



Sifton Bog Environmentally Significant Area Conservation Master Plan 2009 – 2019



**Implementation Status
February 16th , 2011**

What Makes an Environmentally Significant Area?

The presence of ecological features and functions that contribute to ecological integrity and biodiversity as defined by the following criteria:

- **Unusual landforms** or rare to uncommon community types.
- High quality **representative** landform-vegetation **community** types.
- Large **size** to support interior and sensitive species.
- Significant **hydrologic** contribution to maintain ecosystem health.
- High **biodiversity** at the community or species level.
- Important wildlife **habitat or linkage** function.
- Significant habitat for **rare, threatened, endangered species**.

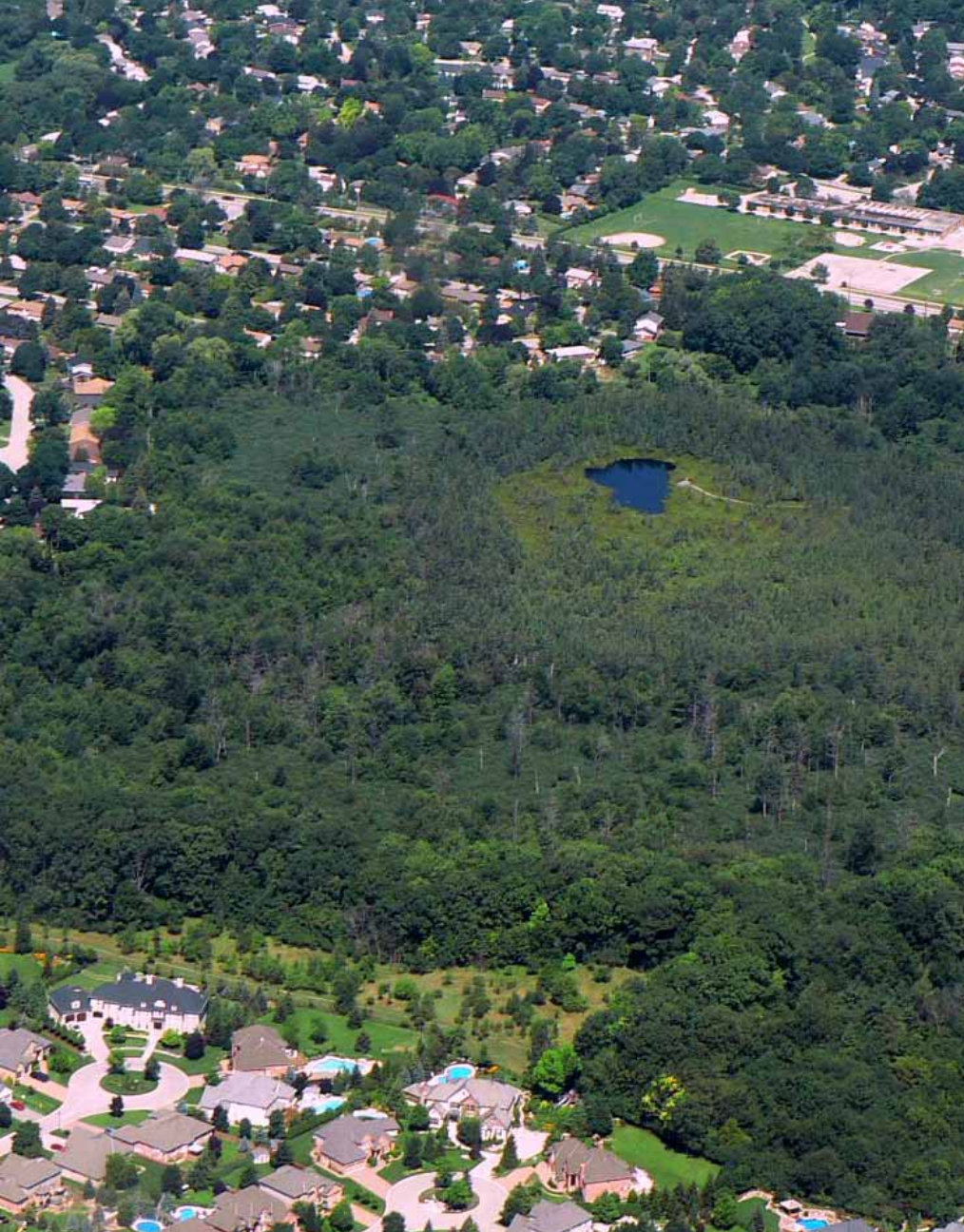
Mission Statement



The primary mission is to conserve the ecological health and uniqueness of Sifton Bog Environmentally Significant Area.

A secondary mission is the provision of appropriate educational and recreational opportunities

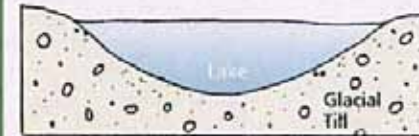
Physical Description



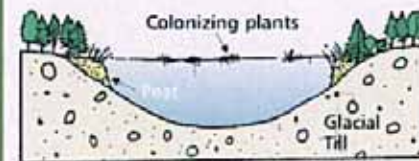
1. Stranded Ice Block



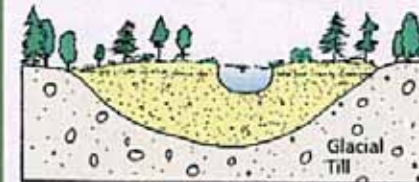
2. Kettle Lake



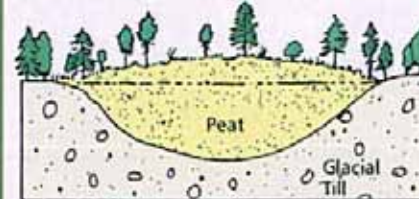
3. Plant Colonization



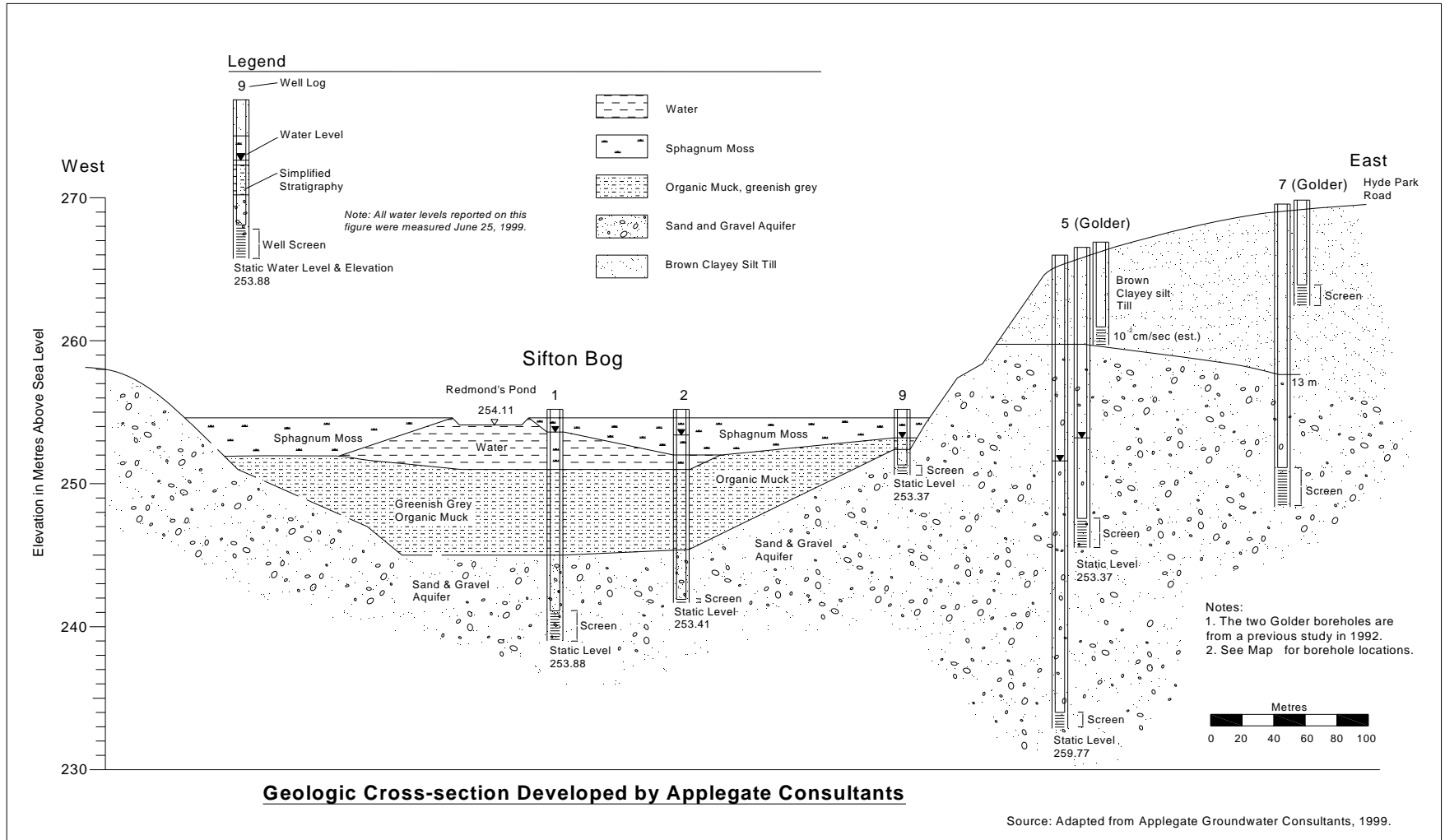
4. Mid-life of a Bog (Sifton Bog)



5. Raised Bog - Old Age

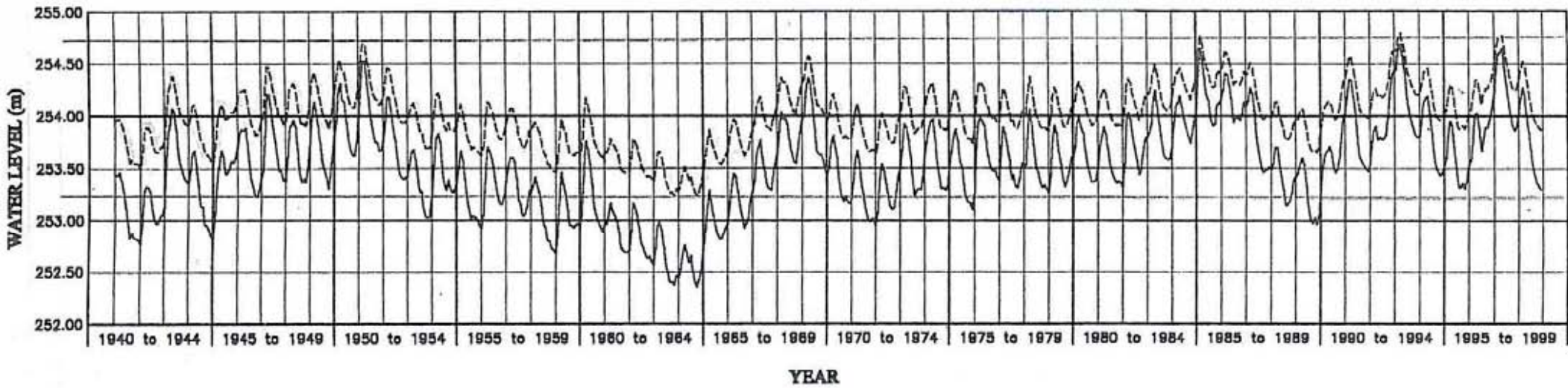


Hydrogeology



Source: Adapted from Applegate Groundwater Consultants, 1999.

Hydrology



—— WELL 25 - - - - REDMONDS POND



Water Chemistry



SCALE: 1:5000
SEPTEMBER 1999



Monitoring Point Locations	
1598 Added Monitoring Points	
1 - 13	Biological - Flora and Fauna
1,2,9,14-15	Hydrogeological
16-20	Surface Ingot and Fauna
Previous Baseline Points (continued in 1598)	
RPn/RPs	Redwoods Pond Monitoring Started in 1990
21-26	Monitoring Wells Installed in 1990 (deep and shallow points)
27-28	Monitoring Wells Installed in 1993

Biological Description



Map 10b
2007 Vegetation Communities
 Sifton Bog ESA
 Management Plan

Legend

- Study Area
- Vegetation Communities
- Polygon ID

Ecological Land Classification Codes (1998)
 (Community Units)

- B001 Open Bog Ecosite
- B052 Shrub Kettle Bog Ecosite
- B072 Towed Kettle Bog Ecosite
- CJM1 Mineral Cultural Meadow Ecosite
- CJM2 Mineral Cultural Woodland Ecosite
- FE01 Open Fen Ecosite
- FO01 Dry-Fresh Oak Deciduous Forest Ecosite
- FO05 Dry-Fresh Sugar Maple Deciduous Forest Ecosite
- FO05- Deciduous Forest Type
- MAM1 Organic Meadow Marsh Ecosite
- MAM3 Organic Shallow Marsh Ecosite
- SAF1 Floating-leaved Shallow Aquatic Ecosite
- SWC4 Tamarack Black Spruce Organic Coniferous Swamp Ecosite
- SWD3 Maple Mineral Deciduous Swamp Ecosite
- SWD6 Maple Organic Deciduous Swamp Ecosite
- SWM1 Maple Organic Mixed Swamp Ecosite
- SWT3 Organic Thicket Swamp Ecosite
- TPS1 Dry Tallgrass Savannah Ecosite

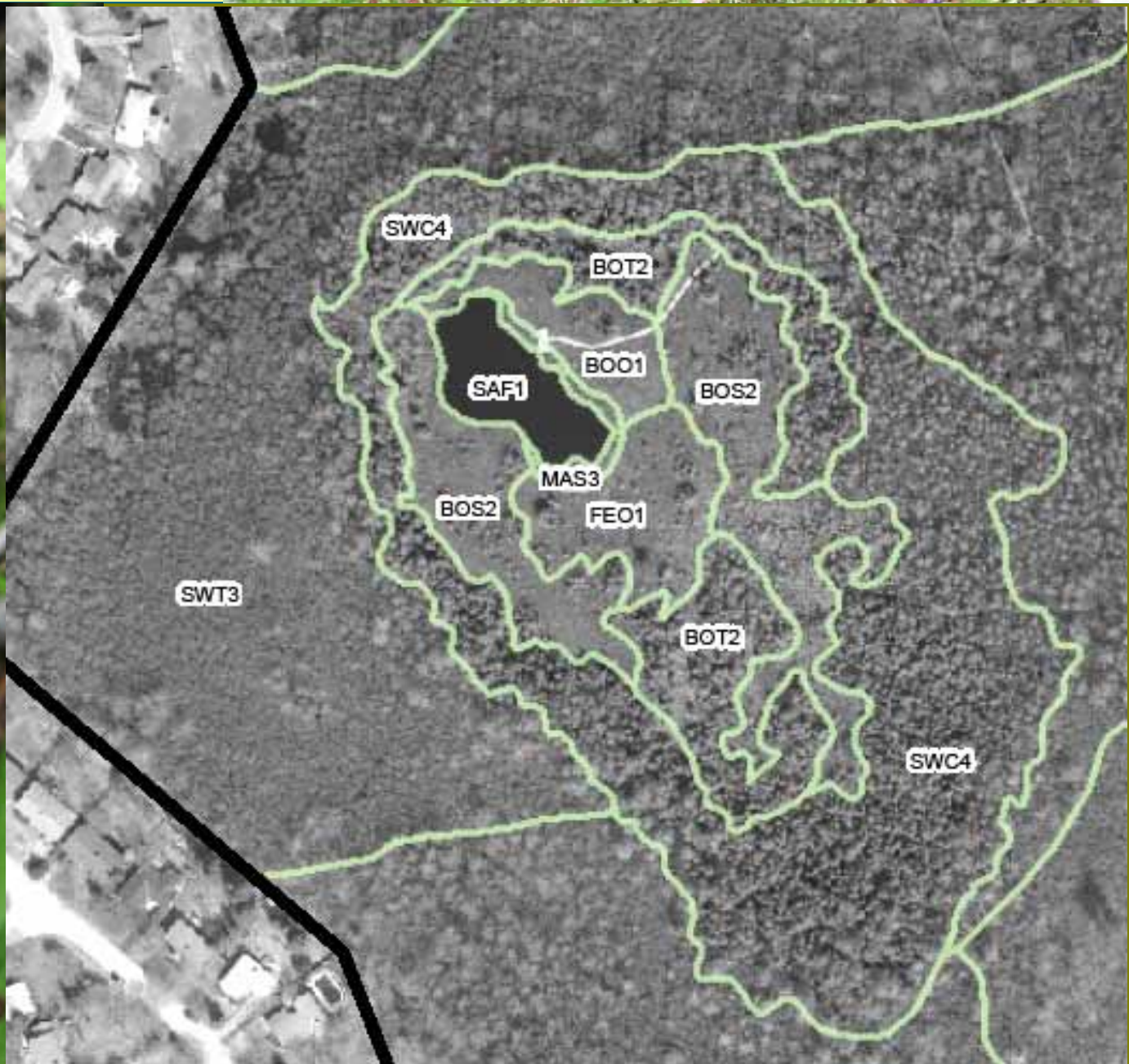
Location Map

0 50 100 150 200
 metres

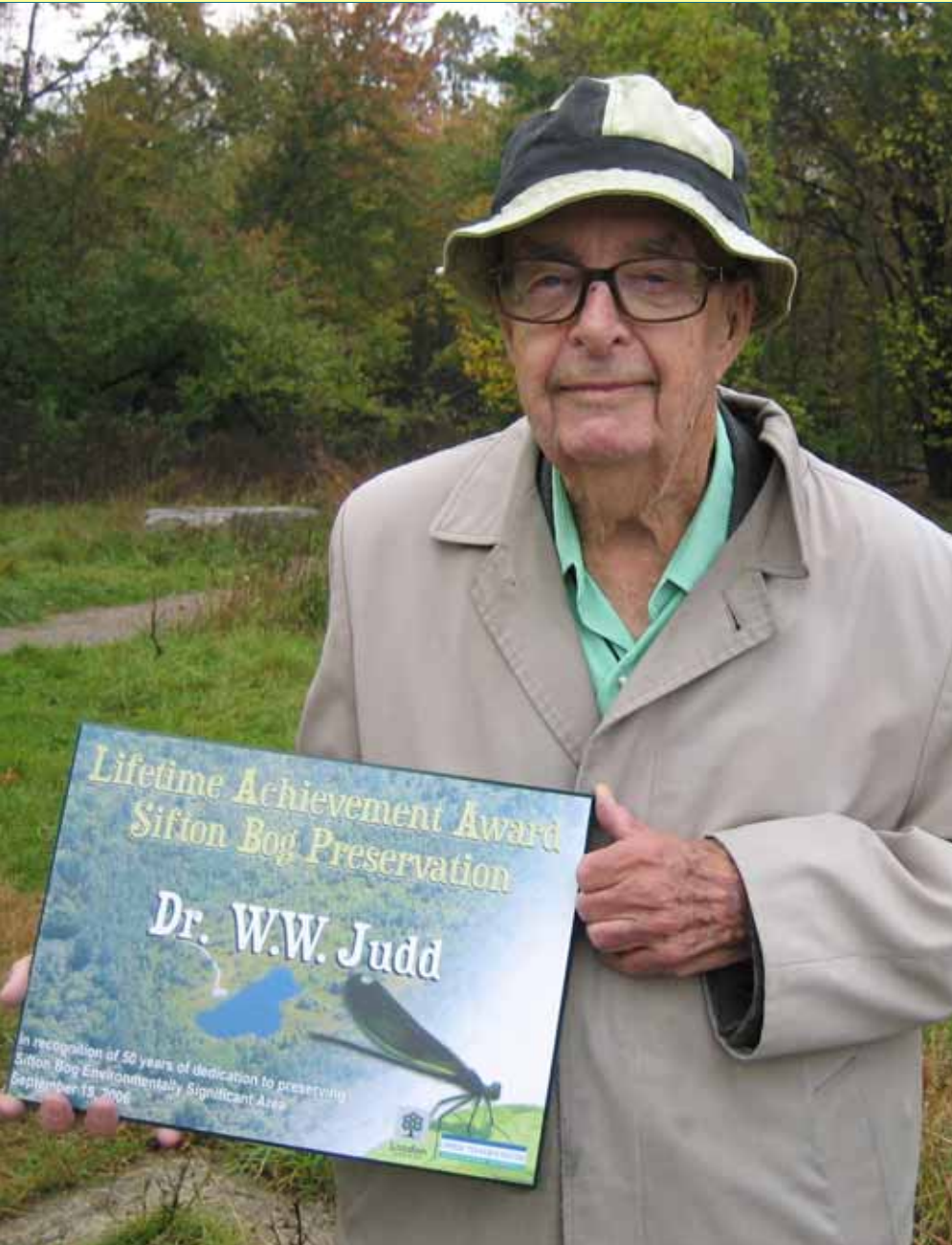
UPPER THAMES RIVER
 ENVIRONMENTAL SCIENTISTS

Map produced by UTRCA with data provided by the City of London
 Copyright © UTRCA Sept 2008

Biological Description



Guiding Principles



- **Conserve ecological health for the long term**
- **Promote awareness of unique natural features**
- **Work with the community to coordinate awareness, education, and appreciation efforts**



Chamaedaphne calyculata
Leatherleaf

Goals, Objectives, Recommendations



3 Goals



11 Objectives



55 Recommendations

Key Issues



KEY ISSUES

1. Encroachment and Human Use Impacts
2. Invasive Alien Plant Species
3. Overabundance of Deer
4. Changes to Hydrology
5. Trails
6. Education, Research, Community Involvement

Example recommendations ...



Example Recommendations



ENCROACHMENT AND HUMAN USE IMPACTS

Rec. 1.2.2

Implement an on-going program that includes boundary identification and annual monitoring and follow-up of encroachment activities.

Rec. 1.3.3

Map all unmanaged trails and work towards closing them using best available methods.



Example Recommendations



MANAGE INVASIVE SPECIES

Rec. 1.4.1

- Hand-pull buckthorn seedlings on the open bog and Black Spruce swamp; remove/kill seed-bearing buckthorn shrubs with the most effective and appropriate tools or methods.

Rec. 1.4.2

- Begin to restore the swamp thicket:
 - i) erect deer-proof fencing,
 - ii) cut and treat buckthorn stumps,
 - iii) plant native species.



Goals & Objectives



AWARENESS, EDUCATION, COMMUNITY INVOLVEMENT

Rec. 3.1.1

Continue to develop on-site and in-class education programs at Sifton Bog

Rec. 3.1.2

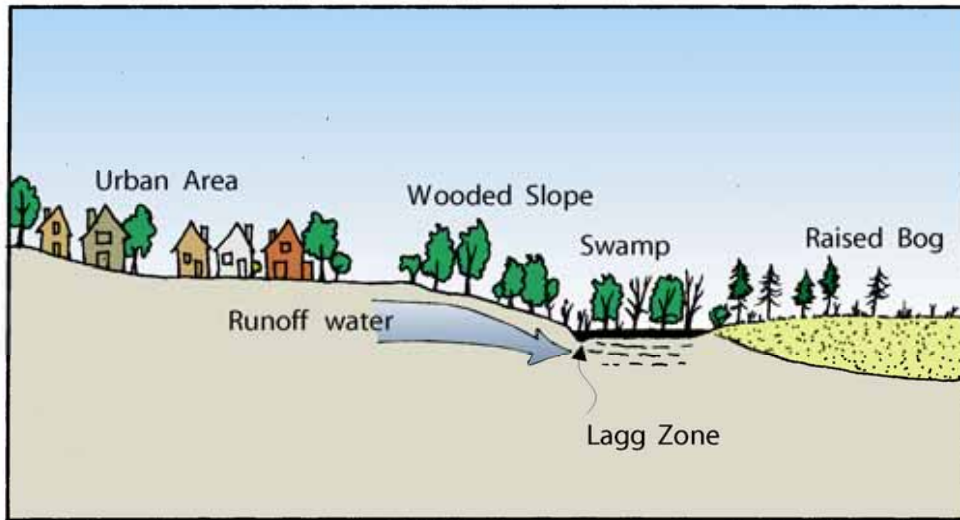
Continue to allow responsible research



Rec. 3.2.4

Encourage community involvement in appropriate activities (planting, clean-ups, fencing)

Example Recommendations



MAINTAIN HYDROLOGICAL BALANCE AND WATER QUALITY

Rec. 1.7.1

Establish a Water Monitoring Committee to review past and present monitoring programs and recommend future needs

Rec. 1.7.3

Provide input into the Oxford Street widening project to assess runoff to the bog



Example Recommendations



MINIMAL, WELL-MARKED, SAFE TRAIL SYSTEM

Rec. 2.1.1

- Formalize and implement the Conceptual Trail and Access Plan:
 - Educational kiosks, bicycle racks at three major access points
 - Improve Naomee Place Access
 - Maintain and improve the major E-W trail
 - Manage trails on any newly acquired lands



Example Recommendations



MANAGE DEER POPULATIONS

Rec. 1.6.2

- Retain consultants to undertake a deer exclosure study to assess the impact of deer browse on native vegetation communities in three ESAs.

Rec. 1.6.3

- Evaluate results from the deer exclosure study, veg. monitoring, deer count numbers and success of other mg. strategies to support a herd reduction as the only remaining feasible intervention to protect the unique ecosystems of Sifton Bog ESA by Feb. 2010.





Nuphar advena

Large Yellow Pond-lily (Spatterdock)

CONCLUSION of City of London Review of Deer

- The management of surplus white-tailed deer cannot be accomplished with a single option.
- The management of surplus white-tailed deer at Sifton Bog and within the City of London must be based on an **Integrated Management Program** that uses a combination of options to achieve population control.
- NSRI contracted to undertake analysis of problem and recommended non-lethal solutions



WILDLIFE MANAGEMENT STUDY Sifton Bog White-tailed Deer Management Study

NRSI: Natural Resource Solutions Inc.

January 2011

Development of Deer Management Strategy

Issues addressed by NRSI Study

An understanding of deer movement patterns.

Examination of linkages and wildlife corridor opportunities, refuge habitats

Assessment of deer herd health

Seasonal & annual fluctuations

Determination of home ranges, ecological carrying capacity and social carrying capacity



White-tailed deer at Sifton Bog

Compilation of Background Information

- Annual Deer Counts (11 years of data range of 4 to 53) 2010 = 8
- Deer – Vehicle Incidents (2004–2009)
- York University Exclosure Study
- City of London Vegetation Monitoring

New Information

- Camera Monitoring
 - Stealth Cam: Rogue IR
 - Moultrie Digital Deer Camera
- Winter Deer Tracks
- Habitat Use (Yards)
- Winter Fly-Over



Deer as “keystone species”

have a strong effect on the environment relative to their numbers

- Over-browsing of woody trees and shrubs

- Intense foraging of understory herbs

- Trampling of soils

This can shift vegetation composition favouring less conservative and non-native species, alter nutrient and water-cycling, lower biodiversity, affect forest



White –Tailed Deer Ecology

- **Ecological Carrying Capacity (2003, 3 deer)**
 - Maximum number of individuals that a habitat can contain (density measure)
 - Estimates must reflect local habitat conditions
 - Home range of local population extends into the urban matrix (750 to 900 m)
- **NRSI calculated ecological cc = 10 deer**
- **Social Carrying Capacity (2003, 6-8 deer)**
 - Level at which the deer population can coexist with the human population without negative impacts (upper population threshold above which management measures may be triggered)

Results of Camera Monitoring

- Movement within Bog
- Doe:Buck Ratio (6:1 to 10:1)
- Doe:Fawn Ratio (2:1= low recruitment)
- Health (good)
- Scavengers (Coyote)



Figure 2
SIFTON BOG
- DEER MOVEMENT PATTERNS -

- Legend
- Sifton Bog ESA
 - Probable Migration Routes
 - Movement within Sifton Bog
 - Deer Fatality Sites
 - Thames Valley Corridor
 - Vegetation
 - Parks



1:12,000



Prepared by: Graphics & Information Services
Planning Division, Corporation of the City of London
Based on April 2009 field data.
Planning & Information Services, Parks & Open Spaces
Planning & Information Services, Parks & Open Spaces
Planning & Information Services, Parks & Open Spaces



Sifton Bog is a small deer “sink” habitat
Thames Valley Corridor is the major “source” habitat
Deer move in and out of the Bog in response to habitat changes
(loss of food resource, loss of available habitat, response to threats)

Deer Movement and Habitat Use

Traditional “deer yarding” behaviour is rare in S. Ontario due to mild winters and SB ESA has limited bedding areas

In urban areas deer feeding and travel are mostly nocturnal = increased risk of deer-vehicle collisions

In urban areas, safe bedding areas or “security zones” are limited as are safe escape routes = less predictable behaviour

In urban areas, “threats” to deer (a prey species) are frequent, and invoke “the flight response” = increased risk of injury



Winter Tracks and Habitat Use

narrow ring of black spruce and tamarack around the open bog mat
limit high quality winter habitat

- Deer movements are random
- No heavily used trails
- Lack of significant movement corridors within the bog



Deer Population and DVO (Deer-Vehicle Occurrence)

Direct relationship between an increase in the deer population in one year leading to a higher DVO the next year.

e.g. deer population increased from 2005 to 2007
and DVOs increase from 2006 to 2008

Year	Deer Count Sifton Bog ESA (UTRCA)	DVO within 1km of Sifton Bog ESA (UTRCA)	Deer Mortalities within 1km of Sifton Bog ESA (City of)
2004	26	15	Unknown
2005	53	6	Unknown
2006	52	16	14
2007	52	22	21
2008	36	17	14
2009	4	Unknown	8
2010	8	Unknown	Unknown

DVO's within 1 km of the Sifton Bog – the incidents are likely related to routine movements within the deer home range

Deer Effects on Vegetation

York University Exclosure Study – Deer are having an impact on wetland and upland vegetation

City of London Vegetation Monitoring – Decrease in species presence in the open bog mat from 54 to 42 species from 1992 to 2008.

- Loss could be a combination of factors, including successional changes, competition with non-native species, hydrological changes, deer browse.
- **Deer are having a definite impact on upland plant species, the magnitude of impact on wetland species is less clear.**



Deer Browse Survey

Notable lack of species presence from 1.5 m to 15 cm above ground

On the Bog Mat

Evidence of deer browse of bulrush, grasses on the bog mat

Moderate browse on Leatherleaf within the ring of Black Spruce on east side

No browse of shrubs elsewhere on the bog mat

In the Upland Forest

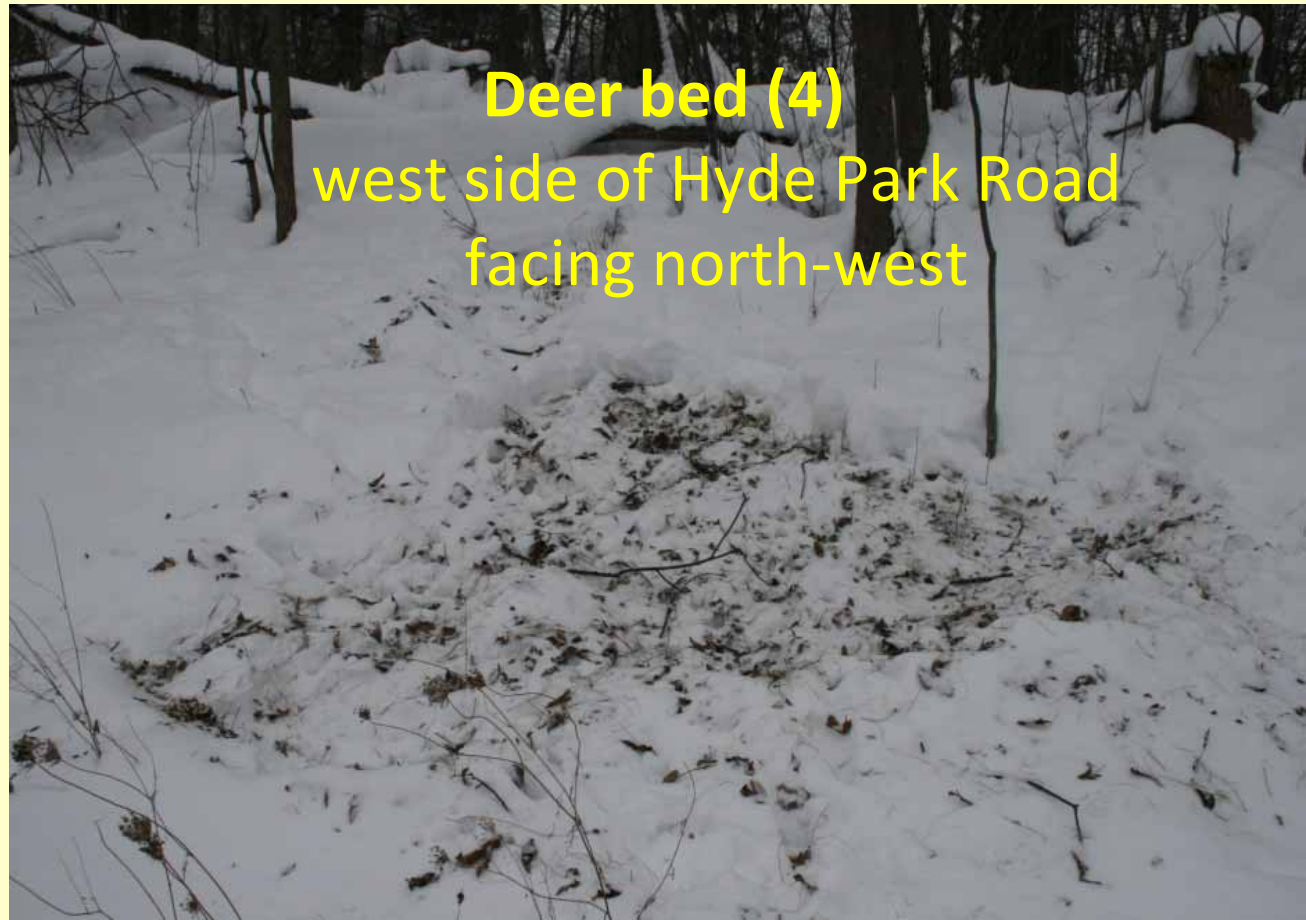
High upper canopy creates a shaded understory

Limited tree saplings and few shrubs present to provide browse

Evidence of light browse (less than 50% of all stems browsed) and no new evidence of severe browse

Factors influencing population decline

- Loss of foraging on agricultural fields since 2005
- Reduction of available winter food
- Reduction of supplemental feeding by residents
- High water levels in 2009 limited foraging and bedding areas
- Public go off-trail in the winter
- Possible predation pressure from coyotes



Recommendations (1)

Sifton Bog ESA will continue to be a refuge for white-tailed deer

Future Studies and Monitoring Needs

- Continue to monitor population, by count and camera and DVOs including additional information on sex, age, health, movement patterns
- Study keystone vegetation responses in relation to water/nutrient dynamics to determine if overbrowse affects structure and/or biogeochemical processes
- More detailed browse surveys on bog mat
- More detailed study into year-round use or habitat

Include Deer Management in any other management programs

e.g. effect of buckthorn removal on deer could remove winter food source too quickly and force deer to forage in residential areas, or to shift browse pressure to bog species

Create a trail system through deer movement and security zones to passively minimize the number of resident deer

Recommendations (2)

Educate with targeted regular information to reflect local behaviour
e.g. deer feeding prior to winter; deer resistant landscaping prior to spring

Implement Traffic Safety Measures

Maintain population at 10-12 Deer: identify a threshold of 17 deer over 2 years as a trigger to initiate management avoiding direct population control unless other management approaches have been unsuccessful

TRAIL ISSUES FOR REVIEW

POLICY, PROCESS, PRACTICE

- **Policy context**

- # 1 priority is resource protection

- # 2 priority is sustainable, safe use

- **Process for trail planning**

- ecology drives the plan, not the use

- process must be transparent, consistent, public

- **Best Practices**

- trail impacts relate to location, width, surface type

- ecological and social issues related to use of asphalt

TRAIL LOCATION, WIDTH, SURFACE

1. Trail location - based on Management Zones

A management strategy is proposed based on the International Union for the Conservation of Nature and Natural Resources (IUCN) protected areas classification and delineation of zone categories that are managed to attain different goals.

This zoning approach is used in Canadian National Parks and Provincial Parks with zones ranging from strictly controlled use and access to zones permitting greater access and variety of use.

TRAIL LOCATION, WIDTH, SURFACE

2. **Trail Width** - as width increases, it can result in greater habitat fragmentation and loss of aesthetic appeal of “wilderness” experience
 - *Specify standard trail width within zones with maximum trail width not to exceed 2.5 m*

3. **Trail Surface Type** - all surface types may create impacts if the use exceeds the ability of the surface to absorb impacts
 - *Specify surface types allowed within each zone, with the standard being natural surface and no restriction on use of asphalt in specified zones only*

NEXT STEPS

1. **Circulate** the *Planning and Design Standards for Sustainable Trails in Environmentally Significant Areas* to the public, other Advisory Committees of Council, and interested stakeholders for review and comment
2. **Test Standards** in the Medway Valley and The Coves ESAs
3. **Incorporate Standards** in all new Conservation Master Plan and new trail planning in significant natural areas





Photo: Stan Caveney

