

US EPA ARCHIVE DOCUMENT

# SHAPING THE LAKE HURON TO LAKE ERIE CORRIDOR'S FUTURE: YOU CAN HELP

It might seem like a lone individual's efforts

could not affect the Lake Huron to Lake

Erie Corridor's environment, compared

with the powerful forces of nature and

technology that created it over the past

10,000 years. However, there are things

you can do to help restore and sustain

this ecological treasure.



Share what you have learned from this book. Education is critical to understanding and maintaining the Corridor's natural heritage. Talk with your family and friends about what you have read. Pass this book along to someone you think would be interested in knowing more.

- Visit your local natural areas. Experiencing and appreciating nature are the first steps toward protecting it.
- If you have a garden, beautify it with native plants. Bringing back native plants to neighborhoods throughout the region could do much to improve wildlife habitat, sustain native biodiversity and enhance water quality.

- If there are creeks or rivers flowing through your community, take a moment to look at them. Do they appear to provide a healthy environment for plants and animals? As you have read, healthy aquatic ecosystems are dependent upon good water quality. Contact your local watershed council or conservation authority. They often

Swimming is a popular activity on beaches throughout the Lake Huron to Lake Erie Corridor. Every summer, thousands flock to the lakes and rivers around the region for relief from the summer heat.

have activities designed to monitor and improve the health of rivers, lakes and streams.

- Help protect significant natural areas in your community by getting involved with a local land conservancy or other conservation organization.
- Volunteer for ecological projects in your area. These can include planting trees, managing invasive plants, collecting seeds and removing litter and trash from natural areas and along waterways. Helping local nature organizations with this kind of work, even just once a year, can go a long way when combined with the efforts of many other volunteers.
- Help scientists identify the best ways of managing native ecosystems. You can do this by participating in

various citizen activities, such as wildlife monitoring and annual bird counts, that help to gather important data for scientific research. At the same time, you will learn more about the creatures that live in the region.

- You can play a role in shaping future development in your community. Development comes under the authority of your municipal council or local planning body, depending on where you live. Generally their decisions are guided by master (or official) plans, policies and bylaws that are set through public processes. You and other citizens can have a say in development decision-making by attending public hearings and taking other opportunities to express your views on what you want your community to look like.

Whatever your age, wherever you live, you can make a difference in the future of the Lake Huron to Lake Erie Corridor.



Students help install soil-bioengineering practices to improve coastal marsh habitat on Grosse Ile, Michigan.



The Clinton River Watershed Council engages students in monitoring water quality and learning about the aquatic life that inhabits the river.



Children explore a wetland in Essex County, Ontario, looking for insects and having fun.

*“Let us be good stewards of the Earth we inherited.*

*All of us have to share the Earth's fragile ecosystems and precious resources, and each of us has a role to play in*

*preserving them. If we are to go on living together on*

*this Earth, we must all be responsible for it.”*

— Kofi Annan,

United Nations Secretary-General, 2001

FTERWARD

When I first came to Michigan from my native New York, I was struck by the beauty and vastness of its natural resources. I realized, too, that with this gift comes a tremendous responsibility to protect and preserve our environment for future generations. I take this charge very seriously, as does DTE Energy and our utility subsidiaries, Detroit Edison and MichCon.

DTE Energy believes that economic activity and environmental protection can be mutually supportive. We are committed to promoting responsible use of traditional and alternative energy solutions to fuel society's growth in the present, without compromising the quality of the environment for future generations. We operate our facilities in full compliance with environmental regulations and go beyond those requirements where feasible. We are reducing our impact on the environment through the installation of innovative pollution control equipment. We are also working towards a sustainable energy future by investing in new technologies based on hydrogen, fuel cells, distributed generation and other renewable sources.

Our corporate commitment to the environment is well demonstrated through the stewardship activities we sponsor. The environmental commitment and dedication of our employees is demonstrated daily through their actions. We have an obligation to enhance the quality of life for today's society and for generations to come. Environmental stewardship is at the heart of this commitment.

DTE Energy has a vested interest in protecting and enhancing our natural heritage. MichCon's natural gas reserves stretch from Traverse City to Taylor. And Detroit Edison's electric generating plants are located from Michigan's "Thumb" to its southeastern border. In fact, the majority of our electric facilities are along the St. Clair and Detroit Rivers.

That's why we're so pleased to support the publication of *Explore our Natural World: A Biodiversity Atlas of the Lake Huron to Lake Erie Corridor*. We believe this publication will help all citizens of southeastern Michigan and southwestern Ontario, as well as the many visitors to our region, grow in

their appreciation and understanding of the beauty and variety of nature that surrounds us. Explore our Natural World has much to teach us about this unique region which is home to so many species of plants and animals.

At DTE Energy, we believe that protecting the environment begins in our own backyard. We appreciate the work of the Wildlife Habitat Council as they advise us in managing our "backyards" to benefit wildlife. To date, seven DTE Energy facilities are certified by the Wildlife Habitat Council as wildlife sites, including three along the St. Clair and Detroit Rivers, and two on Lake Erie.

DTE Energy established the St. Clair River Waterways for Wildlife Project in 1995, with the guidance of the Wildlife Habitat Council. That partnership joined businesses, municipalities, state and provincial agencies and individuals from both sides of the St. Clair River in a common goal of enhancing wildlife habitat and protecting biodiversity along the river.

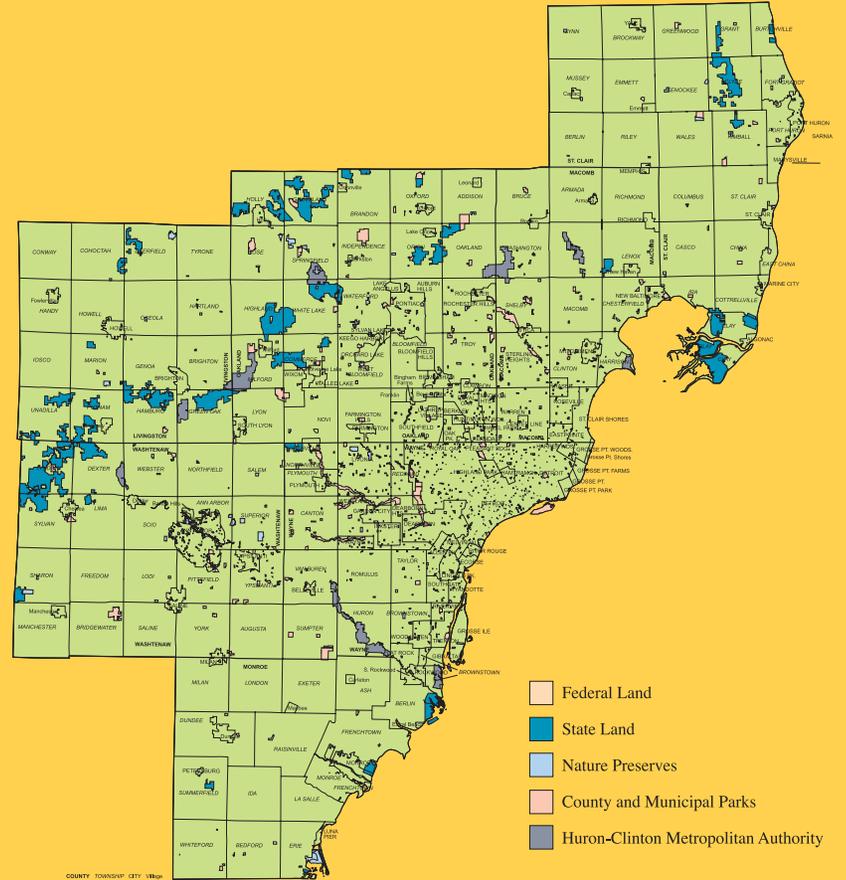
Since then, this project has continued to grow in many ways – in acreage protected, in membership and in geographic scope. And it has fostered other successful international environmental partnerships. The designation of the Detroit River as both a United States and Canadian Heritage River, and the creation of the International Wildlife Refuge in the lower Detroit River, are examples of the growing spirit of international environmental stewardship linking business, industry and our communities. This book is the latest reflection of that spirit, and will contribute to furthering its growth.

DTE Energy is grateful for the opportunity to participate in the creation of this book. My hope is that publication of *Explore our Natural World: A Biodiversity Atlas of the Lake Huron to Lake Erie Corridor* will inspire all of us to regard this region as our own "backyard," deserving of preservation and protection now and for generations to come.

*Afterward by Anthony F. Earley, Jr.,  
Chairman and Chief Executive Officer of DTE Energy*

APPENDIX A: PROTECTED LANDS

Protected Lands in Southeast Michigan, 2003



**SEMCOG**  
 Southeast Michigan Council of Governments  
 535 Griswold, Suite 300, Detroit, MI 48226-3602  
 313-961-4266 • Fax 313-961-4869  
 www.semco.org © SEMCOG, 2003

APPENDIX A: PROTECTED LANDS

<b>Ontario Parks</b>	<b>Ontario</b>
1. Algonquin Provincial Park	1. Algonquin Provincial Park
2. Bruce Peninsula National Park	2. Bruce Peninsula National Park
3. Frontenac Provincial Park	3. Frontenac Provincial Park
4. Greenbelt Provincial Park	4. Greenbelt Provincial Park
5. Huron-Wendat National Park	5. Huron-Wendat National Park
6. Innes Provincial Park	6. Innes Provincial Park
7. Killarney Provincial Park	7. Killarney Provincial Park
8. Lake Simcoe Corridor Provincial Park	8. Lake Simcoe Corridor Provincial Park
9. Niagara Falls Provincial Park	9. Niagara Falls Provincial Park
10. Queen's Park Conservation Area	10. Queen's Park Conservation Area
11. Peterborough Park	11. Peterborough Park
12. Peterborough Waterfront Park	12. Peterborough Waterfront Park
13. Peterborough Woodlands	13. Peterborough Woodlands
14. Peterborough Woodlands	14. Peterborough Woodlands
15. Peterborough Woodlands	15. Peterborough Woodlands
16. Peterborough Woodlands	16. Peterborough Woodlands
17. Peterborough Woodlands	17. Peterborough Woodlands
18. Peterborough Woodlands	18. Peterborough Woodlands
19. Peterborough Woodlands	19. Peterborough Woodlands
20. Peterborough Woodlands	20. Peterborough Woodlands
21. Peterborough Woodlands	21. Peterborough Woodlands
22. Peterborough Woodlands	22. Peterborough Woodlands
23. Peterborough Woodlands	23. Peterborough Woodlands
24. Peterborough Woodlands	24. Peterborough Woodlands
25. Peterborough Woodlands	25. Peterborough Woodlands
26. Peterborough Woodlands	26. Peterborough Woodlands
27. Peterborough Woodlands	27. Peterborough Woodlands
28. Peterborough Woodlands	28. Peterborough Woodlands
29. Peterborough Woodlands	29. Peterborough Woodlands
30. Peterborough Woodlands	30. Peterborough Woodlands
31. Peterborough Woodlands	31. Peterborough Woodlands
32. Peterborough Woodlands	32. Peterborough Woodlands
33. Peterborough Woodlands	33. Peterborough Woodlands
34. Peterborough Woodlands	34. Peterborough Woodlands
35. Peterborough Woodlands	35. Peterborough Woodlands
36. Peterborough Woodlands	36. Peterborough Woodlands
37. Peterborough Woodlands	37. Peterborough Woodlands
38. Peterborough Woodlands	38. Peterborough Woodlands
39. Peterborough Woodlands	39. Peterborough Woodlands
40. Peterborough Woodlands	40. Peterborough Woodlands
41. Peterborough Woodlands	41. Peterborough Woodlands
42. Peterborough Woodlands	42. Peterborough Woodlands
43. Peterborough Woodlands	43. Peterborough Woodlands
44. Peterborough Woodlands	44. Peterborough Woodlands
45. Peterborough Woodlands	45. Peterborough Woodlands
46. Peterborough Woodlands	46. Peterborough Woodlands
47. Peterborough Woodlands	47. Peterborough Woodlands
48. Peterborough Woodlands	48. Peterborough Woodlands
49. Peterborough Woodlands	49. Peterborough Woodlands
50. Peterborough Woodlands	50. Peterborough Woodlands
51. Peterborough Woodlands	51. Peterborough Woodlands
52. Peterborough Woodlands	52. Peterborough Woodlands
53. Peterborough Woodlands	53. Peterborough Woodlands
54. Peterborough Woodlands	54. Peterborough Woodlands
55. Peterborough Woodlands	55. Peterborough Woodlands
56. Peterborough Woodlands	56. Peterborough Woodlands
57. Peterborough Woodlands	57. Peterborough Woodlands
58. Peterborough Woodlands	58. Peterborough Woodlands
59. Peterborough Woodlands	59. Peterborough Woodlands
60. Peterborough Woodlands	60. Peterborough Woodlands
61. Peterborough Woodlands	61. Peterborough Woodlands
62. Peterborough Woodlands	62. Peterborough Woodlands
63. Peterborough Woodlands	63. Peterborough Woodlands
64. Peterborough Woodlands	64. Peterborough Woodlands
65. Peterborough Woodlands	65. Peterborough Woodlands
66. Peterborough Woodlands	66. Peterborough Woodlands
67. Peterborough Woodlands	67. Peterborough Woodlands
68. Peterborough Woodlands	68. Peterborough Woodlands
69. Peterborough Woodlands	69. Peterborough Woodlands
70. Peterborough Woodlands	70. Peterborough Woodlands
71. Peterborough Woodlands	71. Peterborough Woodlands
72. Peterborough Woodlands	72. Peterborough Woodlands
73. Peterborough Woodlands	73. Peterborough Woodlands
74. Peterborough Woodlands	74. Peterborough Woodlands
75. Peterborough Woodlands	75. Peterborough Woodlands
76. Peterborough Woodlands	76. Peterborough Woodlands
77. Peterborough Woodlands	77. Peterborough Woodlands
78. Peterborough Woodlands	78. Peterborough Woodlands
79. Peterborough Woodlands	79. Peterborough Woodlands
80. Peterborough Woodlands	80. Peterborough Woodlands
81. Peterborough Woodlands	81. Peterborough Woodlands
82. Peterborough Woodlands	82. Peterborough Woodlands
83. Peterborough Woodlands	83. Peterborough Woodlands
84. Peterborough Woodlands	84. Peterborough Woodlands
85. Peterborough Woodlands	85. Peterborough Woodlands
86. Peterborough Woodlands	86. Peterborough Woodlands
87. Peterborough Woodlands	87. Peterborough Woodlands
88. Peterborough Woodlands	88. Peterborough Woodlands
89. Peterborough Woodlands	89. Peterborough Woodlands
90. Peterborough Woodlands	90. Peterborough Woodlands
91. Peterborough Woodlands	91. Peterborough Woodlands
92. Peterborough Woodlands	92. Peterborough Woodlands
93. Peterborough Woodlands	93. Peterborough Woodlands
94. Peterborough Woodlands	94. Peterborough Woodlands
95. Peterborough Woodlands	95. Peterborough Woodlands
96. Peterborough Woodlands	96. Peterborough Woodlands
97. Peterborough Woodlands	97. Peterborough Woodlands
98. Peterborough Woodlands	98. Peterborough Woodlands
99. Peterborough Woodlands	99. Peterborough Woodlands
100. Peterborough Woodlands	100. Peterborough Woodlands

APPENDIX B: SPECIES AT RISK

Species at risk are plants and animals whose populations have been declining in response to a variety of factors. Government agencies periodically review species known to be rare and assign them a status that reflects the security of their future. The determination of a species' status is based upon the best available scientific information.

The following are universal terms assigned to species at risk:

**Extinct**—a native species that no longer exists anywhere.

**Endangered**—a native species at risk of extinction imminently throughout all, or a significant portion of its range.

**Threatened**—a native species at risk of becoming endangered throughout all, or a significant portion of its range if declining factors are not reversed.

**Special Concern**—A species whose population is in decline, and whose characteristics make it particularly sensitive to human or natural disturbances.

**Extirpated**—A native species no longer existing in the wild within its natural habitat in a given region, but existing elsewhere in the wild.

A species is protected by law if it is designated as endangered or threatened. It is not legally protected if designated as special concern signal potential losses of biodiversity in the future. This designation gives an opportunity to implement conservation planning and land protection efforts before a species' situation becomes critical.

- Factors that Contribute to the Decline of Native Species**
- Habitat loss and degradation
  - Environmental contamination
  - Genetic and reproductive isolation
  - Human interference with natural events, such as fire
  - Climate change or severe weather
  - Disease
  - Invasive species

Several government agencies at the state/provincial and federal levels, as well as non-government organizations, play a role in identifying plants and animals for protection as well as developing conservation plans.



**Protected Publicly Owned Natural Areas in Southwestern Ontario - Essex, Kent & Lambton Counties**

**Legend**

- Consideration Relative (Prepared as of July 2000)
- Conservation Area / Land
- National Park
- National Wildlife Area
- Provincial Park
- Essex, Kent and Lambton Counties
- County Boundary
- City/Town
- Provincial Highway
- Major Roadway
- Waterbody

This map is for illustrative purposes only. Do not rely on it as being a precise indicator of nature, location, or features or as a guide to navigation.

The information depicted was obtained from publicly available sources and may not include all protected areas within the study area. Any protected areas not shown on this map were not included in the data sources used for this map. Planning Act or by the cooperative and stewardship of the various municipalities and the Ministry of Natural Resources. Municipalities also manage parks and protected areas.

Some of the other facilities may not be publicly accessible. Please contact the managing agency for more information.

Additional information can be obtained from:

- Assisted Biopied Conservation Authority - <http://www.abca.on.ca/>
- Ontario Parks - <http://www.ontarioparks.com/>
- Essex Region Conservation Authority - <http://www.essex.ca/>
- Kent Region Conservation Authority - <http://www.kent.ca/>
- Lambton Kent Region Conservation Authority - <http://www.lambtonkent.ca/>
- Michigan Department of Natural Resources - <http://www.dnr.state.mi.us/>
- Ontario Ministry of Natural Resources - <http://www.mnr.gov.on.ca/>
- Ontario Parks - <http://www.ontarioparks.com/>
- SC Chair Parks Commission - <http://www.scparks.com/>
- SC Chair Region Conservation Authority - <http://www.scparks.com/>

Copyright 2003, Queen's Printer for Ontario  
Prepared by Ontario Parks, Southwest Zone

*Conservation efforts to protect endangered and threatened species from extinction are critical to preserving biodiversity.*

*For the most current information about endangered, threatened and special concern species, contact the following organizations.*

**CANADA**

COSWEIC SECRETARIAT  
CANADIAN WILDLIFE SERVICE  
ENVIRONMENT CANADA  
Ottawa, ON K1A 0H3  
<http://www.speciesatrisk.gc.ca>  
<http://www.cosweic.gc.ca>

**UNITED STATES**

U.S. FISH AND WILDLIFE SERVICE  
Bishop Henry Federal Building  
One Federal Drive  
Ft. Snelling, MN 55111-4056  
<http://midwest.fws.gov/endangered>

MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
WILDLIFE DIVISION  
P.O. Box 30444  
Lansing MI 48909-7944  
<http://www.michigan.gov/dnr>

Michigan Natural Features Inventory  
PO Box 30444  
Lansing, MI 48909-7944  
[www.msue.msu.edu/mnfi/](http://www.msue.msu.edu/mnfi/)

**NORTH AMERICA**

NatureServe is a non-profit conservation organization that provides the scientific information and tools needed to help guide effective conservation action. NatureServe and its network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems.  
<http://natureserve.org/>

**Ontario**

Natural Heritage Information Centre  
Science and Information Branch  
Ontario Ministry of Natural Resources  
P.O. Box 7000  
Peterborough, Ontario  
K9J 8M5 Canada  
[www.mnr.gov.on.ca/MNR/nhic/nhic.cfm](http://www.mnr.gov.on.ca/MNR/nhic/nhic.cfm)

# APPENDIX B: SPECIES AT RISK

### Federal and State/Provincial Designations

- E Endangered
- T Threatened
- SC Special Concern

### Subnational Ranks (SRanks)

The SRank indicates the relative abundance of a species on a state or provincial scale. It is used by natural heritage programs to set protection priorities for rare species and natural communities. These ranks are not legal designations.

- S1 Critically Imperiled (0 to 5 occurrences)
- S2 Imperiled (6 to 20 occurrences)
- S3 Rare, or vulnerable to extirpation (21 to 100 occurrences)
- S4 Apparently secure (usually with 101 to 1000 occurrences)

- S5 Very common (usually with greater than 1000 occurrences)
- SX Extirpated from the state or province
- SH Historically known from a given area, but not reported recently; there is a reasonable expectation that the species may be rediscovered.
- SU Unranked, unrankable because of a lack of or conflict in information.

B Breeding, refers to the breeding population of the species.

? Following a rank indicates some degree of uncertainty

**Rank Ranges**—When ranks are combined, it indicates a range, but there is insufficient information to determine which exact rank applies; for instance, G1G2.

### Global Rank (GRank)

The GRank indicates the relative abundance of a species on a worldwide scale. Global ranks are determined by a consensus among natural heritage programs, scientific experts and The Nature Conservancy. These ranks are not legal designations.

- G1 Critically Imperiled (0 to 5 known occurrences)
- G2 Imperiled (6 to 20 known occurrences)
- G3 Rare, or vulnerable to extinction (20 to 100 known occurrences)
- G4 Apparently secure (more than 100 known occurrences)
- G5 Very common, the species is demonstrably secure under present conditions
- GU Status uncertain, more data needed
- G7 Unranked, or if following a ranking, the rank is tentatively assigned
- T Denotes the rank applies to a subspecies or variety

## Dangered, Threatened and Special Concern Species known to occur in the Lake Huron to Lake Erie Corridor, Winter 2002

COMMON NAME	SCIENTIFIC NAME	MI	ON	US	CA	SRANK MI	SRANK ON	SRANK GRANK	COMMON NAME	SCIENTIFIC NAME	MI	ON	US	CA	SRANK MI	SRANK ON	SRANK GRANK
musks									Pugnose minnow	<i>Notropis emiliae</i>	EN	SC	SC		S1	S2	G5
le wartycback	<i>Cyclonaias tuberculata</i>	SC				S2S3	S3	G5	Silver shiner	<i>Notropis photogenis</i>	EN	SC	SC		S1	S2S3	G5
le catspaw	<i>Epioblasma obliquata</i>								Brindled madtom	<i>Noturus miurus</i>	SC				S2S3	S2	G5
	<i>perobliqua</i>	EN	EN	EN		SH		G1T1	Northern madtom	<i>Noturus stigmosus</i>	EN	SC	SC	S1	S1S2	G3	
thern riflshell	<i>Epioblasma torulosa</i>								Channel darter	<i>Percina copelandii</i>	EN	T	T		S1S2	S2	G4
	<i>ranjiana</i>	EN	EN	EN	EN	S1	S1	G2T2	River darter	<i>Percina shumardi</i>	EN				S1	S3	G5
lbox	<i>Epioblasma triquetra</i>	EN	EN	EN	EN	S1	S1	G3	Southern redbelly dace	<i>Phoxinus erythrogaster</i>	EN				S1		G5
ry-rayed lamp mussel	<i>Lampsilis fasciola</i>	T	EN	EN	S2	S1	G4	Sauger	<i>Stizostedion canadense</i>	T				S1	S4	G5	
rynut	<i>Obovaria olivaria</i>	SC				S2	S1	G4									
nd hickorynut	<i>Obovaria subrotunda</i>	EN	EN			S1	S1	G4	Insects								
nd pigtoe	<i>Pleurobema sintoxia</i>	SC				S2S3	S2S3	G4	Dusted skipper	<i>Atrytonopsis hianna</i>	T				S2S3	S1	G4G5
puppy mussel	<i>Simpsonias ambigua</i>	EN	EN	EN	EN	S1	S1	G3	Pipevine swallowtail	<i>Battus philenor</i>	SC				S1S2	S2B	G5
le lilliput	<i>Toxolasma lividus</i>	EN				S1	G2		Swamp metalmark	<i>Calephelis mutica</i>	SC				S1S2		G3G4
nd bean	<i>Villosa fabalis</i>	EN	EN	EN	EN	S1	S1	G1G2	Frosted Elfin	<i>Callophrys irus</i>	T				S2S3	SX	G3
ow	<i>Villosa iris</i>	SC				S2S3	S2S3	G5	Monarch butterfly	<i>Danaus plexippus</i>	SC	SC	SC		S5	S5	G4
									Wild indigo duskywing	<i>Erymnis baptisiae</i>	SC				S2S3	S1	G5
									Persius duskywing	<i>Erymnis persius persius</i>	T	EXT			S3	SX	G5T2T3
									Duke's skipper	<i>Euphyes dukesi</i>	T				S1	S2	G3
sturgeon	<i>Acipenser fulvescens</i>	T				S2	S3	G3G4	Leafhopper	<i>Flexamia delongi</i>	SC				S1S2		G7
ern sand darter	<i>Ammocrypta pellucida</i>	T	T	T		S1S2	S2	G3	Leafhopper	<i>Flexamia huroni</i>	SC				S1	G7	
ide dace	<i>Clinostomus elongatus</i>	EN	SC	SC	SC	S1S2	S3	G4	Leafhopper	<i>Flexamia reflexa</i>	SC				S1	G7	
herring	<i>Coregonus artedii</i>	T				S3	S5	G5	Leafhopper	<i>Gomphus plagiatus</i>	SC				S1S2	SH	G5
ch kbusucker	<i>Erimyzon oblongus</i>	EN				S1S2	G5		Barrens buckmoth	<i>Hemileuca maia</i>	SC				S2S3		G5
chbusucker	<i>Erimyzon sucetta</i>	T	T			S4	S2	G5	Kamer blue butterfly	<i>Lycoides melissa</i>							
nside darter	<i>Etheostoma blennioides</i>	SC	SC	S4	S4	G5				<i>samuelis</i>	T	EN		S2	SX	G5T2	
neye	<i>Hiodon tergisus</i>	T				S2	S4	G5	Mitchell's satyr butterfly	<i>Neonympha mitchelli</i>	EN				S1		G1G2
r chub	<i>Hybopsis storeiana</i>	SC	SC	SC	SC	S2S3	S2	G5	American burying beetle	<i>Nicrophorus americanus</i>	EN	EN	SH	SH	G2G3		
thern brook lamprey	<i>Ichthyomyzon fossor</i>	SC	SC	S4	S3	G4			Poweshiek skipperling	<i>Oarisma poweshiek</i>	T				S1S2		G2
outh buffalo	<i>Lectichthys cyprinellus</i>	SC	SC	S3	SU	G5			Tamarack tree cricket	<i>Oecanthus laricus</i>	SC				S1S2		G1G2
ted gar	<i>Lepisosteus oculatus</i>	SC	T	T	S2S3	S2	G5		Pine tree cricket	<i>Oecanthus pini</i>	SC				S1S2	S1	G7
ted sucker	<i>Minytrema melanopus</i>	T	SC	SC	S3	S2	G5		Blazing star borer moth	<i>Papaipema beariana</i>	SC				S1S2		G3
r redhorse	<i>Moxostoma carinatum</i>	T	SC	SC	S1	S2	G4		Maritime sunflower borer	<i>Papaipema maritima</i>	SC				S1S2		G4
k redhorse	<i>Moxostoma quaesnei</i>	T	T	S3	S2	G5			Culver's root borer moth	<i>Papaipema sciata</i>	SC				S2S3		G3G4
ose shiner	<i>Notropis anogenus</i>	SC	SC	S3	S2	G3			Silphium borer moth	<i>Papaipema silphii</i>	T				S1S2		G3G4
e shiner	<i>Notropis bifrenatus</i>	SC	SC			S2	G5										

COMMON NAME	SCIENTIFIC NAME	MI	ON	US	CA	SRANK MI	SRANK ON	SRANK GRANK	COMMON NAME	SCIENTIFIC NAME	MI	ON	US	CA	SRANK MI	SRANK ON	SRANK GRANK
Regal fern borer	<i>Papaipema speciosissima</i>	SC				S2S3		G4	Louisiana waterthrush	<i>Seiurus motacilla</i>	SC	SC			S2S3	S3B	G5
Red-legged spittlebug	<i>Prosapia ignipectus</i>	SC				S2S3	S1?	G4	Caspian tern	<i>Sterna caspia</i>					S2	S3B	G5
Regal fritillary	<i>Speyeria idalia</i>	EN	EXT			SH		G3	Forster's tern	<i>Sterna forsteri</i>	SC				S2	S4B	G5
									Common tern	<i>Sterna hirundo</i>	T				S2	S4B	G5
Amphibians									Western Meadowlark	<i>Sturnella neglecta</i>	SC				S4	S4B	G5
Smallmouth salamander	<i>Ambystoma texanum</i>	EN	SC	SC	S1	S1	G5		Barn Owl	<i>Tyto alba</i>	EN	EN	EN		S1	S1	G5
Blanchard's cricket frog	<i>Acris crepitans</i>								Hooded warbler	<i>Wilsonia citrina</i>	SC	T	T		S3	S3B	G5
	<i>blanchardii</i>	SC	EN			S2S3	SH	G5T5									
Fowler's toad	<i>Bufo fowleri</i>	T	T	S5	S2	G5			<b>Mammals</b>								
Five-lined skink	<i>Eumeces fasciatus</i>	SC	SC	S4	S3	G5			Least shrew	<i>Cryptotis parva</i>	T	EXT			S1S2	SH	G5
									Southern flying squirrel	<i>Glaucomys volans</i>	SC	SC	S5	S3	G5		
Reptiles									Woodland vole	<i>Microtus pinetorum</i>	SC	SC	SC	S3S4	S3	G5	
Eastern spiny-softshell	<i>Apalone spinifera</i>								Indiana bat	<i>Myotis sodalis</i>	EN	EN			S1		G2
	<i>spinifera</i>								Eastern mole	<i>Scalopus aquaticus</i>	SC	SC	S5	S2	G5		
Spotted turtle	<i>Clemmys guttata</i>	T	SC	SC	S2	S3	G5		American badger	<i>Taxidea taxus</i>	EN	EN	S4	S2	G5		
Kirtland's snake	<i>Clonophis kirtlandii</i>	EN				S1	G2										
Blue racer	<i>Coluber constrictor</i>	EN	EN	S5	S1	G5			<b>Plants</b>								
Black rat snake	<i>Elaphe obsoleta obsoleta</i>	SC	T	T	S3	S3	G5T5		Climbing fumitory	<i>Adlumia fungosa</i>	SC				S3	S4	G4
Eastern fox snake	<i>Elaphe vulpina gloydi</i>	T	T	T	S2	G5T3			Gattinger's agalinis	<i>Agalinis gattingeri</i>	EN	EN	EN	S1	S2	G4	
Blinding's turtle	<i>Emydoidea blandingii</i>	SC	T	S3	S3?	G4			Skinner's agalinis	<i>Agalinis skinneriana</i>	EN	EN	EN	S1	S1	G3	
Northern map turtle	<i>Graptemys geographica</i>	SC	S5	S4		G5			Colic root	<i>Aletris farinosa</i>	T	?	?	S2	G5		
Milk snake	<i>Lampropeltis triangulum</i>	SC	S5	S4	G5				Lake cress	<i>Arnica lacustris</i>	T			S2	S3	G4	
Copperbelly water snake	<i>Nerodia erythrogaster</i>								Leadplant	<i>Amorpha canescens</i>	SC				S3	SH	G5
	<i>neglecta</i>	EN	T	S1	G5T2T3				Hairy angelica	<i>Angelica venososa</i>	SC				S3	SR	G5
Lake Erie water snake	<i>Nerodia sipedon insularum</i>	EN	EN			S2	G5T2		Missouri rock cress	<i>Arabis missouriensis</i>							
Queen snake	<i>Regina septemvittata</i>	T	T	S4	S2	G5			<i>var deamii</i>	SC				S2		G5	
Eastern massasauga	<i>Sistrurus catenatus</i>								Three-awned grass	<i>Aristida longespica</i>	T				S2	S2	G5
	<i>catenatus</i>	SC	T	T	S3S4	S3	G3G4T3T4		Virginia snakeroot	<i>Aristolochia serpentaria</i>	T				S2		G4
Eastern box turtle	<i>Terrapene carolina carolina</i>	SC				S2S3	SE1	G5T5	Sullivants milkweed	<i>Asclepias sullivanti</i>	T				S2	S2	G5
Butler's garter Snake	<i>Thamnophis butleri</i>	T	T	S4	S2	G4			Purple milkweed	<i>Asclepias purpurascens</i>	SC				S3	S2	G5
									Tall green milkweed	<i>Asclepias hirtella</i>	T				S2	S1	G5
									Crooked stem aster	<i>Aster prenanthoides</i>	T	T	?	?	S2	G4G5	
Birds									White wood aster	<i>Aster divaricatus</i>	T				SR	S1	G5
Cooper's hawk	<i>Accipiter cooperii</i>	SC				S3S4	S4B	G5	Canadian milk-vetch	<i>Astragalus canadensis</i>	T				S1S2	S4	G5
Northern goshawk	<i>Accipiter gentilis</i>	SC				S3	S4	G5	Cooper's milk-vetch	<i>Astragalus neglectus</i>	SC				S3	S3	G4
Henslow's sparrow	<i>Ammodramus henslowii</i>	T	EN	EN	S2S3	S1B	G4		Prairie indigo	<i>Baptisia alba</i>	SC	SR	SR	G5			
Short-eared owl	<i>Asio flammeus</i>	EN	SC	S1	S3S4B	G5			Slough grass	<i>Beckmannia syzigachne</i>	T				S2	S4	G5
Long-eared owl	<i>Asio otus</i>	T				S2	S4	G5	Murray birch	<i>Betula murrayana</i>	SC				S1		G1Q
American bittern	<i>Botaurus lentiginosus</i>	SC				S3S4	S4B	G4	Side-oats grama grass	<i> Bouteloua curtipendula</i>	T				S1S2	S2	G5
Red-shouldered hawk	<i>Buteo lineatus</i>	T	SC	SC	S3S4	S4B	G5		Bluehearts	<i>Buchnera americana</i>	EN	EN	SX	S1	G5		
Black tern	<i>Chlidonias niger</i>	SC				S3	S3B	G4	Large water-starwort	<i>Callitriche heterophylla</i>	T				S1	S2	G5
Northern harrier	<i>Circus cyaneus</i>	SC				S3	S4B	G5	Wild-hyacinth	<i>Camassia scilloides</i>	T	T	T		S2	S2	G4G5
Marsh Wren	<i>Cistothorus palustris</i>	SC				S3S4	S5B	G5	Raven's foot sedge	<i>Carex crux-corvi</i>	T						

MON NAME	SCIENTIFIC NAME	MI	ON	US	CA	SRANK MI	SRANK ON	GRANK	COMMON NAME	SCIENTIFIC NAME	MI	ON	US	CA	SRANK MI	SRANK ON	GRANK
le coneflower	<i>Echinacea purpurea</i>	EXT				SX	SE1	G4	Violet wood-sorrel	<i>Oxalis violacea</i>	T				S1		G5
e-rush	<i>Eleocharis geniculata</i>	T				S7	S1	G5	Ginseng	<i>Panax quinquefolius</i>	T	EN	EN		S2S3	S2	G3G4
lmann's spike rush	<i>Eleocharis engelmannii</i>	SC				S2S3	S1	G4G5	Leiberg's panic grass	<i>Panicum leibergii</i>	T				S2	S2	G5
etail spikerush	<i>Eleocharis equisetoides</i>	SC	EN	EN	SX	S1	G4		Small fruited panic grass	<i>Panicum microcapron</i>	SC				S2	S2	G5T5
e-rush	<i>Eleocharis radicans</i>	EXT				SX	G5		Low-forked chickweed	<i>Paronychia fastigiata</i>	SC			SH	S1	G5T5	
grass	<i>Eragrostis capillaris</i>	SC				SH	S1	G5	Smooth beardtongue	<i>Penstemon calycosus</i>	T				S2	SE1	G5
ll-ooe grass	<i>Eragrostis pilosa</i>	SC				SH	SE1	G4	Pale beard tongue	<i>Penstemon pallidus</i>	SC			S3	SE1	G5	
love grass	<i>Euonymus alatus</i>	SC				S3	S3	G5	Wild bean	<i>Phaseolus polystachios</i>	SC			SH	G4		
nd boneset	<i>Eupatorium sessilifolium</i>	T				S1	G5		Heart-leaved plantain	<i>Plantago cordata</i>	EN	EN	EN	S1	S1	G4	
d spurge	<i>Euphorbia commutata</i>	T				S1	S1	G5	Orange fringed orchid	<i>Platanthera ciliaris</i>	T				S2	SX	G5
tnut sedge	<i>Fimbristylis puberula</i>	EXT				SX	S1	G5	Eastern prairie fringed								
ash	<i>Fraxinus quadrangulata</i>	SC	SC			S7	S3	G5	orchid	<i>Platanthera leucophaea</i>	EN	SC	T	EN	S1	S2	G2
rella-grass	<i>Fuirena squarrosa</i>	T				S2	S2	G4G5	Bog bluegrass	<i>Poa paludigena</i>	T				S2	G3	
ny orchis	<i>Galearis spectabilis</i>	T				S2	S4	G5	Jacob's ladder	<i>Polemonium reptans</i>	T				S2	SEH	G5
ny gentian	<i>Gentiana puberulenta</i>	EN				S1	SX	G4G5	Cross-leaved milkwort	<i>Polygala cruciata</i>	SC			S3	SX	G5	
gentian	<i>Gentianella quinquefolia</i>	T				S2	S2	G5	Pink milkwort	<i>Polygala incarnata</i>	EXT	EN	EN	SX	S1	G5	
pe prairie gentian	<i>Gentiana alba</i>	EN	EN	EN	S1	S1	G4		Honey-flowered	<i>Polygonatum</i>							
avens	<i>Gentium virginianum</i>	SC				S1S2	S1	G5	Solomon's seal	<i>bilforum var melleum</i>	EXT			SX	SH	G5TH	
stone oak fern	<i>Gymnocarpium robertianum</i>	T				S2	S2	G5	Carey's smartweed	<i>Polygonum careyi</i>	T			S1S2	S3S4	G4	
ucky coffee-tree	<i>Gymnocladus dioica</i>	SC	T			S3S4	S2	G5	Swamp cottonwood	<i>Populus heterophylla</i>	EN			S1	G5		
skered sunflower	<i>Helianthus hirsutus</i>	SC				S3	SE1	G5	Vasey's pondweed	<i>Potamogeton vaseyi</i>	T			SH	S4	G4	
ny sunflower	<i>Helianthus mollis</i>	T				S2	SE1	G4G5	Sand cinquefoil	<i>Potentilla paradoxa</i>	SU			S3	G5		
rb bulrush	<i>Hemicarpha micrantha</i>	SC				S3	S1	G5	Bald rush	<i>Psilocarpha scipoides</i>	T			S2	G4		
oth rose mallow	<i>Hibiscus laevis</i>	SC				SH	SX	G5	Pinedrops	<i>Pteropora andromedea</i>	T			S2	S2	G5	
mp rose mallow	<i>Hibiscus moscheutos</i>	SC				S3S4	S3	G5	Hoary mountain mint	<i>Pycnanthemum incanum</i>	EN	EN		S1	G5		
led hawkweed	<i>Hieracium paniculatum</i>	SC				S2	S2	G5	Hairy mountain mint	<i>Pycnanthemum pilosum</i>	T			S2	S1	G5T5	
n violet	<i>Hybanthus concolor</i>	SC				S3	S2	G5	Shumard oak	<i>Quercus shumardii</i>	SC	SC	SC	S2	S3	G5	
enseal	<i>Hydrastis canadensis</i>	T	T	T		S2	S2	G4	Spearwort	<i>Ranunculus ambigens</i>	T			SH	SR	G4	
ian-leaved	<i>Hypericum gentianoides</i>	SC				S3	S1	G5	Prairie buttercup	<i>Ranunculus rhomboideus</i>	T			S2	S3	G5	
ohn's wort	<i>Hypericum gentianoides</i>	SC				S3	S1	G5	Meadow-beauty	<i>Rhexia virginica</i>	SC			S3	S3S4	G5	
td-fruited	<i>Hypericum radicans</i>	SC				S3	S1	G5	Climbing prairie rose	<i>Rosa setigera</i>	T	SC	S2S3	S3	G5		
ohn's wort	<i>Hypericum sphaerocarum</i>	SC				S1	S1	G5	Tooth-cup	<i>Rotala ramosior</i>	SC	EN	EN	S3	S1	G5	
l whorled pogonia	<i>Isoetes macrospora</i>	EN	T	EN	S1	S1	G2		Hairy ruellia	<i>Ruellia humilis</i>	T			S1	G5		
rlad pogonia	<i>Isoetes verticillata</i>	T	EN	EN	S2	S1	G5		Arrowhead	<i>Sagittaria montevidensis</i>	T			S1S2	G4G5		
leaf	<i>Jeffersonia diphylla</i>	SC				S3	S4	G5	Canadian burnet	<i>Sanguisorba canadensis</i>	T			S1	G5		
tr fruited rush	<i>Juncus brachycarpus</i>	T				S1S2	S1	G4G5	Clinton's bulrush	<i>Scirpus clintonii</i>	SC			S3	S2	G4	
y's rush	<i>Juncus vaseyi</i>	T				S1S2	S3	G5T	Tall nut-rush	<i>Scleria triglomerata</i>	SC			S3	S1	G5	
er-willow	<i>Justicia americana</i>	T	T			S2	S1	G5	Few-flowered nut-rush	<i>Scleria pauciflora</i>	EN			S1	S1	G5	
b boneset	<i>Kuhnia eupatorioides</i>	SC				S2	G5		Fire pink	<i>Silene virginica</i>	T			S1	SX	G5	
land lettuce	<i>Lactuca floridana</i>	T				S2	S2	G5	Compass plant	<i>Silphium laciniatum</i>	T			S1S2	S1	G5	
et's pinweed	<i>Lechea pulchella</i>	T				S1S2	S1	G5	Cup plant	<i>Silphium perfoliatum</i>	T			S2	S2	G5	
tin pinweed	<i>Lechea minor</i>	SC				SH	SX	G5	White goldenrod	<i>Solidago bicolor</i>	SC			S3	S4T	G5	
der bush clover	<i>Lespedeza virginica</i>	EN	EN	S7	S1	G5		Riddell's goldenrod	<i>Solidago riddellii</i>	SC	SC	S7	S3	G5			
conobea	<i>Leucospora multifida</i>	SC				S7	S1	G5	Showy goldenrod	<i>Solidago speciosa</i>	EN	EN	S7	S1	G5		
ng-star	<i>Liatris squarrosa</i>	EXT				SX	G5		Prairie dropseed	<i>Sporobolus heterolepis</i>	SC			S3	S3	G5	
se blazing star	<i>Liatris spicata</i>	T	T	S7	S2	G5		Blue-eyed grass	<i>Sisyrinchium hastile</i>	EXT	S7	S1	G5T				
owed flax	<i>Linum sulcatum</i>	SC				S2S3	S3	G5	Smooth carrion flower	<i>Smilax herbacea</i>	SC			S3	S4	G5	
ia flax	<i>Linum virginianum</i>	T				S2	S2	G4G5	Round-leaved greenbrier	<i>Smilax rotundifolia</i>	T	T	S7	S2	G5		
le twayblade	<i>Liparis liliifolia</i>	SC	EN	EN	S3	S2	G5	Trailing wild bean	<i>Strophostyles helvola</i>	SC			S3	S3	G5		
ow-leaved puccion	<i>Lithospermum incisum</i>	EXT				SX	S1	G5	Wood poppy	<i>Stylophorum diphyllum</i>	EN	EN	S7	S1	G5		
d-leaved puccion	<i>Lithospermum latifolium</i>	SC				S2	S3	G4	Virginia goat's rue	<i>Tephrosia virginiana</i>	EN	EN	S7	S1	G5		
box	<i>Ludwigia alternifolia</i>	SC				S3	S1	G5	Virginia spiderwort	<i>Tradescantia virginiana</i>	SC			S2	SE1	G5	
tern appressed	<i>Lycopodiella subappressata</i>	SC				S2	G2		Bastard pennyroyal	<i>Trichostema dichotomum</i>	T			S2	S1	G5	
mp candles	<i>Lysimachia hybrida</i>	SC				S2	S1	G5	Dropping trillium	<i>Trillium flexipes</i>	EN	EN	S7	S1	G5		
umber tree	<i>Magnolia acuminata</i>	EN	EN	S2	G5			Prairie trillium	<i>Trillium recurvatum</i>	T			S2S3	G5			
stemmed	<i>Minulus alatus</i>	EXT				SX	S2	G5	Toadshade	<i>Trillium sessile</i>	T			S2S3	G4G5		
lyflower	<i>Monarda didyma</i>	EXT				SX	S3	G5	Painted trillium	<i>Trillium undulatum</i>	EN			S1S2	S5T	G5	
balin	<i>Morus rubra</i>	T	EN	EN	S2	S2	G5	Nodding pogonia	<i>Triphora trianthophora</i>	EN	EN	S1	S1	G3G4			
mulberry	<i>Muhlenbergia richardsonii</i>	T				S2	S2	G5	Sand grass	<i>Triplasis purpurea</i>	SC			S2	S4T	G4G5	
mulhy	<i>Nelumbo lutea</i>	T				S2	S2	G4	Corn-salad	<i>Valerianella umbilicata</i>	T			S2	S1	G3G5	
rican lotus	<i>Opuntia humifusa</i>	EN	EN	S7	S1	G5		Prairie birdfoot violet	<i>Viola pedatifida</i>	T	EN	S1	S1	G5			
ern prickly pear cactus								Frost grape	<i>Vitis vulpina</i>	T			S1S2	S1	G5		
								Wild rice	<i>Zizania aquatica</i>	T			S2S3	S4	G5T5		

## APPENDIX C: RECOMMENDED READING

*A Checklist of Ontario Freshwater Fishes.* 1992. Royal Ontario Museum, Toronto

*A Guide to Michigan's Endangered Wildlife.* 1992. David C. Evers, University of Michigan Press, Ann Arbor, Michigan.

*Amphibians and Reptiles of the Great Lakes Region.* 1997. James H. Harding, University of Michigan Press, Ann Arbor, Michigan.

*Amphibians and Reptiles of Ontario.* 2002. Ross D. MacCulloch, Royal Ontario Museum and McClelland & Stewart Ltd. Toronto, Ontario.

*Atlas of Breeding Birds in Ontario.* 1987. Federation of Ontario Naturalists and Long Point Bird Observatory.

*Atlas of the Mammals of Ontario.* 1994. Federation of Ontario Naturalists

*Atlas of Rare Vascular Plants of Ontario.* 1982-87. National Museum of Sciences, Ottawa.

## APPENDIX D: ACKNOWLEDGEMENTS

Special thanks to the following individuals for their contributions towards this Atlas:

Dennis Albert, Michigan Natural Features Inventory

David S. Appel

Rollin H. Baker

Dan Ballnik, Ford Motor Company

Wasył Baskowski, Natural Heritage Information Centre

Trish Beckjord, Smith Group JJR

Brittany Bird, Wildlife Habitat Council

Caroline Birbauer, Wildlife Habitat Council

Mary Bohling, DTE Energy

Suzann Campbell, Belle Isle Nature Center

Matthew Child, Essex Region Conservation Authority

Citizens Environmental Alliance

Bob Collins, St. Clair County Community College

Larry Cornelis, Sydenham Field Naturalists

Donald Craig, St. Clair Region Conservation Authority

Julie A. Craves, Rouge River Bird Observatory

Jim DuBay, DTE Energy

Chris Durand, St. Clair Region Conservation Authority

Floyd Elliott, Lambton Wildlife Inc.

*Birds of Southeast Michigan: Dearborn Wayne County.* 1996. Julie A. Craves. Cranbrook Institute of Science Bulletin 62. Cranbrook Institute of Science, Bloomfield, Hills, Michigan.

*Insects of the Great Lakes Region.* 1996. Gary A. Dunn. University of Michigan, Ann Arbor, Michigan.

*Lake Erie and Lake St. Clair Handbook.* 1993. Edited by Stanley J. Bolsenga and Charles E. Hurdendorf. Wayne State University Press, Detroit, Michigan.

*Mammals of the Great Lakes Region.* 1997. Allen Kurta. University of Michigan Press, Ann Arbor, Michigan.

*Michigan Trees.* 1981. Burton V. Barnes. University of Michigan Press, Ann Arbor, MI.

*Newcomb's Wildflower Guide.* 1977. Lawrence Newcomb. Little, Brown and Company, Boston, Massachusetts.

*Ontario Birds at Risk.* 1994. Federation of Ontario Naturalists and Long Point Bird Observatory.

*Orchids of the Western Great Lakes Region.* 1987. Frederick W. Case, Jr. Cranbrook Institute of Science Bulletin 48. Cranbrook Institute of Science, Bloomfield, Hills, MI.

*The Geology of Michigan.* 1970. John A. Door and Donald F. Eschman. The University of Michigan Press, Ann Arbor, Michigan.

*The Ontario Butterfly Atlas.* 1991. Toronto Entomologists' Association, Toronto.

*The Tallgrass Restoration Handbook.* 1997. Society of Ecological Restoration. Island Press, Washington, D.C.

Hal Schraeder, Ontario Ministry of Natural Resources

Daryl Smith, Ontario Ministry of Natural Resources

Doug Sweet, Belle Isle Aquarium

John and Dorothy Tiedje

Molly Urbaneck, student intern-UM Dearborn

Roberta Urbani, DTE Energy

Dave White, Walpole Island Heritage Centre

Tom Woiwoode, Southeast Michigan Greenways Initiative

Allen Woodliffe, Ontario Ministry of Natural Resources

John M. Zawiskie, Cranbrook Institute of Science

Many of the photographs used in this book are from U.S. and Canadian citizens who entered a Photo Contest in the fall of 2002. We thank them for their generosity and enthusiasm for the beauty of the region.

All non-credited photographs taken by Lisa M. Appel

A special thanks to the following photographers for the donation of their outstanding work to the project:

Robert Stewart

Glenn Ogilve

Jim Simek

Allen Chartier

## APPENDIX E: RESOURCES AND ORGANIZATIONS

ow is a list of organizations  
lved with environmental  
cation and protection in the Lake  
on to Lake Erie Corridor

### Locations

ople Island Heritage Center  
) 627-1475  
w.bkejwanong.com

### Government – Binational

ational Joint Commission  
) 257-6710  
w.ijc.org

### Government – United States

y Corps of Engineers  
roit District  
) 226-6767

le Isle Aquarium  
) 852-4075  
w.ci.detroit.mi.us/recreation/cen-  
/M/belle\_isle/belleM.htm

sin Great Lakes Museum  
) 852-4050  
w.ci.detroit.mi.us/recreation/cen-  
/M/belle\_isle/belleM.htm

on-Clinton Metropolitan Authority  
) 407-2757  
w.metroparks.com

higan Department  
griculture  
ronmental Stewardship Division  
) 241-0236  
w.mda.state.mi.us  
ironm/index.html

higan Department of  
ronmental Quality  
00-662-9278  
w.michigan.gov/deq

higan Department of Natural  
ources  
) 373-1207  
w.michigan.gov/dnr

ural Area Preservation  
of Ann Arbor  
artment of Parks and Recreation  
) 996-3266  
w.ci.ann-  
or.mi.us/framed/parks/nap.htm

ional Oceanographic and  
ospheric Administration (NOAA)  
at Lakes Environmental  
earch Laboratory (GLERL)  
) 741-2235  
://www.glerl.noaa.gov

land County Planning &  
nomic Development Services  
) 858-0720

://www.co.oakland.mi.us/peds/  
theast Michigan Council  
overnments  
) 961-4266  
w.semccog.org

St. Clair County Planning Commission  
(810) 989-6950  
www.stclaircounty.org/offices/metro/

U.S. Department of Agriculture  
Natural Resources Conservation  
Service  
(517) 324-5270

United States Environmental  
Protection Agency  
Great Lakes National Program Office  
(312) 353-2117  
www.epa.gov/glnpo

U.S. Fish and Wildlife Service  
Great Lakes-Big Rivers Region 3  
1-800-657-3775  
http://midwest.fws.gov

U.S. Geological Survey  
Biological Resources Division  
Great Lakes Science Center  
(734) 994-3331  
www.gls.c.usgs.gov

### Government – Canada

Canadian Wildlife Service  
(819) 997-1095  
www.cws.ec.gc.ca

Environment Canada  
Inquiry Centre  
1-800-668-6767  
www.ec.gc.ca

Essex Region Conservation Authority  
(519) 776-5209  
www.erca.org

Essex County Stewardship Network  
Ontario Ministry of Natural Resources  
(519) 354-6274  
www.ontariostewardship.org/  
Essex/essex.htm

Lower Thames Valley Conservation  
Authority  
(519) 354-7310  
www.lowerthames-  
conservation.on.ca

Ontario Ministry of Natural Resources  
Main Office – Peterborough  
(705) 755-2000  
www.mnr.gov.on.ca/MNR/

Ontario Parks  
1-800-ONTARIO  
www.ontarioparks.com

Rural Lambton Stewardship Network  
(519) 354-5013  
www.ontariostewardship.org/  
LAMBTON/lambton.htm

St. Clair Region  
Conservation Authority  
(519) 245-3710  
www.scrca.on.ca

Upper Thames River  
Conservation Authority  
(519) 451-2800  
www.thamesriver.on.ca

### Non-government Organizations – United States

Cranbrook Institute of Science  
(248) 645-3200  
www.cranbrook.edu/institute/

Detroit Audubon Society  
(810) 545-2928  
www.detroitaudubon.expage.com

The Detroit Zoological Society  
(248) 541-5717  
www.detroitzoo.org

Ducks Unlimited, Inc.  
Great Lakes/Atlantic Region Office  
(734) 623-2000  
www.ducks.org

East Michigan Environmental  
Action Council  
(248) 258-5188  
www.emecac.org/

Great Lakes Commission  
(734) 971-9135  
www.glc.org

Greening of Detroit  
(313) 237-8733  
www.greeningofdetroit.com

Michigan Odonata Survey  
Insect Division, Museum  
of Zoology  
http://insects.umzm.lsa.umich.edu/  
michodo/mos.html

National Wildlife Federation  
(734) 769-3351  
www.nwf.org

Rouge River Bird Observatory  
Environmental Interpretive Center  
University of Michigan-Dearborn  
(313) 593-5338  
www.umd.umich.edu/dept/  
rouge\_river

Southeast Michigan Greenways  
Initiative  
Community Foundation for  
Southeast Michigan  
(313) 961-6675  
http://greenways.cfsem.org

Southeastern Michigan Raptor  
Research  
(734) 379-5020 x 5736  
www.smrr.net

Southeast Michigan Resource  
Conservation and Development  
Council  
www.semicd.org

Southeast Michigan Stewardship  
Network  
www.snre.umich.edu/  
stewardshipnetwork

Southwest Detroit  
Environmental Vision  
(313)842-1961  
comnet.org/local/orgs/sdev

White Lake C.A.R.E.  
www.wlrcare.com

Wildlife Habitat Council  
(301) 588-8994  
www.wildlifehc.org

### Watershed Councils

Clinton River Watershed Council  
(810) 853-9580  
www.crcwv.org

Friends of the Rouge  
(313) 792-9627  
www.therouge.org

Huron River Watershed Council  
(734) 769-5123  
www.hrwc.org

Friends of St. Clair River  
www.friendsofstclair.com

Johnson Creek Protection Group  
(734) 761-1010  
www.jcpg.org

River Raisin Watershed Council  
(517) 263-5614  
www.riverraisin.org

Detroit American Heritage River  
(313) 568-9594  
www.teliusnews.com/ahr

### Land Protection

Bluewater Land Conservancy  
P.O. Box 611424  
Port Huron, MI 48061-1424

Grosse Ile Nature and Land  
Conservancy  
(734) 676-6657  
www.ginlc.org

Holly Land Trust  
304 S. Broad Street, Suite A  
Holly, MI 48442

Independence Land Conservancy  
8062 Ortonville Road  
Clarkston, MI 48016

Livingston Land Conservancy  
(810) 229-3290  
www.livingstonland  
conservancy.org

Macomb Land Conservancy  
(586) 784-5848  
www.savingplaces.org

Michigan Nature Association  
(517) 655-5655  
www.michigannature.org

Monroe County Land Conservancy  
(734) 279-2149  
www.bendor.org/mlc.shtml

North Oakland Headwaters  
Land Conservancy  
(248) 846-6547  
www.nohlch.org

Oakland Land Conservancy  
(248) 601-2816  
www.oaklandlandconservancy.org

Raisin Valley Land Trust  
(734) 428-8108  
www.rvlt.org

Southeast Michigan Land  
Conservancy  
(734) 997-0942  
www.bendor.org/smlc.html

Superior Land Conservancy  
(734) 482-7414  
www.bendor.org/slc.shtml

The Nature Conservancy  
Michigan Chapter  
(517) 316-0300  
http://nature.org/wherework/  
northamerica/states/michigan

Washtenaw Land Trust  
(734) 302-LAND  
www.washtenawlandtrust.org

West Bloomfield Land  
Conservancy  
7293 Verona Drive  
West Bloomfield, MI 48322  
(248) 788-3940

### Non-government Organizations – Canada

Carolinian Canada  
(519) 873-4631  
www.carolinian.org

Ducks Unlimited Canada  
(705) 721-4444  
www.ducks.ca

Essex County Field Naturalists'  
Club  
(519) 733-9972  
www.ojibway.ca/ECFN.htm

Federation of Ontario Naturalists  
(416) 444-8419  
www.ontarionature.org

Holiday Beach Migration  
Observatory  
Essex Region Conservation  
Authority  
(519) 736-3772  
www.hbmo.org

Lambton Wildlife Incorporated  
www.sarnia.com/groups/  
lwi/lwi.html

Little River Enhancement Group  
(519) 735-0418  
www.lilreg.com/

Ontario Federation of Anglers  
and Hunters  
(705) 748-6324  
www.ofah.org

Sarnia-Lambton Environmental  
Association  
(519) 332-2010  
www.sarniaenvironment.com

Sarnia Urban Wildlife Committee  
www.suwvc.org

Sydenham Field Naturalists  
P.O. Box 22008  
Dufferin Ave.  
Wallaceburg, ON N8A 5G4

Tallgrass Ontario  
(519) 873-4631  
www.tallgrassontario.org

Wetland Habitat Fund  
(613) 722-2090  
www.wetlandfund.com

### Land Protection

Thames Talbot Land Trust  
(519) 652-2189

Nature Conservancy of Canada  
(416) 932-3202

### Nature Centers - U.S. and Canada

Ojibway Nature Centre  
(519) 966-5852  
www.ojibway-ca/index.htm

Longwoods Road Conservation  
Area, Resource Centre and  
Ska-Nah-Doht Iroquoian Village  
and Museum  
(519) 264-2420  
www.lowerthames-  
conservation.on.ca/Longwoods  
RoadCA.htm

Pinery Provincial Park Visitor  
Centre  
(519) 243-8574  
www.pinerypark.on.ca

Point Pelle National Park Nature  
Centre  
(519) 322-2365  
www.pc.gc.ca/pn-  
np/on/pellee/index\_E.asp

Rondeau Provincial Park  
Visitor Centre  
(519) 674-1768  
www.rondeauprovincialpark.ca

Wawanosh Wetlands Conservation  
Area Education Centre  
www.mvca.on.ca/wawa.html

A.W. Campbell Conservation Area  
Nature House  
(519) 847-5357

University of Michigan-Dearborn  
Environmental Interpretive Center  
(313) 593-5338  
www.umd.umich.edu/dept/na

Dinosaur Hill Nature Preserve  
City of Rochester and Rochester  
Community Schools  
(248) 656-0999  
www.livinglibrary.com/dinohill

Drayton Plains Nature Center  
(248) 647-2119  
www.draytonplainsnaturecenter.org  
Howell Interpretive Nature Center  
(517) 546-0249  
www.ismi.net/howellnature

James D. Reader, Jr. Urban  
Environmental Education Center  
Nichols Arboretum  
University of Michigan  
(734) 998-9540  
www.umich.edu/~wwwarb/about

Kensington Metropark  
Nature Center  
Huron-Clinton Metropolitan  
Authority  
(248) 685-1561  
www.metroparks.com

Matthaei Botanical Gardens  
University of Michigan  
(734) 998-7061  
www.isa.umich.edu/mbg

Nankin Mills Nature Center  
Wayne County Road Commission  
(734) 261-1850  
www.waynecounty.com/parks/nank  
in\_ic.htm

Oakwoods Metropark  
Nature Center  
Huron-Clinton Metropolitan  
Authority  
(734) 782-3966  
www.metroparks.com

Pine River Nature Center  
St. Clair County Regional Education  
Service Agency  
(810) 325-9106  
www.scrca.org

Seven Ponds Nature Center  
Michigan Audubon Society  
(810) 796-3200  
www.geocities.com/sevenponds/

Sterling Heights Nature Center  
(586) 446-2711

Stony Creek Metropark  
Nature Center  
Huron-Clinton Metropolitan  
Authority  
(586) 781-4242  
www.metroparks.com

Metro Beach Metropark  
Nature Center  
Huron-Clinton Metropolitan  
Authority  
(586) 463-4581  
www.metroparks.com

Indian Springs Metropark  
Nature Center  
Huron-Clinton  
Metropolitan Authority  
(248) 625-7280  
www.metroparks.com

Lewis E. Wint Nature Center  
Oakland County Parks  
and Recreation  
(248) 625-6473  
www.co.oakland.mi.us/parksrec/  
ppark/wint\_center.html

Lloyd A. Stage  
Outdoor Education Center  
City of Troy  
(248) 524-3567  
www.ci.troy.mi.us/parks/OEC/  
NatureCenter.asp

Lake Erie Metropark Museum  
and Nature Center  
Huron-Clinton  
Metropolitan Authority  
(734) 379-5020  
www.metroparks.com

The Madison Heights Nature  
Center at Friendship Woods  
City of Madison Heights  
(248) 585-0100

Gerald E. Eddy Geology Center  
Michigan Department  
of Natural Resources  
Waterloo Recreation Area  
(734) 261-1900

Leslie Science Center  
Ann Arbor Parks and Recreation  
(734) 997-1553  
www.ci.ann-  
arbor.mi.us/Parks/LeslieScience/le  
slie.htm

Holiday Forest  
and Wildlife Preserve  
(734) 261-1900  
www.waynecounty.com/parks/  
william\_p\_holiday.htm

**Private**

DTE Energy  
(313) 235-4000  
www.dteenergy.com

Ontario Power Generation  
(416) 592-2555  
www.opg.com

Ford Motor Company  
1-800-392-3673  
www.ford.com

Smith Group JJR  
1-866-SMITHGROUP  
www.smithgroup.jjr.com

## GLOSSARY

- otic**—a nonliving factor in an environment (e.g. light, water, temperature.)
- otrophic**—substance with a pH value greater than 7.
- otophiles**—plants that live in acidic soils.
- otline**—substance with a pH value greater than 7.
- otrobic**—lacking oxygen.
- otter**—an underground geological formation or group of formations containing water. Aquifers are sources of groundwater for wells and springs.
- otroph**—an organism capable of self-feeding by using inorganic materials as a source of nutrients and using photosynthesis or chemosynthesis as a means of energy (e.g. plants.)
- otfill**—material, often dirt or broken concrete, used to fill the space behind retaining wall or other shoreline reinforcing structure.
- otens**—level or slightly rolling land, usually with relatively infertile sandy soils and few trees.
- otock**—the rock underlying soils (extending from zero (when exposed to erosion) to several hundred feet of elevation).
- otthic**—relating to the bottom of a body of water.
- otthic macroinvertebrate**—an aquatic invertebrate animal large enough to be seen with the human eye. Macroinvertebrates include insects, mollusks, crayfish, snails and worms. Analysis of the types and numbers of macroinvertebrates present in a stream is a very useful indicator of water quality and habitat conditions.
- otthos**—the bottom of a river, lake, or ocean.
- otiversity**—the variety of organisms existing in a particular area or region. It can include diversity within species (genetic), and diversity among ecosystems.
- otmass**—the total mass of a living organism in a given environment.
- otne**—a large geographic area with a relatively uniform climatic conditions; a complex of communities characterized by a distinctive type of vegetation maintained under the climatic conditions of the region.
- otota**—animal and plant life of a region.
- otiotic**—the living organisms in a community, including all of the plant and animal life in a community.
- otbog**—peat-accumulating wetland with precipitation as the dominant water source, typically acidic and normally dominated by Sphagnum spp. mosses.
- otbuffer**—areas or strips of land in permanent vegetation, designed to intercept pollutants and sediment. Buffers include riparian buffers, filter strips, windbreaks, and living snow fences.
- otbulkhead**—a retaining structure of timber, steel, or reinforced concrete used for shoreline protection or harbors.
- otcalcareous**—chalkiness due to the presence of calcium carbonate.
- otcanopy**—the cover formed by the tallest, leafy upper branches of trees in a forest.
- otcarnivorous**—animals that eat meat; a plant that eats insects.
- otchannalization**—human engineering of river channels to enlarge, straighten, embank, or protect existing channels, create new channels, or protect adjacent structures.
- otchlay**—a sediment type, consisting of particles less than 0.002 mm in diameter. A soil type consisting of greater than 40% clay, less than 45% sand, and less than 40% silt.
- otchlimax community**—a stage in ecological succession in which a community of organisms, especially plants, is stable and capable of perpetuating itself.
- otchcommunity**—a group of plants and animals living and interacting with one another in a specific region under relatively similar conditions.
- otchconifer**—a plant that bears its seeds in cones; mostly needle-leaved or scale-leaved; mainly evergreen.
- otchconnecting channel**—a waterway or long strait between two lakes (e.g. the St. Clair River, Lake St. Clair, and Detroit River are a connecting channel between Lake Huron and Lake Erie.)
- otchconservation easement**—legal agreement that restricts landowners to uses that are compatible with conservation and environmental values.
- otchconsumer**—an organism that eats plants or animals for its food.
- otchcontaminant**—something that makes water, soil, or air unsuitable, unclear, or toxic; a pollutant.
- otchcover**—the vegetation, debris, and irregularities of the land that provide concealment, sleeping, feeding, and breeding areas for wildlife.
- otchD**
- otchdeciduous plant**—a plant that sheds all its leaves every year during a certain season.
- otchdecomposer**—microorganisms, fungus, or insects that convert dead organic materials into inorganic materials.
- otchdecomposition**—chemical breakdown of a compound into simpler compounds, often accomplished through the aid of microorganisms.
- otchdelist**—a term used by the International Joint Commission (IJC) to indicate when water and habitat quality standards within an Area of Concern have improved to the point of no longer being a concern.
- otchdelta**—a geological formation that occurs where a stream or river deposits sediment into a receiving basin or lake.
- otchdeposition**—the act or process of being deposited (e.g. the placement of excavated soils or dredged materials in a new location; sediments transported by water current to a new place.)
- otchdike**—a human-made barrier built around a wetland designed to control water levels within an enclosed area.
- otchdiversity**—variety.
- otchdredging**—the process of using machinery to remove sediments from the bottom of a waterway.
- otchdune**—a sand hill or sand ridge formed by the wind, usually in deserts or near lake and ocean shorelines.
- otchE**
- otchecology**—the study of relationships between organisms and their environments.
- otchecosystem**—a system defined by the interaction of a community of organisms with their physical environment.
- otchecotone**—the transition zone between two different plant communities, such as between a forest and a prairie.
- otchembayment**—a bay.
- otchericaceous**—plants of the heath family, such as bog rosemary and leatherleaf, which usually prefer to grow in acid substrates.
- otcherosion**—the process by which the surface of the earth is worn away by water, glaciers, winds, and waves, which is often intensified by land-clearing practices related to farming, residential, industrial development, road building, or logging.
- otcherosional features**—topography and landforms shaped by flowing water and glacial ice.
- otcheutrophication**—describes a phenomenon in water bodies that occurs when waters are rich in mineral and organic nutrients. It results in a proliferation of plant life, especially algae, that reduce the dissolved oxygen content and often causes the death of other organisms in the water.
- otchexotic species**—organisms (plant or animal) introduced to a habitat where they are non-native. They are often severe agents of habitat alteration and degradation and are a major cause of the loss of biological diversity, often referred to as introduced, alien, or non-indigenous species.
- otchF**
- otchfauna**—animals, collectively.
- otchfen**—peat-accumulating wetlands with groundwater as the dominant water source, and a variety of plant species, including grasses and sedges.
- otchfloodplain**—the land bordering a river or stream that is subject to flooding. The floodplain is built up of sediments from overflow of the stream.
- otchflora**—plants, collectively.
- otchfood chain**—the transfer of food energy from one organism to another as each consumes a lower member and in turn is preyed upon a higher member.
- otchfood web**—the totality of interacting food chains within an ecological community.
- otchforb**—a broad-leaved flowering plant, such as black-eyed susan and wild bergamot; a wildflower; does not include grasses, sedges, trees and shrubs.
- otchfossils**—any remains, impression, or trace of a living thing from a former geologic age.
- otchfragmentation**—the process, usually the result of development or agriculture, in which natural areas, such as forests or wetlands, are cut away or changed so that only small, isolated remnants of the original community remain.
- otchG**
- otchgame fish**—fish large enough to be caught by recreational sport fishermen; sport fish.
- otchgenetic diversity**—the chromosomal diversity available within a species.
- otchgeology**—the science that deals with the dynamics and physical history of the earth, rocks, and the earth's physical, chemical, and biological changes.
- otchgrassland**—an area in which grasses and wildflowers are the dominant vegetation.
- otchgravel**—a sediment type, consisting of small stones and cobble.
- otchGreat Lakes Basin**—the five Great Lakes plus the watershed land that surrounds them; the largest freshwater system in the world.
- otchGreat Lakes coastal marsh**—a freshwater wetland ecosystem that occurs along the coast of the Great Lakes, which is highly influenced by fluctuating water levels.
- otchground water**—water beneath the earth's surface that supplies wells and springs. Precipitation that is absorbed into the ground replenishes groundwater.
- otchH**
- otchhabitat**—the arrangement of food, water, shelter or cover, and space suitable to animals' needs.
- otchheadwaters**—the origin or upper tributaries of a river.
- otchherb layer**—the layer of soft-stemmed (non-woody) plants growing close to the forest floor.
- otchherbaceous vegetation**—non-woody vegetation, including ferns, sedges, emergent, submerged, and floating plants.
- otchheterotroph**—an organism requiring organic compounds for its principal source of food.
- otchhydrology**—the study of the occurrence, circulation, distribution, and property of the natural waters on Earth.
- otchhypothermal**—elevated temperature.
- otchimpervious surfaces**—hard surfaces within a watershed including rooftops, parking lots, streets, sidewalks, and driveways that do not allow water to infiltrate soils.
- otchindicator species**—plant or animal communities whose presence indicates good habitat or water quality; species that offer a signal of the biological condition of a given area.
- otchinvasive species**—a species of animal or plant that is moved, usually by intentional or unintentional human intervention, from its native location to a new location; without natural predators or consumers in the new location, an invasive species can become a nuisance species that threatens or eliminates native species; also known as non-native species, exotic species, or nuisance species.
- otchinvertebrates**—organisms without a backbone.
- otchJ**
- otchK**
- otchL**
- otchlacustrine**—of, or pertaining to, a lake.
- otchlakeplain**—old lake bottom of the ancestral Great Lakes.
- otchland use planning**—the process of deciding appropriate uses of land.
- otchlandforms**—hills, valleys, low areas, and lakes that comprise the topography of an area; a natural feature of a land surface.
- otchlarva**—the immature, wingless, feeding stage of an insect.
- otchlife history**—the developmental history of an individual or group.
- otchlitter layer**—the forest floor characterized by fallen, decomposing leaves, decaying stumps, mosses and lichens.
- otchloam**—a soil type, consisting of a moderate amount of sand, silt, and clay; a soil composed of 7-27% clay, 28-50% silt, and 23-52% sand.
- otchlowland**—land that is low or level in comparison to adjacent terrain.
- otchM**
- otchmacrophyte**—a plant, especially an aquatic plant, large enough to be visible to the naked eye.
- otchmarsh**—low, wet land, often treeless with open water, generally characterized by grasses, sedges, cattails, and rushes.
- otchmesic**—moderately moist.
- otchmicroclimate**—climates of small specific areas as contrasted with the general climate of the area.
- otchmigrate**—to pass seasonally from one region or climate to another.
- otchmitigation (of wetlands)**—restoration, creation, enhancement, or preservation of wetlands that expressly compensates for unavoidable wetland losses due to development actions.
- otchmoraine**—an accumulation of gravel, and stone carried and deposited by glaciers, often forming mounds or hills.
- otchN**
- otchnaid**—the juvenile form of the dragonfly, damselfly, or mayfly.
- otchnearshore waters**—a band of varying width around the perimeter of a lake between the land and the deeper offshore waters, as determined by the thermocline; the part of a large lake in which fish spawn, waterfowl feed, and mammals prey.
- otchnative species**—an animal or plant that originated in a particular place or region.
- otchnon-native**—in conservation terms, an organism that has been introduced to an area in which it did not originate.
- otchnonpoint source pollution**—pollution that comes from many different sources over a broad area. It usually caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up pollutants, finally depositing them into lakes, rivers, streams, and wetlands. Farm fields and parking lots, or from an unseen location, such as an underground storage tanks or failing septic systems are sources of nonpoint source pollution.
- otchnuisance species**—see invasive species.
- otchO**
- otchorganic matter**—plant and animal matter that is in the process of decomposing.
- otchorganism**—a living thing; a form of life composed of parts that work together to carry on the various processes of life.
- otchP**
- otchPAH**—Polycyclic aromatic hydrocarbon.
- otchPCB**—Polychlorinated biphenyl.
- otchparent material**—rock or glacial sediment from which soils originate.
- otchperiphyton**—benthic algae that grow attached to surfaces, such as rocks or larger plants.
- otchpesticide**—a chemical preparation used to control populations of organisms. **pioneer species**—plants that are typically shade-intolerant, short-lived, and the first to grow in land that has been disturbed by fire, agriculture, or other events.
- otchplankton**—small, passively floating or weakly mobile aquatic organisms.
- otchpoint source pollution**—pollution that originates from a specific, identifiable location. Point source pollution can be discharged from any pipe, ditch, channel, tunnel, conduit, well, concentrated feeding operation, sewage discharge pipe, landfill leachate collection system, vessel, or other floating craft.
- otchpollinator**—a creature, often an insect, bird, bat, moth or butterfly that conveys a flower's pollen from the anther to the stigma.
- otchpollution**—the introduction of harmful substances or products into an environment.
- otchpopulation**—the quantity of a certain species living in a certain location.
- otchpredator**—an animal that kills and eats other animals.
- otchprey**—animals that are killed and eaten by other animals.
- otchproducer**—a green plant or bacterium that uses photosynthesis or chemosynthesis; constitutes the first trophic level in a food chain.
- otchQ**
- otchR**
- otchrelict**—a plant, animal, or geological feature that has survived in a considerably changed environment.
- otchremnant**—a small, fragmented piece of a previously large, intact natural community.
- otchrevetment**—a wall, often constructed of masonry or concrete, to protect an embankment from water erosion.
- otchrhizome**—a horizontal underground stem, usually rooting at the nodes.
- otchriparian**—of, situated, or dwelling on the bank of a river or stream.
- otchriverine**—of, or pertaining to, a river.
- otchriver mouth**—the lower end of a river or stream where water is discharged into a larger body of water, such as a lake.

## GLOSSARY

**ribe system**—rivers, streams, lakes, and drains as well as the cent buffers that border them and with the fringe of adjacent land areas.

**ff**—precipitation, snow melt, irrigation water that runs off the into surface water. Runoff can y pollutants from the air and into receiving waters.

**h**—a soil type, consisting articles between 0.05 and 2.0 mm diameter.

**anna**—a grassland with scattered s, either as individuals or clumps. ansional community between rie and forest.

**ment**—fragmented material that nates from weathering of rocks is transported by, suspended r deposited by water or air.

**eline**—the line where shore water meet.

**eline hardening**—the installation ificial shoreline structures such oncrete docks, steel breakwalls, ns, and concrete revetments gned to prevent erosion and ect properties from being washed y. In the process, natural station and habitat is eliminated.

**b layer**—the part of a forest floor acterized by shrub growth or ng trees (woody vegetation.)

**tion**—the deposit of or mulation of very tiny soil cles (silt.)

**a** soil particle between 0.05 0.002 mm in diameter; a soil type.

**ts**—dead trees that are still ding or have partially fallen.

**gh**—a hollow filled with mud water (e.g. an inlet from a river.)

**a** dynamic natural body composed ineral and organic materials and g forms in which plants grow.

**wn**—to deposit eggs or sperm ctly into water, as fish do.

**ies at risk**—plant and animal ies in which populations are ining to low levels; species that are d as special concern, threatened, danger of extinction.

**ng ephemerals**—forest wildflowers flower in the spring before nearby s can produce leaves and k sunlight.

**stormwater or stormwater runoff**—water that flows over the ground after a rainstorm; water that quickly runs off paved surfaces and into storm sewers.

**submergent**—plants that grow under water; submerged.

**subwatershed**—the drainage area of a small creek or stream, which flows into a larger river; a component of larger watershed.

**succession**—the replacement of plant species in an orderly sequence of development.

**surface water**—water on the surface of the earth.

**swamp**—a wetland dominated by trees and shrubs, with standing water; limited drainage, and often neutral or slightly acidic soils.

## T

**temperate zone**—the part of the Earth's surface lying between the Tropics and the Arctic, characterized by warm summers, cold winters, and moderate springs and falls.

**terminus**—the southernmost edge of a glacier.

**terrestrial**—of, or pertaining to land.

**topography**—the elevation, including of the soil surface, including its relief and the position of natural and manmade features.

**toxic**—a poison or something that has been poisoned.

**tributary**—any river or stream that connects with a larger river or stream before reaching its final outflow.

**trophic level**—a group of living things that share the same level in the food chain.

## U

**understory**—part of a forest where tall shrubs and shade-tolerant trees grow beneath the main canopy.

**upland**—land above the level where water flows or flooding occurs.

## V

**vegetation**—all the plants that grow in a region or area.

**vernal pool**—ponds or small lakes that occur only in springtime. [vernal = springtime]

**vertebrate**—organism having a backbone.

## W

**wastewater**—water that has been used within homes, businesses, factories, or outdoor activities and discharged back into the environment.

**watershed**—the land area that drains into a single body of water such as a lake, river, or stream.

**waterway**— a lake, river, or stream.

**wetlands** — an area that is inundated or saturated by surface water or groundwater with a frequency and duration sufficient to support vegetation adapted for life under those soil conditions. Swamps, marshes, fens, and bogs are examples of wetlands.

**wildlife**—undomesticated animals living in the wild.

**woodland**—land having a cover of trees and shrubs (less densely than a forest.)

## X

**xeric**—dry

## Y

**zone of saturation**—point at which groundwater totally saturates the soil. Water in the zone of saturation will flow into a well and is called ground water; an aquifer.

## INDEX

heat sink, 14  
Highland Recreation Area, 103  
Holiday Beach Conservation Area, 53  
Holiday Beach  
Migration Observatory, 53  
Holocene Epoch, 6  
Houghton, Dr. Douglas, 83  
Hubbard, Bela, 32, 42, 48  
Humburg Marsh, 51  
hydrologic cycle, 20

Ice Age, 6  
impervious surfaces, 116  
industrial heritage, 110  
insects, 103  
interglacial period, 7  
interlobate area, 10  
International Joint Commission (IJC), 114  
invasive forest plants, 99  
invasive aquatic species, 31, 34, 113  
Islands, Detroit River, 19  
Island Lake Recreation Area, 102  
isostatic rebound, 11

Lake Erie Metropark, 53, 115  
Lambton Wildlife Inc., 67  
land-use planning, 118  
Leamington, 9  
Lighthouse Cove, 24  
London, 29  
Lorne C. Henderson Conservation Area, 86  
Lotus Garden Club of Monroe, 43  
Lower Huron Metropark, 85, 94  
lumbering, 108

kame, 8  
Kensington Metropark, 96  
kettle, 8  
kettle and kame topography, 8

Macomb Buffer Initiative, 123  
marsh, 73  
mayfly, 29  
mastodon, 13, 106  
meadow, 59  
melt-water, 8  
Michigan Department of Natural Resources, 35  
Michigan Nature Association, 81, 98  
Michigan Natural

Features Inventory, 63  
migration, bird, 54–55  
migration, fish, 33  
migratory flyway, 54–55  
Minden Bog, 83  
moraines, 7, 10–12  
mussels, freshwater, Unionidae, 29–31, 37  
native landscaping, 121  
natural community, 3  
nearshore waters, 25

oak barrens, 102–103  
oak savanna, 56, 65–68  
Ojibway Prairie Complex, 64  
Ontario Ministry of Natural Resources, 35, 64  
outwash, 8

Palmer Park, 86  
physiographic regions, 12  
periphyton, 27  
phytoplankton, 26, 41  
Pine River Nature Center, 94  
Pinery Provincial Park, 67, 101  
pit-and-mound topography, 86  
Point Pelee National Park, 66, 101  
Pointe Mouillee State Game Area, 50  
precipitation, 20  
Proud Lake Recreation Area, 82

Raisin River, 29, 30  
Remedial Action Plan (RAP), 114  
Ridgetown, Ontario, 9  
riparian zones, 38  
River, Belle, 29  
River, Black, 29  
River, Canard, 39  
River, Clinton, 29, 30, 41  
River, Huron, 29, 39, 94  
River, Pine, 29, 30, 38, 123  
River, Sydenham, 29, 30, 38, 40  
River, Thames, 12, 29, 33, 40  
Rondeau Provincial Park, 101  
Rural Lambton Stewardship Network, 122

Shiawassee and Huron Headwaters Resource Preservation Project, 120  
shrub-carr, 94, 88  
Sibley Prairie, 63  
soil, 14  
Southwest Michigan Raptor Research, 53  
Springfield Township, 80, 120  
St. Lawrence Seaway, 17  
St. Clair National Wildlife Area, 50  
St. Clair River Delta, 18–19  
St. Johns Marsh, 51  
Stevenson, Robert, 56  
Stonycreek Metropark, 8  
submergent aquatic plants, 27–28  
succession, 85  
swamp, conifer, 88  
swamp, hardwood, 90  
swamp, shrub, 92

Talbot Trail, 9  
tallgrass prairie, 56–61, 63–64  
The Nature Conservancy, 6, 63  
till, 7  
transpiration, 20  
tributaries, 22

University of Michigan, 35  
University of Michigan–Dearborn  
Campus Natural Area, 54  
urban sprawl, 117–120  
urban wildlife, 124  
U.S. Fish and Wildlife Service, 35, 67, 123  
U.S. Geological Service, 35

vernal pools, 91,

Walpole Island, 25, 19, 30, 50, 70–71, 106  
Waterfowl, 46, 55  
water-lain moraine, 8  
Wawanosh Wetlands, 74  
Wayne County Community College - Downriver Campus, 84  
West Bloomfield Woods Nature Preserve, 75  
wet meadow, 78–79  
wildflowers, woodland, 97  
Wildlife Habitat Council, 122

zooplankton, 27

## SPECIES INDEX

### Plants

Alternate-leaved dogwood, *Cornus alternifolia*, 94  
American beech, *Fagus grandifolia*, 86, 87, 93, 96, 97, 100  
American chestnut, *Castanea dentata*, 84  
American elm, *Ulmus americana*, 88, 90, 93  
American hazelnut, *Corylus americana*, 66  
American lotus, *Nelumbo lutea*, 43  
Aromatic sumac, *Rhus aromatica*, 102  
Arrowhead, *Sagittaria* spp., 73

Basswood, *Tilia americana*, 82, 84, 90, 96, 100  
Bergamot, *Monarda fistulosa*, 61, 66, 67  
Big bluestem, *Andropogon gerardi*, 56, 57, 61, 66, 78, 102  
Birch, *Betula* spp., 104  
Bitternut hickory, *Carya cordiformis*, 104  
Black ash, *Fraxinus nigra*, 82, 86, 88, 90  
Black cherry, *Prunus serotina*, 66, 87, 100  
Black chokeberry, *Aronia melanocarpa*, 88  
Black-eyed susan, *Rudbeckia hirta*, 60  
Black gum, *Nyssa sylvatica*, 84  
Black oak, *Quercus velutina*, 66, 87, 100, 102  
Black spruce, *Picea mariana*, 82, 88  
Black walnut, *Juglans nigra*, 96  
Black willow, *Salix nigra*, 90, 93  
Bloodroot, *Sanguinaria canadensis*, 97, 100  
Blue ash, *Fraxinus quadrangulata*, 84  
Blue-beech, *Carpinus caroliniana*, 90  
Blueberry, *Vaccinium* spp., 66, 100  
Blue-eyed grass, *Sisyrinchium albidum*, 60  
Blue flag iris, *Iris virginica*, 74  
Blue-green algae, *Oscillatoria* spp., 27  
Blue joint grass, *Calamagrostis canadensis*, 56, 66, 78  
Bog rosemary, *Andromeda glaucophylla*, 82  
Bottlebrush grass, *Hystrix patula*, 96  
Bottle gentian, *Gentiana andrewsii*, 63  
Bur oak, *Quercus macrocarpa*, 66, 90  
Bushy pondweed, *Najas flexilis*, 28  
Butterfly milkweed, *Asclepias incarnata*, 60  
Butterfly weed, *Asclepias tuberosa*, 65, 102  
Buttonbush, *Cephalanthus occidentalis*, 92  
Canada tick trefoil, *Desmodium canadense*, 61  
Canada wild rye, *Elymus canadensis*, 57  
Cardinal flower, *Lobelia cardinalis*, 94  
Chokeberry, *Aronia melanocarpa*, 66  
Choke cherry, *Prunus virginiana*, 100  
Common buckthorn, *Rhamnus cathartica*, 99  
Common bur reed, *Sparganium eurycarpum*, 73  
Common cattail, *Typha latifolia*, 73  
Common milkweed, *Asclepias syriaca*, 61  
Common mountain mint, *Pycnanthemum virginianum*, 66  
Common water plantain, *Alisma subcordatum*, 73  
Coontail, *Ceratophyllum demersum*, 28  
Coral mushroom, *Hiericium ramosum*, 96  
Cotton grass, *Eriophorum* spp., 82  
Cucumber tree, *Magnolia acuminata*, 84  
Culver's root, *Vernoniastrum virginicum*, 61  
Diatom, *Fragilaria* spp., 27  
Dogwood, *Cornus* spp., 66  
Downy arrowwood, *Viburnum rafinesquianum*, 100  
Dragon's mouth, *Arethusa bulbosa*, 88  
Duckweed, *Lemna minor*, 73  
Dutchman's breeches, *Dicentra cucullaris*, 97, 100  
Dwarf chinquapin, *Quercus prinoides*, 102



MANDY DUNLAP

INDEX

y meadow rue, *Thalictrum*  
 com, 93  
 ern cottonwood, *Populus*  
*toides*, 90, 93  
 ern hemlock, *Tsuga*  
*nadensis*, 96, 98  
 ern prairie fringed orchid,  
*anthera leucophaea*, 59  
 ern redcedar, *Juniperus*  
*piniana*, 66  
 isian watermilfoil,  
*riophyllum* spicum, 28  
  
 e foxglove, *Aureolaria flava*, 67  
 star sedge, *Carex sterilis*, 80  
 ering dogwood, *Cornus florida*, 84  
 ering spurge, *Euphorbia*  
*ollata*, 65  
 ged gentian, *Gentiana crinita*, 61, 81  
  
 ic mustard, *Alliaria petiolata*, 99  
 er plant, *Zingiber officinale*, 93  
 en Alexanders, *Zizia aurea*, 60  
 en ragwort, *Senecio aureus*, 93  
 en-seeded spike rush,  
*ocharis elliptica*, 80  
 ss of Parnassus,  
*massia glauca*, 80  
 ss pink, *Calopogon tuberosus*, 82, 88  
 dogwood, *Cornus racemosa*, 80  
  
 -stemmed bulrush,  
*trpus acutus*, 80  
*atica*, *Hepatica* spp., 100  
 bush blueberry, *Vaccinium*  
*myrsinum*, 82, 88  
 y buccoon,  
*nosperum canescens*, 60  
 yelocust, *Gleditsia tricanthos*, 93  
 tree, *Ptelea trifoliata*, 84  
  
 an grass, *Sorghastrum*  
*tans*, 56, 61, 80, 102  
 an plantain, *Calacia plantaginea*, 80  
 weed, *Vernonia fasciculata*, 61, 66  
  
 -in-the-pulpit, *Arisaema*  
*orubens*, 97  
 pye weed, *Eupatorium*  
*culmiflorum*, 61, 78  
  
 lucky blue grass,  
*aprensitis*, 57, 117  
 lucky coffee tree, *Gymnocladus*  
*ticus*, 84, 93, 94  
  
 e cranberry, *Vaccinium*  
*crocarpa*, 82  
 e-flowered trillium,  
*lilium grandiflorum*, 97  
 herleaf, *Chamaedaphne*  
*lyculata*, 82  
 elf's twayblade, *Liparis loeselii*, 88  
 e bluestem, *Schizachyrium*  
*opariis*, 61, 66, 67, 80, 102  
 apple, *Podophyllum peltatum*, 97  
 denhair fern, *Adiantum pedatum*, 94  
 sh bellflower,  
*mpanula aparinoides*, 78  
 sh blazing star,  
*tris spicata*, 58, 60, 61  
 sh fern, *Thelypteris palustris*, 72  
 sh marigold, *Caltha palustris*, 90, 93  
 mulhy, *Muhlenbergia*  
*hardsonis*, 80

Michigan lily, *Lilium michiganense*, 60  
 Mountain mint,  
*Pycnanthemum virginianum*, 60  
  
 Needle grass, *Stipa spartea*, 102  
 New Jersey tea, *Ceanothus*  
*americanus*, 66  
 Northern hackberry, *Celtis*  
*occidentalis*, 93  
 Northern pin oak, *Quercus*  
*ellipsoidalis*, 102  
 Ohio goldenrod, *Solidago ohioensis*, 81  
 Ostrich fern, *Matteuccia*  
*struthiopteris*, 94  
 Painted trillium, *Trillium undulatum*, 98  
 Panicked aster, *Aster simplex*, 78  
 Paw-paw, *Asimina triloba*, 84  
 Peach-leaved willow,  
 Pennsylvania sedge,  
*Carex pennsylvanica*, 57, 66, 100  
 Pickerelweed, *Pontederia*  
*cordata*, 53, 73  
 Pignut hickory, *Carya*  
*glabra*, 66, 100, 102  
 Pin oak, *Quercus palustris*, 66, 90  
 Pink lady's slipper, *Cypripedium*  
*acaulis*, 88  
 Pitcher plant, *Sarracenia* spp., 82, 83  
 Poison sumac, *Rhus vernix*, 80, 82  
 Pondweed, *Potamogeton* spp., 28, 73  
 Poplar, *Populus* spp., 90  
 Prairie cord grass, *Spartina*  
*pectinata*, 61, 78  
 Prairie dropseed, *Sporobolus*  
*heterolepis*, 61  
 Pumpkin ash, *Fraxinus profunda*, 90  
 Purple loosestrife, *Lythrum salicaria*, 75  
 Purple trillium, *Trillium erectum*, 97  
 Fussy willow, *Salix discolor*, 80  
  
 Quaking aspen, *Populus*  
*tremuloides*, 90  
 Queen Anne's lace, *Daucus carota*, 59  
  
 Red ash, *Fraxinus*  
*pennsylvanica*, 88, 96  
 Redbud, *Cercis canadensis*, 93  
 Red maple, *Acer rubrum*, 88, 100  
 Red oak, *Quercus rubra*, 85, 93, 96, 100  
 Red-osier dogwood, *Cornus*  
*stolonifera*, 80  
 Red pine, *Pinus resinosa*, 66  
 Redhead grass, *Potamogeton*  
*richardsonii*, 28  
 Reed canary grass, *Phalaris*  
*arundinacea*, 78  
 Richardson's sedge, *Carex*  
*richardsonii*, 80  
 Riddell's goldenrod, *Solidago*  
*riddellii*, 66, 81  
 Riverbank grape, *Vitis riparia*, 93  
 Rose pogonia, *Pogonia*  
*ophiogyssoides*, 68  
 Rough blazing star,  
*Liatris aspera*, 66, 102  
 Rue anemone, *Anemone*  
*thalictroides*, 100  
  
 Sand milkweed, *Asclepias*  
*amplexicaulis*, 102  
 Sassafras, *Sassafras*  
*albidum*, 84, 98, 100  
 Scarlet oak, *Quercus coccinea*, 100  
 Sedge, *Carex* spp., 82  
 Shagbark hickory, *Carya ovata*, 96, 102  
 Shrubby cinquefoil, *Potentilla*  
*fruticosa*, 80  
 Shumard oak, *Quercus shumardii*, 92  
 Silver maple, *Acer*  
*saccharinum*, 88, 90, 93  
 Skunk cabbage, *Symplocarpus*  
*foetidus*, 82, 93

Slippery elm, *Ulmus rubra*, 82  
 Small cranberry, *Vaccinium*  
*oxycoccos*, 82  
 Small green wood-orchid,  
*Platanthera clavellata*, 88  
 Small white lady's-slippers,  
*Cypripedium candidum*, 60  
 Smooth aster, *Aster laevis*, 61  
 Sphagnum moss, *Sphagnum* spp., 82  
 Spicebush, *Lindera bezornii*, 88  
 Spotted knapweed,  
*Centaurea maculosa*, 59, 102  
 Spring cress, *Cardamine bulbosa*, 94  
 Stiff goldenrod, *Solidago rigida* spp.  
 Glabrata, 102, 103  
 Sugar maple, *Acer*  
*saccharum*, 85, 87, 96, 100, 104  
 Sullivant's milkweed,  
*Asclepias sullivantii*, 60  
 Sundew, *Drosera* spp., 82, 83  
 Swamp cottonwood,  
*Populus heterophylla*, 92  
 Swamp milkweed, *Asclepias*  
*incarnata*, 78, 79  
 Swamp rose mallow,  
*Hibiscus moscheutos*, 43  
 Swamp thistle, *Cirsium muticum*, 78  
 Swamp white oak, *Quercus*  
*bicolor*, 66, 82, 90  
 Switch grass, *Panicum virgatum*, 61  
 Sycamore, *Platanus occidentalis*, 90, 93  
  
 Tall sunflower, *Helianthus giganteus*, 61  
 Tall water parsnip, *Stum suave*, 73  
 Tamarack, *Larix*  
*laricina*, 48, 80, 82, 88, 89  
 Tatarian honeysuckle, *Lonicera*  
*tatarica*, 99  
 Tickseed, *Coreopsis lanceolata*, 66  
 Touch-me-not, *Impatiens capensis*, 94  
 Trout lily, *Erythronium americanum*, 97  
 Tuliptree, *Liriodendron tulipifera*, 96  
 Tussock sedge, *Carex stricta*, 78, 80  
 Twigrush, *Cladium mariscoides*,  
 Virginia creeper, *Parthenocissus*  
*quinquefolia*, 86  
  
 Walnut, *Juglans* spp., 104  
 Waterweed, *Elodea canadensis*, 28  
 Water stargrass, *Heteranthera dubia*, 28  
 White ash, *Fraxinus americana*, 100  
 White cedar, *Thuja occidentalis*, 82, 88  
 White lady's slipper orchid,  
*Cypripedium candidum*, 60  
 White oak, *Quercus*  
*alba*, 48, 66, 87, 93, 96, 100, 102  
 White pine, *Pinus strobus*, 66, 82, 98  
 White prairie gentian, *Gentiana*  
*alba*, 70  
 White water lily, *Nymphaea*  
*tuberosa*, 73  
 Whorled pogonia, *Isotria*  
*verticillata*, 88  
 Wicket spike rush, *Eleocharis*  
*rostellata*, 80  
 Wild celery, *Vallisneria*  
*americana*, 28  
 Wild columbine, *Aquilegia*  
*canadensis*, 97  
 Wild geranium, *Geranium*  
*maculatum*, 93, 97  
 Wild ginger, *Asarum*  
*canadense*, 93  
  
 Wild lupine, *Lupinus*  
*perennis*, 66, 67, 102  
 Wild plum, *Prunus americana*, 66  
 Wild rice, *Zizania aquatica*, 43, 70  
 Winterberry, *Ilex verticillata*, 66, 88  
 Wintergreen, *Gaultheria*  
*procumbens*, 82

Witch hazel, *Hamamelis virginiana*, 100  
 Wood betony, *Pedicularis*  
*canadensis*, 60  
  
 Yellow birch, *Betula*  
*alleghaniensis*, 88, 90, 96, 98  
 Yellow coneflower, *Ratibida*  
*pinnata*, 60  
 Yellow fringed-orchid,  
*Platanthera ciliaris*, 88  
 Yellow lady's-slipper, *Cypripedium*  
*calceolus*, 79  
 Yellow oak, *Quercus muehlenbergii*, 48  
 Yellow star-grass, *Hypoxis hirsuta*, 60  
  
**Animals**  
 Alewife, *Alosa pseudoharengus*, 34  
 American badger, *Taxidea taxus*, 68  
 American bittern, *Botaurus*  
*lentiginosus*, 78  
 American kestrel, *Falco*  
*sparverius*, 63, 68  
 American widgeon, *Anas*  
*americana*, 46  
 Acadian flycatcher, *Empidonax*  
*virescens*, 87  
 Arrow clubtail, *Stylurus spiniceps*, 77  
  
 Bald eagle, *Haliaeetus*  
*leucocephalus*, 24, 27, 37, 41, 51,  
 53, 104, 115  
 Beaver, *Castor canadensis*, 24, 48, 92  
 Black bear, *Ursus americanus*, 4, 104  
 Black bullhead, *Ameiurus melas*, 34  
 Black capped chickadee,  
*Poecile atricapilla*, 92  
 Black crappie, *Pomoxis*  
*nigromaculatus*, 36  
 Black duck, *Anas rubripes*, 46, 55  
 Black redhorse, *Moxostoma*  
*duquesnei*, 36  
 Black saddlebags, *Tramea lacerata*, 76  
 Black tern, *Chlidonias niger*, 45  
 Blanchard's cricket frog, *Acris*  
*crepitans blanchardi*, 80  
 Eurasian water milfoil,  
*Myriophyllum spicatum*, 113  
 European starling, *Sturnus vulgaris*, 68  
 Eyed brown, *Satyrodes eurydice*, 78  
  
 Fawn darner, *Boyeria vinosa*,  
 Five-lined skink, *Eumeces fasciatus*, 99  
 Freshwater drum, *Aplodinotus*  
*grunniens*, 34  
 Hickorynut, *Obovarea olivaria*, 31  
  
 Mudpuppy mussel,  
*Simpsoniias ambigua*, 31  
  
 Northern riffleshell,  
*Epioblasma torulosa rangiana*, 29, 31  
 Broad-winged hawk,  
*Buteo platypterus*, 53, 55  
 Brown bullhead, *Ameiurus*  
*nebulosus*, 34  
 Brown-headed cowbird,  
*Molothrus ater*, 54  
 Brown thrasher, *Toxostoma rufum*, 68  
 Brown trout, *Salmo trutta*, 34  
 Buffalo, *Bison bison*, 4, 63, 66, 104  
 Bullhead, *Bucephala albeola*, 46  
 Bluffleg, *Rana catesbeiana*, 27  
 Burrowing mayfly, *Hexagenia* spp., 29  
 Butler's garter snake,  
*Thamnophis butleri*, 64, 92  
  
 Canada goose, *Branta*  
*canadensis*, 46, 47, 123  
 Carvesback duck,  
*Aythya valisineria*, 28, 46  
 Cardinal, *Cardinalis cardinalis*, 124  
 Cecropia moth, *Hyalophora*  
*cecropia*, 103

Cerulean warbler, *Dendronica*  
*cerulea*, 95  
 Channel catfish, *Ictalurus punctatus*, 34  
 Channel darter, *Percina copelandi*, 36  
 Chinook salmon, *Oncorhynchus*  
*tshawytscha*, 33  
 Chorus frog, *Pseudacris* spp., 73  
 Coho salmon, *Oncorhynchus*  
*kisutch*, 34  
 Common carp, *Cyprinus carpio*, 34  
 Common goldeneye,  
*Bucephala clangula*, 46  
 Common loon, *Gavia immer*, 51  
 Common tern, *Sterna hirundo*, 37  
 Common whittetail damselfly,  
*Plattania lydia*, 76, 77  
 Cottontail, *Sylvilagus floridanus*, 68, 73,  
 92, 124  
 Cormorant, *Phalacrocorax auritus*, 27  
 Coyote, *Canis latrans*, 37, 66  
  
 Duke's skipper, *Euphyes dukesi*, 63, 78  
  
 Eastern bluebird, *Sialia sialis*, 63, 66, 68  
 Eastern fox snake, *Elaphe*  
*vulpina gloydi*, 44, 64  
 Eastern fox squirrel, *Sciurus niger*, 68  
 Eastern Massasauga rattlesnake,  
*Sistrurus catenatus*,  
*catenatus*, 64, 78, 81, 88  
 Eastern meadowlark,  
*Sturnella magna*, 62  
 Eastern pondhawk,  
*Erythemis simplicicollis*, 77  
 Eastern red damselfly,  
*Amphigriorh saccium*, 76  
 Eastern sand darter,  
*Ammocrypta pellucida*, 36  
 Eastern screech owl, *Otus asio*, 99  
 Eastern spiny softshell,  
*Apalone spinifer spinifer*, 44  
 Elk, *Cervus elaphus*, 4, 104  
 Emerald shiner, *Notropis*  
*airhenoides*, 27  
 Eurasian water milfoil,  
*Myriophyllum spicatum*, 113  
 European starling, *Sturnus vulgaris*, 68  
 Eyed brown, *Satyrodes eurydice*, 78  
  
 Fawn darner, *Boyeria vinosa*,  
 Five-lined skink, *Eumeces fasciatus*, 99  
 Freshwater drum, *Aplodinotus*  
*grunniens*, 34  
 Hickorynut, *Obovarea olivaria*, 31  
  
 Mudpuppy mussel,  
*Simpsoniias ambigua*, 31  
  
 Northern riffleshell,  
*Epioblasma torulosa rangiana*, 29, 31  
 Broad-winged hawk,  
*Buteo platypterus*, 53, 55  
 Brown bullhead, *Ameiurus*  
*nebulosus*, 34  
 Brown-headed cowbird,  
*Molothrus ater*, 54  
 Brown thrasher, *Toxostoma rufum*, 68  
 Brown trout, *Salmo trutta*, 34  
 Buffalo, *Bison bison*, 4, 63, 66, 104  
 Bullhead, *Bucephala albeola*, 46  
 Bluffleg, *Rana catesbeiana*, 27  
 Burrowing mayfly, *Hexagenia* spp., 29  
 Butler's garter snake,  
*Thamnophis butleri*, 64, 92  
  
 Canada goose, *Branta*  
*canadensis*, 46, 47, 123  
 Carvesback duck,  
*Aythya valisineria*, 28, 46  
 Cardinal, *Cardinalis cardinalis*, 124  
 Cecropia moth, *Hyalophora*  
*cecropia*, 103

Gadwall, *Anas strepera*, 46  
 Giant reed grass,  
*Phragmites australis*, 51  
 Giant shad, *Dorosoma*  
*capedianum*, 27, 34  
 Grasshopper sparrow,  
*Ammodramus savannarum*, 102  
 Gray catbird, *Dumetella*  
*carolinensis*, 54  
 Gray fox, *Urocyon*  
*cineoerogentus*, 37  
 Gray squirrel, *Sciurus*  
*carolinensis*, 100, 124  
 Great blue heron, *Ardea*  
*herodias*, 26, 51, 75  
 Great egret, *Ardea alba*, 42, 50  
 Greater scaup, *Aythya marila*, 46  
 Green damer, *Anax junius*, 76  
 Green-winged teal, *Anas crecca*, 46  
  
 Henslow's sparrow, *Ammodramus*  
*henslowii*, 62, 102  
 Hooded merganser,  
*Lophodytes cucullatus*, 46  
 House sparrow,  
*Passer domesticus*, 68, 124  
  
 Indigo bunting, *Passerina cyanea*, 68  
  
 Karner blue butterfly,  
*Lycaeides melissa samuelis*, 67, 69  
 Killdeer, *Charadrius vociferans*, 117  
 Killifish, *Fundulus* spp., 34  
 King rail, *Rallus elegans*, 45  
  
 Lake chubsucker, *Erimyzon sucetta*, 36  
 Lake herring, *Coregonus*  
*artedii*, 32, 34, 36  
 Lake sturgeon, *Acipenser*  
*fulvescens*, 32, 33 – 35, 36, 37, 41  
 Lake trout, *Salvelinus*  
*namaycush*, 32, 34,  
 Lake whitefish, *Coregonus*  
*clupeiformis*, 32, 34  
 Larch casebearer,  
*Coleophora laricella*, 89  
 Larch sawfly, *Pristiphora erichsonii*, 89  
 Largemouth bass,  
*Micropterus salmoides*, 33, 34  
 Least bittern, *Icthyophaga exilis*, 45, 50  
 Leopard frog, *Rana pipens*, 72, 73  
 Lesser scaup, *Aythya affinis*, 46  
 Loggerhead shrike,  
*Lanius ludovicianus*, 62, 102  
 Lynx, *Lynx* spp., 4  
  
 Mallard duck, *Anas platyrhynchos*, 46  
 Mayfly, *Hexagenia* spp., 26, 27  
 Meadow vole,  
*Microtus pennsylvanicus*, 55  
 Milkweed beetle, *Tetraopes*  
*tetraopthalmus*, 103  
 Mink, *Mustela vison*, 73, 74, 75, 92  
 Mitchell's satyr, *Neonympha*  
*mitchelli*, 81, 88  
 Monarch butterfly,  
*Danaus plexipopus*, 54, 81  
 Mooneye, *Hiodon tergisus*, 36  
 Moose, *Alces alces*, 4  
 Mullberry wing butterfly,  
*Poanes massasoit*, 78  
 Muskellunge, *Esox*  
*masquinongy*, 4, 27, 31, 33, 34  
 Muskrat, *Ondatra*  
*zibethicus*, 29, 37, 48, 73, 92  
 Mute swan, *Cygnus olor*, 46, 47  
  
 Northern brook lamprey,  
*Ichthyomyzon fossor*, 36  
 Northern flicker, *Colaptes auratus*, 124  
 Northern madtom, *Noturus*  
*stigmaeus*, 36  
 Northern harrier, *Circus cyaneus*, 55, 78

Northern pike, *Esox lucius*, 27, 31, 33, 34  
 Northern pintail, *Anas acuta*, 46  
 Northern shoveler, *Anas clypeata*, 46  
 Northern water snake,  
*Nerodia sipedon*, 73  
 Nuthatch, *Sitta* spp., 92  
  
 Osprey, *Pandion haliaetus*, 27, 37  
 Ovenbird, *Seiurus aurocapillus*, 87  
  
 Painted turtle, *Chrysemys picta*, 27  
 Passenger pigeon,  
*Ectopistes migratorius*, 98  
 Peregrine falcon, *Falco peregrinus*, 125  
 Praying mantis, *Stagmomantis*  
*carolina*, 103  
 Pugnose minnow,  
*Oporospeoed emiliae*, 36, 41  
 Pugnose shiner, *Notropis anogenus*, 36  
 Pumpkinseed, *Lepomis gibbosus*, 33  
  
 Raccoon, *Procyon*  
*lotor*, 27, 37, 44, 73, 92, 124  
 Rainbow trout, *Oncorhynchus*  
*mykiss*, 33, 34  
 Rainbow smelt, *Osmerus mordax*, 34  
 Red fox, *Vulpes vulpes*, 68, 75, 124  
 Red-breasted merganser,  
*Mergus serrator*, 46  
 Redhead, *Aythya americana*, 46, 55  
 Redheaded woodpecker, *Melanerpes*  
*erythrocephalus*, 98  
 Red-shouldered hawk,  
*Buteo lineatus*, 95  
 Residue dace, *Clinostomus*  
*elongatus*, 40, 41  
 Red-tailed hawk,  
*Buteo jamaicensis*, 101  
 Red-winged blackbird,  
*Agelaius phoeniceus*, 75  
 Ribbon snake, *Thamnophis*  
*sauritus*, 73  
 Ring-necked duck, *Aythya collaris*, 46  
 River otter, *Lontra canadensis*, 29, 48  
 River hordesee, *Moxostoma*  
*carinatum*, 36  
 Rock bass, *Ambloplites rupestris*, 34  
 Rose-breasted grosbeak,  
*Peucaeus ludovicianus*, 54  
 Round goby, *Neogobius*  
*melanostomus*, 34, 35, 113  
 Ruddy duck, *Oxyura jamaicensis*, 46  
  
 Salmon, *Oncorhynchus* spp., 33  
 Sauger, *Stizostedion canadense*, 32, 36  
 Scarlet tanager,  
*Piranga olivacea*, 87, 95  
 Sea lamprey, *Petromyzon*  
*marinus*, 104, 113  
 Sedge wren, *Cistothorus*  
*platensis*, 78, 79  
 Semi-palmated sandpiper,  
*Calidris pusilla*, 54  
 Sharp-shinned hawk,  
*Accipiter striatus*, 55, 68  
 Short-billed dowitcher,  
*Limnodromus griseus*, 54  
 Short-eared owl, *Asio flammeus*, 78  
 Silver chub, *Hybopsis storelana*, 36  
 Silver shiner, *Notropis*  
*potogenis*, 40, 41  
 Smallmouth bass, *Micropterus*  
*dolomieu*, 4, 33, 34  
 Snapping turtle, *Chelydra*  
*serpentina*, 73  
 Snow goose, *Chen caerulescens*, 46  
 Snowy owl, *Nyctea scandiaca*, 55  
 Song sparrow, *Melospiza melodia*, 124  
 Southern flying squirrel,  
*Glaucomys volans*, 98  
 Spotted gar, *Lepisosteus oculatus*, 36  
 Spotted salamander,  
*Ambystoma* spp., 91