links among water partners are needed so stewardship programs and decisions can reinforce one another. Information management, capacity within organizations, communication and cooperation amongst agencies and individuals, public education on water issues and decision-making support systems are all important tools to achieve the objectives of the Strategy.

One of the greatest challenges in this area is transforming data to knowledge and providing this knowledge effectively and efficiently to all parties, particularly those involved in water management decisions. There are several information management initiatives underway but more needs to be done to bring these separate initiatives together in a coordinated and comprehensive way. New knowledge, both traditional and western scientific needs to be incorporated throughout the Strategy in effective and adaptive ways.

4.5 Audit and Evaluation

Audits and evaluations provide the "check and balance" essential to well-functioning systems. In the NWT, audits of the state of the environment and the state of environmental management are frequent. However, the feedback process and the incorporation of audit recommendations into improved practices are often inadequate.

Audit tools are readily available. These include the NWT Environmental Audit required pursuant to Part 6 of the *Mackenzie Valley Resource Management Act*, Auditor General of Canada audits and the Mackenzie River Basin Board's State of the Aquatic Ecosystem Reports.

The effectiveness of all components of the Strategy can be measured through audit and evaluation. The results should allow water partners to improve their respective processes. If properly conducted and recommendations are effectively implemented, audits and evaluations can help ensure the goals of the Strategy are being met. Audits also allow for public participation in the review of public policy.

Improved auditing and reporting and the effective and timely implementation of audit recommendations can improve the Strategy and its water stewardship aspects.

Photo credit: S. Bohnet

5.0 Filling the Gaps

The Strategy establishes a process of continuous improvement. It requires commitment to the concept of adaptive management and to the components of the Water Stewardship Framework.

The following sections identify keys to success to realize the vision of the Strategy. These specific actions address existing gaps and can strengthen and integrate the respective components of the Water Stewardship Framework. These actions form the basis of the implementation plan, which will be discussed with water partners during the winter of 2009-2010.

5.1 Vision and Guiding Principles

The Strategy is guided by the collective vision: “the waters of the Northwest Territories will remain clean, abundant and productive for all time”.

Keys to Success

Activity	Timeframe
Confirm the vision and guiding principles through a process of engagement with NWT residents.	Spring 2010

Photo credit: P. Vecse

5.2 Planning and Environmental Programs

Many environmental programs and planning efforts are underway in the NWT. These programs are often incomplete, poorly integrated and do not benefit from the best information currently available. Planning efforts also suffer from disconnections and inadequate information. The following sections identify key weaknesses and deficiencies and describe measures to address the shortcomings.

5.2.1 Planning

Planning can take many forms in the NWT. It includes strategic plans, policy-driven initiatives, regional and community-based land use plans. Many strategic plans relating to water stewardship are in place or under development. Many land use planning initiatives are in place or underway. The Strategy is intended to bring together various strategic plans related to water in the NWT.

The land use planning context for the NWT is incomplete. Only the Inuvialuit community conservation plans and the Gwich'in Land Use Plan are being implemented in the NWT. These plans are being actively used for land management. Work is continuing on the Sahtu and Dehcho land use plans. A Tłı̨chǫ Land Use Plan is under development. It will apply to Tłı̨chǫ-owned lands only. The Akaitcho land use planning process has not started.

The NWT Protected Areas Strategy has not been fully implemented. A number of sites have been identified for protection but only one site has received formal protection since the program began in 1999.

Keys to Success

Activity	Timeframe
Complete NWT Water Stewardship Strategy.	Spring 2010
Complete and approve land use plans for the Dehcho and Sahtu regions.	December 2012
Start land use planning for the Akaitcho region.	Immediate
Identify options for land use planning in the Wek'èezhìi management area outside Tłı̨chǫ-owned lands.	December 2010
Identify all PAS special areas and representative areas as described in the current NWT Protected Areas Strategic Plan (2009-2014).	December 2011
Identify sponsors or other mechanisms for land stewardship for all PAS special areas and representative areas.	December 2014
Complete the broader network of managed protected areas, including those established through the PAS or other programs, such as Parks Canada programs, Marine Protected Areas and contributions of regional land use plans.	December 2018

5.2.2 Monitoring and Research

Effective and comprehensive monitoring and research programs ensure an effective response to a changing environment. Both traditional knowledge and western science must be considered when developing research or monitoring programs.

Monitoring programs allow the tracking and measurement of physical, ecological, economic, and social factors and influences related to water resources. This information provides improved knowledge for water management decisions. It also allows for effective evaluation of past decisions and the ability to change management practices as required. Monitoring also helps attribute cause and effect and evaluate the significance of change.

Effective monitoring programs need to be developed. Existing monitoring programs need to be enhanced and coordinated more effectively. Guidance is needed to determine the need for, and the allocation of, monitoring resources. More community-based monitoring is also needed.

Research programs improve the understanding of the physical, ecological, economic and social influences and relationships affecting water resources and how the ecosystem works as a whole. Research programs address specific aspects of water management. Combined with effective monitoring, effective research programs contribute to precision, accuracy and reliability of the information for water management decisions.

Environmental monitoring programs need to be better coordinated and the NWT Cumulative Impact Monitoring Program must be fully implemented. Land use plans in the NWT need to be completed and implemented.

Keys to Success

Activity	Timeframe
Identify and prioritize gaps in existing water-related research and monitoring programs. Analysis should draw on existing studies including traditional knowledge research and consider the findings of the NWT Environmental Audit.	December 2010
Develop monitoring indicators related to trends and drivers in aquatic ecosystem health and water resources use including ecosystem maintenance indicators and instream flow needs sustainability indicators. Link indicators to overall sustainability index and the NWT Environmental Audit.	December 2010
Host a conference on monitoring indicators.	December 2010

Keys to Success continued

Activity	Timeframe
Expand existing water quality and water quantity network of monitoring stations by establishing a minimum of 250 water quality stations and 150 hydrometric stations at sites identified through a comprehensive planning process.	December 2014
Complete overview report on status of remote sensing capacity and capability and options to improve remote sensing operations in the NWT.	December 2010
Enhance remote sensing capacity and capabilities in the NWT to enable better and more cost-effective collection of water and water-related data.	On-going
Conduct research including traditional knowledge research on receiving water standards; thresholds and carrying capacity; sensitivity of northern aquatic species to toxins produced by industrial activities; monitoring indicators; and, the effects of climate change on ecosystems, water quality and water quantity in the NWT.	On-going
Establish a network of funding partners prepared to commit resources to the research priorities.	On-going
Conduct comprehensive and community-sensitive engagement mechanisms to identify communities that can be better engaged in research and monitoring activities including needs assessment and priority setting.	December 2011
Share monitoring program findings with water partners through effective data management and communication mechanisms.	On-going
Circulate results of NWT Environmental Audit, Mackenzie River Basin Board's State of the Aquatic Ecosystem Report and other reports related to the quality of the NWT aquatic environment.	On-going
Fully fund and implement the NWT Cumulative Impact Monitoring Program.	December 2011
Prepare for negotiations with Alberta on a transboundary water agreement and other Mackenzie River Basin jurisdictions.	December 2010

5.3 Enviromental Assessment and Regulation

Regional land use plans and a protected areas network can provide context and clarity to regulators and review boards on where, and under what conditions, development activities are supported. In the absence of these plans, review boards and regulators must develop a better understanding of the public values and perceptions associated with a development of a particular kind in a particular place. This lengthens and complicates the review process and results in significant delays.

Related programs and guidelines, such as the Aquatic Effects Monitoring Program Guidelines, can further assist agencies in fulfilling their respective obligations.

Improved understanding of the nature of the water resources, the causes and effects of change, and better quantification of the values and relative weights of the values NWT residents attribute to water and water resources can facilitate effective, efficient decision-making by boards and agencies.

Improved cooperation among boards and interveners in the regulatory process can facilitate decision-making, in part through better understanding of the respective needs of each agency.

Improving the use of existing resources and enhancing capacity, where necessary, can lead to better and more informed decision-making and effective enforcement.

Apparent gaps and weaknesses in current legislation should be addressed through regulatory improvement initiatives already underway in the NWT. The Strategy supports these initiatives through the identification of necessary changes to the regulatory system, which could improve water stewardship in the NWT.

Keys to Success

Activity	Timeframe
Establish on-going communication links between, and among, the partners involved in the Strategy and parties responsible for regulatory improvement initiatives to ensure that regulatory changes are consistent with the vision of the Strategy.	Immediate
Identify Aboriginal, territorial and federal environmental enforcement capacity shortfalls and develop an implementation plan to address the identified concerns.	December 2010
Complete a review of the *NWT Waters Act* and identify desirable changes, including options to address the water use fee structure set out in the Act with a view to increasing fees to reflect the value of the resources.	December 2012

Keys to Success continued

Activity	Timeframe
Publish NWT Effluent Quality Criteria Guidelines.	December 2011
Publish diamond mine effluent regulations.	December 2011
Publish revised Guidelines for Aquatic Effects Monitoring Programs in the NWT.	December 2011
Publish policy related to water and effluent quality management in the NWT.	December 2010
Update NWT Mine Site Reclamation Guidelines.	December 2010
Resolve weaknesses with respect to down-hole disposal of drilling wastes.	December 2010
Resolve shortcomings with respect to water-related regulatory security deposits.	December 2010

Photo credit: INAC

5.4 Administration, Coordination and Communication

Implementation of the Strategy requires sound cooperation among the many parties and individuals with water stewardship responsibilities in the NWT. It also requires cooperation between, and among, jurisdictions including Alberta, Yukon, Saskatchewan, British Columbia and Nunavut. When agencies and individuals work together effectively, guided by a common vision, principles, concepts and programs, overall capacity is enhanced and more effective water stewardship results.

Clearly defined roles and responsibilities are essential for sound integrated watershed management. Improved information-sharing and communication can result in more informed and consistent decisions on water resource use. To achieve this, there is a need for:

- better definition and understanding of roles and responsibilities among Aboriginal, territorial and federal governments;
- sharing of information about water resources among all partners through compatible information management and decision-making systems; and,
- increased consistency in water management decisions from place to place and from time to time.

5.4.1 Information Collection and Management

The continental-scale Mackenzie River Basin and the numerous smaller river basins of the NWT are watersheds with many sub-basins. A considerable amount of information and effort is required to ensure decisions are ecosystem-based and made in the context of the entire watershed. Integrated watershed management does not require perfect information. It does require the best available information, both traditional knowledge and western science, be widely shared and applied wisely.

A comprehensive collection of all readily available and accessible geo-referenced information for watersheds in the NWT is required.

Best Available Knowledge: Traditional and Local Knowledge

Traditional knowledge (TK) is important information and provides important guidance for all stewardship actions. TK is not just another source of knowledge or information. It considers how to effectively involve people in decision-making processes. TK is based on respect and understanding the values of others. It has cultural elements that stand alone because they cannot be simply translated into western counterparts.

The appropriate incorporation of TK requires continuity and sound, respectful and collaborative working relationships with TK holders. Existing TK protocols developed by communities, regions and Aboriginal governments must be used wherever available. These protocols, the GNWT Traditional Knowledge Framework and the ENR Traditional Knowledge Implementation Plan guide how research should be carried out appropriately with communities and TK holders. They also guide how results can be respectfully incorporated in decision-making.

Local knowledge is also a good source of information and can provide important guidance for decision-makers and other parties.

Best Available Knowledge: Western Science

Government agencies, industry, academia and individuals gather a great deal of scientific information about water resources in the NWT. This includes data and information related to water quantity, quality, flow, aquatic ecosystems and water values. The available information is dispersed among various organizations and is not readily or widely available.

Knowledge gaps need to be filled. Existing and new information must be made more accessible to all water management partners. A technically sound framework must be provided to enable better interpretation and application of this information.

Keys to Success

Activity	Timeframe
Inventory all TK protocols already completed by communities, regions, Aboriginal, territorial and federal governments and support the development of protocols where needed.	Spring 2010
Review current TK protocols and implement a process where current protocols can be modified or new ones developed so that research is carried out in an effective and respectful manner and supports all elements of the Strategy.	December 2011
Complete a comprehensive inventory of watershed information available for the NWT.	Spring 2010
Update relevant geo-databases.	On-going
Develop management decision models that identify appropriate ways to apply both TK and western science to management decisions through a collaborative process.	December 2011
Initiate a process to identify and resolve issues impeding coordinated watershed data collection, sharing and management decisions through a collaborative process.	Spring 2010
Establish required mechanisms and protocols that will support a common approach among NWT agencies.	December 2011
Implement data collection, sharing and communication protocols and tools to ensure data and knowledge are collected effectively and efficiently transmitted to decision-makers at all levels.	On-going

5.4.2 Stewardship Roles and Responsibilities

Sound water stewardship requires all parties to share a collective responsibility to ensure that NWT waters remain clean, abundant and productive.

Stewardship involves many parties with many responsibilities working together in a coordinated and effective manner. It includes management of water flow and water use, effluent discharge quality and quantity and the programs, initiatives and policies that influence and inform management decisions. Water stewardship also includes individual actions at all levels.

Traditional knowledge, monitoring programs and research results provide people with information about the state of water resources and the actions needed to keep ecosystems healthy and productive and water uses sustainable. Specific direction can be given in land use plans, multi-party agreements and regulatory authorizations. Guidance documents provide information on best practices, regulatory processes and the values and expectations of local people.

Water-related management responsibilities are held by various levels of government (Aboriginal, territorial and federal), regulatory boards and agencies, resource management boards and local communities. Most of the NWT water management framework is laid out in land claim agreements. Additional roles and responsibilities are set out in other legislation including the *NWT Waters Act*, *Navigable Waters Protection Act* and *Fisheries Act*. Treaty and Aboriginal rights set a broad context for water management decisions and other actions.

Land claim and self-government agreements and associated legislation set out the NWT resource management regime and the regulatory boards and agencies responsible for various water-related plans and decisions. These include land use plans, water licences, fisheries and wildlife research and planning. Board decisions are based on the views of industry, communities, government agencies, environmental organizations and individuals and are made in the context of applicable legislation.

Several regional forums have been established to share information and collectively steward NWT lands and waters. One example is the Wek'èezhíı Forum, which includes the Wek'èezhíı Land and Water Board, Wek'èezhíı Renewable Resources Board and Tłı̨chǫ Lands Protection Department. Two other examples are the Mackenzie River Basin Board and the NWT Board Forum, which includes all resource management boards in the NWT and the federal and territorial governments. These bodies allow for coordinated discussion and actions on many fronts including water stewardship.

As the Strategy is developed and implemented, stronger and more effective relationships among all NWT water partners will evolve. Through collaborative mechanisms, water stewardship can better reflect NWT-wide interests and concerns, and decisions can be more consistent with the views and aspirations of NWT residents.

Keys to Success

Activity	Timeframe
Develop clear description of the roles and responsibilities of water stewardship partners and communication of those roles and responsibilities.	Spring 2010
Complete agreed commitments through memoranda of understanding and other agreements.	Spring 2011
Conduct engagement and hold regular conferences of NWT water stewards in communities, regions, and central agencies.	On-going

Photo credit: C. Scott

5.4.3 Capacity

One of the biggest challenges to enhancing water stewardship in the NWT is the limited capacity at almost all levels. More effective coordination of current resources within NWT agencies and communities should show immediate benefits. This can result by avoiding duplication of efforts such as the development of similar, overlapping and, sometimes, contradictory guidelines by agencies independently of one another. Better use of existing resources through cooperation, coordination and partnerships can address some of the resource challenges. However, additional capacity is required for full implementation of the Strategy. Sound joint strategic planning is necessary to make the best use of existing resources and to justify requests for additional resources.

Steps involved in preparing strategic plans include identifying roles, responsibilities and areas of overlap among agencies and water partners; developing performance indicators to track improvement; public reporting of results; and, coordinating training and resource requests to improve overall capacity. Many agencies are already developing and implementing capacity building programs.

Keys to Success

Activity	Timeframe
Conduct a comprehensive inventory of capacity limitations and challenges; capacity-building initiatives including educational and training programs; and, opportunities for funding and other support.	December 2010
Develop a partnership-based proposal for submission to funding agencies including governments, foundations and other potential sources for short and long-term funding.	Spring 2011
Conduct regular needs assessments to identify capacity challenges, shortfalls and opportunities through various means including audits, performance reviews, conferences and workshops.	On-going

5.4.4 Decision-Support Tools

A systematic process is necessary to enable sound management decisions. Partners in the decision-making process must commit to continuous improvement and adaptive management. This process should include: identifying design alternatives; critically evaluating alternatives and considering intended outcomes; forecasting expected outcomes for selected alternatives including how each choice could effect current or future water uses or enhance or degrade water values; choosing the "best" of the alternatives; planning, implementing and assess effectiveness performance; and, reporting on results.

Water managers and decision-makers must handle large volumes of data, information and knowledge to apply a decision-making support system consistently, broadly and effectively. They must also be able to examine advantages and disadvantages of possible alternatives. A comprehensive analytical system, or "decision support tool", could facilitate this analysis. There are numerous decision support tools available or under development. Careful analysis of options is required before a particular tool(s) is selected.

Keys to Success

Activity	Timeframe
Develop decision guidance mechanism(s) to allow water managers to better assess the potential impact of new water use proposals.	December 2011
Prepare and release comprehensive inventory of water use information, on a watershed basis.	Spring 2010
Update the comprehensive inventory of water use information.	On-going
Assess need for a decision support tool, examine options and select tool(s) for full evaluation.	Spring 2010

5.4.5 Communication, Awareness and Engagement

Continuous communication, education and awareness about water issues is required to keep NWT residents fully engaged in water stewardship on an on-going basis. It may be necessary to establish an on-going "umbrella" mechanism to make sure we individually and collectively work towards the Strategy's common vision.

Keys to Success

Activity	Timeframe
Integrate NWT Water Stewardship Strategy with current NWT watershed and natural resource planning and management frameworks.	On-going
Host an annual gathering or conference for water partners update the status of their respective commitments in the Strategy.	2010 and on-going
Develop public education and information plan to advise NWT residents and other Canadians about the importance of NWT water and water issues.	Spring 2010
Complete an inventory of current resource stewardship communication networks and use findings to develop a water stewardship network.	Spring 2010
Conduct a comprehensive review of the Strategy that is linked to the NWT Environmental Audit.	Every five years
Develop an NWT Water Stewardship Strategy website.	December 2010
Establish an umbrella mechanism to ensure the Strategy stays on track.	Spring 2010

5.5 Audit and Evaluation

Residents must be informed of the progress of the water stewardship activities undertaken through the Strategy and the effectiveness of these actions in on a regular basis. The results of sustainability accounting and the changes to various indicators must be reviewed regularly to make sure the Strategy is protecting natural capital and providing benefits to NWT residents.

Keys to Success

Activity	Timeframe
Publish an annual overview of water-related research and monitoring programs results.	July 2010
Publish an annual comprehensive water-related sustainability account, audit and evaluation finings.	July 2010
Publish annual summaries of water uses within, or adjacent to the NWT, with an outline of the net benefit of the uses to the NWT residents.	2011
Conduct audit of the Strategy as part of the NWT Environmental Audit.	Every five years
Use best efforts to implement audit recommendations, building on strengths and addressing weaknesses and shortfalls.	On-going

6.0 Moving Forward

The final NWT Water Stewardship Strategy will include the following documents:

- an overview of the Strategy;
- supporting technical reports;
- an implementation plan summarizing the key commitments, a schedule for their completion and the agencies and resources involved.

Discussion on the final Strategy and actions needed to strengthen water stewardship are continuing throughout the NWT winter of 2009-2010.

The engagement of all parties interested in water stewardship in the NWT is encouraged to ensure their concerns and ideas are clearly heard and reflected in the final Strategy and implementation plan.

Regular reviews and updating of the Strategy and the implementation plan will be completed. A major review of the Strategy will be done every five years.

On-going engagement of NWT residents at all stages is necessary to ensure all parties remain aware of water stewardship successes and issues and their roles and responsibilities for meeting them.

Photo credit: P. Vecsei

Appendix A: Our Water Use

Summary of Human Uses of Water within the Mackenzie River Basin

Sub-basin	Water Body	Uses
Athabasca Basin	Athabasca River	Traditional use Community water supply Recreational use Oil sands development Pulp mills Agriculture Forestry, including saw mills Conventional oil and gas Coal mining
	Clearwater River	Traditional use Recreational use High sediment load Canadian Heritage River
	South Heart River	Traditional use Recreational use Heart River 1 dam used for flood control and water supply
	Lesser Slave River	Traditional use Recreational use Pulp mills Agricultural activities
	Paddle River	Traditional use Recreational use Paddle River dam used for flood control and water supply
	Pembina River	Traditional use Recreational use 12% of land use is agriculture Oil and gas; coal

Summary of Human Uses of Water within the Mackenzie River Basin continued

Sub-basin	Water Body	Uses
Athabasca Basin continued	Charlot River	Traditional use Recreational use Hydroelectric power production
	Wapiti River	Traditional use Community water supply Recreational use Pulp mills Forestry Oil and gas
	Lesser Slave Lake	Traditional use Recreational use
	Lake Athabasca	Traditional use Recreational use Uranium mining
	Peace-Athabasca Delta	RAMSAR Wetland of International Importance (Peace-Athabasca Delta) UNESCO World Heritage Site (WBNP)
Peace River Basin	Peace River	Traditional use Recreational use Oil and gas Mining (coal) Agriculture Hydroelectric power production
	Williston Lake	Recreational use Hydroelectric development - reservoir of W.A.C Bennett Dam

Summary of Human Uses of Water within the Mackenzie River Basin continued

Sub-basin	Water Body	Uses
Great Slave Basin	Tazin River	Traditional use Recreational use Water is diverted from the river to Charlot River for hydroelectric power generation
	Talston River	Traditional use Recreational use Hydroelectric power production
	Slave River	Traditional use Community water supply Recreational use
	Lockhart River	Traditional use Recreational use Mining activities
	Yellowknife River	Traditional use Community water supply Recreational use Current and historic mining and exploration Hydroelectric power production
	Snare River	Traditional use Recreational use Hydroelectric power production
	Hay River	Traditional use Recreational use Agricultural activities Forestry activities Oil and gas development (Cameron Hills and northern Alberta)
	Great Slave Lake	Traditional use Recreational use Commercial fishery Community water supply Current and historical mining activities

Summary of Human Uses of Water within the Mackenzie River Basin continued

Sub-basin	Water Body	Uses
Great Slave Basin continued	Snare Lake	Traditional use Community water supply Recreational use
Mackenzie-Great Bear Basin	Great Bear River	Traditional use Recreational use Hydroelectric potential under study
	Mackenzie River	Traditional use Community water supplies Recreational use Summer navigation route from Hay River Oil and gas development (Norman Wells) and exploration
	Keele River	Traditional use Recreational use
	Arctic Red River	Traditional use Recreational use Canadian Heritage River
	Great Bear Lake	Traditional use Community water supply Important for sport and subsistence fishing Recreational use Historical mining and current exploration
Liard Basin	Muskwa River	Traditional use Community water supply Recreational use Forestry Oil and gas

Summary of Human Uses of Water within the Mackenzie River Basin continued

Sub-basin	Water Body	Uses
Liard Basin continued	Fort Nelson River	Traditional use Recreational use Forestry Oil and gas
	South Nahanni River	Traditional use Canadian Heritage River and UNESCO site Mining activities (tungsten) World-class recreational destination Potential mining activity
	Liard River	Traditional use Recreational use Oil and gas development
Peel Basin	Peel River	Traditional use Recreational use Yukon/NWT Transboundary agreement Mining and oil and gas exploration, potential development

Summary of Human Uses of Water outside of the Mackenzie River Basin

Sub-basin	Water Body	Uses
Kazan River Basin	Kazan River	Traditional use Recreational use Canadian Heritage River
Dubawnt River Basin	Dubawnt River	Traditional use Recreational use
Thelon River Basin	Thelon River	Traditional use Recreational use Thelon Game Preserve Canadian Heritage River
Back River Basin	Back River	Traditional use Recreational use
Coppermine River Basin	Coppermine River	Traditional use Recreational use Diamond mines in headwaters in the NWT (Lac de Gras)
Hornaday River Basin	Hornaday River	Traditional use Community water supply Recreational use Hydroelectric and mineral development potential
Horton River Basin	Horton River	Traditional use Recreational use
Anderson River Basin	Anderson River	Traditional use Recreational use Oil and gas exploration
Husky Lakes	Husky Lakes	Traditional use Recreational use

Many other smaller rivers and creeks in the Mackenzie River Basin are important for traditional use. These include: Kakisa River; Morrissey Creek; Wallice Cree; Bouvier River; Red Knife River; Trout River; Horn River; Birch Creek; Blue Fish Creek; Buffalo River; Rabbit Skin River; Willow River; and, Lafferty Creek.

More information, on the draft NWT Water Stewardship Strategy, can be found at: **www.enr.gov.nt.ca.**

Northwest Territories

Canada

November 2009