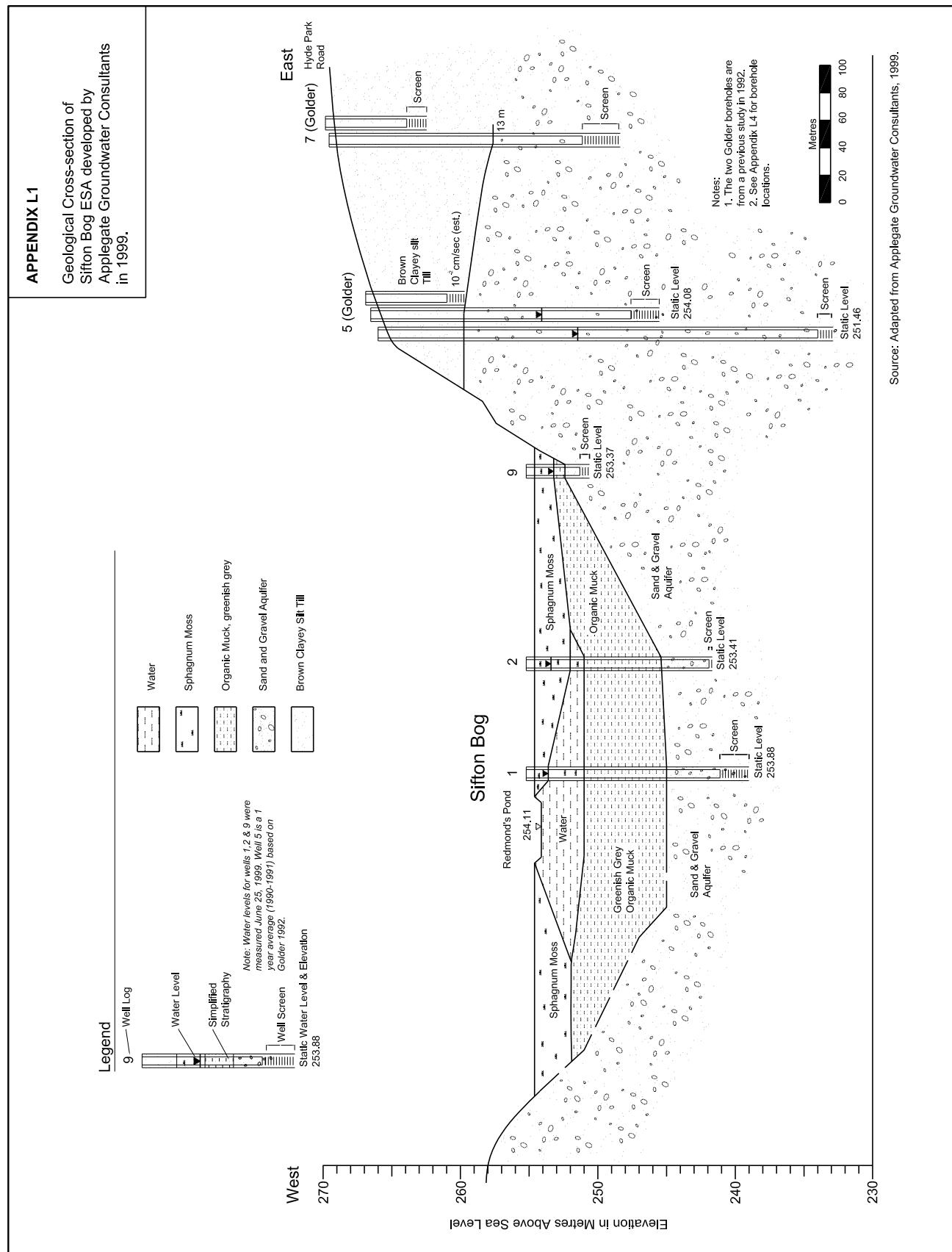


Appendix L1. Geological Cross-section of Sifton Bog ESA (Applegate Groundwater Consultants, 1999)

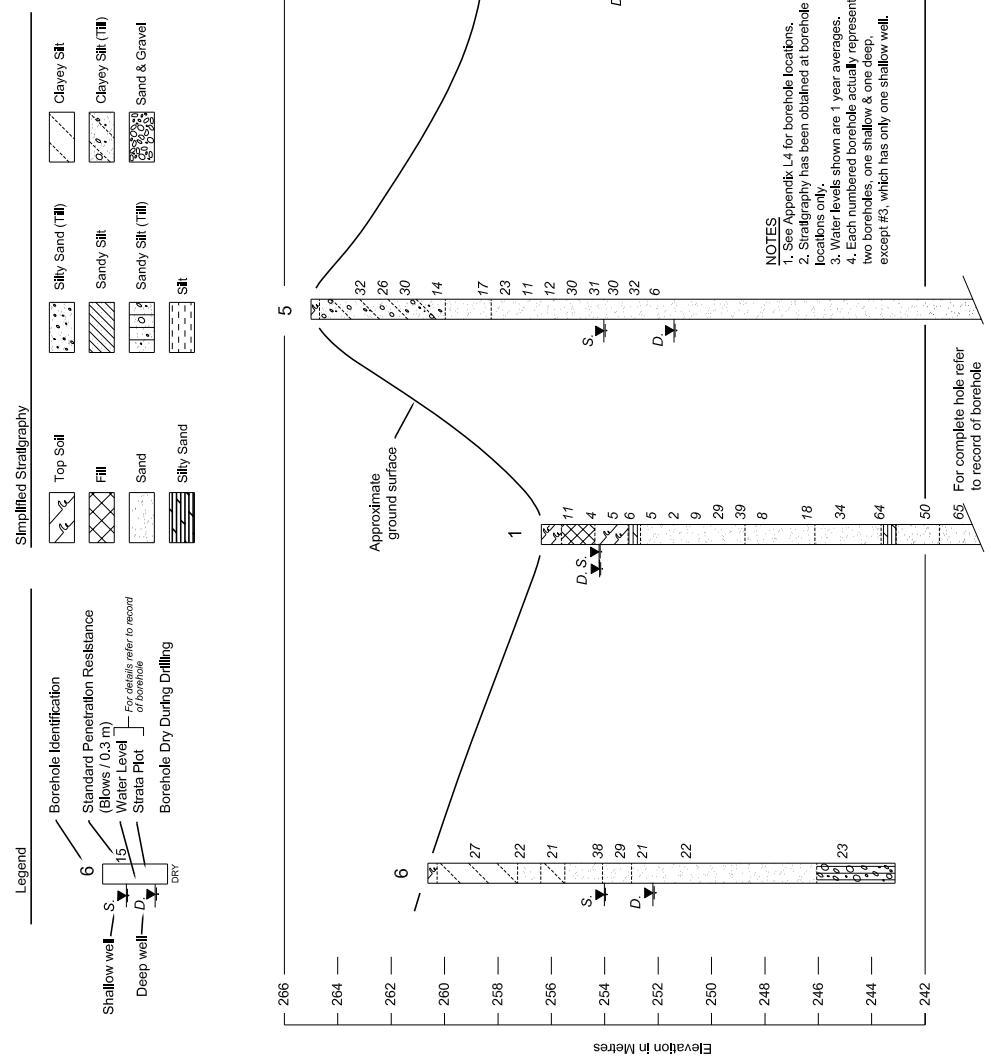


Source: Adapted from Applegate Groundwater Consultants, 1999.

Appendix L2. Geological Cross-section of the Perimeter of Sifton Bog ESA (Golder Associates, 1992)

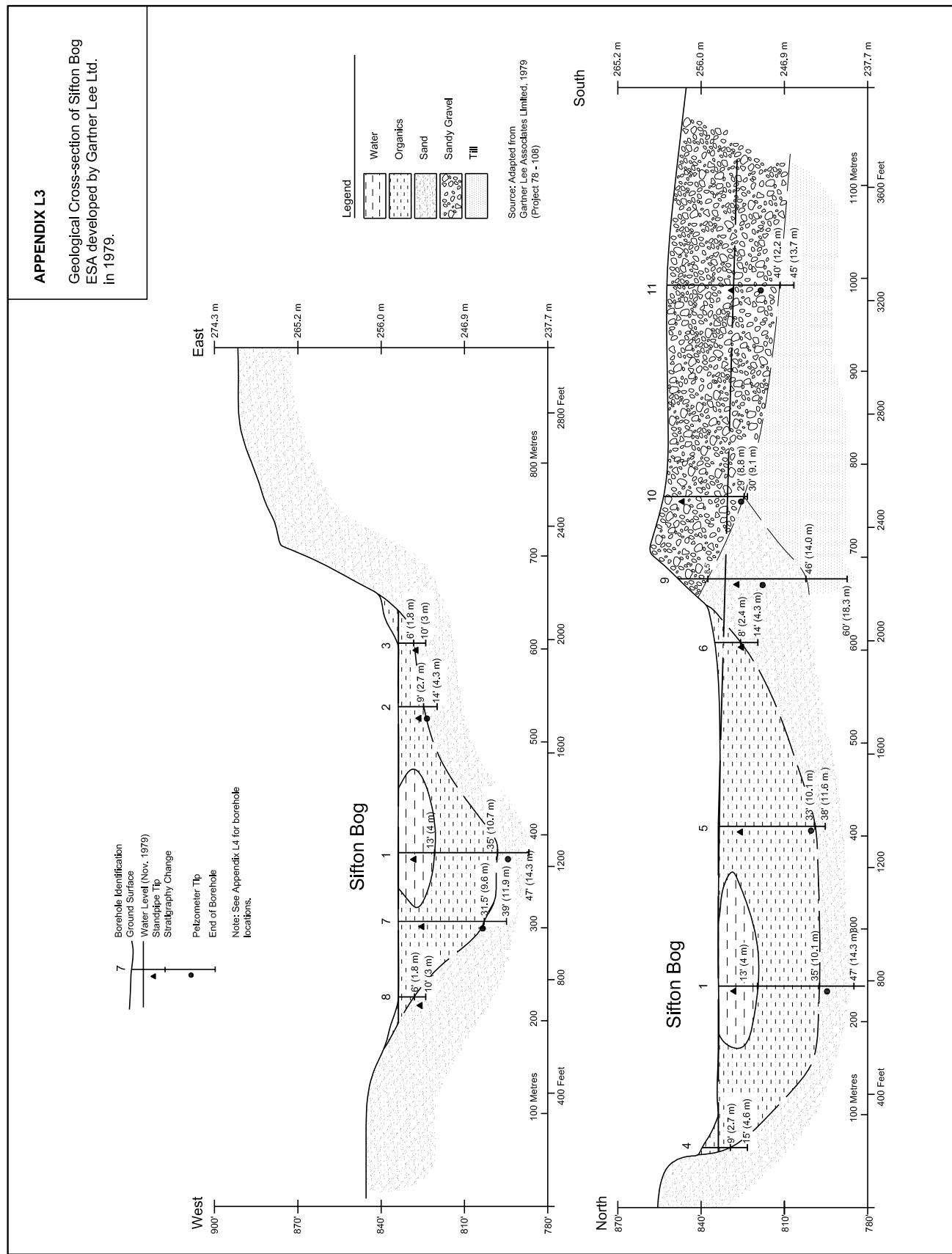
APPENDIX L2

Geological Cross-section of the Perimeter
of Sifton Bog ESA developed by Golder
Associates in 1992.

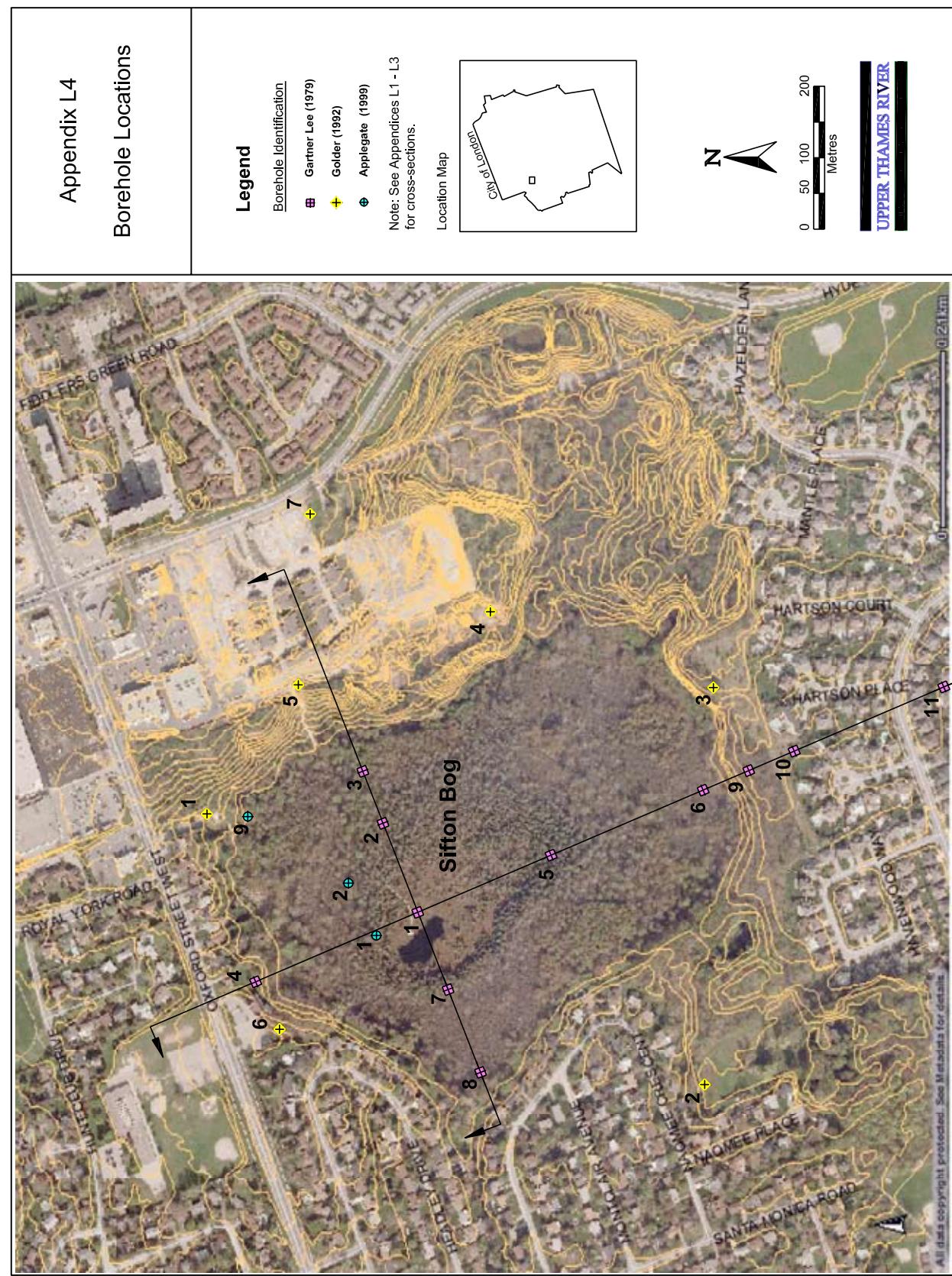


Sifton Bog ESA Conservation Master Plan 2009 - 2019

Appendix L3. Geological Cross-section of Sifton Bog (Gartner Lee Ltd., 1979)



Appendix L4. Borehole Locations



All data copyright protected. See Metadata for details.

**Appendix M1. Exploring the littoral of the Sifton Botanical Bog Brochure
(PUC, circa 1980)**



Access to the field house classroom and tours of the Bog may be arranged by contacting the Parks Department of the Public Utilities Commission. Information for further study may be obtained from the London Public Library and Art Museum, 305 Queens Ave. or the Departments of Zoology and Botany, University of Western Ontario, London, Ontario.

By arrangement between the Upper Thames Conservation Authority and the Public Utilities Commission, the Sifton Botanical Bog is being cared for as part of London's park system, with provision for its preservation in its natural state.

The property was purchased with the assistance of the Government of Ontario.

Appendix M1. Exploring the littoral of the Sifton Botanical Bog Brochure (PUC, circa 1980) (continued)



HISTORICAL DEVELOPMENT

At the end of the Wisconsin period, some 15,000 years ago, glaciers covered most of Canada, extending into the United States below the Great Lakes. About 11,000 years ago, the glaciers retreated from Southern Ontario. Acid bogs developed along the edge of the retreating glacier but were gradually replaced in Southern Ontario by vegetation of the Transition Zone. But in a few places, where there were deep undrained pot holes in the ground, acid bogs persisted. One such bog is the Sifton Botanical Bog. A huge block of ice, a remnant of the ice sheet, melted in the depression now occupied by the bog. As the weather warmed up, Sphagnum Moss filled the depression and in decaying, left a deposit of peat, now some sixty feet deep. Thus the bog remains in a state similar to its condition of 10,000 years ago, while all around it, the landscape has developed as the familiar woods and fields of Southern Ontario.

Appendix M1. Exploring the littoral of the Sifton Botanical Bog Brochure (PUC, circa 1980) (continued)

VEGETATION

The progressive development of the bog has produced three main types of vegetation in concentric rings, as shown on the map.

1. On the outside are wooded slopes which are comparatively dry. The main trees here are hardwoods, including White Oak, Black Cherry, Red Oak, Sugar Maple and Basswood. Beneath the trees grow many kinds of shrubs and vines, including American Hazel, Witch Hazel, Ninebark, Bladder-nut, Gray Dogwood, Alternate-leaved Dogwood, Common Elder, Virginia Creeper, Carrion-flower, Bristly Greenbrier, Running Strawberry-bush and Wild Grape. The White Trillium, Ontario's flower, grows in profusion and flowers in May on the southern slopes.
2. Below the wooded slopes is a low, damp, wooded region. The trees here include White Pine, White Birch, Red Maple and Silver Maple. The commonest shrub is Alder-buckthorn which grows about twenty feet tall. It is an import from Europe and is well established in the bog, forming dense thickets. Other shrubs here include Swamp Rose, Winterberry, Mountainholly, Red Osier Dogwood, Silky Dogwood and Red-berried Elder. The inner limits of the low woods include a growth of Larch and Black Spruce.
3. The centre of the bog consists of a floating mat of Sphagnum Moss, some sixty feet deep at the centre. Most of the mat of moss is covered with bushes of Leather-leaf. Four other shrubs intermingled with the Leather-leaf are Bog Rosemary, Bog-laurel, Black Huckleberry and High-bush Blueberry. Low against the moss, grow Cranberry and the

two carnivorous plants, Pitcher Plant and Sundew. In the Northwest corner of the floating bog is Redmond's Pond, named after Michael Redmond who once owned the bog. In Summer, its surface supports a growth of the flowers and floating leaves of Yellow Waterlily.

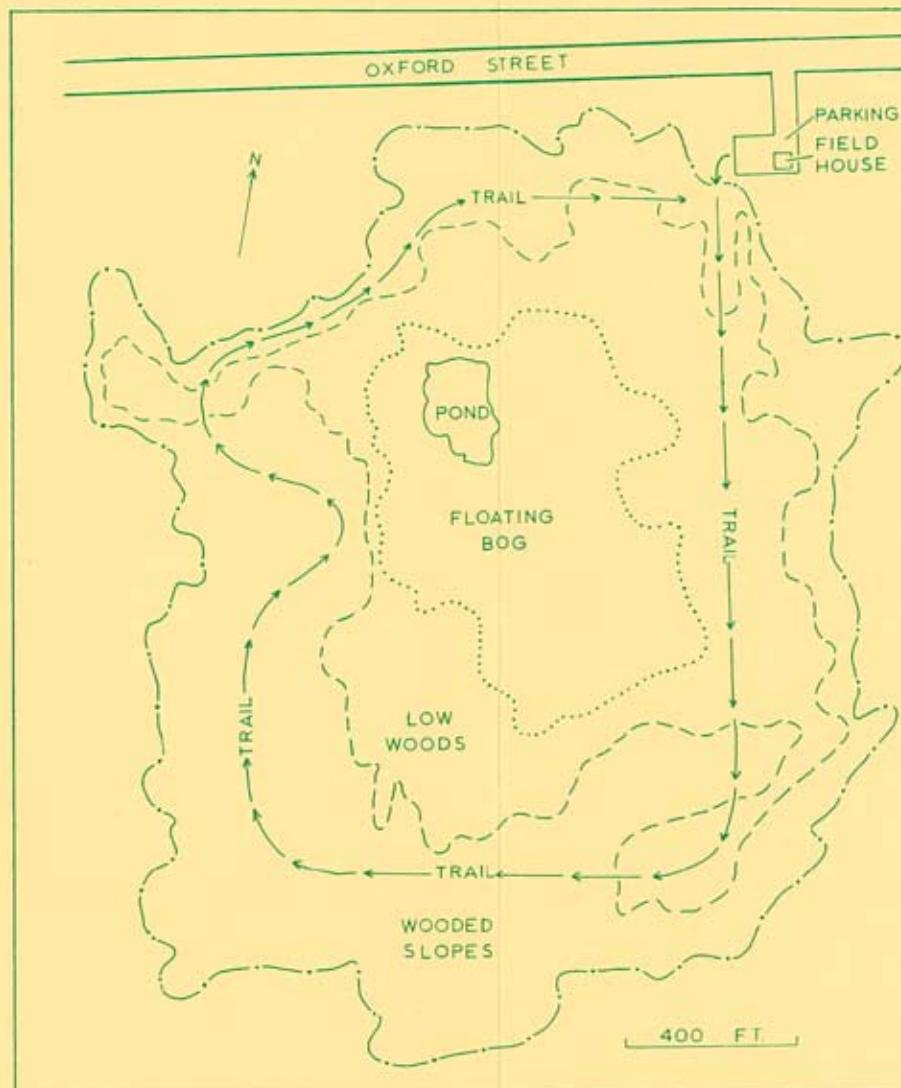
MAMMALS

Until 1959, White-tailed Deer were seen in the bog but none have been seen since then. Likewise, the European Hare once frequented the bog but has not been seen since 1961. Mammals that are found on the wooded slopes are Raccoons, Striped Skunks and Woodchucks. In the low, damp woods, are Chipmunks, Short-tail Shrews and Gray Squirrels in both their gray and black phases. Among the bushes on the floating bog, live Cottontail Rabbits, and in the moss, though seldom seen, are the Masked Shrew, the Smoky Shrew and the Southern Bog Lemming. Muskrats live about the borders of Redmond's Pond.

REPTILES AND AMPHIBIANS

Redmond's Pond is a permanent body of water and the Sphagnum mat is constantly damp, so the bog is a choice dwelling place for turtles and frogs. The turtles are Snapping Turtle, Blanding's Turtle, Spotted Turtle and Painted Turtle. Seven kinds of frogs are present; they are Green Frog, Leopard Frog, Pickerel Frog, Wood Frog, Spring Peeper, Chorus Frog and Gray Tree Frog. The American Toad lives among the bushes on Sphagnum mat.

Appendix M1. Exploring the littoral of the Sifton Botanical Bog Brochure (PUC, circa 1980) (continued)



- a-a: outer border of open floating bog
- b-b: outer border of lower, damp woods
- c-c: outer border of open wooded slopes
- d: Redmond's Pond
- e: location of tent-trap
- f: location of baited insect trap
- g: location of co-ordinate point— $42^{\circ}58'15''N, 81^{\circ}19'15''W$
- h: drainage ditch
- i: small ponds in bog

Appendix M2. Sifton Bog Brochure (PUC, UTRCA, circa 1986)



DIRECTIONS:

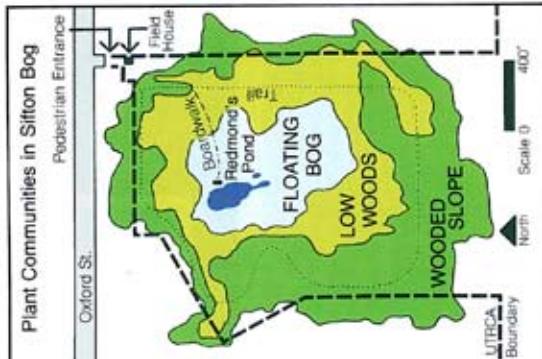
Sifton Bog is located on Oxford Street West between Hyde Park Road and Sanatorium Road. Parking for three cars is provided at the entrance, or larger groups can park across the road at Oakridge Mall. A pedestrian gate, located on the east fence line, is open to the public year-round.

Photo Credits: London Camera Club

The Upper Thames River Conservation Authority acquired the Sifton Bog in 1986 and 1987 in an effort to have it preserved. About half of the property was received as a donation from the Bladnir Construction Company. An arrangement between the Public Utilities Commission and the UTRCA includes the bog as part of London's park systems, with provision for its preservation in its natural state.

for further information please contact:

PARKS DEPARTMENT
Public Utilities Commission
P.O. Box 2700, London, Ontario N6A 4H6
(519) 661-5783



FLOATING BOG

In the base of the depression, or kettle hole, is found the fascinating plant life of the bog. The centre consists of a floating mat of Sphagnum Moss, alive at the surface, and slowly decaying below. A large area of the mat is covered with Leatherleaf intermingled with Bog Rosemary, Bog laurel, Black Huckleberry and Highbush Blueberry. Cranberry is found growing low against the moss, along with two carnivorous plants, Pitcher-plant and Sundew. Bogs are well known for their orchids and of the nine kinds recorded here, Rose Pogonia and Grasspink are the most common.

Plant Communities in Sifton Bog

Pedestrian Entrance

Oxford St.

Further down the slope, the habitat becomes cooler and moister. Eastern White Pine, White Birch, Red Maple and Silver Maple are found here. The understory includes Swamp Rose, Winterberry, Mountain-holly, Red Osier Dogwood, Silky Dogwood, and Red-berried Elder. At the inner limits of the low woods are found Tamarack and Black Spruce, trees which are more commonly found much further north.

Plant Communities

Acid bogs are typically a more northerly or Boreal type of plant community, making the plants found in the Sifton Bog quite unique to Southern Ontario. Also, the acidic nature of a bog contributes to unusual plant life.

WOODED SLOPE

Located around the perimeter of the bog, this area contains typical southern hardwood tree species including: White and Red Oak, Black Cherry, Sugar Maple and Basswood. Beneath the trees grow many kinds of shrubs and vines including: American Hazel, Witch-hazel, Ninebark, Bladdernut, Gray Dogwood, Alternate-leaved Dogwood, Common Elder, Virginia Creeper, Cannon Flower, Blistly Greenbrier, Running Strawberry Bush and Wild Grape.

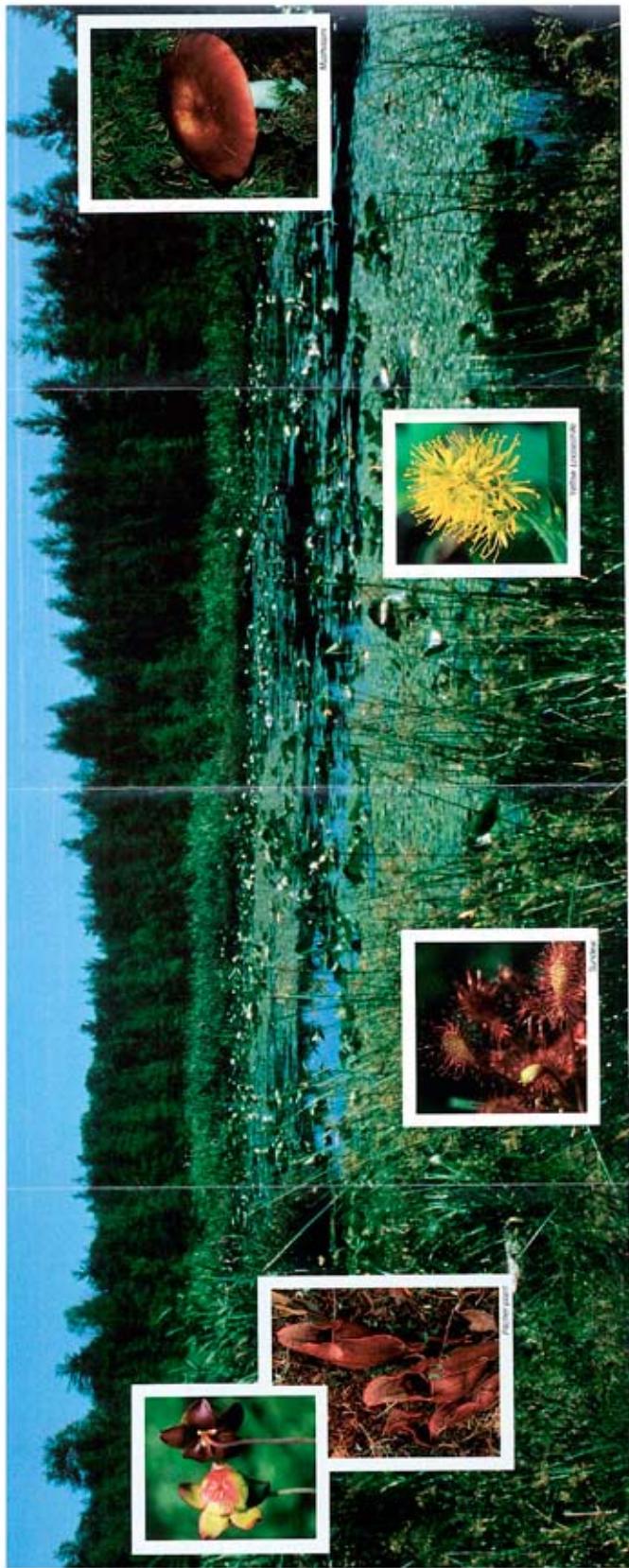
WOODED SLOPE

Located around the perimeter of the bog, this area contains typical southern hardwood tree species including: White and Red Oak, Black Cherry, Sugar Maple and Basswood. Beneath the trees grow many kinds of shrubs and vines including: American Hazel, Witch-hazel, Ninebark, Bladdernut, Gray Dogwood, Alternate-leaved Dogwood, Common Elder, Virginia Creeper, Cannon Flower, Blistly Greenbrier, Running Strawberry Bush and Wild Grape.

LOW WOODS



Appendix M2. Sifton Bog Brochure (PUC, UTRCA, circa 1986) (continued)



Natural History of Sifton Bog

At the end of the Wisconsin period, some 15,000 years ago, glaciers covered most of Canada and extended into the United States below the Great Lakes. Acid bogs developed along the edges of the retreating glaciers but were gradually replaced in Southern Ontario by deciduous and coniferous vegetation of the Transition Zone. The Sifton Bog formed when a huge chunk of ice left by a glacier created a deep, undrained depression. As the climate warmed, Sphagnum Moss grew and filled this depression and upon decaying, it left a deposit of peat which today is

some 60 feet deep. Thus the Sifton Bog remains, surrounded by the more typical deciduous forests of the area.

Bogs, swamps, marshes and fens are four types of wetlands found in Ontario. Bogs are defined as peat-covered areas or peat-filled depressions with a high water table and a surface carpet of mosses. The bog surface is often raised and virtually isolated from mineral soil waters making the bog waters and peat strongly acidic and extremely deficient in minerals and nutrients.

The Sifton Bog is the most southerly large acid bog in Canada. It exists within the Carolinian life zone, well separated from the Boreal life zone

where bogs are common. Because of its uniqueness in Southern Ontario, the Sifton Bog has been an invaluable study area for many groups including natural history clubs, service clubs and students from elementary school to university.

White-tailed Deer and European Hare once frequented Sifton Bog but have not been seen for many years. Raccoon, Striped Skunk and Woodchuck are found on the wooded slopes. In the low, damp woods are Eastern Chipmunk, Short-tailed Shrew and Eastern Gray Squirrel in both its gray and black phases. Among the shrubs, on the floating bog, Iive Eastern

Cottontail and in the moss, though seldom seen, are the Masked Shrew, the Smoky Shrew and the Southern Bog Lemming. Muskrat live around the borders of Redmond's Pond.

Redmond's Pond is a permanent body of water and the sphagnum mat is constantly damp, creating an ideal environment for turtles and frogs including: Snapping Turtle, Midland Painted Turtle, Green Frog, Northern Leopard Frog, Wood Frog, Spring Peeper, Midland Chorus Frog and Gray Treefrog. Only rarely have the Spotted Turtle, Blanding's Turtle and Pickerel Frog been seen. On the fringes, the American Toad, Eastern Garter Snake, Brown Snake and the uncommon Milk Snake make their home.

Appendix M3. Sifton Bog Natural Area Brochure (PUC, circa 1990)

SIFTON BOG

A NATURAL AREA IN
LONDON, ONTARIO, CANADA

LEGEND:

- → → BOARD WALK
- - - TRAIL
- T TAMARACK
- S BLACK SPRUCE

Insects:
Certain butterflies, moths and other insects are found here because of the acidic bog plants. These include the pitcher-plant moth, the bog copper butterfly (cranberry plants) and the bog elfin (blueberry plants). Bog crickets can be found in the sphagnum moss. In the late spring and summer mosquitoes are abundant. Protect yourself accordingly.

Reptiles and Amphibians:
Because the pond is permanent and the sphagnum mat is always damp, the bog is ideal for turtles and frogs. Four species of turtles have been recorded: snapping, Blanding's, spotted, and painted. Seven kinds of frogs are known: green, leopard, pickerel, wood, chorus, grey tree, and spring peeper. American toads live among the bushes on the sphagnum mat.

Painted Turtles

Green Frog

V. Storozec

PLEASE

- travel only on existing trail and boardwalk
- take only pictures
- leave only footprints
- do not disturb animals
- do not pick or transplant flowers
- keep this Natural Area litter free
- the wilderness character of the Natural Areas within an urban setting is best appreciated by walking!

For more information, contact:

PUC

Meadowlily Woods
Medway Valley Heritage Forest
Warbler Woods
Westminster Ponds

A brochure for each is available.

This brochure was prepared by the Advisory Committee on Natural Areas of the London Public Utilities Commission in 1990, and may be copied. It was funded by CWIP, a Community Wildlife Involvement Program of the Ontario Ministry of Natural Resources.

When you have finished with this brochure, please give it to a friend, so that others can learn about London's Natural Areas.

Enjoy nature in London's other Natural Areas:

R. Chambers

**Ontario Ministry of Natural Resources
Community Wildlife Involvement Program**

CWIP

Sifton Bog ESA Conservation Master Plan 2009 - 2019

Appendix M3. Sifton Bog Natural Area Brochure (PUC, circa 1990) (continued)

GEOLOGY

DESCRIPTION
The Sifton Bog is an acidic bog in which a limited number of plants can grow, most of which would normally be found in more northern climates. Since it is surrounded by woods with Carolinian affinities, one can experience in a ten minute walk changes in vegetation that could take a journey of several hundred kilometers. Because it is the most southerly large acidic bog in Canada, it is an invaluable study area, the more so because of its location in a large urban centre. The Sifton Bog is a Class 2 provincially significant wetland.

BUS ROUTES AND ACCESS

From Dundas and Talbot Street: #19 Oakridge to Royal York Road and Oxford Street. Cross Oxford Street to the main gates. A small pedestrian gate in the fence line to the east is open to the public.

TRAILS

Look for the trail at the southwest end of the paved area. It leads south through wet woods to the start of the boardwalk on the floating bog. The boardwalk ends at a viewing platform on Redmond's Pond. To protect the fragile plants in the bog, please stay on the boardwalk.

PLANT COMMUNITIES

Wooded Slope:

The higher part of the upland slope surrounding the bog is covered with trees and shrubs typical of southern Ontario's hardwood forest, with Carolinian affinities. The most common species of trees are white and red oak, black cherry, sugar maple and basswood. The under-story of shrubs and vines includes American hazel, witch-hazel, ninebark, bladdernut, grey dogwood, alternate-leaved dogwood, common elder, Virginia creeper, currion flower, bristly greenbrier, running strawberry bush, and wild grape.



HISTORY
Evidence exists that the aboriginal people used the area as a hunting ground. Some of the 20th century owners of this bog tried to exploit its natural resources by attempting to drain it to grow cereal, removing layers of peat for sale, or by selling the black spruce for Christmas trees. During World War II the alder buckthorn was removed for use in the production of fuse powder.

In 1957 a movement to preserve Byron Bog (as it was then called) was led by Dr. W.W. Judd, of the University of Western Ontario, who has written over 50 articles on the bog, specifically on its rich insect life. Success came in 1967 when UTRCA acquired the area through a grant from the Province of Ontario and a donation from the Sifton Construction Company. It was then named the Sifton Botanical Bog.

Low Woods:

Toward the bottom of the slope, the habitat becomes cooler and moister. Here we find white pine, white birch, and red and silver maple. The under-story includes swamp rose, winterberry, mountain-holly, red-osier dogwood, silky dogwood, and red-berried elder. Still closer to the bog we find tamarack and black spruce, trees typical of much more northern habitats.



Floating Bog:
The bog's most fascinating plant life is found in the depression, or kettle hole. The centre consists of a floating mat of sphagnum moss, alive at the surface and slowly decaying below. Much of the surface of the mat is covered with leatherleaf intermingled with bog rosemary, bog-laurel, black huckleberry, and highbush blueberry. Cranberry is found growing low against the moss, along with five species of carnivorous plants (pitcher-plant, two sundews and two bladderworts). Bogs are well-known for their orchids, and of the nine kinds recorded here, rose pogonia and grass-pink are the most common.

ANIMALS

Birds:

In spring and fall, numerous species of warblers, sparrows and other migrants can be found. In winter, the cones of black spruce and tamarack attract the "winter finches" – evening and pine grosbeaks, crossbills, pine siskins, redpolls and purple finches.

Mammals:

As with the plants, the more northerly mammals are found in the heart of the bog. Racoons, striped skunks, and woodchucks are found on the slopes, while chipmunks, short-tail shrew, and grey squirrels in both black and grey phases are in the low, damp woods. Among the bushes on the floating bog live cottontail rabbits, and in the moses, though seldom seen, are masked and smoky shrews and the southern bog lemming. Muskrats live along the borders of Redmond's Pond.

Appendix M4. Sifton Bog Natural Area Brochure (UTRCA, McIlwraith Field Naturalists of London Inc., City of London, London Community Foundation, 1995)

Sifton Bog Natural Area

in London, Ontario



Protecting Natural Areas

The five designated *Natural Areas* in London are officially called *Environmentally Significant Areas (ESAs)*. Many agencies and groups are actively involved in the management and protection of the ESAs:

The **City of London** protects ESAs by identifying them in the Official Plan and regulating land use through zoning by-laws, which maintain the areas' ecological integrity and sensitive natural features. Site management and operations are carried out to protect these areas.

The **Upper Thames River Conservation Authority** protects many natural land forms, such as wetlands and natural areas, throughout the upper Thames River watershed. Protection may be achieved by purchasing land, enforcing ill and construction regulations, applying provincial policies, and site management and operations.

The **Environmental and Ecological Planning Advisory Committee (EEPAC)** is made up of experts in disciplines such as biology, botany, and geology, appointed by the City of London. EEPAC advises the city on matters pertaining to the designation, protection and enhancement of ESAs.

The **McIlwraith Field Naturalists of London** have been active lobbyists in the identification and protection of natural areas for over 100 years.

Members of the **Thames Valley Trail Association** dedicate many hours to trail maintenance in some of the ESAs, so that users can safely enjoy the areas without damaging the very plants and animals that make them special.

Various **Community Associations and Rotarians Groups** are increasingly active lobbyists for the ongoing protection of the ESAs and other green spaces in their neighbourhoods. Examples include the Oakridge-Hazelden Ratepayers (around Sifton Bog), the Pond Mills Community Association and the Lower Medway Valley Ratepayers Association.



Trails

Look for the trail at the southwest end of the paved area. It leads south through wet woods to the start of the boardwalk onto the floating bog. The boardwalk ends at a viewing platform on Richmond's Pond. To protect the fragile plants in the bog, please stay on the boardwalk. Water levels fluctuate, and rubber boots are needed in the spring and after summer rainstorms.

Description

The Sifton Bog is an acidic bog in which only a limited number of plants can grow. Most would normally be found in more northern climates. Since it is surrounded by woods with Carolinian affinities, one can experience in a ten minute walk changes in vegetation that could take a journey of several hundred kilometers. Because it is the most southerly large acidic bog in Canada, it is an invaluable study area, the more so because of its location in a large urban centre. The Sifton Bog is a Class 2 provincially significant wetland.

Ownership/Management

The Upper Thames River Conservation Authority (UTRCA) owns the 28 hectare Natural Area, and jointly manages it with the City of London.

Access

Park at Oakridge Mall on the north side of Oxford Street and enter through the small pedestrian gate in the left-hand fence on the south side of Oxford Street.

Enjoy nature in London's other Natural Areas:

- Meadowlily Woods
- Medway Valley Heritage Forest
- Warbler Woods
- Westminster Ponds

Brochures for each are available from the Upper Thames River Conservation Authority (519) 571-2300, the City of London (519) 661-4980, and at the Visitor & Convention Bureau 300 Dufferin Street (City Hall) or 6376 Wellington Road South.

Location

Sifton Bog is located on the south side of Oxford Street west of Hyde Park Road, just west of Oakridge Mall.



- travel only on existing trails
- ride only pictures, leave only footprints
- do not spray wildlife or kick or transplant flowers
- keep fire pits away from the wetland character of this area
- help to keep up-to-date the wetland character of this area

This brochure was made possible by grants from the Arborgo Reo Family Foundation and the London Community Foundation. Produced by Upper Thames River Conservation Authority. Phone toll free to 100-1.



Sifton Bog ESA Conservation Master Plan 2009 - 2019

Appendix M4. Sifton Bog Natural Area Brochure (UTRCA, McIlwraith Field Naturalists of London Inc., City of London, London Community Foundation, 1995) (continued)

WILDLIFE

Birds

In spring and fall, numerous species of warblers, sparrows and other migrants can be found. In some winters, the cones of Black Spruce and Tamarack attract the "winter finches": Evening and Pine Grosbeaks, White-winged Crossbills, Pine Siskins, Common Redpolls and Purple Finches.

Mammals

As with the plants, the more northerly mammals are found in the heart of the bog. Raccoons, Striped Skunks and Woodchucks are found on the slopes, while Eastern Chipmunks, Short-tailed Shrews and Grey Squirrels are in the low, damp woods. Among the shrubs on the floating bog live Eastern Cottontails and in the moss, though seldom seen, are Masked and Smoky Shrews. Muskrats have been reported in Redmond's Pond.

Reptiles and Amphibians

Because the pond is permanent and the sphagnum mat is always damp, the bog is ideal for turtles and frogs. Of the four species of turtles that have been recorded, the Painted, Snapping, Blanding's and Spotted, the last two have not been found in many years. Six kinds of frogs are known: Green, Leopard, Wood, Chorus, Gray Treefrog and Spring Peeper. A seventh species, the Pickerel Frog, has not been recorded at Sifton for many years. American Toads live among the shrubs on the sphagnum mat.

Insects

Certain butterflies, moths and other insects are found here because of the acidic bog plants. These include the pitcher-plant Moth, the Bog Copper Butterfly, which feeds on the cranberry plants, and the Bog Elfin, which feeds on the blueberry plants. Bog Crickets can be found in the sphagnum moss. In the late spring and summer, visitors will encounter abundant mosquitoes.

Sifton Bog Natural Area

Legend:

- Access
- Trails
- Boardwalk
- Pond
- Floating Bog

Hyde Park Rd.

Oxford St.

Wooded Slope

Low Woods

Floating Bog

N

PLANT COMMUNITIES

Wooded Slope

The higher part of the upland slope surrounding the bog is covered with trees and shrubs typical of southern Ontario's hardwood forest with Carolinian affinities. The most common species of trees are White and Red Oak, Black Cherry, Sugar Maple and Basswood. The understorey of shrubs and vines includes American Hazelnut, Witch-hazel, Ninebark, Bladdernut, Grey Dogwood, Alternate-leaved Dogwood, Common Elder, Virginia Creeper, Carrion Flower, Brushy Greenbrier, Running Strawberry Bush and wild grape.

Floating Bog

The bog's most fascinating plant life is found in the depression, or kettle hole. The centre consists of a floating mat of sphagnum moss, alive at the surface and slowly decaying below. Much of the surface of the open mat is covered with Leatherleaf intermingled with Bog Rosemary, Dog-laurel, Black Huckleberry and Highbush Blueberry. Cranberry is found growing low against the moss, along with five species of carnivorous plants (Pitcher-plant, two

Low Woods

Toward the bottom of the slope, the habitat becomes cooler and moister. Here we find White Pine, White Birch, and Red and Silver Maple. The understorey

History

Evidence exists that the aboriginal people used the Sifton Bog area as a hunting ground. Some of the 20th century owners of this bog tried to exploit its natural resources by attempting to drain it to grow cedar, removing layers of peat for sale, or by selling Black Spruce for Christmas trees. During World War II the Alder Bockholt was removed for use in the production of gun powder.

In 1957 a movement to preserve Sifton Bog (as it was then called) was led by Dr. W. W. Judd, of the University of Western Ontario, who has written over 50 articles on the bog, mostly on its rich insect life. Success came in 1967 when UTRCA acquired the area through a grant from the Province of Ontario and a donation from the Sifton Construction Company. It was renamed the Sifton Botanical Bog. It was removed for use in the production of gun powder.

Geology

The bog depression was once occupied by a large block of ice, left as the last glacier melted about 13,000 years ago. Under the vegetation is a thick peat layer, which rests on the stony soil or till that surrounded the ice block. When the block melted, the depression or kettle remained. The glacial deposits are about 2.5 metres thick and cover limestone bedrock about 375 million years old. Sifton Bog is the best preserved isolated kettle in the London area.

PLANT COMMUNITIES

Wooded Slope

The higher part of the upland slope surrounding the bog is covered with trees and shrubs typical of southern Ontario's hardwood forest with Carolinian affinities. The most common species of trees are White and Red Oak, Black Cherry, Sugar Maple and Basswood. The understorey of shrubs and vines includes American Hazelnut, Witch-hazel, Ninebark, Bladdernut, Grey Dogwood, Alternate-leaved Dogwood, Common Elder, Virginia Creeper, Carrion Flower, Brushy Greenbrier, Running Strawberry Bush and wild grape.

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Low Woods

Toward the bottom of the slope, the habitat becomes cooler and moister. Here we find White Pine, White Birch, and Red and Silver Maple. The understorey

Sifton Bog ESA Conservation Master Plan 2009 - 2019

Appendix M5. Sifton Bog ESA Brochure (UTRCA, City of London, 2009)



Tails

Sifton Bog Environmentally Significant Area (ESA) is located on the south side of Oxford Street, west of Hyde Park Road. The map on the reverse shows the access points and trails. Parking is available at the main entrance on Oxford Street.

The main feature of this 40-ha public site is the floating acid peat bog and associated boreal plant life. Deciduous swamp and upland forest surround the bog, providing a sharp contrast between the northern (boreal) and southern (Carolinian) vegetation types.

Bog Formation

The bog is a product of glaciation. As the last ice sheet melted 13,000 years ago, a large block of ice broke off and settled in the glacial till (sand and gravel). When the block melted it left a kettle lake cut off from any watercourses. Sedges, mosses and other plants gradually colonized the margins of the lake. Due to the cool, oxygen-poor conditions, when dead plants sank to the bottom, they did not break down fully, but became compressed as peat.

History

Since the bog's "discovery" by local naturalists in the 1870s, it has been a site of fascination and some controversy. In the 20th century, drainage was attempted to grow celery, layers of peat were harvested and Black Spruce trees were sold for Christmas trees.

Wildlife

Numerous species of warblers, sparrows and other migrants stop over during spring and fall migration. In some years, the Black Spruce and Tamarack cones attract the winter finches.

Raccoon, Grey Squirrel, Eastern Chipmunk and other mammals typical of urban natural areas can be found in the drier habitats. Green Frog and Grey Treefrogs are often heard in the spring. Painted Turtle frequent Redmond's Pond.

A very large population of White-tailed Deer resides within and around the ESA. The herd's intense browsing pressure is known to result in the loss of young trees, which has a long-term impact on forest regeneration. Sifton Bog is home to uncommon butterflies, including the Bog Copper, whose larvae feed on cranberry plants, and the Bog Elfin, which relies on blueberry plants. Many brightly coloured dragonflies and damselflies can be seen around the pond in summer.

Plant Communities

The bog's most fascinating plant life is found near Redmond's Pond, where colourful Sphagnum mosses grow on the surface of a quaking mat of partly decayed mosses. Other common plants include leatherleaf, small cranberry, Black Huckleberry and Highbush Blueberry, carnivorous plants

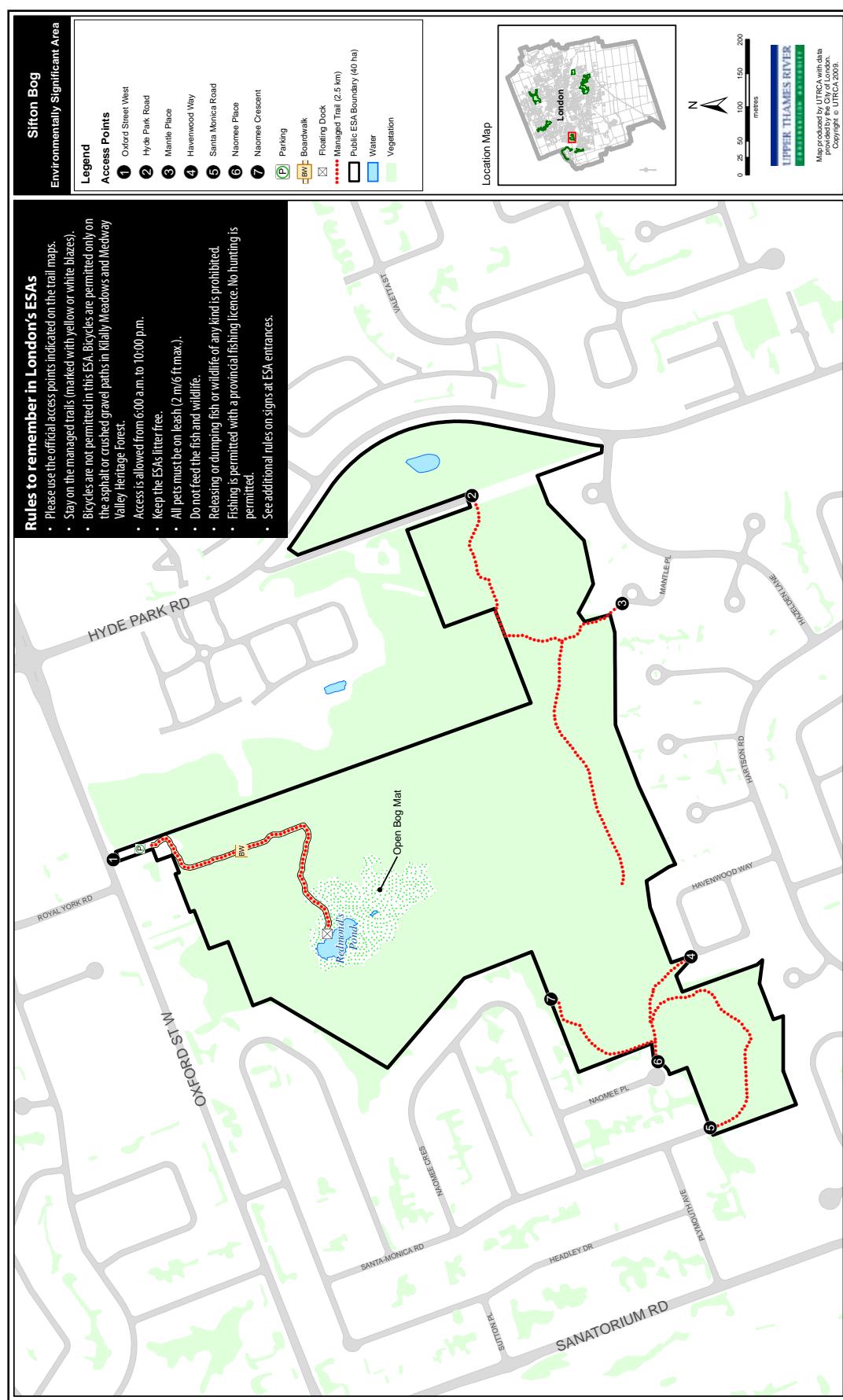
For More Information

For more information on London's ESAs, please contact:

- Upper Thames River Conservation Authority (519-451-2800, www.thamesriver.ca)
- City of London Forestry Services (519-661-2500 ext. 4980) (www.london.on.ca) or Planning Department (519-661-2500 ext. 4980) (www.london.on.ca)

Sifton Bog ESA Conservation Master Plan 2009 - 2019

Appendix M5. Sifton Bog ESA Brochure (UTRCA, City of London, 2009) (continued)



Appendix N. Buckthorn Control Methods Brochure (UTRCA, 2007)

Buckthorn Control Methods

Upper Thames River Conservation Authority



Common Buckthorn leaves and berries



Glossy Buckthorn leaves and berries

Alien Invaders

Common or European Buckthorn (*Rhamnus cathartica*) and Glossy Buckthorn (*R. frangula*) are non-native shrubs that are so invasive that they pose a serious threat to natural areas throughout eastern North America. These shrubs can form monocultures, taking over areas that once supported a large range of native plants.

Land managers across North America have studied these shrubs and experimented with ways to control them. This factsheet summarizes some of the literature in terms of what does and does not work at controlling buckthorn species.

Description & Natural History

Common and Glossy Buckthorn are tall shrubs or small trees reaching 2-7 m (6-25 ft) in height, and 25 cm (10 in) in diameter. They usually have a few to several stems or trunks and spreading, loosely-branched crowns. The bark is grey to brown with prominent lighter-coloured lines.

Common Buckthorn has dull green, oval leaves with tiny teeth along the edge, and are often pointed or folded at the tip. Glossy Buckthorn has thin, glossy, oval leaves with a shiny upper surface. The leaves are larger than the Common Buckthorn leaves and are not toothed.

Common and Glossy Buckthorn are native to Europe and western Asia where they were used for producing a fine quality charcoal for gunpowder and as a laxative in herbal medicine. Buckthorns were introduced to North America in the late 1800s as part of windbreak and wildlife plantings. They have spread naturally across this continent, invading a range of habitats. Buckthorns now extend from Nova Scotia to Saskatchewan, south to Missouri and east to Virginia.

Common Buckthorn is dioecious, meaning that each plant produces only male or female flowers and fruiting trees are always female. Both buckthorns reach seed bearing age quickly. Common Buckthorn berries stay on the plant longer

than Glossy Buckthorn berries, and are more visible. The fruit is eaten by birds and mice and has a severe laxative effect, helping distribute seeds far away.

A large percentage of the seeds will germinate quickly. This fact may mean that seeds do not remain viable for long, if left in the soil for many years (Miller 2005).

Buckthorns have long growing seasons, rapid growth rate, and re-sprout vigorously even if the entire shrub is cut down near the ground. They leaf out prior to most native deciduous plants and retain their green leaves to November.

Glossy Buckthorns rapidly form dense, even-aged thickets. In an open site, buckthorn establishment is followed by lateral crown spread, which continues until branches touch adjacent shrubs. The large leaves and continuous canopy create dense shade. North American insects do not readily feed on buckthorn, probably because of the modin (laxative).



Glossy Buckthorn (left) and Common Buckthorn (right) leaves.

Control Methods

Many control methods have been used on Common and Glossy Buckthorn including mechanical, biological and chemical techniques. Generally, mechanical methods are used in cases where the infestation is small or where the presence of rare species or habitats prevents the use of

Appendix N. Buckthorn Control Methods Brochure (UTRCA, 2007) (continued)



A dense buckthorn thicket.

herbicides. Chemical methods are used when the infestation is great, resources are limited, and other methods have failed to control the problem. Converse (1984) provides a detailed bibliography of buckthorn control research.

The goal of buckthorn control is to reduce their numbers in order to provide a regeneration ‘window’ for native species to grow.

Biological Control Methods

The best hope

for a long-term management strategy may be the release of a biological control agent (e.g. host-specific insect). The Minnesota Department of Natural Resources initiated research for the two buckthorn species. The research is being conducted by the Centre for Applied Bioscience International (CABI) in Switzerland. Several insect species show promise and the research continues (www.mda.state.mn.us/plants/thicket/volume1no1/buckthorn.htm).

Mechanical Control Methods

A variety of mechanical control methods can be used to kill or remove buckthorn and other non-native plants.

Cutting/Mowing

Cutting buckthorn shrubs has limited effectiveness as the plant resprouts. Even when cut in late September, Glossy Buckthorn can resprout before winter (Andreas 1983). Recutting within several hours does not kill Common Buckthorn (Coenen 1983).

Lovely (1983) found that cutting Glossy Buckthorn in early June and again in late August for three successive years resulted in fewer and shorter stems than a control site. Thus, with enough labour, re-cutting may be effective at eventually weakening the root and killing the plant. Buckthorn resprouts from buds at the base of stems so it is critical to cut to ground level. Covering cut stems with aluminum cans or black plastic prevents resprouting.

Girdling

Girdling involves cutting the phloem (inner bark) but leaving the xylem (sapwood) intact. The roots nourish the top, but the top sends no nourishment back to the roots, which die out. Girdling is most effective in late spring or early summer (DNR WI). The shrub takes a year or two to die (Packard 1997).

A saw can be used to cut a 2-3 cm wide band around the base of each shrub, completely encircling each stem. Alternatively, a five second flame torch application around the stem has been shown to kill the cambium (living part of stem) of small stems less than 4.5 cm in diameter (Reed 1983).



Buckthorn resprouts from the base of stems.

Pulling and Excavation

Seedlings or small plants may be hand pulled or removed with a grubbing hoe and will not resprout (DNR MN). Pulling is best done when the soil is moist.

Larger plants (1-6 cm in diameter) may be pulled out with heavy equipment or a Weed Wrench™. The Weed Wrench uses leverage to pull the shrub out of the ground and can take considerable effort. Disturbed soil will result from these techniques and should be tamped down to minimize exposing new buckthorn seeds (DNR WI). This technique may be most useful to control invasion at low densities, or along trails and woodland edges.



Hand-pulling buckthorn seedlings.

Appendix N. Buckthorn Control Methods Brochure (UTRCA, 2007) (continued)

Burning

Land managers have had mixed results with the use of prescribed fire to control buckthorn species. Fire does not spread readily through buckthorn thickets and the buckthorn resprouts following burns, especially if moisture is available. Fire is only appropriate in vegetation communities adapted to fire, such as oak savannas and tallgrass prairies.

Underplanting

Underplanting disturbed woods with native woody species is potentially effective to prevent primary invasion or re-invasion of buckthorns. However, Ware (1983) found that planted Sugar Maple seedlings did not grow well under the buckthorn canopy.

Restoring Water Levels

In wetlands, restoring water levels to historic conditions can control buckthorns.

Chemical Control Methods

Chemicals should be used only when their benefits exceed their risks. Chemical control methods are best done during the fall or winter when most native plants are dormant yet buckthorns are still actively growing. This lessens the risk of affecting non-target plants. There are several methods available that minimize the amount of chemical used and the risk of killing non-target plants. A pesticide licence is required for the application of many types of herbicides.

With large infestations, the largest seed-producing plants should be removed first. Isolated plants should also be removed or killed before they produce seed. Table 1 summarizes the technical aspects of herbicide application.

In wetlands, herbicides can be applied only during dry periods when there is no standing water.

Stump Application

Applying chemical (e.g. Garlon 4, glyphosate) to a recently cut stump is usually quite effective at killing buckthorns and minimizes the amount of chemical used. Shrubs can be cut using hand tools, chain saws or brush cutters and should be cut close to the ground.

Chemical must be applied to freshly cut stumps to be effective. The chemical can be applied by paint brush or squirt bottle. Some chemicals must be applied to the remaining bark as well. Stump treatment can be carried out throughout the growing and dormant season. Dye should be added to mark the treated stumps.

Basal Bark Application

Basal bark treatment is a method that applies chemical on the bark of a standing tree/shrub. The chemical and its binding agent are absorbed through the bark into the plant, where it kills the living cambium.

For stems less than 5 cm diameter, chemical is applied to one side; for larger stems, the chemical is applied all the way around in a 30 cm (1 ft) high strip. Basal bark application can be carried out in all seasons. A paint brush or ultra-low volume sprayer can be used to apply the chemical to the bark.

Buckthorn treated in this fashion can be left standing or cut at a later date. Higher concentrations of chemical may be needed for large (tree sized) buckthorns.



Painting a freshly-cut stump with herbicide.

Frilling

Frilling involves killing a standing tree by applying herbicide to a gash cut in the bark. The tree is gashed with an axe or chain saw and the herbicide is applied directly in the gash, killing the tree immediately. While this method requires a little more time than basal bark treatment, it is generally more effective as the chemical is applied directly to the growing parts of the standing trunk. This technique may be the most effective method to kill large buckthorn trees.

Foliar

Foliar treatment refers to the application of chemical to the leaves of the target plant. Herbicide application to buckthorn seedlings has been shown to be effective. This method is only appropriate for degraded sites as the chemical can drift to non-target plants. The best time to spray the foliage is before native plants leaf out.

Ongoing Treatment

Once begun, control methods may be needed for many years. Buckthorn seeds in the soil can remain viable for three to five years. It is important to control seedlings that emerge after initial control efforts. With no follow up control, buckthorn will come back. Sites may require replanting of desirable tree, shrub and herbaceous species after buckthorns have been removed.

Appendix N. Buckthorn Control Methods Brochure (UTRCA, 2007) (continued)

Table 1. Sample of Chemical Trials that Successfully Controlled Buckthorn

Method	Chemical	Timing
Cut Stump Application	20 - 25% glyphosate (diluted in water)	August or September
	10% glyphosate	August
	12.5% triclopyr (form for oil dilution)	Summer or winter
	Garlon 4 (1:3 of Garlon 4:oil/diluent)	
	4% ester with diesel	
	AMS, aqueous concentrated	Year round
	25% Picloram + 75% 2,4-D	Summer
Frilling	25% Picloram + 75% 2,4-D	Growing season
	Garlon 4	
Basal Bark Application	2-4% ester 2,4-D in diesel fuel	Early summer
	12.5% 2,4-D	
	2.5–3% glyphosate	May to June
	10-20% Garlon in diesel fuel	Fall
Foliar	4% fosamine	Actively growing
	Glyphosate (e.g. Roundup)	Actively growing

Note: Some trade name chemicals are not available in Canada.

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DNR MN. Department of Natural Resources, Minnesota. www.dnr.state.mn.us/invasives/terrestrial_plants/woody/buckthorn/control.html

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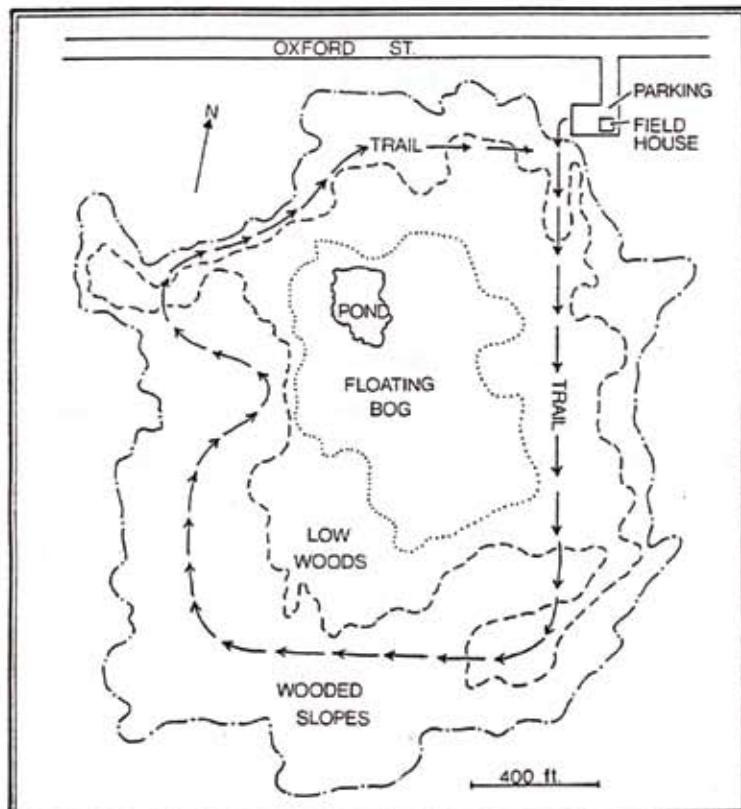
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Maps

Historical Account of Byron Bog (Sifton Botanical Bog) London, Ontario



by W.W. Judd



Phelps Publishing Co.

1985

London, Ontario



Maps

1. Plan Area
2. Property Ownership
3. Water Monitoring Wells
4. Physiography
5. Monitoring Point Locations
6. Drainage Basin
- 7a. 1950 – 1982 Air Photos
- 7b. 1989 – 2006 Air Photos
8. Basal Area Stands and Plots
- 9a. Existing Trails and Access Points
- 9b. Conceptual Trails and Access Plan
- 10a. 1992 Vegetation Communities
- 10b. 2007 Vegetation Communities
11. Deer Count Stations

