

## THE SOUTH MARCH HIGHLANDS IN WEST OTTAWA

### Introduction:

The South March Highlands (“SMH”) have been described as a “*wild island*” of natural landscape within the City of Ottawa. Until recently they remained largely in their original natural state largely because the rugged landscape was unsuitable for agriculture or urban development. The SMH is a distinctive setting in the National Capital from 4 major perspectives:

- Visual Distinctiveness
- Natural Ecosystem
- Geomorphology & Geology
- Cultural Heritage

The SMH also has a proven capability for enhancing the prestige of the National Capital Region as evidenced by a video featuring the SMH being used in the Canadian pavilion at the World’s Fair, and that international sporting events such as the Canadian Orienteering Championships will attract international press attention to the National Capital Region.



Figure 1: Map of SMH [Brunton 2007]

## Visual Distinctiveness

The SMH provides many diverse, unique, and distinctive visuals that enhance the National Capital Region. The aerial photo below shows some of the visual diversity that can be found in the SMH ranging from lakes, forests, meadows, rocky ridges, and farmland.



*Figure 2 – Aerial Photo of the western side of the SMH*

The Beaver Pond at the southernmost tip of the SMH illustrates a natural beauty representative of the Canadian landscape that has been iconified by the Group of Seven.



Figure 3 – Beaver Pond

The mountain meadows along the Richardson Ridge are unique in the City.





*Figure 4 – Meadows along Richardson Ridge*

The Carp River valley extends beyond the SMH and brings the agricultural aspect of the National Capital Region into view.



*Figure 5 – View of Carp River Valley from Richardson Ridge*

## The Natural Ecosystem:

No other major city in the world includes within its borders a vigorous old growth forest with endangered species such as the SMH. The closest is perhaps Vancouver's Stanley Park which is 1/3 the size, contains half the variety of vascular plants, and no species-at-risk ("SAR") compared to the SMH.



Figure 2: Old Growth in the SMH

The SMH is rated as a Candidate Provincially Significant Area of Natural and Scientific Interest ("ANSI") for both its Life Science value (895 hectares) and for its unique Wetland Complex (114 hectares). The area has been valued by scientists as the **"most important reservoir of ecological potential"** in the City of Ottawa ("City") because it has the densest biodiversity and 30 eco-types of vegetation which provide a wide variety of resources for the renewal of depleted natural areas elsewhere. Dr. Jeremy Kerr, a professor of Macroecology at the University of Ottawa has even speculated that the SMH may possibly represent one of the densest bio-diverse areas in Canada.

Diana Beresford-Kroeger, an internationally known and widely respected expert in medical biochemistry and botany has extolled the genetic potential and unique qualities of the SMH:

*"The collective genome of this forest is singular. A trunk bole height of 60 –70 feet is common to almost all species [in the SMH]. The boles are straight and true to a covering canopy. This in itself indicates a gene pool of a very ancient source of perhaps 400 million years of development. In the forest itself, there is a 25 foot in circumference fingerprint stool of *Fagus grandiflora*, the American Beech, just one of many. The White Ash, *Fraxinus alba*, are the largest in diameter, approximately 5 feet, in the area, **if not in Eastern Canada**. A natural graft twin between *F. alba**



and *Carya cordiformis*, **the butternut hickory is a scientific first** and demands of itself research and investigation. There is also a melding of the Carolinian forest system in these woods, *carpinus caroliniana*, American hornbeam or bluebeech, stands out as an important medicinal tree of the Birch family. In addition, the increasingly rare *Betula Intea*, yellow birch, is seen holding its own for height. This tree, too, is medicinal for men.”

There are 10 distinct habitats within the SMH that are home to 18 SAR and one of the largest deer wintering yards (925 hectares) in the City. In addition, the SMH are home to 18 more species that are identified by the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as priorities for SAR candidates. Table 1 summarizes the SAR observed in the SMH and Table 2 summarizes the species believed to be extirpated from the SMH.

The SMH are ecologically unique in the City of Ottawa, supporting over 440 native species of vascular plants, including: 64 Regionally Significant, 50 Locally Significant, 6 Provincially Rare, and 2 Nationally Endangered species. It has the highest floristic diversity of any natural area in the City. Of this vascular flora, the Coalition to Protect the South March Highlands has to-date identified 30 native plants that have been traditionally employed for medicine by First Nations.

This habitat is home to 75 species of Mammals, Fish, Amphibians, and Reptiles including 5 species-at-risk and 2 locally uncommon species. The habitat is crucial for 164 species of birds, including 136 species that are known to breed in this area, 9 SAR, and 30 Regionally Significant species that inhabit this ecosystem. The area is also home to the Monarch Butterfly, another species at risk, and possibly other interesting insects, however no study of insect, fungi, or bryophyte (non-vascular plant) species has ever been performed. Ms. Beresford-Kroeger estimates that approximately 40 species of insects can be anticipated for each species of tree found in the SMH.

In 2008, a scientific study of the conservation forest conducted by Daniel Brunton found that

*The [current] ecological integrity of the flora and vegetation in the Conservation Forest is also exceptionally high, as measured by the ‘naturalness’ of the native flora. The native flora of the study area demonstrates an average Coefficient of Conservation (CC) rating of 5.08 - **higher than any City of Ottawa Urban Natural Area...** The Coefficient of Conservation provides a rating of the ‘naturalness’ of native plant species (i.e. the degree to which each species requires relatively pristine conditions) on a zero to 10 scale, where 0 indicates species having no requirement for natural habitat and 10 indicating taxa which require pristine habitat. Ottawa and eastern Ontario urban natural areas typically average under 4.0. “.*

However, the same study also warned that **“The Conservation Forest is clearly in a fragile state and facing serious challenges to its long term ecological integrity... the Conservation Forest is presently too small to fully represent South March Highlands’ natural features and functions.”** Time is of the essence to preserve the remainder of this astounding ecosystem that we are so lucky to have in the City.

<b><i>The following 3 species are Endangered both provincially and nationally:</i></b>
American Ginseng - danger of extirpation Butternut Tree Loggerhead Shrike - possibly extirpated
<b><i>The following species are Threatened in the jurisdictions noted in parenthesis:</i></b>
Blanding's Turtle (Ontario & Quebec) Whip-poor-will (All provinces east of Alberta) Golden Winged Warbler (Ontario & Quebec) Western Chorus Frog (listed Federally for Ontario & Quebec but not yet listed under SARO) Eastern Musk Turtle (Ontario & Quebec) - possibly extirpated Olive Sided Flycatcher (All Provinces)
<b><i>The following are of Special Concern:</i></b>
Bridle Shiner - possibly extirpated Short Eared Owl Black Tern Common Nighthawk Snapping Turtle Eastern Milksnake Monarch Butterfly Bald Eagle Red Headed Woodpecker
<b><i>These additional are on the COSEWIC Candidate List for Ontario (priority shown in parenthesis):</i></b>
Evening Grosbeak (high-priority) Eastern Wood Peewee (high-priority) Wood Thrush (high-priority) Bank Swallow (high-priority) American Bullfrog (mid-priority) American Kestrel (mid-priority) Belted-Kingfisher (mid-priority) Eastern Red-Backed Salamander (mid-priority) Field Sparrow (mid-priority) Blue-Spotted Salamander (low priority) American Toad (low priority) Bluntnose Minnow (low priority) Boreal Chickadee (low priority) Killdeer (low priority) Midland Painted Turtle (low priority) Northern Two-Lined Salamander (low priority) Green Frog (low priority) Wood Frog (low priority)

*Table 1 – SAR previously observed in the SMH*

**The following species are believed to be extirpated (previously observed in the SMH):**

Cathcart's Woodsia  
Oregon Woodsia  
Spiny Coon-tail  
Adder's-tongue Fern  
Back's Sedge  
Large Duckweed  
Long-spurred Violet  
Showy Orchis  
Southern Arrow-wood  
Strawberry-blight  
Virginia Spring Beauty

*Table 2: Species previously observed in the SMH and believed extirpated*

Some of the SMH are protected through City ownership via a “Conservation Forest” that does not prevent the City from attempting to build a 4-lane highway through the middle of it. The urban natural features inventory conducted for the City’s Greenspace Master Plan identifies the SMH as containing some of the most significant natural areas of the City (Trillium Wood, Beaver Pond, Richardson Forest, and the lands surrounding the SMH Conservation Forest).

### **The Cultural Heritage**

The cultural heritage value of the SMH accrues from both pre- and post- European settlement in the National Capital Region.

Grandfather William Commanda (the most senior Elder of the Algonquin First Nation and a member of the Order of Canada) has declared the SMH to be “*an ancient and sacred site [that] is of great archaeological importance to the Indigenous Peoples of the Kichissippi, the Ottawa River Watershed.*”

In a recent report Dr. Robert McGee (a Fellow of the Royal Society of Canada, former Curator at the Museum of Civilization and former President of the Canadian Archaeological Society), outlines the unique archeological value of the SMH, not just for the Ottawa area, but for Eastern Ontario. His report substantiates the traditional knowledge of the Algonquin and is another compelling dimension for the case for preserving of what is left of the South March Highlands, and for their inclusion in an expanded Emerald Necklace. Dr. McGee’s description is as follows:

*In the early postglacial period, between approximately 11,000 and 9000 years ago, this area formed the shore of the Champlain Sea. This was a productive mid-latitude version of a seasonally frozen Subarctic sea, probably combining some of the characteristics of the present Hudson Bay and the northern portion of the Gulf of St. Lawrence. Champlain Sea sediments in gravel pits have yielded the bones of a full range of ice-adapted sea mammals including bowhead whale (*Balaena mysticetus*), beluga (*Delphinapterus**

leucas) and walrus (*Odobenus rosmarus*), together with ringed, bearded and harp seals (*Phoca hispida*, *Eringnathus barbatus*, *Phoca groenlandica*).

During this period **the Carp Ridge emerged as a series of rocky islands** paralleling the southern shore of the sea. These islands were separated from one another and from the shore by narrow channels through which tidal currents, together with those of melt water flowing from the nearby mouth of the Ottawa River, would have produced turbulent mixing of fresh and salt water as well as inhibiting the formation of winter ice. Polynia conditions such as these are very productive locales in Arctic waters, attracting both sea mammals and their human predators.

When the level of the Champlain Sea dropped below an elevation of about 90 metres above current sea level **the islands coalesced to form the Carp Ridge**, and this was attached to the mainland at the head of a narrow and shallow bay that now forms the floodplain of the Carp River. This new configuration, which took form at some time between 10,000 and 9,000 BP, removed the conditions that would have made the local area an exceptional hunting locality during early postglacial times.

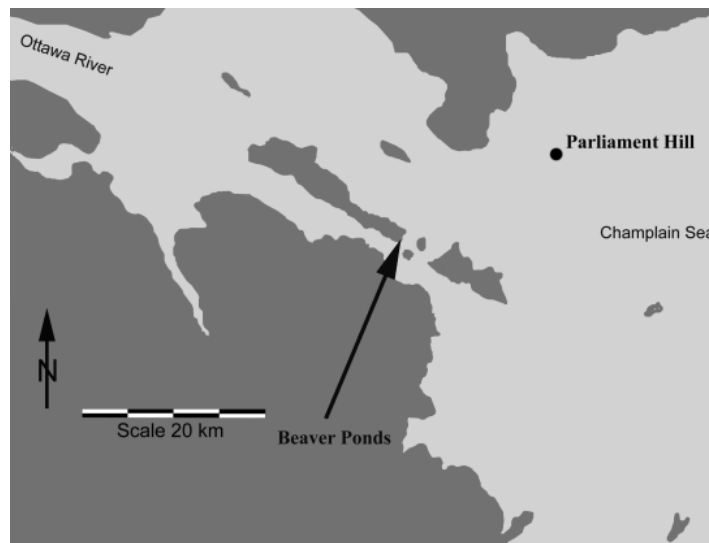


Figure 3: Location of the Beaver Ponds [Southern Tip of SMH] relative to Champlain Sea height of 110m [light grey is under water], approximately 11-10,000 years ago

When this fact is taken into account, the rocky upland areas can be considered to be of **high potential for occupation by early postglacial sea mammal hunters** along subsequent shorelines as local sea levels dropped from about 120 m above current sea level at around 11,000 radiocarbon years ago, to 90 meters above sea level at some time around 9,000 years ago. The apparent presence of quartz veins in the groundmass of these highland areas would have provided another attraction to early hunters of the time, as quartz was the primary tool-stone used by the early Archaic period occupants of the maritime regions to the east (Gulf of St. Lawrence) and south (Gulf of Maine).



*On the nearby Broughton Lands, Swayze (2005, 2009) recovered convincing evidence of a significant Early Archaic occupation along shorelines of the recessional Champlain Sea. **This is, in fact, the earliest known evidence of occupation in Eastern Ontario.** In fact, a basic knowledge of the physiographic history of the local region makes it apparent that these are the regions most likely to have archaeological potential for preservation of important sites related to the earliest postglacial occupations of the Ottawa Valley area.*

Dr. McGee's assessment is also supported by Marcel Laliberte's assessment for the NCC of the Archaeological Resource Potential for the National Capital Region (1998) which emphasizes the importance of sites, such as the SMH, known to be on the ancient shores of the Champlain Sea:

*Although the current portrait of archaeological discoveries in the Ottawa Valley itself indicates relatively late settlement, hardly more than 6,000 years, there is every reason to believe that groups ventured into the NCR much earlier, even when the sea flooded the newly exposed land .... Fluted projectile heads typical of the Early Paleo-Indian period have also been reported as far as the Rideau Lakes region, barely 80 km south of the of the Ottawa River. Furthermore, the vast majority of Early Paleo-Indian sites in Ontario are located near the shores of the Champlain Sea.*

The archaeological sites discovered in the SMH by Ken Swayze were also assessed in-person by Dr. Hansjürgen Müller-Beck (an internationally recognized expert on archaeology and a Professor Emeritus of Palaeohistory and Archaeology of Hunting Cultures at the University of Tübingen):

*Those stone fragments are really very scattered remains from raw material stone tool quarries of pre-historic times, sometimes forming clusters of more intense work. The dating of that waste material was open but might go back quite well into Paleo-Indian times.*

The Coalition to Protect The South March Highlands as also recently discovered another site in the SMH that is at the same elevation and very similar in layout to the ones found by Ken Swayze. Artifacts were found that are believed to be similar to the stone fragments assessed by Dr. Müller-Beck. These are currently being considered by the City which has requested assistance from the NCC in evaluating it.

In addition to significant pre-contact cultural heritage, the SMH also contains unique post-contact cultural heritage that is not otherwise found in the Greenbelt. Euro-Canadian settlement of March township began about 1819 and the Richardson Farm area was established in 1820 (the stone house shown in Walling's 1863 map of the area still stands). When the great fire of 1870 swept across the Ottawa Valley, the SMH wetlands presented a fire resistant barrier that prevented the destruction of Lewisville (now known as South March).

There are several registered archaeological sites in the SMH and some of the more interesting of these include:

- A Feldspar Mine dating approximately to 1919-1921 (unique in the City)
- Several 19<sup>th</sup> Century homesteads dating back to 1820 (as old as Pinhey's Point)
- Richardson Stone House dating back to approx. 1860 (as old as the Log Farm)
- McMurtry's Tannery built in the 1860s still stands on 2<sup>nd</sup> Line Road (unique in the City)



Figure 4: McMurry's Tannery in the SMH

### **The Geomorphology, Hydrology, & Geology**

The SMH are at the southern tip of the Precambrian Shield bedrock outcrop known as the Carp Ridge which is 500 million to 4 billion years old and represents **the only presentation of the Canadian Shield on the Ontario side** of the National Capital Region.

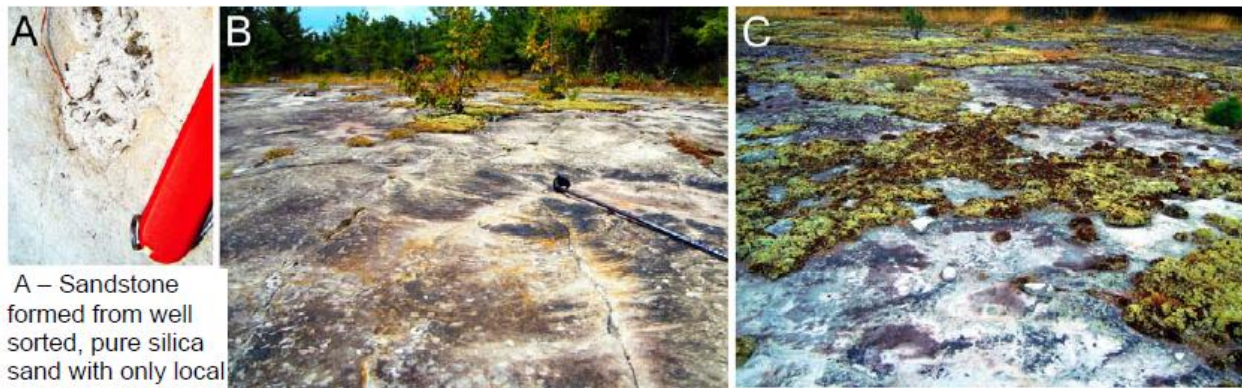
The SMH are geologically located along the edge of the Hazeldean Fault and exhibit many examples of glacial scouring and lacustrine activity. Their geology is uniquely complex and the combination with wetland-rich land has been described in the City's Natural Environment Assessment (done for the City's Greenspace Master Plan inventory) as ***"an island of rugged, heavily-glaciated, rocky, Gatineau Hills-like habitat"***.

The SMH is approximately 3,500 – 4,000 years older than low lying areas in Ottawa such as Stoney Swamp and Mer Bleue. Adding the SMH to the Greenbelt would incorporate an area higher in elevation to (and therefore much older than) the existing Greenbelt.

The hydrology of the SMH is integral to both the Carp River as well as to the Shirley's Bay wetland complex in the existing Greenbelt. According to the Shirley's Brook/Watt's Creek Subwatershed Study, the SMH supplies approximately half of the basewater flow for the Shirley's Bay wetland complex.

The SMH is also a unique occurrence of a significant Sandstone Pavement Barren that displays many sedimentary and glacial features as illustrated below. This unique geological feature is approximately 500m in length by 150m wide and once would have once resembled a polished mirror-like surface.



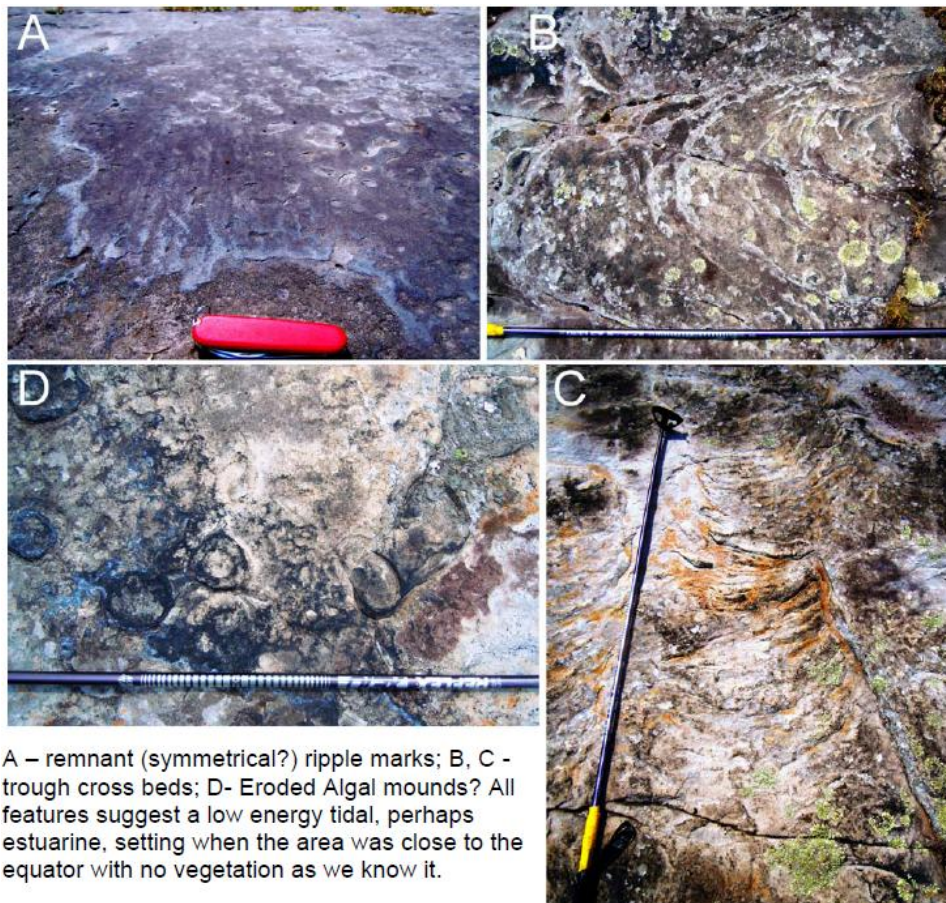


A – Sandstone formed from well sorted, pure silica sand with only local carbonate cement.

B, C Sandstone pavement supports limited species of trees, mosses and lichens.

*Figure 5: Sandstone Pavement Barren*

Notable sedimentary structures formed during deposition some 500 million years ago, include trough cross bedding, ripples and what may be eroded algal mounds.



A – remnant (symmetrical?) ripple marks; B, C - trough cross beds; D- Eroded Algal mounds? All features suggest a low energy tidal, perhaps estuarine, setting when the area was close to the equator with no vegetation as we know it.

*Figure 6: Ancient Sea on Display in the SMH*

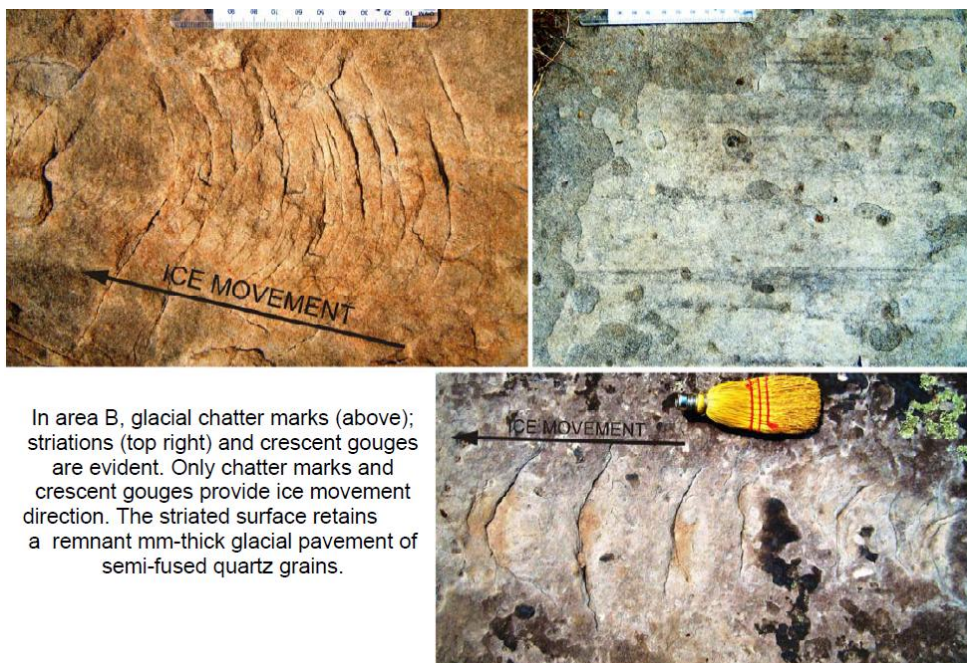
Other signs of fossilization are also readily found in the SMH:





Figure 7: Ancient Fossil on Display in SMH

As rock-studded flaciers advanced southwards over the Carp Ridge over 13,000 years ago, they left chatter marks, striations, and crescent gouges that are visible today.



In area B, glacial chatter marks (above); striations (top right) and crescent gouges are evident. Only chatter marks and crescent gouges provide ice movement direction. The striated surface retains a remnant mm-thick glacial pavement of semi-fused quartz grains.

Figure 8 - Glaciation on Display in SMH

## Linkages

The SMH are linked by air (bird flyways), water (hydrologically), and land (wildlife corridor) to the existing Greenbelt at Shirley's Bay.

The following map shows the documented wildlife corridors running between the SMH and the Constance Lake-Mud Pond wetland area. This links to a corridor already documented for the NCC by Dave Seburn (*Blanding's Turtle Habitat Mapping*, 2008) between the Constance Lake-Mud Pond wetland area and Shirley's Bay wetlands.

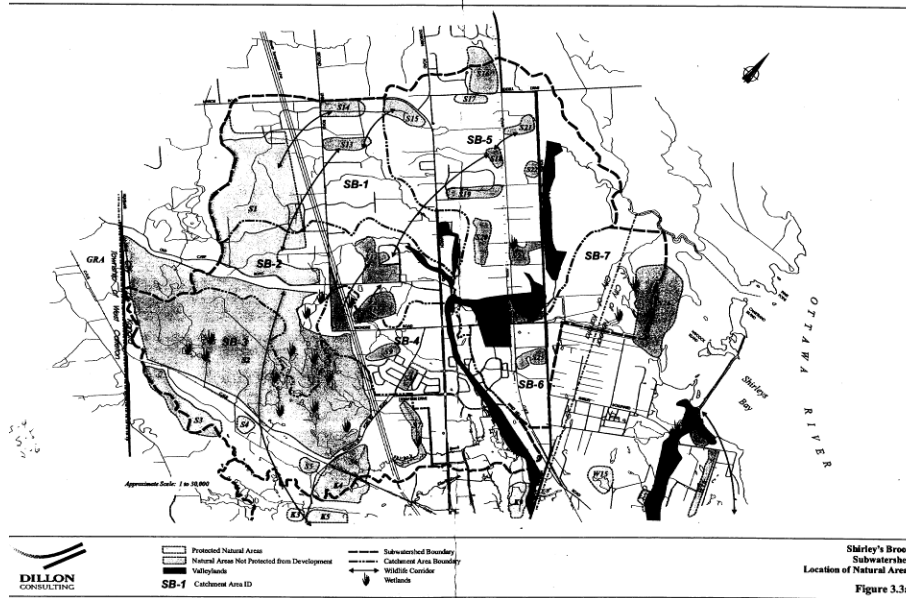


Figure 9 – Wildlife Corridors from Shirley's Brook / Watt's Creek Subwatershed Study

## Summary

During the Part 1A for the Greenbelt Master Plan process, the NCC heard 10 key messages from the public consultation. Incorporating the SMH into the Greenbelt as part of the Emerald Necklace supports all of these objectives:

1. **Protect the Greenbelt** – by protecting key wildlife linkages and the upstream water source for Shirley's Bay wetland complex;
2. **Greenbelt as Sustainability Showcase** – by protecting the many SAR in the SMH;
3. **Communicate Greenbelt Values** – by initiating a visible expression of these values through a high-profile initiative to protect the SMH;
4. **Keep Greenbelt Publically Owned** – by collaborating with the City who has existing public ownership of part of the SMH and expanding public ownership over privately held SMH lands;
5. **No Net Loss Policy** – by tapping into the bio-resources of the SMH and other ecological reservoirs to replenish the stress on the existing Greenbelt;
6. **Add More Land to the Greenbelt** - by augmenting the Greenbelt with additional land purchases in the SMH;
7. **Recognize Greenbelt as part of Survival** – by recognizing the importance of macro-ecosystem values to survival and that eco-corridors and eco-reservoirs such as the SMH are key to the implementation of those values;
8. **Limited Smart Growth** – by ensuring that the Emerald Necklace balances growth and by preventing unsustainable growth in the SMH;
9. **Greenbelt Appreciated by Public** – by incorporating the SMH that is well appreciated by thousands of citizens;
10. **Creatively Revisit the "Belt" in Greenbelt** – by incorporating a "Shepherd's Hook" linking the existing Greenbelt to SMH and creating a national symbol of stewardship.