



**CITY OF YELLOWKNIFE  
SMART GROWTH PLAN  
NATURAL AREA PRESERVATION STRATEGY**

***FINAL REPORT***

***July 7, 2010***

***Submitted to:***

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## EXECUTIVE SUMMARY

The Natural Area Preservation Strategy (the Strategy) is one of a series of studies and reports commissioned by the City of Yellowknife (the City) as a component of the Smart Growth Plan (the Plan). Dillon Consulting Limited commenced work in the fall of 2008 as one of three consulting teams working concurrently under the direction of the City with input from a committee of appointed community representatives.

The following excerpt from the Terms of Reference prepared by the City summarizes the purpose of this study:

“In the context of Yellowknife’s growth pressures and existing conditions within the three study areas, tough decisions with measured trade-offs will need to be made. The *Strategy* will assist the *Plan* in arriving at practical preservation/development strategies through further site investigation and ongoing public input on quality of life impacts. As suggested in the City’s *General Plan (2004)* there is strong public expectation for community growth that balances development, green space, recreation and alternative transportation routes/trails that are non-vehicular.”

Dillon was retained to develop the Strategy, and work was undertaken in four study areas:

- Mapping and field investigations
- Quality of life valuation
- Ecological valuation
- Policy and regulatory framework

The main body of this report presents the Strategy and outlines a policy framework. However a substantial portion of the work involved the mapping of the natural area sites (see Appendix A) and the development of a Toolkit that can be used to implement the Strategy (see Appendix E).

Preceding all work on this study, a public exploration of choices and future outcomes was coordinated by the City starting in 2008 that included a community wide survey, and eight community workshops led by MetroQuest. The January 2009 report ‘Yellowknife: 50 Year Vision’, produced for the City by MetroQuest, documents the vision that surfaced from the

workshops. Preserving the natural beauty of Yellowknife as it grows is an integral part of that vision. The Strategy describes an approach that can be adopted by the City of Yellowknife to plan for the integration of natural areas with the urban environment in keeping with the Smart Growth Vision.

The Strategy is presented in this report beginning with terms and classifications developed to allow a systematic approach to site evaluations. Next, the contributions of natural areas to the urban environment are explored and ecological and ‘quality of life’ features identified. From this, policy direction is set and a strategy including specific actions to meet policy goals is outlined. Finally, mapping and an inventory of natural sites, preservation criteria, and guidelines are then provided that can be used to implement the Strategy.

This Strategy has been designed to work in tandem with a compact growth scenario proposed by the City through the Plan. While the compact growth scenario indicates it is not imperative to develop any of the Natural Area Sites in the urbanized areas of the city immediately, it is unrealistic to expect there will be no development pressures. In time, the City will also need to identify lands for the city to expand. The Strategy provides a defensible decision making process that will allow the City to acknowledge issues, consider impacts, and demonstrate the process that was followed as part of a long term planning process.

Recommendations in this Strategy include both processes and outcomes as summarized here:

*Inventory of  
Natural Areas*

The City adopt and maintain the inventory of natural areas developed for this Strategy including:

- **Thirty Nine (39)** sites defined as Natural Area Sites located in the current urbanized area
- Future natural area sites to be delineated and added to the inventory as new growth areas are identified

### *Preservation*

**Twenty five (25)** of the currently inventoried Natural Area Sites be retained and **preserved** in a natural state with minimal development of outdoor facilities.

Portions of **fourteen (14)** of the currently inventoried Natural Area Sites may be made available **in part for the development** of residential, commercial or institutional facilities, or to provide for uses permitted in parks.

### *Development*

Any development permitted on Natural Area Sites be **controlled** to limit the number and size of any structures, the destruction of any natural features, and damage from motorized vehicles.

Any portion of a Natural Area Site made available for the development of residential, commercial or institutional facilities be used only for **exemplary projects** that that will leave a legacy reflecting contemporary values of environmental stewardship and sustainable development and demonstrate Smart Growth principles.

Development on sites adjoining Natural Area Sites should be controlled to mitigate impacts on ecological functions of the Site.

### *Regulations*

Natural Area Sites be zoned ‘Nature Preservation’ with regulations as set out in Zoning Bylaw 4044, with the exception of sites where ‘Parks and Recreation’ is consistent with current use and future development plans.

When any portion of a Natural Area Site is released for the development of exemplary projects, the zoning of the affected parcel be amended to Site Specific with development controls.

Where terminology adopted for the Strategy is inconsistent with existing City Bylaws, the terms in use in those Bylaws be amended to facilitate the implementation of this Strategy.

***Protected Area  
Candidate Sites***

The City recognize sites that lie only partially within the municipal boundary and nominate them as sites for consideration under the **NWT Protected Area Strategy** including:

- The Vee Lake Drainage area including the Martin Lake Trail and Ranney Hill
- The Yellowknife River watershed

***Public  
Involvement***

Ongoing City programs or incentives be adopted to:

- Communicate the goals of the Plan
- Encourage and enable **advocates of natural area preservation to invest** in exemplary design projects

***Implementation***

Natural Area qualities, distribution, connections and quantities be monitored regularly and assessed against the targets recommended in the Strategy.

Targets for the intensification of development in specific Districts established in the Plan be monitored and coordinated with monitoring of Natural Areas.

***Public Support***

Natural areas are retained and protected in cities across Canada for their contribution to sense of place, environmental health, stormwater management, and beauty. A strong case has already been made for retaining natural areas in Yellowknife's urban environment in previous studies undertaken by the City. The *2004 General Plan and Background Report* and the *Integrated Parks, Trails and Open Space and Development Plan* in particular formed an important backdrop for this Strategy.

The recommendations included in this report were first introduced and subsequently modified following public presentations held as part of process used to develop the Plan. Interviews, comments received at public open houses, and the results of a 4 day design charrette all indicate there is broad public support for the policy direction of the Strategy. An advisory committee established by the City for the Plan also provided oversight and direction as the Strategy was developed.

Specific Natural Area Site preservation recommendations will be the most tangible outcome of this study for many residents. When the decision making process laid out in this Strategy is applied, the following 25 Natural Area Sites satisfy the conditions for a high level of protection:

<i>Site #</i>	<i>Site Name</i>	<i>Site #</i>	<i>Site Name</i>
<b>1</b>	Niven Lake East (Fritz Theil Rock)	<b>18</b>	Niven Lake
<b>2</b>	Bush Pilot Monument	<b>21</b>	Rat Lake
<b>3</b>	McAvoy Rock	<b>23</b>	Tin Can Hill Shoreline
<b>4</b>	Willow Flats	<b>25</b>	Mosher Island Shoreline
<b>5</b>	Peace River Flats	<b>28</b>	Range Lake
<b>6</b>	Yellowknife Ski Club	<b>29</b>	Sir John Rock
<b>8</b>	School Draw Shoreline	<b>30</b>	Con Road West
<b>9</b>	Willow Flats Shoreline	<b>31</b>	Con Road East (Diamond Ridge)
<b>10</b>	Latham Island E Shoreline	<b>32</b>	Toboggan Hill
<b>13</b>	Ski Club/ Jackfish Ravine	<b>37</b>	Gitzel Outcrop
<b>14</b>	Back Bay Shoreline	<b>38</b>	Kam Lake Road / Old Airport Road
<b>17</b>	Joliffe Island Shoreline and Dog Islands	<b>39</b>	Niven Lake North Square
		<b>40</b>	Balsillie Court and east of airport

Natural Area Sites where it is recommended that a portion of the sites may be considered for the development of exemplary projects include:

<i>Site #</i>	<i>Site Name</i>
<b>7</b>	Latham Island Rock South
<b>11</b>	Old Yellowknife Ski Club Area
<b>12</b>	Joliffe Island
<b>15</b>	Latham Island Rock North
<b>16</b>	Twin Pine Hill
<b>19</b>	NCC Lands
<b>20</b>	Fred Henne Territorial Park/ Prospectors Trail
<b>22</b>	Tin Can Hill
<b>24</b>	Mosher Island
<b>27</b>	Con Mine Infill
<b>33</b>	Tommy Forrest Outcrop (Infill)
<b>34</b>	CBC Outcrop
<b>35</b>	Taylor Road/ Sissons Court (Infill)
<b>36</b>	Fire Hall Outcrop (Infill)

*Site maps for all Natural Area Sites can be found in Appendix A of this report.*

## ***Implementation***

This Strategy has been developed to guide future decisions about Natural Area Sites in the existing urban area, and the planning of future urban development areas where natural areas are integrated with development. The test of its success will be found in:

- Political support
- Administrative actions
- Measurable and documented achievements
- Relevance over time in spite of unforeseen events and new opportunities

In most cases the responsibility for directing growth to existing developed areas and preserving natural areas will lie with the City through the use of statutory planning documents including the General Plan and Zoning Bylaws. Because most undeveloped lands in the municipality are currently publicly held, the City has a rare opportunity to plan ahead for natural area preservation, an option not available to most cities in Canada. This study lays out a strategy that can be followed to achieve an urban environment with a high proportion of natural areas integrated into developed areas. The mapping and inventory tools provided with the Strategy can be updated and used over the years as choices are considered and decisions are made.

## ***Keeping the Future in Mind***

Who knows what changes 50 years will bring to Yellowknife? The Strategy has been developed to help prepare for the future, but the context in which it is applied will be continuously subject to change. Development constraints and opportunities will change over time, particularly as brownfield remediation advances and land claims within the municipal boundary are settled. Market preferences and the value people place on natural areas may also change over time. Finally, if the technology available for public consultation and site analysis changes as much in the next 50 years as it has in the past 50 years, new opportunities may surface that we cannot imagine today.

# 1 Introduction

The City of Yellowknife is located in a truly unique and inspiring natural setting. The rocks, lakes, boreal forest and animal life that are visible and accessible throughout the city enhance the daily experience of residents and visitors, providing them with immediate opportunities to connect with nature, engage in nature-based recreational activities, and simply appreciate where they are.



## *A short history of Yellowknife urban development*

How the city has grown over the years has been very much shaped by the landscape. Large remnant natural areas in the city are a legacy of an approach to building that avoided difficult to develop sites, while taking advantage of lake access.



Easy access to the lake made the rocky peninsula of the Old Town, Joliffe Island and Latham Island a good place to start a town back in 1937. As an exploration base, transportation to outlying areas was important and possible by boat, dogsled, cat train and planes on floats and skis. Small buildings could be fit into the natural terrain on smooth rock outcrops with little site clearing or grading.



*Courtesy NWT Archives*

By the late 1940's the difficulties of providing water and sewer services to the growing population forced development up the hill from the original Old Town site. The land selected for the new downtown area was naturally flat and sandy and easily developed in a typical North American grid pattern.



Residential growth in the 1970's expanded into the draws between rocky outcrops surrounding the downtown. Throughout the 1980's the "loops and lollipops" suburban model worked its way around the rocky outcrops and steel pile foundations allowed mobile homes to find a perch on the rocks.



By the 1990's new development began to meet some of the challenges presented by the natural landscape by blasting away rock. This approach has proven expensive, and the subject of much public debate. In 2005 the City of Yellowknife had three separate studies prepared that examined how to accommodate growth while retaining natural areas that were valued by residents for recreational and aesthetic benefits.



### ***Future Vision***

Public concern and the many constraints that make urban expansion challenging in the Yellowknife area have all led the City to look to Smart Growth principles to guide future planning. A public exploration of choices and future outcomes was coordinated by the City starting in 2008 that included a community wide survey, and eight community workshops led by MetroQuest. The January 2009 report 'Yellowknife: 50 Year Vision', produced for the City by MetroQuest documents the vision that surfaced from the workshops. Preserving the natural beauty of Yellowknife as it grows was an integral part of that vision.

## **Scope of this Study**

The following excerpt from the Terms of Reference summarizes the purpose of this study:

“In the context of Yellowknife’s growth pressures and existing conditions within the three study areas, tough decisions with measured trade-offs will need to be made. The *Strategy* will assist the *Plan* in arriving at practical preservation/development strategies through further site investigation and ongoing public input on quality of life impacts. As suggested in the City’s *General Plan (2004)* there is strong public expectation for community growth that balances development, green space, recreation and alternative transportation routes/trails that are non-vehicular.”

As a component of the Smart Growth Plan (the Plan), the Natural Area Preservation Strategy (the Strategy) is one of three studies commissioned by the City of Yellowknife (the City) following the initial work done to set out the Vision. Dillon was retained to as to develop the Strategy, and work was undertaken in four study areas:

- Mapping and field investigations
- Quality of life valuation
- Ecological valuation
- Policy and regulatory framework

Public participation included interviews to confirm previous findings, a 4 day design charrette, and two public open houses.

Over the course of the study, the name of the strategy changed from the ‘Ecological Area Preservation Strategy’ to the ‘Natural Area Preservation Strategy’ to better communicate the scope of the Strategy.

## **1.1 Smart Growth in Yellowknife**

While Smart Growth principles are somewhat universal, they need to be adapted to suit the local social, environmental, physical and economic context. In contrast to many other cities in Canada, Yellowknife has a relatively small area of urbanized land surrounded by a vast wilderness. The rationale for retaining natural landscapes in Yellowknife cannot be the same as that used in larger cities surrounded by agricultural lands. Smart Growth will be less focused on protecting rare or endangered plant and wild animal habitat from human activity, and more about integrating plant and animal habitat with human habitat. There is tremendous opportunity for Yellowknife to realize an innovative community form shaped by the Smart Growth principles of:

- Compact development
- Preservation and integration of natural features
- Transportation alternatives
- Housing choices
- Innovation
- Public collaboration

The principles of Smart Growth may appear to encompass some contradictory goals in promoting both more compact development and the retention of open space and natural areas. However, it is only through the integration of the various principles that the development of a highly livable, affordable, and desirable human environment can be guided. A good balance of compact urban development and high quality and accessible public open space will also help to meet other City goals of more affordable housing, reduced environmental impacts, and attracting investment.

## 1.2 New Trade-Offs

Most of the “easy to develop” land within Yellowknife’s municipal boundaries are now developed and deciding where to develop next has many challenges. A strong economy has made it possible for many residents to make expensive choices, however there is an increasing call for the City to promote more affordable development options.

Through a series of workshops led by MetroQuest in 2008 residents were given an opportunity to look into the future and consider the implications of today’s choices. Because residential development currently accounts for one of the largest proportions of urban land development, the choice is one that every resident of the city can help to make.

The 50 Year Vision that emerged from the public consultation process guided by MetroQuest identifies some important trade-offs that will have to be made if the Smart Growth vision is to be achieved.

- *Smaller private homes and yards in favour of preserved green space and greater efficiency.*
- *More compact development near key urban ‘nodes’ in favour of a more efficient development pattern and transportation system.*
- *More investment in transportation alternatives in favour of reducing automobile travel.*
- *More regulations and spending on programs to conserve natural resources in favour of better environmental responsibility.*

*Source :Yellowknife 50-Year Vision, MetroQuest, 2009*

Becoming a more compact city through intensification will by default allow more natural areas to be retained. Conversely, without retaining easily accessible natural areas, more compact development may be less marketable. The benefits of more affordable housing, healthy living, and reduced greenhouse gas emissions will need to be seen to outweigh any perceived losses by residents and investors.

When decisions need to be made in the future about whether to develop or retain natural areas, the way that costs and benefits are balanced will need to shift: from assuming greenfield development is the best way to grow the city; to looking first for opportunities to make better use of existing infrastructure and natural resources. This shift will have important implications for residents and the development industry. As the market for medium density housing grows, the pressures to develop remnant natural areas in the city should diminish.

*This Strategy must be implemented in concert with a city development strategy in order to achieve the Smart Growth vision.*

### **1.3 Strategy Recommendations**

This document describes an approach that can be used to determine what natural areas be integrated with developed areas of the City in keeping with the Smart Growth vision.

The Strategy presents:

- A clear rationale to determine whether to develop existing natural area sites in the urbanized area of the City while the development focus is on intensification
- Trade-offs that can be made where preservation of an entire site is difficult to justify following the decision making rationale
- Guidelines for identifying natural areas to be integrated into areas of future urban expansion
- Actions to use to implement this strategy as part of the Plan

## 2 Natural Areas in Yellowknife

This section of the report introduces the natural areas in the city that are the focus of the Strategy. To begin, terms are defined, and then a classification system is introduced that was developed to allow a systematic approach to site identification and evaluation.

### 2.1 Terminology

The Natural Area Sites are part of a larger open space system in the city. The terminology adopted for this Strategy distinguishes natural areas from other types of green space. The hierarchy of terms below will need to be adopted in other City bylaws to facilitate the implementation of this Strategy.

**Open Space:** a term used to include all publicly owned parks and natural areas as well as urban plazas or landscaped areas that form part of publicly accessible institutional lands.

**Green Space:** encompasses parks and natural areas, and also includes any private lands in a natural state or landscaped with a significant amount of vegetation.

**Parks:** lands that have been set aside for public use and developed either publicly or privately for active recreational uses where facilities are maintained including buildings, shelters, lawns, sports fields, playground equipment.

**Natural Areas:** undeveloped lands in a natural or near-natural state

**Natural Area Sites:** natural areas that are publicly owned and publicly accessible, and left primarily in a natural state and have been included in an established inventory

**Major Natural Area Site:** sites that are accessible from or adjoining more than one neighbourhood or district.

**Local Natural Area Site:** sites accessible from and surrounded by development within a neighbourhood or district.

**Natural Boundary:** edges defined by abrupt changes in elevation, watershed or view shed limits, or sudden changes in vegetation that form a clear line when viewed on aerial photos or satellite images.

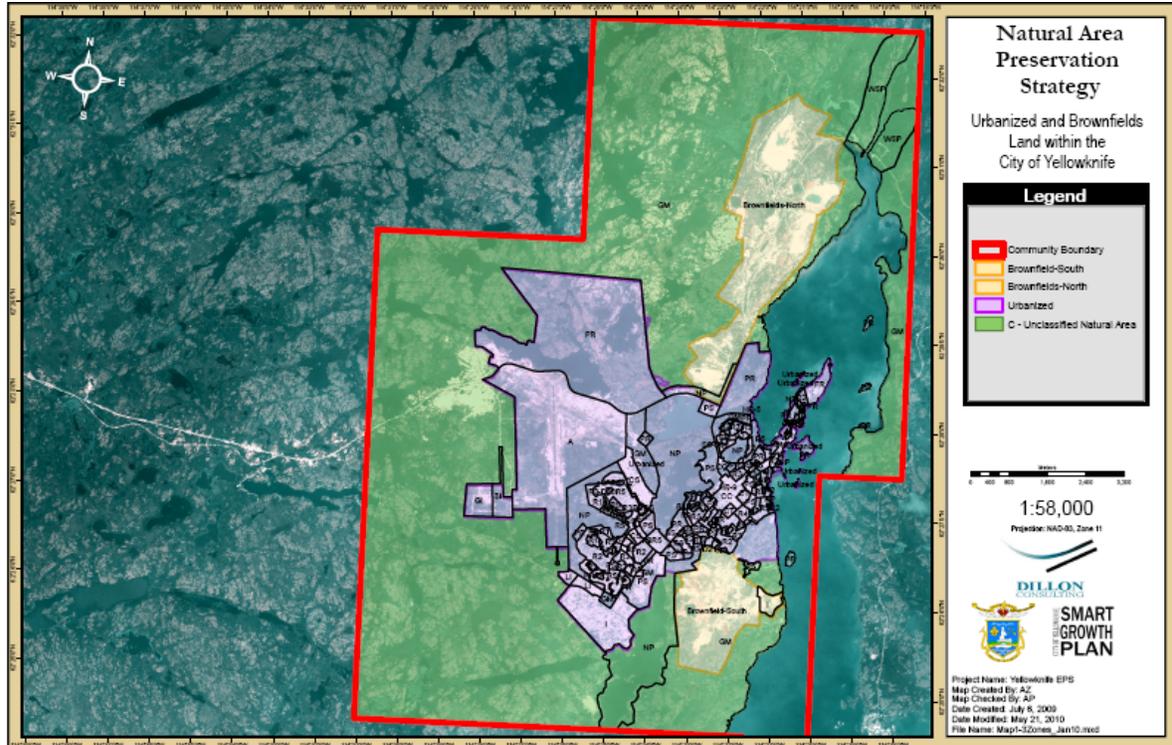
*Where terms defined here are inconsistent with existing City Bylaws, it is recommended those bylaws be amended to facilitate the implementation of the Strategy.*

## 2.2 Municipal Landscape Categories

Given the existing development pattern of the municipal landscape, the wilderness lands that surrounds it, and the presence of significant brownfields, the lands within the municipal boundary have been divided into three distinct development zones:

Zone	Description	% Area
<b>A</b>	urbanized areas of the city that are currently zoned by land use	<b>22 %</b>
<b>B</b>	brown-field areas currently off limits due to environmental contamination	<b>9%</b>
<b>C</b>	non-urbanized areas that are largely in a natural state	<b>69%</b>

Each of these three zones is unique in terms of development potential and constraints, and warrants distinct policy approaches. Lands included in each zone will change over time. As development expands into Zone C, and as lands in Zone B are remediated and become available for development, the area of Zone A will increase. A map delineating these zones, as illustrated below, can be found in Appendix A.



### **Zone A: Urbanized Landscape**

Zone A encompasses the developed areas within the municipal boundary. This includes all residential, industrial, commercial, and greenspaces within the urbanized area. (Note: It is similar, though not identical to, the urbanized area defined in the 2005 Residential Growth Study). Zone A also contains Joliffe Island and other small islands in Yellowknife Bay, as well as Fred Henne



Territorial Park. Zone A is the priority area for new development and redevelopment in keeping with Smart Growth principles. As developable land becomes increasingly scarce appropriate actions will need to be taken to preserve and protect the natural features as an integral part of this urbanizing landscape.

*The total area of Zone A is approximately 2,980 hectares, or 22% of the total area within the Municipal Boundary.*

### **Zone B: Brownfield Areas**

Zone B encompasses brownfield sites at the, Giant Mine, Con Mine, and the municipal landfill site. The boundaries of areas included in Zone B have been determined based on brownfield definitions used by the Federal Government (DIAND) and the *Public Health Act*. These sites are currently not available for redevelopment due to environmental contamination. The process



of remediating the two mine sites is ongoing. Over time, if portions of these lands are released for municipal development needs, they would be reclassified as either Zone A or Zone C, depending on the intended use.

*The total area of Zone B is approximately 1,180 hectares, or 9% of the total area within the Municipal Boundary.*

### **Zone C: Non-Urbanized Area**

Zone C includes lands located within the municipal boundary but outside of developed areas including Yellowknife Bay (Great Slave Lake). Future growth of the City will likely extend into this Zone over time which is primarily in a state of wilderness, although not pristine at this time.

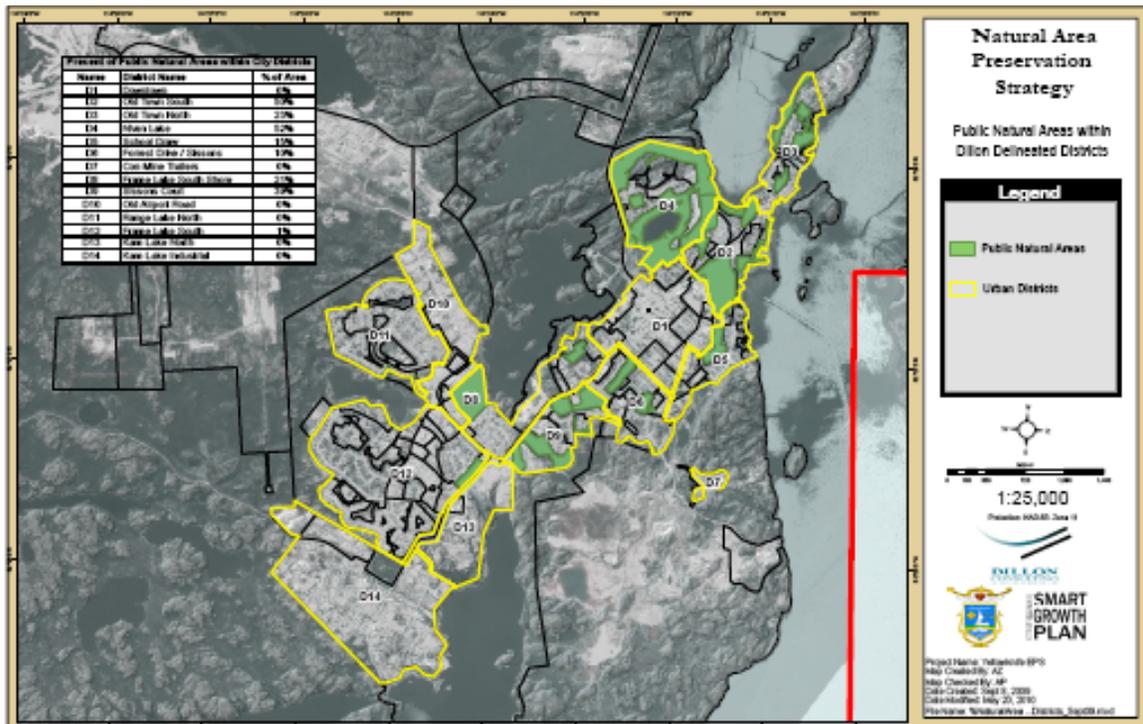


*The total area of Zone C is approximately 9,500 hectares, or 69% of the total area within the Municipal Boundary.*

## 2.3 Urban Districts

A further subdivision of the urbanized area into Districts is useful for conducting more detailed analysis at a scale most relevant to Smart Growth principles of accessibility and place-making. Districts have been identified within the existing extent of Zone A, however the term can also be used when discussing areas in Zones B or C when they are being considered for development. District boundaries in the existing Zone A lands are shown in the map below. These generally correspond with existing neighborhoods with distinct characters and/or road networks. (For example they correspond with areas defined in *City Explorer* mapping, and those used by the City to determine growth scenarios for the Plan).

A map delineating these Districts, illustrated below, can be found in Appendix A.

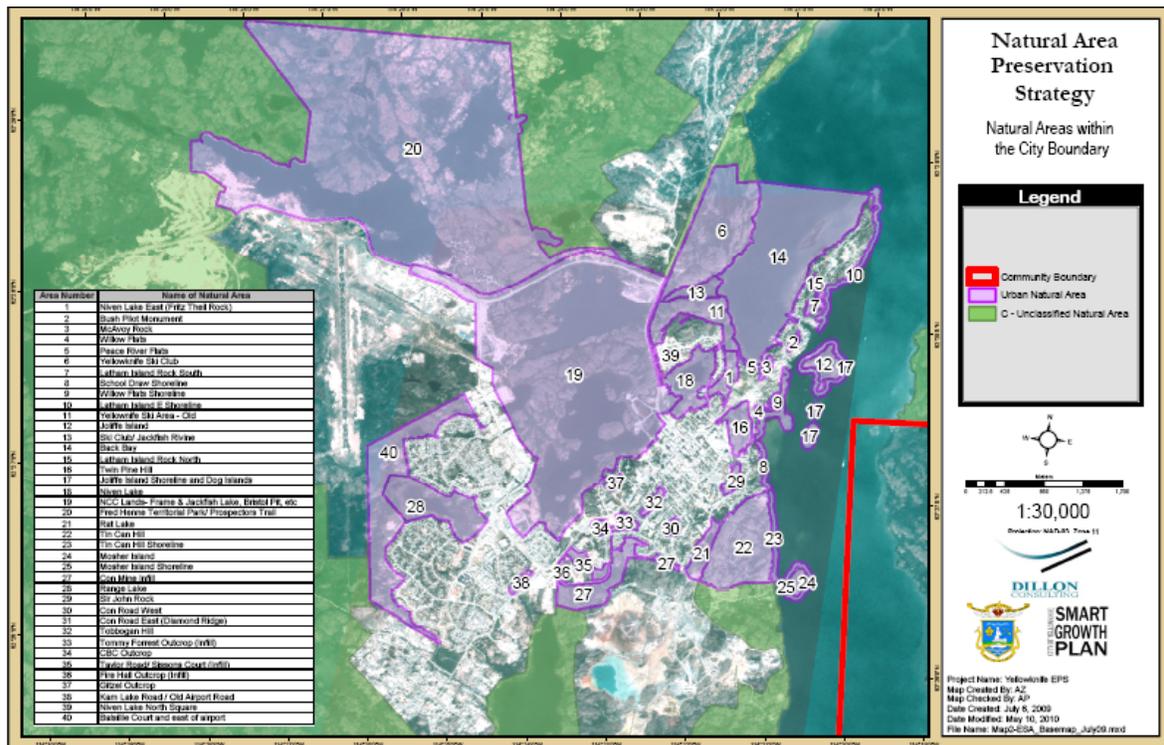


## 2.4 Natural Area Site Inventory

The 2005 Yellowknife Ecological Resources Inventory (2005 ERI), produced for the City by Jacques Whitford, provided a starting point for the Strategy. The sites in the 2005 ERI were determined through a public nomination process, whereby some 75 sites were nominated and subsequently reduced to a total of 40 sites.

*Natural Area Sites* have been identified and delineated in Zone A only. This distinguishes them from natural areas not yet integrated into the urbanized areas of the city, and consequently not facing the same development pressures. A process for defining future Natural Area Sites is described later in the report.

A map delineating these sites, illustrated below, can be found in Appendix A.

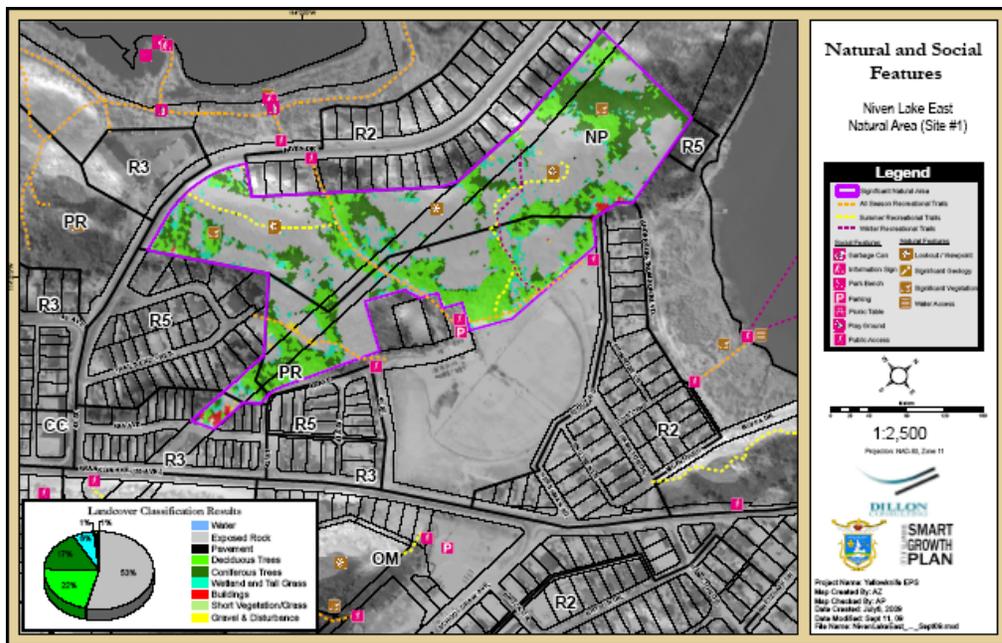


The inventory developed for this Strategy has expanded on and refined information included in the 2005 ERI. Modification made to better allow for the kinds of analysis needed to evaluate the trade-offs between preservation and development include:

- Guidelines for **delineating** Natural Area Sites have been developed and used to more accurately define the extent of each site
- Publicly accessible natural areas not included in the 2005 ERI have been **added** to this inventory
- Some very large areas identified as one site in the 2005 ERI have been **subdivided** in this inventory
- A distinction has been made between **major** natural area sites and **local** sites that are part of existing neighborhoods

Appendix B provides a copy of the Excel based inventory that includes detailed information about each of the Natural Area Sites. The table on the following page lists the sites currently included in the inventory. This inventory will change over time and information will need to be routinely verified and updated.

Maps for each individual site, illustrated below, can be found in Appendix A.



Site #	Site Name	Area (ha)
1	Niven Lake East (Fritz Theil Rock)	8.25
2	Bush Pilot Monument	1.25
3	McAvoy Rock	2.12
4	Willow Flats	2.04
5	Peace River Flats	1.12
6	Yellowknife Ski Club	71.06
7	Latham Island Rock South	2.44
8	School Draw Shoreline	0.34
9	Willow Flats Shoreline	2.03
10	Latham Island E Shoreline	1.13
11	Yellowknife Ski Area - Old	26.20
12	Joliffe Island	10.11
13	Ski Club/ Jackfish Ravine	7.99
14	Back Bay Shoreline	8.41
15	Latham Island Rock North	1.16
16	Twin Pine Hill	12.70
17	Joliffe Island Shoreline and Dog Islands	1.62
18	Niven Lake	18.29
19	NCC Lands- Frame & Jackfish Lake, Bristol Pit, etc	289.43
20	Fred Henne Territorial Park	489.32
21	Rat Lake	7.19
22	Tin Can Hill	56.43
23	Tin Can Hill Shoreline	0.70
24	Mosher Island	4.31
25	Mosher Island Shoreline	0.44
27	Con Mine Infill	24.96
28	Range Lake	23.36
29	Sir John Rock	3.67
30	Con Road West	1.61
31	Con Road East (Diamond Ridge)	0.18
32	Toboggan Hill	2.54
33	Tommy Forrest Outcrop (Infill)	3.66
34	CBC Outcrop	2.33
35	Taylor Road/ Sissons Court (Infill)	5.94
36	Fire Hall Outcrop (Infill)	2.01
37	Gitzel Outcrop	1.69
38	Kam Lake Road / Old Airport Road	2.20
39	Niven Lake North Square	1.14
40	Balsillie Court and east of airport	71.19
	<b>Total Area</b>	<b>1,164 ha</b>

### ***Site Delineation Protocol***

Existing Natural Area Sites in the city range in size from small pockets of land, such as the rock outcrop behind the CBC building (2.3 ha) to very large areas, such as Fred Henne Park (490 ha). Many of the sites are already completely surrounded by development including roadways, a number are along the shoreline of the Great Slave Lake, while others are contiguous with undeveloped lands that may or may not be legally surveyed or otherwise identified.

The delineation of the Natural Area Sites included in this study was done taking the following factors into consideration generally in the order shown:

1. Property lines
2. Zoning boundaries
3. Environmental setbacks
4. Natural boundaries (topography, water bodies, vegetation)
5. Watershed boundaries
6. Littoral zones

The delineation of future Natural Area Sites can use a similar rationale, but applied generally in reverse order:

1. Littoral zones
2. Watershed boundaries
3. Natural boundaries (topography, water bodies, vegetation)
4. Environmental setbacks
5. Zoning boundaries
6. Property lines

Because the City will expand into lands that are not yet privately owned, and therefore the delineation of Natural Area Sites in future growth areas can be determined more by the natural features, and not by artificial boundaries that do not consider topography or existing recreational uses such as seasonal trails.

## **3 The Case for Retaining Natural Areas in Yellowknife**

Natural areas are retained and protected across Canada for their contribution to sense of place, environmental health, stormwater management, and beauty. As a result, our National Park system, the Territorial Park system, and the NWT Protected Area Strategy have each adopted ways of defining, valuing, and protecting land areas. This section of the report draws on precedents, the results of public consultation, and information from previous studies to identify reasons natural areas are retained in cities. A strong case has already been made for retaining natural areas in Yellowknife's urban environment in previous studies which have formed an important backdrop for this Strategy. A listing of reference materials is included as Appendix E. A summary of public consultation completed as part of this study is provided as Appendix C.

### ***3.1 Precedents***

Reasons for retaining natural areas in urban settings have been articulated in policies and strategies in most Canadian cities for decades. In developing a strategy for Yellowknife it is important to look to what has and is happening elsewhere, but also to understand something about the differences.

#### ***Urban Planning History***

Natural areas have been an important part of North American urban planning history. The preservation, rehabilitation, and even the re-creation of large natural areas in the midst of the city are unquestionably important legacies in cities like Vancouver, Montreal, and New York. Stanley Park, Mount Royal, and Central Park were all created not so much to protect plant and wildlife habitat from human activity, as to maintain them for public enjoyment.

#### ***Development Constraints***

As in other municipalities with flood plains or steep embankments, in Yellowknife, many natural areas exist by default. A combination of steep rock, discontinuous permafrost,

numerous lakes and marshes make much of the land in the municipal boundary simply too difficult to build on, and yet still useable by people as public outdoor areas.

### ***Scan of Current Canadian Municipal Policies***

Comparing Yellowknife to other Canadian cities is difficult for several reasons: the city is surrounded by public wilderness lands which is quite a different than the situation of most Canadian cities where lands on the outskirts are typically privately held and often agricultural lands; being a Capital city means that Yellowknife enjoys the large institutional public spaces of the Capital Site; and the topography and soil conditions are much more challenging for municipal servicing and construction in general. Despite the differences, precedents for natural area preservation can be found in city planning documents from across the country.

A review of natural area or green space policies for **Twelve (12) Canadian cities** is provided in Appendix D. The approach taken for many of these policies is to first identify sensitive or rare natural environments threatened by urban development. This approach typically involves identifying important habitat for plants and wildlife, protecting these areas from development, and even acquiring lands to be protected. There is, however, growing recognition that the integration of greenspace as a part of human habitat needs to consider other values and factors such as distribution and access.

In 2004 the Evergreen Foundation released a report, *Green Space Acquisition and Stewardship in Canada's Urban Municipalities* that compared green space inventories in cities across Canada. A major finding was that it is difficult to compare trends as there is no standard method for defining and measuring greenspace. Using data collected through a survey, the best comparative measure found was to use natural areas as hectares per 1,000 people. With a population of approximately 19,000 people, and 1,164 ha of natural areas in Zone A **Yellowknife** currently has about **61 ha/1,000** people. Once the population reaches 33,000 and if development remains concentrated in the same developed area, that ratio could change to about **35 ha/1000**. Although Yellowknife was not included in the survey, it would be in the highest range, close to that of Calgary today, which has **42 ha/1,000** people.

## **Smart Growth Integration Principles**

Well planned open space may be essential if a more compact/dense urban fabric is to become more acceptable to city residents. The difference between intentionally integrating natural areas with development and protecting environmentally sensitive areas may be subtle, but the approach will influence policy, strategy and actions. Examples of decision making processes that effectively negotiate ecological and environmental goals with development needs in a Smart-Growth context can be found in Leadership in Energy Efficient Design (LEED) Green Building Rating System.

### **3.2 Public Consultation and Debate**

Strongly held community values regarding the preservation of Yellowknife's natural landscape have been a recurring theme in the planning and development of the city. Planning documents dating back to the early 1970's reflect the City's intention to remain close to these community values and mediate the tension between growth and development on one hand and the protection of natural areas on the other.

Organized public consultations over the years have produced documentation of the comments and recommendations of many, many individuals and groups. The media has also been a venue for people to discuss, consider, and come to a general, though sometimes undocumented consensus that natural areas are greatly valued.

#### **1988 General Plan:**

“ . . . . recognize and protect distinctive important topographic features such as high points, steep slopes and unique individual valleys and to incorporate them into the detailed planning for open space, park and recreation systems”

#### **1996 General Plan:**

“The philosophy of the plan emphasizes long range considerations: it tries to strike a balance between natural setting and existing manmade responses to community needs in an effort to accommodate the expressed desire for a unique ‘Northern Lifestyle’ . . . .”

#### **2004 General Plan**

“The beauty and diversity of the natural environment of the Canadian Shield in and around Yellowknife – the rock, water and vegetation – offer many opportunities and challenges in accommodating the growth needs while at the same time preserving and enhancing convenient accessibility, both physically and visually, to rock outcrops, unique stands of vegetation and the water's edge.”

Public Consultation related to the development of this Strategy is documented in Appendix C.

### **3.3 Yellowknife Studies and Related Documents**

Detailed studies and reports have been completed to further develop ideas included in the City's 2004 General Plan that are particularly relevant to this Strategy.

#### ***Ecological Resource Inventory, Jacques Whitford, 2007***

This inventory was produced for the Community Services Division of the City of Yellowknife in response to public demands for the City to protect sites from development because of their environmental value. In addition to compiling detailed biophysical data about 40 candidate sites, the report provided the city with a definition for Environmentally Sensitive Areas (ESA's) as follows:

*“Areas or sites in a natural or nearly natural state, with significant land features, unique environmental, cultural or heritage traits, and which may be sensitive to further disturbance or development. Because of these features, the areas or sites have value to the surrounding environment or society, in a local, regional, national or international context, and are worth conserving as a result”.*

A classification system was developed as part of the inventory, and used to assign a conservation priority to each site. The system assigned a high priority for conservation to larger areas located at the periphery of the developed area of the city, including shoreline areas. Smaller natural areas within the developed area of the city were given a lower priority rating. Field investigations completed for the inventory focused on flora, wildlife, and geological attributes of each site. Cultural heritage or human social values are mentioned but were not studied. It should be noted that the study did not identify any of the candidate ESA sites as being rare example of any particular habitat or landscape feature.

The inventory report recommends that protective measures be considered for all or portions of each **larger** or **smaller** site to protect **biophysical features** or to maintain **ecological functions**. The ERI report mentions it is important, but does not provide any specific recommendations about how conservation should be coordinated with development.

### ***Community Energy Plan Action Area 6 Report - Definition of Sustainable Planning Principles, Jacques Whitford, 2006***

This report developed a set of sustainability planning principles for the Yellowknife Community Energy Plan in recognition that urban development patterns have a ‘dramatic impact on the use of energy and emission of greenhouse gases’. The report promotes the use of strategic guidelines to choose an appropriate course of action, over taking actions to meet immediate needs. Building with respect for the local landscape, and the **integration of green space** in future development are also promoted with the goal of providing opportunities to connect with nature **within walking distance** of residential areas. The information in this report is well aligned with Smart Growth Principles.

### ***Integrated Parks, Trails and Open Space Development Study, Dillon Consulting 2005***

This report provided comprehensive review of all of the components of green space in the city, recognizing natural areas as one type of land use in a hierarchy of parks and open space. By documenting public opinions, existing uses and trails, the report was also able to identify policy and information gaps.

*“Green space may include parks and preserves, linkages, corridors, green belts, hubs and regional parks. In Canada there are standards addressing the quantity of green space it generally ranges from .7 to 6 hectares/1,000 people and averages 2.79 hectares/1,000 people), however there are very few standards addressing the quality of green space. Yellowknife’s unique geographical situation may also require the consideration of such things as the quality of the landscape, ecological health and biodiversity, appropriate of design for diverse users and activities, interpretive and educational programming and the amount of green space in the surrounding region.”*  
(*Integrated Trails, Parks and Open Space, p. 26*)

### ***Residential Growth Study, Planning and Lands Division, City of Yellowknife, 2005***

This study was undertaken to evaluate the feasibility of developing 9 sites within the developed area of the city, and another 6 sites adjacent to existing neighborhoods. All sites were still in a natural state at the time of the study, and all sites were also studied as part of the ERI. The goal of this study was to determine the potential for infill development on these sites. Intensifying the use of the developed area through redevelopment was not taken into consideration.

### 3.4 Lessons Learned

Not only studies and reports, but real life experiences where attempts have been made to integrate natural areas with development can be reviewed to look for lessons that could guide future actions – in terms of how sites are delineated, how connections are recognized, and how the outcomes have contributed to the environment and ecology of the city.

#### Niven Lake



This valued natural area was formerly used as the City's sewage Lagoon. A formal trail was installed in advance of residential development by the City. When the first residential lots were surveyed, several existing connecting routes were inadvertently cut off. When made aware, the City was able to re-survey the lots to maintain an important connection between Niven Lake and the Fritz Theil Park. Other informal connections between Niven Drive and Back Bay have been lost as a result of development, while a designated trail through an underpass has proven problematic because of seasonal drainage and freezing.

*Lessons learned: coordinating site planning and lot surveys with detailed site information can reduce the total effort required to maintain valued natural features.*

#### Range Lake



When a subdivision was planned it was acknowledged that the lake would add value to lots abutting the natural buffer. A formal trail along the south shore of the lake was not developed however until after the subdivision was complete. Public access to the trail is limited and connections to other pedestrian routes poor. The level of the lake also created problems for surrounding properties, and for those concerned with wildlife habitat. Both of these issues were resolved over time and the trail and lake are well appreciated as part of the neighbourhood.

*Lessons learned: a better understanding of the natural processes, and developing trails and access points as part of subdivision development would have produced the same outcome, with fewer problems.*

## 4 The Contributions of Natural Areas to Urban Ecology

The previous section of this report summarized the studies, public feedback and precedents that have substantiated the premise that natural areas make a positive contribution to urbanized environments. Looking more closely at the nature of the contributions identified will help to clarify the issues that policies and evaluation criteria developed for this strategy need to respond to.

### 4.1 Quality of Life

The features of natural areas that are important to human habitat are sometimes referred to as ‘quality of life’ features. These features provide humans with an environment that is not just functional, but pleasing. Policies and evaluation criteria developed with these in mind will be different from a more environmental science based approach where the goal is to maintain habitat for wild animals and vegetation.

#### *Cultural Heritage*

Natural areas have acquired significance for people in the city because of their association with activities and events. Commemorative plaques or benches or the names given formally or commonly used are often indicators that a place is part of the community story. The ‘Bush Pilot’s Monument’ and ‘The Toboggan slide’ rock are two examples of community landmarks that, like many local neighbourhood names indicate how the landscape orients us to the place we live in.

#### *Sense of Place*

Of all of the qualities that contribute to the character of the city, the natural environment may be the most enduring and distinctive. Buildings and infrastructure in Yellowknife follow trends that can be found across Canada and/or North America, but the strong natural features that have shaped the city in the past will continue to shape it into the future. The distinctive Precambrian shield and boreal forest, the lakes, ponds and streams, contribute



to the unique sense of place. Natural landmarks and boundaries like the many rock outcrops and lakeshores help to define neighborhoods and districts in the city.

### *Beauty*

The sheer beauty of the natural environment is sometimes considered reason enough for people to want a natural area to be preserved. Local artwork frequently draws on the natural landscape for inspiration, and promotional publications frequently feature photographs of natural features because the beauty of it is widely appreciated.

### *Health and Spiritual Well-being*

Natural areas are a valued setting for outdoor recreational activities like skiing, walking or kayaking, but also appreciated because of the spiritual connection many people feel with the natural environment when they spend time in it.



## **4.2 Ecological Function**

The natural environment plays a role in maintaining clean air and clean water in an urban setting where pollutants from vehicle and heating system exhaust are concentrated. Natural wetlands help to manage surface water run-off which is particularly relevant to the Yellowknife landscape and seasonal melt patterns.



## **4.3 Habitat for Plants and Animals**

Although cities are for people, plants and animals remind us humans that we share this planet. The winter ptarmigan population, year round resident ravens and foxes are not only symbolic of our wilderness location, but can serve as indicators of a healthy environment.



#### **4.4 Relationship to Economic Sustainability**

The perception of Yellowknife as an attractive place to live and do business draws on the natural beauty of the city's setting. Photographs in promotional materials are carefully composed to feature the lakes, plants, rocks, and sky juxtaposed against housing, office towers and local institutional buildings.

#### **4.5 Placing a Value on the Contributions of Natural Areas**

Without a common 'currency' it is difficult for different people to compare the value of the contributions natural areas make to a city against the value of development. Comparing the amount of land allotted to other uses that are valued and publicly accepted norms is one approach. Two examples that can be easily quantified include:

- 1) The equivalent of approximately **15 to 20 ha/1000** people is typically available as private yard space in single detached housing developments as calculated using minimum lot sizes, maximum lot coverage from the City's Zoning bylaw, and removing allowances for parking areas.
- 2) The land area devoted to roads and parking lots ranges from **27%** in the downtown to **20%** in a suburban District such as Frame Lake.

The MetroQuest exercise and focus group sessions conducted as part of the process used in developing the Plan had residents consider the cost and environmental implications of different housing and transportation choices and preferences. Based on the outcomes of these sessions a wide cross section of people appear to be more open to changing from placing a high value on low density housing and debating the need to preserve and natural areas; to seeing higher density housing as desirable and a network of public natural areas as essential.

## 5 Protecting Natural Areas

There is a legacy of integrating natural areas with development in Yellowknife. That this should continue has been supported in previous studies, precedents from other cities across Canada, and in public consultation undertaken as part of this study. The policy direction, evaluation criteria and methodology presented here has been developed taking into consideration lessons learned, contributions and precedents reviewed in the preceding sections of the report.

### 5.1 Policy Direction

The following set of guiding principles provides the necessary foundation for future decision making about protecting natural areas in the City, and what to protect:

<b>1.</b>	<b>A high ratio of Natural Areas to Developed Areas</b>
	Is a defining characteristic of the City of Yellowknife
	Can be achieved without unduly constraining development
	Helps to balance the environmental impacts of northern urban development
	Contributes to public acceptance of a more compact urban form
<b>2.</b>	<b>Natural Areas Sites selected for preservation</b>
	Should include environmentally sensitive sites and those considered difficult to develop, which will often be one and the same.
	Should be protected from impacts of adjacent developments
	Should be retained on the basis of their contribution to the city in terms of quantities of land, distribution in different areas of the city, continuity, and both biophysical and cultural qualities.
<b>3.</b>	<b>Transforming the natural landscape</b>
	Is part of creating human habitat
	Should minimize disturbance of ecological functions.
	Should retain landscapes that allow humans to cohabit with other animals and vegetation.
	Should integrate natural areas with development by design.
	Should be done in a way that leaves a legacy reflecting contemporary values of environmental stewardship and sustainable development.

## 5.2 Natural Area Site Evaluation Criteria

The contributions of natural areas to urban ecology previously described are also factors that contribute to a high quality urban environment. These factors, have been grouped into four categories as a way to structure the evaluation of Natural Area Sites:

- Qualities
- Distribution
- Continuity
- Quantities

Any and all of these factors can help to determine whether the contribution a site makes to the urban environment should be protected in any way, if and when development is being considered. Evaluation criteria are described for each factor and these can be used to develop recommendations for preservation or development conditions.

### Qualities

Qualitative aspects of a site can be a clear indication that it should be protected in some way. Some qualities may indicate a site warrants protection though possibly not in its entirety. The extent and nature of protection of some site qualities require detailed study to better understand sensitivities. Once all other factors have been evaluated however, detailed studies may or may not be warranted as other reasons for protection may be found. The status of land ownership is another consideration that while not strictly qualitative, may indicate how viable municipal protective measures may be.

Previous studies remain credible resources for detailed biophysical information and additional information has been captured in the GIS database developed for this study including slope analysis, landcover classification, ownership, trails and viewpoints.

<b>QUALITIES</b>	
<b>High level of protection</b>	<b>Potential Protection</b>
Lakes and rivers	Cultural heritage
Streams and water courses	Higher authority designation
Wetlands	Rare or endangered flora habitat
Shorelines	Rare or endangered fauna habitat
Steep slopes	High rock outcrops/heights of land

## ***Distribution***

To facilitate the analysis of distribution this strategy has divided the city into *Districts* and has distinguished between *Local Natural Areas*, and *Major Natural Areas* (see Terminology in Part 5). Having natural areas within walking distances of home has been identified by many as one of the more important factors that needs to be taken into consideration when determining if sites should be preserved in its natural state or developed. Target distances to both local and major natural sites are suggested, along with the number of sites in a District.

The Natural Area Inventory provides the areas of all Districts and Sites and can be used to determined % areas. Mapping can be produced to show distances to Natural Area Sites from anywhere in the city, and scenarios can be created to find out what the distances would change to if sites were lost to development.

<b><i>DISTRIBUTION</i></b>	
<b><i>High level of protection</i></b>	<b><i>Potential protection</i></b>
Sites that are the only Natural Area Site in the district.	Local Natural Area Sites that are not the only one in the District.
Sites that provide residents access to a local Natural Area within a walking radius of no more than <b>600 m</b> on average from within a District.	
Sites that provide residents access to a Major Natural Area within a walking radius of no more than <b>800m</b> on average from anywhere in the City.	

## Connections

Winter and summer trails routes through Natural Areas are a feature much appreciated and well used by Yellowknife residents for alternative transportation including walking, biking, skiing and snowmobile. Wetland and wooded areas are sensitive to impacts of traffic, motorized vehicles in particular.

Water courses and seasonal drainage paths are also ecologically significant connections. Disruptions to natural drainage patterns can damage natural vegetation and adjacent properties. Given the soil conditions and discontinuous permafrost typical of the Yellowknife area, drainage patterns are subject to change over time. Seasonal melting may often be better or more easily managed through natural processes rather than the use of built infrastructure.

Many if not most of the frequently used routes have been well documented in the *Integrated Trails, Parks and Open Space Study*, on the *Yellowknife Green Map* produced by the Canadian Parks and Wilderness Association in 2001, and on the *Natural Area Site maps* completed for this study and compiled in Appendix A. It is currently possible to follow routes to traverse the city in both winter and summer conditions with minor interruptions.

The impacts on drainage or trails from any proposed developments can be predicted by modeling changes using site specific mapping. Mitigation measures can then be made a condition of development. Similarly, the impact of any proposed development on the continuity of alternative transportation routes can be modeled and mitigation measures made a condition of development.

<b>CONNECTIONS</b>	
<b>High level of protection</b>	<b>Potential protection</b>
Natural Area Sites that form part of a continuous or near-continuous corridor in either winter or summer conditions to allow the passage of people, animals or water (drainage courses).	Site connects 2 or more Districts in either winter or summer conditions to allow the passage of people, animals or water (drainage courses).

## Quantity

While quantity is an indicator that can be simple to calculate and measure, it is important that it be used in a meaningful way. Different measures can also be useful for different purposes. Some of the quantifiable features of natural areas that have been considered for this Strategy include:

- Numbers and areas of individual natural area sites
- Comparative land areas that are valued for other uses
- Aggregate areas of sites in a district, zone or at the municipal level
- Quantities as a percentage of a district, zone or at the municipal level
- Amounts of natural areas per capita
- Walking distances in minutes or hours
- Buffers between development and water bodies, wetlands or trails

<b>QUANTITIES</b>	
<b>High level of protection</b>	<b>Potential protection</b>
<i>Major Natural Area Sites</i> that contribute to a target of <b>20 ha/1,000 people</b> based on a 50 year population projection	Areas of <i>Major Natural Area Sites</i> that provide more than the target area.
<i>Local Natural Area Sites</i> that contribute to a target of <b>10%</b> of the land are in a District	Areas of <i>Local Natural Area Sites</i> greater than <b>10%</b> of the District area
Portions of <i>Natural Area Sites</i> that provide: <b>50 m</b> buffer from all water bodies <b>30 m</b> buffer from all wetlands <b>20m</b> buffer between trails in NAS and adjacent developments	

### 5.3 Determining Levels of Protection

Determining what level of protection should be applied to Natural Area Sites and what features of the sites are in need of protection must be consistent with the proposed policy and make use the proposed evaluation criteria. It is possible however, to follow a process of elimination to arrive at a conclusion by setting out those conditions under which: an entire Natural area Site would be preserved with a high level of protection; or a portion of a Natural Area Site could be considered for future development.

#### Conditions for a High Level of Protection

Where a site satisfies any of the conditions shown in the table below a high level of protection should be assigned to the entire Natural Area Site (NAS).

Conditions	Type of Information Needed to evaluate	Evaluation
Site contains a lake, wetland or shoreline.	Landcover classification mapping	At least 90% of the area of the NAS including setbacks is classified.
Site is within an environmental setback or reserve	Constraints maps included in General Plan	The entire site lies within an environmental setback or reserve
Steep slopes	Slope information	Over 85% of the site, or a substantial portion of the perimeter has slopes over 15% , making development, or access to developable lands, very difficult to overcome for conventional servicing
<i>Combination of the above</i>	<i>All of the above</i>	<i>Entire site preserved by a combination of any of the above 3 reasons</i>
Only local NAS in a District and less than target area	Site inventory land area information	NAS is less than or equal to 10% of District land area
Needed to contribute to target area of NAS in Districts	Site inventory land area information	NAS is one of several that together make up less than or equal to 10% of District land area

**Development on any of these sites should be restricted and development carefully controlled.**

### Conditions for Partial Protection

Should a site not meet any one of the conditions for a high level of protection of the entire site, then some development of the site may potentially be considered. In keeping with Policy Direction any portion of a Natural Area Site is to be made available only for exemplary projects that that will leave a legacy reflecting contemporary values of environmental stewardship and sustainable development and demonstrate Smart Growth principles. The portion of each site to be preserved should be determined by assessing the natural features that contribute to the urban environment. Development conditions that respect and integrate these features with development may then be developed.

Conditions	Type of information needed to assess contributions	Potential Preservation Considerations
Site contributes to major NAS access target	Mapping showing target access radius	Area needed to provide average access distance to a major site within 800 m from one or more District must be preserved
Site contributes to local NAS access target	Mapping showing target access radius	Area needed to provide average access distance to a local site within 600 m from within District must be preserved
Site contributes to major NAS area target	Site inventory land area information	Area required to contribute to total NAS ratio of 20 ha/1,000 people must be preserved
Site contributes to local NAS area target	Site inventory land area information	Area required to maintain 10% of the District as natural area must be preserved.
Cultural heritage features on site.	Heritage inventory NAS mapping	Designated heritage sites and acknowledged community landmarks must be retained and protected with suitable buffers.
Site includes connecting trails or drainage course.	Mapping showing locations of existing routes and drainage courses	Trail, drainage, or wildlife corridors that provide linkages between NAS must be retained and protected with suitable buffers.
Land not available to the City for development	Mapping showing access and target area contributions, and locations of all natural features.	Detailed site planning study required to identify natural features and potential conflicts with potential development requirements.
Marginal development potential	Mapping showing access and target area contributions, and locations of all natural features.	Detailed site planning study required to identify natural features and potential conflicts with potential development requirements.

**A high level of protection can be assigned to a portion of the Natural Area Site, and development conditions developed for the remainder.**

## **5.4 Protection and Development Guidelines**

Once it is determined what level of protection is required, the following guidelines outline what protection entails, or what development may be permitted.

### ***Guidelines for High Level of Protection***

In areas of Natural Area Sites where a high level of protection is recommended the intent is to keep any future disturbance of the site to a minimum. The case for needing any new development or site improvement at all must be compelling and:

- Any new development should first be directed to any previously disturbed parts of the site.
- The use of motorized vehicles on land areas should be limited to winter conditions on designated routes only.
- Trails, interpretive signage, docks and other outdoor facilities may be considered if constructed using the Frame Lake Trail and Niven Lake Trails examples as the standard of acceptance.
- Docks or over water structures that can be constructed and used with minimal disturbance to the natural site conditions may be considered for Natural Area Sites located along the Yellowknife Bay shoreline to provide primarily non-motorized access to and from the waterfront.

### ***Guidelines for Potential Protection***

Until such time as a development proposal is considered on any Natural Area Site, where it has been determined that a portion may be developed, a high level of protection should apply to all undeveloped areas of the site.

Some development, consisting of buildings or other structures, currently exists on several of the Natural Area Sites identified in this Strategy. Such development can be assessed using the same guidelines for future development to determine if they are suitable to be retained, or should be removed to allow the area to return to a natural state.

Once there is an interest in development on a Natural Area Site both preservation and development must be guided by the natural features and functions of the site.

- Guidelines for a high level of protection will apply to all areas set aside for preservation
- Any new development must first be directed to any previously disturbed parts of the site.
- Development must be designed and developed to minimize disturbance of the known contributions to the urban environment including qualities and connections such as rare or outstanding flora or geological features, or cultural heritage features including trails.
- Development must be controlled to mitigate impacts on ecological functions of the remaining Natural Area Site, with attention paid to seasonal differences.

A closer examination of the natural features that contribute to the urban environment must be undertaken to establish more specific site development guidelines for individual sites. Such an examination should include:

- Mapping of the extent of features and appropriate setbacks at a suitable scale to determine whether the land area in question can accommodate both the proposed development and protected features.
- Mapping the extent of any existing development or disturbance of the site at a suitable scale to determine where development should first be directed.
- Determining the type of public access that should be maintained including consideration of both physical and visual access if the feature is primarily an aesthetic contribution.
- Identifying natural boundaries of the portion of the site to be retained as a Natural Area Site.
- Determining whether any portion of the site is subject to protection by higher authority, and whether further protective measures should be taken by the City.

## ***Guidelines for Exemplary Developments***

The recommendation to limit development on Natural Area Sites to exemplary projects is intended to further the goals of the Smart Growth Plan by encouraging a shift to more sustainable forms of development. This is a trade-off that many proponents of preserving natural areas have suggested, as it would see public lands developed for the greater public good in the long term. The guidelines presented here are intended to clarify what form development may take to ‘exemplify’ the principles of Smart Growth. Setting out any more specific requirements prior to a specific development proposal is not advisable as flexibility is necessary to achieve a good result when designing for an irregular landscape with a wide variety of local characteristics.

Where all or a portion of a Natural Area Site in Zone A has been re-zoned to allow for an exemplary development project, it is recommended the City adopt the following guidelines:

- Development should be limited to residential, commercial, institutional, parks and recreation uses, or any mix of the foregoing uses.
- Where a Park use is considered, development should be limited to outdoor facilities with design conditions established for individual sites so that:
  - Known site qualities that contribute to the urban environment are maintained and integrated into the site design.
  - Sustainable planning principles are followed.
  - Alternative energy sources are used to the greatest extent possible.
  - Alternative servicing, road and parking standards are adopted that include strict limits to impermeable outdoor surfaces.
- Where residential, commercial, institutional or mixed use developments are considered, design conditions should be established for individual sites so that:
  - Known site qualities that contribute to the urban environment are maintained and integrated into the site design.

- Sustainable Planning Principles included in the Community Energy Plan design are followed in designing the project.
- Projects are eligible for ‘Leadership in Energy and Environmental Design’ certification (LEED) and meet requirements for Sustainable Site Credits for site selection and development density.
- Multiple buildings are clustered to reduce fragmentation of natural areas of the site.
- A buffer of at least 10 meters is provided between exemplary projects and adjoining existing development to mitigate ‘NIMBY’ (not in my back yard) concerns.
- Where residential or mixed use development is proposed the maximum number of dwelling units allowed is determined by the site capacity for a low density development of 10 uph, but designed for medium density of at least 30 uph.
- Alternative servicing, road and parking standards be adopted as part of site specific zoning regulations to minimize land requirements and site disturbances, and to allow for alternatives to engineering standards required in other areas of the city.
- When major alterations to the natural landscape would need to be made in order to install servicing, roads or buildings, the costs and benefits be carefully reconsidered and publicly scrutinized to determine if the development should proceed.
- Development be limited to multiple unit building forms to reduce the site disturbance required to install water and sewer services.
- Surface parking be limited and vehicle parking be accommodated within the building footprint to the greatest extent possible.
- Strict limits be placed on the use of impermeable surface finishes.

## 5.5 Future Development Districts

The previous section discusses the protection of delineated natural area sites within the existing urbanized area of the City. Current population projections suggest the City may need to expand into new growth areas within the next twenty years. These growth areas are primarily public wilderness lands, and as such Yellowknife has a unique opportunity identify natural areas as an integral part of future development districts. Unlike most other Canadian municipalities, the lands are not being converted from agricultural uses, or being transferred from private landowners.

Applying Smart Growth principles in advance of expansion, future growth areas can be identified, delineated and designed to:

- Take advantage of natural site conditions and avoid difficult to develop lands.
- Retain and integrate significant natural features that are known to contribute to a high quality human environment.
- Retain natural features that can be integrated with urban design, transportation and drainage systems.

The process for identifying and delineating future growth areas, apart from any transfer of authority for the site, will include four basic steps:

Step	Purpose	Considerations
1.	Establish an area of interest and determine area required for development	<ul style="list-style-type: none"> <li>• proximity to existing infrastructure</li> <li>• include natural features suitable for local landmark</li> <li>• site area for intended development and future expansion using medium density model</li> <li>• geotechnical conditions suitable for development</li> </ul>
2.	Assess landcover and review of qualities and connections	<ul style="list-style-type: none"> <li>• areas of different landcover classes</li> <li>• hydrological corridors</li> <li>• existing trails, significant heights of land, any known heritage</li> </ul>
3.	Identify steep slopes	<ul style="list-style-type: none"> <li>• slopes &gt; 15% considered difficult to develop</li> </ul>

		<ul style="list-style-type: none"> <li>• significant heights can be a feature</li> </ul>
4.	Delineate development area and identify transportation routes	<ul style="list-style-type: none"> <li>• delineation should follow natural boundaries</li> <li>• measures to mitigate impact on local drainage</li> <li>• measures to integrate natural features and alternative transportation routes</li> </ul>

**A more detailed illustration of this process is included in Appendix E.**

### **5.6 Protected Areas of Interest**

Natural areas and features that enhance the attractiveness of Yellowknife and contribute to the quality of life for both residents and visitors also exist outside of the municipal boundary.

For example, the ERI identified the Martin Lake trail and Ranney Hill as two areas of special significance. The Yellowknife River watershed would be another example. Although outside of the scope of this Strategy, it is recommended that the City consider nominating these sites for protection under the NWT Protected Area Strategy.

## 6 Achieving Policy Goals

Despite the studies and plans that have reiterated the desire to retain a balance of developed and natural areas in Yellowknife, no simple and defensible means of determining what that balance should be has found broad public support to date. This Strategy provides a model consistent with Yellowknife Smart Growth principles that can be used to determine how natural areas are integrated with development.

### *Goals of the Strategy*

- Policy guidelines that support the development of a sustainable urban environment
- A practical process that can be used to determine when and where natural areas should be retained as the City grows
- Supporting tools that can be used to implement the Strategy including an improved Natural Area Inventory with clear delineation and site feature mapping

The changes the city has witnessed over the past 50 years indicate the magnitude of change that could occur over the next 50 years in terms of population, technology, values and the economy. It also underscores the enduring legacy of planning decisions.

The Strategy has been designed to work in tandem with a compact growth scenario proposed by the City. The scenario indicates that the city has the capacity to absorb a population of up to 30,000 people through the intensification of existing developed areas. Although this indicates it is not imperative to develop any of the Natural Area Sites in Zone A immediately, it is unrealistic to expect there will be no development pressures before the 30,000 population threshold is reached. In time, the City will also need to identify lands for the City to expand. The strategy and actions described below provides a defensible decision making process that will allow the City to acknowledge issues, consider alternatives, and demonstrate the process followed as part of a long term planning process.

## 6.1 Strategy

The methods for achieving the policy goals are inherently wrapped up with how lands are selected for development. The proposed strategy is to:

1. **Control the pressures that drive the demand to release Natural Area Sites for development by:**
  - setting and meeting re-development density targets in existing developed urban areas
  - re-evaluating constraints and opportunities as brownfield lands are rehabilitated and aging neighborhoods are ready for redevelopment
2. **Limit the release of Natural Area Sites for Development so that:**
  - quantity, distribution and continuity targets are maintained throughout the city and by District
3. **Regulate development on Natural Area Sites released in whole or in part for development so that:**
  - encourage advocates of natural area preservation to invest in exemplary design projects

Following this strategy will not only influence development patterns, but will likely influence public sentiments about the preservation of natural areas: public comments have consistently indicated that development would be viewed more positively if the natural landscape was better integrated and not destroyed by development.

Changes to development industry standard practice take time. Yellowknife's market is relatively small and the move to more sustainable practices is in the early stages of a national trend. Land developers, contractors and committed investors are all key players who will need to participate in the change. Exemplary developments and pilot projects are one way to help move this forward.

## **6.2 Actions**

Implementing the strategy is going to involve both actions and reactions on the part of the City.

### **1. Promote and encourage the transition to higher density housing**

- publish, using newsletters, brochures or websites, successful examples of housing developments from other jurisdictions
- provide technical assistance and support to potential developers, and housing cooperatives or associations, in recognition of the effort required to change

### **2. Maintain a Natural Area Site Database**

- adopt and maintain the NAS inventory prepared for this strategy
- maintain the ERI as a valuable reference document for detailed information about biophysical conditions
- use the database as an analytical tool in conjunction with mapping

### **3. Monitor development pressures and constraints to identify emerging opportunities**

- as brownfields are rehabilitated new opportunities for developing lands may emerge and decrease development pressure on natural areas
- as Districts in the city age, additional opportunities for redevelopment may emerge than have been identified to date

### **4. Encourage citizens to remain engaged**

- establish an ongoing communication program for smart growth that includes information about natural areas
- take advantage of new technology such as on-line interactive scenario planning, or future 3-D vision graphics to assist residents to consider trade-offs
- provide incentives or programs to encourage advocates of natural area preservation to invest in exemplary design projects

### 6.3 Overview of Conditions Today

Although this strategy includes policies and actions intended to apply to the future, the present is its starting point. How do the existing Natural Areas meet the targets and objectives set out in the proposed policies and site preservation recommendations? Is there enough, or too much? Is it well distributed? Do the connections contribute to alternative transportation routes or maintain natural drainage patterns? Are habitat areas for local plants and animals maintained? The table below summarizes observations about the current state of natural areas in Yellowknife:

<p><b>Qualities</b></p>	<ul style="list-style-type: none"> <li>• Natural Area Sites currently include a wide range of representative landscapes in different areas of the city</li> <li>• Habitat for a wide range of flora and fauna are located in the recommended Natural Area Sites</li> <li>• Several sites are under the authority of the GNWT or the Federal Government, or more than one land authority</li> </ul>
<p><b>Distribution</b></p>	<ul style="list-style-type: none"> <li>• In most Districts natural features are important landmarks</li> <li>• <b>Major Natural Area Sites</b> are currently accessible from almost all areas of the city within an <b>800 m walking radius</b></li> <li>• <b>Local Natural Area Sites</b> are currently accessible in most districts of the city within a <b>600 m walking radius</b></li> <li>• There are only two districts (or neighborhoods) do not include a publicly accessible natural area within their boundaries</li> </ul>
<p><b>Connections</b></p>	<ul style="list-style-type: none"> <li>• A winter corridor exists that allows for cross city alternative transportation routes, although there are several interruptions</li> <li>• A summer corridor exists that allows for cross city alternative transportation routes, although there are several significant interruptions</li> </ul>
<p><b>Quantities</b></p>	<ul style="list-style-type: none"> <li>• The current inventory of Natural Area Sites includes 15 major sites and 24 local sites</li> <li>• There is a total of 1,164 hectares of Natural Area Sites in Zone A providing approximately <b>61 ha /1,000</b> people for the current population of approximately <b>19,000</b> people.</li> <li>• Existing Natural Area Sites have the capacity to provide <b>23 ha/1,000</b> should the land area of Zone A remain unchanged, and the population expand to <b>50,000</b> people.</li> <li>• Local Natural Area Sites in districts represent a range of 0% to 47% with an average of <b>13%</b> of the land area in a <b>district</b>.</li> </ul>

## 7 Implementation

The Strategy has been developed to guide decisions about Natural Area Sites in the existing urban area, and the planning of future urban development areas where natural areas are integrated with development.

The test of its success will be through:

- Political support for policy and strategy recommendations
- Its ability to guide administrative actions consistent with policy and strategy
- Achieving measurable and documented results
- Continuing relevance in spite of unforeseen events and new opportunities

### ***7.1 Natural Area Site Preservation Recommendations***

Until the City reaches a population of closer to 30,000 it appears to be possible to accommodate growth through intensification of existing developed areas. By making use of this latent capacity the immediate pressure to develop Natural Area Sites can be controlled. Recommendations for the sites currently included in the Natural Area Site inventory follow. These recommendations were developed by applying the methods for determining levels of protection described in Section 5.3.

As the city and population grows and changes, a re-evaluation of the constraints and costs of development options, and the contributions of natural areas, will be necessary: future development decisions may alter the context in which decisions about preservation are made, and measurements of public good inevitably change over time.

The recommendations here are also future oriented: the criteria for Natural Area Sites are not intended to be applied retroactively to address any shortfalls in a given District. Development patterns in any city are temporal, and leave behind a legacy of their time.

### **Sites Recommended for a High Level of Protection**

The Natural Area Sites that satisfy the conditions for a high level of protection of the entire site are shown in the chart below, and categorized according to the conditions met:

<i>Site #</i>	<i>Site Name</i>
<b>Condition: Primarily a lake, wetland or shoreline</b>	
<b>4</b>	Willow Flats
<b>5</b>	Peace River Flats
<b>8</b>	School Draw Shoreline
<b>9</b>	Willow Flats Shoreline
<b>10</b>	Latham Island E Shoreline
<b>14</b>	Back Bay Shoreline
<b>17</b>	Joliffe Island Shoreline and Dog Islands
<b>21</b>	Rat Lake
<b>23</b>	Tin Can Hill Shoreline
<b>25</b>	Mosher Island Shoreline
<b>26</b>	Yellowknife Bay and Islands
<b>28</b>	Range Lake
<b>Condition: Entire Site within an environmental setback</b>	
<b>40</b>	Balsillie Court and east of airport
<b>Condition: Steep slopes</b>	
<b>1</b>	Niven Lake East (Fritz Theil Rock)
<b>2</b>	Bush Pilot Monument
<b>3</b>	McAvoy Rock
<b>13</b>	Ski Club/ Jackfish Ravine
<b>Condition: Combination of previous conditions</b>	
<b>6</b>	Yellowknife Ski Club
<b>18</b>	Niven Lake
<b>Condition: Only site in the District and/or needed to meet area target</b>	
<b>37</b>	Gitzel Outcrop
<b>38</b>	Kam Lake Road / Old Airport Road
<b>39</b>	Niven Lake North Square
<b>30</b>	Con Road West
<b>31</b>	Con Road East (Diamond Ridge)
<b>32</b>	Toboggan Hill

### **Sites Recommended for Partial Protection**

The Natural Area Sites where the conditions for a high level of protection of the entire site were not satisfied are shown in the chart below, and the portion of the site that could be considered for development noted.

<i>Site #</i>	<i>Site Name</i>	<i>Notes</i>
<b>7</b>	Latham Island Rock Sough	Marginal potential due to servicing and access constraints.
<b>11</b>	Old Yellowknife Ski Club Area	Approximately 50% of this site is currently identified as Phase 7 of the Niven Lake subdivision.
<b>12</b>	Joliffe Island	Marginal potential due to servicing and access constraints.
<b>15</b>	Latham Island Rock North	Marginal potential due to servicing and access constraints.
<b>16</b>	Twin Pine Hill	Natural constraints make the conventional development of this site economically challenging, and modifications to the development conditions that apply to the existing Site Specific zone should be considered
<b>19</b>	NCC Lands	Access and area targets can be maintained if the western portion of the Capital Site Vicinity is developed.
<b>20</b>	Fred Henne Territorial Park	Existing development in the park is controlled by the GNWT.
<b>22</b>	Tin Can Hill	Access and area targets can be maintained if approximately 20% this site can be developed
<b>24</b>	Mosher Island	Marginal potential due to servicing and access constraints.
<b>27</b>	Con Mine Infill	Approximately 20% of this site lies outside of environmental setbacks and the remainder may become available to the City in the foreseeable future.
<b>33</b>	Tommy Forrest Outcrop (Infill)	These sites will need to be considered comprehensively as they are located in the same District – development of any one site will impact the need to retain another.
<b>34</b>	CBC Outcrop	
<b>35</b>	Taylor Road/ Sissons Court (Infill)	
<b>36</b>	Fire Hall Outcrop (Infill)	

## **7.2 Land Administration**

In most cases the responsibility for directing growth to existing developed areas or defining future growth areas will lie with the City through the use of statutory planning documents including the General Plan and Zoning Bylaws. Most Natural Area Sites in Zone A and lands in Zones B and C are currently publicly held. As such, the City of Yellowknife has an opportunity to plan ahead for preservation with the confidence that it can be achieved, and achieved without the need to establish an acquisition fund.

### **Managing Public Lands**

Because the Natural Area Site lands in the recommended inventory are publicly held, the City can set out development conditions prior to making any lands under its authority available for private development. Zoning regulations can be used to:

- a. Limit development
- b. Define site specific performance standards

More complex development mechanisms that can be used to control development on privately held lands, such as density bonuses or transferring development rights, can be avoided.

However, because the land authority for much of the land area within the municipal boundary does not lie with the City, the implementation of the Strategy will be contingent, at least in part, on coordination and cooperation with other agencies:

- The Territorial Government has the authority to transfer lands to the municipality and should be advised of the contents of the Strategy and recommended approach to the delineation of future growth areas.
- Federal government restrictions for lakeshores and water bodies are generally compatible with the recommendations of the Strategy, however any guidelines or restrictions being considered by the City should continue to be coordinated with Federal authorities.
- Lands that have been identified in the Akaitcho land withdrawal include portions of several of the Natural Area Sites: the recommendations of this Strategy should be brought forward as part of any further discussions, agreements, or memoranda of understanding.

## *Development Controls*

For the Strategy to be successfully implemented, it will first need to be adopted as a component of the Smart Growth Plan, and the General Plan in turn aligned with the Smart Growth Plan. The 2004 General Plan is certainly supportive of the principles of Smart Growth, but over the time frame of the 50 year vision this support will need to be reaffirmed: with General Plan reviews every 5 years, another ten versions of General Plans can be anticipated.

Zoning regulations consistent with the General Plan will be the mechanism most directly affecting the preservation or development of natural areas in the City. Many of the Natural Area Sites are currently zoned Park or Nature Preservation although portions of some sites are zoned for residential development, or as Growth Management areas.

It is recommended that the zoning of all Natural Area Sites be Nature Preservation with the exception of:

- The Capital Site for which a Development Scheme has been adopted under Bylaw 3934.
- Fred Henne Park and Joliffe Island where the existing Park Zoning is consistent with current and planned uses.

Recommended changes to existing zoning have been identified for each site in the Natural Area Site Inventory.

When any portion of a Natural Area Site is released for the development of exemplary projects, the zoning of the affected parcel should then be amended to Site Specific with controls for exemplary developments. Site Specific Zones should be created and **form based** regulations developed in accordance with the Guidelines included in this Strategy. Visual examples of requirements should be included as part of the regulations to clearly illustrate the results to be achieved. Public review of preliminary plans for proposed projects, in addition to statutory requirements associated with the Zoning amendment, should also be required.

### ***Special Consideration for Yellowknife Bay***

Given the complexity of regulating development over water, the City has recently established a Harbour Committee. With a mandate to consider development opportunities along the shoreline of Yellowknife Bay and the feasibility of establishing a regulatory body, it is expected that the Committee will be providing further guidance for development on Natural Area Sites in the area of concern.

In most cases the policy direction, strategy, and guidelines developed in this Strategy may be applied to all inventoried Natural Area Sites. However, it is expected that more detailed direction and control mechanisms will be articulated by the Committee and subject to public consultation.

### ***7.3 Monitoring Smart Growth***

In an urban setting, decisions about what areas to preserve in a natural state really cannot be made without also considering where to build, and what to build. When decisions involve finding a balance, or making trade-offs – both sides of the equation will need to be analyzed: life cycle cost of municipal infrastructure will need to be known when any argument is put forward to develop a natural area site so that other choices can be considered. “If not here, where?” will always be the essence of the decision to be made.

This Strategy relies on the achievement of Smart Growth objectives for compact development and intensification of existing developed areas of the city: natural area preservation targets will not be achieved independently. Targets for the intensification of development of specific Districts have been set as part of the Compact Growth Scenario proposed by the City for the Smart Growth Plan. A coordinated means of monitoring these two sets of targets will need to be adopted by the City.

The Strategy provides a **process** and the **tools** that can be used to implement it over time, as well as providing a baseline from which future changes can be measured. The following chart suggests a monitoring framework that could be used to indicate the status of Natural Areas in the City as it grows.

	Targets	Current Population 19,000	Forecast 30,000	Forecast 50,000
<b>Qualities</b>	Lakes, rivers, water courses, shorelines, rock outcrops	A wide range of landscapes on public lands	<i>same</i>	<i>same</i>
<b>Distribution</b>	Access to local NAS within 600 m	Achieved in 8 out of 14 Districts (60%)	<i>Achieved in 10 out of 16 Districts (63%)</i>	<i>Achieved in 14 out of 20 Districts (70%)</i>
	Access to major NAS within 800 m			
<b>Connections</b>	Near-continuous travel corridor for people, animals, water (in summer and winter)	Some interruptions in summer, fewer in winter	<i>improved</i>	<i>improved</i>
<b>Quantities</b>	20 ha/1,000 population	60 ha/1,000	<i>36 ha/1,000</i>	<i>25 ha/1,000</i>

## 7.4 Keeping the Future in Mind

Who knows what changes 50 years will bring to Yellowknife? The Strategy has been developed to help prepare for the future, but the context in which it is applied will be continuously subject to change. Development constraints and opportunities will change over time, particularly as brownfield remediation advances and land claims within the municipal boundary are settled. Market preferences and the value people place on natural areas may also change over time. Finally, if the technology available for public consultation and site analysis changes as much in the next 50 years as it has in the past 50 years, new opportunities may surface that we cannot imagine today.