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.



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

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



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

AFTERWARD

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.

At DTE Energy we believe 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 illustrated through the stewardship activities we sponsor. And 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.

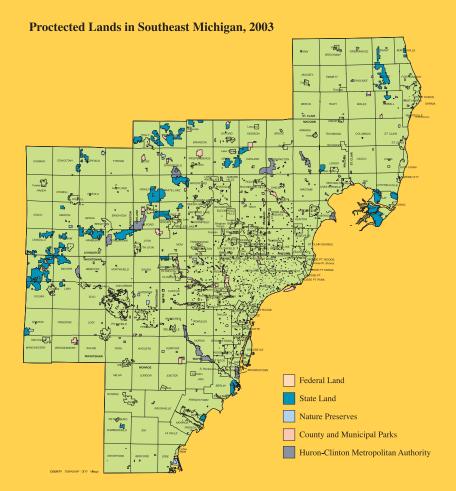
DTE Energy established the St. Clair River Waterways for Wildlife Project in 1995, with the guidance of the Wildlife Habitat Council. That partnership joined businesses, municipalities, state and provincial agencies and individuals from both sides of the St. Clair River in a common goal of enhancing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

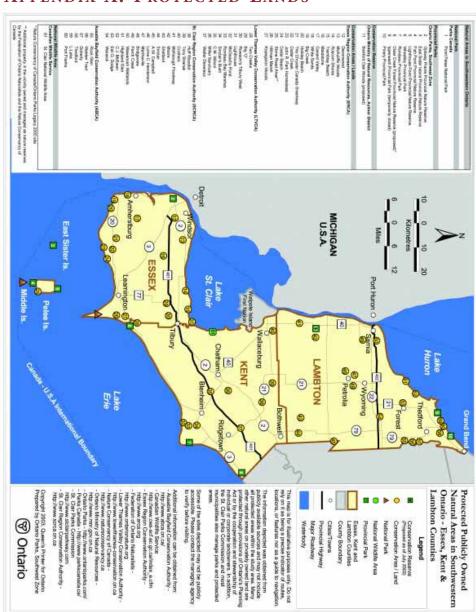
APPENDIX A: PROTECTED LANDS



SEMCOG

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APPENDIX A: PROTECTED LANDS



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. Species listed 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.

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

SPECIES AT RISK PROJECT ONTARIO PARKS 300 Water Street

Http://www.cosweic.gc.ca

Peterborough, ON K9J 8M5 Http://www.mnr.gov.ca

Natural Heritage Information Centre Science and Information Branch Ontario Ministry of Natural Resources P.O. Box 7000

Ontario Ministry of Natural Resources P.O. Box 7000 Peterborough, Ontario K9J 8M5 Canada www.mnr.gov.on.ca/MNR/nhic/nhic.cfm

UNITED STATES

U.S. FISH AND WILDLIFE SERVICE
Bisphop 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/

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/

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.
- Breeding, refers to the breeding population
- 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
- G? Unranked, or if following a ranking, the rank
- is tentatively assigned T Denotes the rank applies to a subspecies

Endangered, Threatened and Special Cocern 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	GRANK	COMMON NAME	SCIENTIFIC NAME	MI	ON US	CA	SRANK MI	SRANK ON	GRANK
Mollusks									Pugnose minnow	Notropis emiliae	EN	SC	SC	S1	S2	G5
Purple wartyback	Cyclonaias tuberculata	SC				S2S3	S3	G5	Silver shiner	Notropis photogenis	EN	SC	SC	S1	S2S3	G5
White catspaw	Epioblasma obliquata								Brindled madtom	Noturus miurus	SC			S2S3	S2	G5
	perobliqua	EN	EN	EN		SH		G1T1	Northern madtom	Noturus stigmosus	EN	SC	SC	S1	S1S2	G3
Northern riffleshell	Epioblasma torulosa								Channel darter	Percina copelandi	EN	T	T	S1S2	S2	G4
	rangiana	EN	EN	EN	EN	S1	S1	G2T2	River darter	Percina shumardi	EN			S1	S3	G5
Snuffbox	Epioblasma triquetra	EN	EN		EN	S1	S1	G3	Southern redbelly dace	Phoxinus erthyrogaster	EN			S1		G5
Wavy-rayed lamp mussel	Lampsilis fasciola	T	EN		EN	S2	S1	G4	Sauger	Stizostedion canadense	T			S1	S4	G5
Hickorynut	Obovaria olivaria	SC				S2	S1	G4								
Round hickorynut	Obovaria subrotunda	EN	EN			S1	S1	G4	Insects							
Round pigtoe	Pleurobema sintoxia	SC				S2S3	S2S3	G4	Dusted skipper	Atrytonopsis hianna	T			S2S3	S1	G4G5
Mudpuppy mussel	Simpsonaias ambigua	EN	EN		EN	S1	S1	G3	Pipevine swallowtail	Battus philenor	SC			S1S2	S2B	G5
Purple lilliput	Toxolasma lividus	EN				S1		G2	Swamp metalmark	Calephelis mutica	SC			S1S2		G3G4
Rayed bean	Villosa fabalis	EN	EN		EN	S1	S1	G1G2	Frosted Elfin	Callophrys irus	T			S2S3	SX	G3
Rainbow	Villosa iris	SC				S2S3	S2S3	G5	Monarch butterfly	Danaus plexippus		SC	SC	S5	S5	G4
									Wild indigo duskywing	Erynnis baptisiae	SC			S2S3	S1	G5
Fish									Persius duskywing	Erynnis persius persius	T	EXT		S3	SX	G5T2T3
Lake sturgeon	Acipenser fulvescens	T				S2	S3	G3G4	Duke's skipper	Euphyes dukesi	T			S1	S2	G3
Eastern sand darter	Ammocrypta pellucida	T	T		T	S1S2	S2	G3	Leafhopper	Flexamia delongi	SC			S1S2		G?
Redside dace	Clinostomus elongatus	EN	SC		SC	S1S2	S3	G4	Huron river leafhopper	Flexamia huroni	SC			S1		G?
Lake herring	Coregonus artedi	T				S3	S5	G5	Leafhopper	Flexamia reflexa	SC			S1		G?
Creek chubsucker	Erimyzon oblongus	EN				S1S2		G5	Russet-tipped clubtail	Gomphus plagiatus	SC			S1S2	SH	G5
Lake chubsucker	Erimyzon sucetta		T		T	S4	S2	G5	Barrens buckmoth	Hemileuca maia	SC			S2S3		G5
Greenside darter	Etheostoma blennioides		SC		SC	S4	S4	G5	Karner blue butterfly	Lycaeides melissa						
Mooneye	Hiodon tergisus	T				S2	S4	G5		samuelis	T	EN		S2	SX	G5T2
Silver chub	Hybopsis storeiana	SC	SC		SC	S2S3	S2	G5	Mitchell's satyr butterfly	Neonympha mitchelli	EN			S1		G1G2
Northern brook lamprey	Ichthyomyzon fossor		SC		SC	S4	S3	G4	American burying beetle	Nicrophorus americanus	EN	EN		SH	SH	G2G3
Bigmouth buffalo	Ictiobus cyprinellus		SC		SC	S3	SU	G5	Powesheik skipperling	Oarisma powesheik	Τ			S1S2		G2
Spotted gar	Lepisosteus oculatus	SC	T		T	S2S3	S2	G5	Tamarack tree cricket	Oecanthus laricis	SC			S1S2		G1G2
Spotted sucker	Minytrema melanops		SC		SC	S3	S2	G5	Pine tree cricket	Oecanthus pini	SC			S1S2	S1	G?
River redhorse	Moxostoma carinatum	T	SC		SC	S1	S2	G4	Blazing star borer moth	Papaipema beeriana	SC			S1S2		G3
Black redhorse	Moxostoma duquesnei		T		T	S3	S2	G5	Maritime sunflower borer	Papaipema maritima	SC			S1S2		G4
Pugnose shiner	Notropis anogenus	SC	SC		SC	S3	S2	G3	Culver's root borer moth	Papaipema sciata	SC			S2S3		G3G4
Bridle shiner	Notropis bifrenatus		SC		SC		S2	G5	Silphium borer moth	Papaipema silphii	T			S1S2		G3G4

COMMON NAME	SCIENTIFIC NAME	МІ	ON	US (SRANK	GRANK	COMMON NAME	SCIENTIFIC NAME	MI	ON	US	CA		SRANK	GRANK
Regal fern borer	Papaipema speciosissim	200				MI S2S3	ON	G4	Louisiana waterthrush	Seiurus motacilla		SC		SC	MI S2S3	ON S3B	G5
Red-legged spittlebug	Prosapia ignipectus	SC					S1?	G4	Caspian tern	Sterna caspia	Т	36		36	S233	S3B	G5
Regal fritillary	Speyeria idalia	EN	EXT			SH	31!	G3	Forster's tern	Sterna forsteri	SC				S2	S2S3B	G5
negarmunary	Speyeria iualia	LIV	LAI		,	011		us	Common tern	Sterna hirundo	T				S2	S4B	G5
Amphibians									Western Meadowlark	Sturnella neglecta	SC				S4	S4B	G5
Smallmouth salamander	Ambystoma texanum	FN	SC		SC S	S1	S1	G5	Barn Owl	Tyto alba	EN	EN		EN	S1	S1	G5
Blanchard's cricket frog	Acris crepitans	LIV	36		36 (01	31	UJ	Hooded warbler	Wilsonia citrina	SC	T		T	S3	S3B	G5
Dianchard S Chicket Hog	blanchardii	SC	EN			S2S3	SH	G5T5	House warbler	vviisonia ciuma	30				33	330	u J
Fowler's toad	Bufo fowleri	00	T	-		S5	S2	G5	Mammals								
Five-lined skink	Fumeces fasciatus		SC			S4	S3	G5	Least shrew	Cryptotis parva	Т	EXT			S1S2	SH	G5
TIVE IIIICU SKIIIK	Lumeces rasciatas		00		00 0	01	00	03	Southern flying squirrel	Glaucomys volans	•	SC		SC	S5	S3	G5
Reptiles									Woodland vole	Microtus pinetorum	SC	SC		SC	S3S4	S3	G5
	Apalone spinifera								Indiana hat	Myotis sodalis	EN	-	EN	00	S1	00	G2
Education opiny dollarion	spinifera		Т		Г		S3	G5T5	Fastern mole	Scalopus aquaticus		SC		SC	S5	S2	G5
Spotted turtle	Clemmys guttata	Т	SC			S2	S3	G5	American badger	Taxidea taxus		EN		EN	S4	S2	G5
Kirtland's snake	Clonophis kirtlandii	FN				S1		G2								-	
Blue racer	Coluber constrictor		EN			S5	S1	G5	Plants								
Black rat snake	Elaphe obsoleta obsoleta	s SC	T			S3	S3	G5T5	Climbing fumitory	Adlumia fungosa	SC				S3	S4	G4
Eastern fox snake	Elaphe vulpina gloydi	T	T			S2		G5T3	Gattinger's agalinis	Agalinis gattingeri	EN	EN		EN	S1	S2	G4
Blanding's turtle	Emydoidea blandingii	SC				S3	S3?	G4	Skinner's agalinis	Agalinis skinneriana	EN	EN		EN	S1	S1	G3
Northern map turtle	Graptemys geographica		S5	S4				G5	Colic root	Aletris farinosa		T		T	?	S2	G5
Milk snake	Lampropeltis triangulum	-	SC	٥.		S5	S4	G5	Lake cress	Armoracia lacustris	Т				S2	S3	G4
Copperbelly water snake	Nerodia erthyrogaster						٠.	30	Leadplant	Amorpha canescens	SC				S3	SH	G5
	neglecta	EN		Т		S1		G5T2T3	Hairy angelica	Angelica venenosa	SC				S3	SR	G5
Lake Erie water snake	Nerodia sipedon insularu		EN	-	EN		S2	G5T2	Missouri rock cress	Arabis missouriensis							
Queen snake	Regina septemvittata		T			S4	S2	G5	Wildow Trook Groot	var deamii	SC				S2		G5
Eastern massasauga	Sistrurus catenatus						02	00	Three-awned grass	Aristida longespica	T				S2	S2	G5
	catenatus	SC	Т		г :	S3S4	S3 G:	3G4T3T4	Virginia snakeroot		T				S2	-	G4
Eastern box turtle	Terrapenne carolina								Sullivants milkweed	Asclepias sullivantii	T				S2	S2	G5
Edotom box tartio	carolina	SC				S2S3	SE1	G5T5	Purple milkweed	Asclepias purpurascens					S3	S2	G5
Butler's garter Snake	Thamnophis butleri		Т	-		S4	S2	G4	Tall green milkweed	Asclepias hirtella	T				S2	S1	G5
Dation organism chance	mannopnio bation						02	0.	Crooked stem aster	Aster prenanthoides	T	Т			?	S2	G4G5
Birds									White wood aster	Aster divaricatus		Т			SR	S1	G5
Cooper's hawk	Accipiter cooperii	SC				S3S4	S4B	G5	Canadian milk-vetch	Astragalus canadensis	Т	÷			S1S2	S4	G5
Northern goshawk	Accipiter gentilis	SC		-		S3	S4	G5	Cooper's milk-vetch	Astragalus neglectus	SC				S3	S3	G4
Henslow's sparrow	Ammodramus henslowii		EN			S2S3	S1B	G4	Prairie indigo	Baptisia alba	SC				SR	SR	G5
Short-eared owl	Asio flammeus	EN	SC			S1	S3S4B	G5	Slough grass	Beckmannia syzigachne					S2	S4	G5
Long-eared owl	Asio otus	T	-			S2	S4	G5	Murray birch	Betula murrayana	SC				S1		G1Q
American bittern	Botaurus lentiginosus	SC				S3S4	S4B	G4	Side-oats grama grass		T				S1S2	S2	G5
Red-shouldered hawk	Buteo lineatus	Т	SC			S3S4	S4B	G5	Bluehearts	Buchnera americana		EN		EN	SX	S1	G5
Black tern	Chlidonias niger	SC				S3	S3B	G4	Large water-starwort	Callitriche heterophylla	Т				S1	S2	G5
Northern harrier	Circus cyaneus	SC				S3	S4B	G5	Wild-hyacinth	Camassia scilloides	T	Т		Т	S2	S2	G4G5
Marsh Wren	Cistothorus palustris	SC					S5B	G5	Raven's foot sedge	Carex crus-corvi	Т				SH	S1	G5
Northern bobwhite quail	Colinus virginianus		EN			S4	S1S2	G5	Davis's sedge	Carex davisii	SC				S3	S2	G4
Yellow rail	Coturnicops								Fescue sedge	Carex festucacea	SC				S1	S1	G5
	noveboracensis	Т	SC		SC S	S1S2	S4B	G4	Frank's sedge	Carex frankii	SC				S2S3	S2	G5
Cerulean warbler	Dendroica cerulea	SC	SC		SC S	S3	S3B	G4	False hop sedge	Carex lupuliformis	Т	EN		EN	S2	S1	G4
Acadian flycatcher	Empidonax virescens		EN			S3S4	S2B	G5	Broad-leaved sedge	Carex platyphylla	T				S1	S5	G5
Merlin	Falco columbarius	Т					S4B	G5	Richardson's sedge	Carex richardsonii	SC				S3S4	S4	G4
Peregrine falcon	Falco peregrinus	EN	Т			S1	S2S3B	G4	Weak stellate sedge	Carex seorsa	T				S2	S2	G4
Common moorhen	Gallinula chloropus	SC				S3	S4B	G5	Squarrose sedge	Carex squarrosa	SC				S1	S2	G4G5
Common Ioon	Gavia immer	T				S3S4	S4B	G5	Hairy-fruited sedge	Carex trichocarpa	SC				S2	S3	G4
OUIIIIIUII IUUII		т	EN	T		S4	S4B	G4	American chestnut	Castanea dentata	Е	Т		Т	S1S2	S3	G4
	Haliaeetus leucophalus								Dwarf hackberry	Celtis tenuifolia	SC			SC	S3	S2	G5
Bald eagle Eastern yellow-breasted	Haliaeetus leucophalus								DWall Hackbelly	ocitis tenunona	00						
Bald eagle	Icteria virens virens		SC		SC S	S3	S2S3B	G5	Purple turtlehead	Chelone obliqua	E				S1		G4
Bald eagle Eastern yellow-breasted chat		T				S3 S2	S2S3B S3B	G5 G5								S3	G4 G3
Bald eagle Eastern yellow-breasted	Icteria virens virens		SC	:	Г :				Purple turtlehead	Chelone obliqua	E				S1	S3	
Bald eagle Eastern yellow-breasted chat Least bittern Loggerhead shrike	Icteria virens virens Ixobrychus exilis	T	SC T	:	Г :	S2	S3B	G5	Purple turtlehead Hill's thistle	Chelone obliqua Cirsium hillii	E SC				S1 S3	S3 SH	G3
Bald eagle Eastern yellow-breasted chat Least bittern	Icteria virens virens Ixobrychus exilis Lanius Iudovicianus	T	SC T	;	EN S	S2 S?	S3B	G5	Purple turtlehead Hill's thistle Dodder	Chelone obliqua Cirsium hillii Cuscuta indecora	SC SC				S1 S3 SH		G3 G5
Bald eagle Eastern yellow-breasted chat Least bittern Loggerhead shrike	Icteria virens virens Ixobrychus exilis Lanius Iudovicianus Melanerpes	T	SC T EN	;	EN S	S2 S?	S3B S2B	G5 G4	Purple turtlehead Hill's thistle Dodder Knotweed dodder	Chelone obliqua Cirsium hillii Cuscuta indecora Cuscuta polygonorum	SC SC SC				S1 S3 SH S2	SH	G3 G5 G5
Bald eagle Eastern yellow-breasted chat Least bittern Loggerhead shrike Red-headed woodpecker	Icteria virens virens Ixobrychus exilis Lanius Iudovicianus Melanerpes	T	SC T EN	;	EN S	\$2 \$? \$5	S3B S2B	G5 G4	Purple turtlehead Hill's thistle Dodder Knotweed dodder Yellow nut-grass	Chelone obliqua Cirsium hillii Cuscuta indecora Cuscuta polygonorum	SC SC SC	EN			S1 S3 SH S2	SH	G3 G5 G5
Bald eagle Eastern yellow-breasted chat Least bittern Loggerhead shrike Red-headed woodpecker Black-crowned	Icteria virens virens Ixobrychus exilis Lanius Iudovicianus Melanerpes erythrocephalus	T EN	SC T EN	;	EN S	\$2 \$? \$5	\$3B \$2B \$3B	G5 G4 G5	Purple turtlehead Hill's thistle Dodder Knotweed dodder Yellow nut-grass Small white flowered	Chelone obliqua Cirsium hillii Cuscuta indecora Cuscuta polygonorum Cyperus flavescens	SC SC SC SC	EN			\$1 \$3 \$H \$2 \$2\$3	SH S2	G3 G5 G5 G5
Bald eagle Eastern yellow-breasted chat Least bittern Loggerhead shrike Red-headed woodpecker Black-crowned night heron	Icteria virens virens Icobrychus exilis Lanius Iudovicianus Melanerpes erythrocephalus Nycticorax nycticorax	T EN	SC T EN	;	EN S	\$2 \$? \$5 \$2\$3	\$3B \$2B \$3B	G5 G4 G5	Purple turtlehead Hill's thistle Dodder Knotweed dodder Yellow nut-grass Small white flowered lady's slipper	Chelone obliqua Cirsium hillii Cuscuta indecora Cuscuta polygonorum Cyperus flavescens Cypripedium candidum	SC SC SC	EN			\$1 \$3 \$H \$2 \$2\$3	SH S2	G3 G5 G5 G5
Bald eagle Eastern yellow-breasted chat Least bittern Loggerhead shrike Red-headed woodpecker Black-crowned night heron Osprey	Icteria virens virens Icobrychus exilis Lanius Iudovicianus Melanerpes erythrocephalus Nycticorax nycticorax Pandion haliaetus	T EN SC T	SC T EN	;	EN S	\$2 \$? \$5 \$2\$3 \$4	\$3B \$2B \$3B \$3B \$3B	G5 G4 G5 G5 G5	Purple turtlehead Hill's thistle Dodder Knotweed dodder Yellow nut-grass Small white flowered lady's slipper Ram's head lady slipper	Chelone obliqua Cirsium hillii Cuscuta indecora Cuscuta polygonorum Cyperus flavescens Cypripedium candidum Cypripedium arietinum	E SC SC SC SC T	EN			\$1 \$3 \$H \$2 \$2\$3 \$2\$3	SH S2 S1 S3	G3 G5 G5 G5 G4 G3
Bald eagle Eastern yellow-breasted chat Least bittern Loggerhead shrike Red-headed woodpecker Black-crowned night heron Osprey Wilson's phalarope	Icteria virens virens Ixobrychus exilis Lanius Iudovicianus Melanerpes erythrocephalus Nycticorax nycticorax Pandion haliaetus Phalaropus tricolor	T EN SC T	SC T EN SC	:	EN :	\$2 \$? \$5 \$5 \$2\$3 \$4 (N)	\$3B \$2B \$3B \$3B \$4B \$3B	G5 G4 G5 G5 G5 G5	Purple turtlehead Hill's thistle Dodder Knotweed dodder Yellow nut-grass Small white flowered lady's slipper Ram's head lady slipper Large toothwort	Chelone obliqua Cirsium hillii Cuscuta indecora Cuscuta polygonorum Cyperus flavescens Cypripedium candidum Cypripedium arietinum Dentaria maxima	E SC SC SC SC T T	EN			\$1 \$3 \$H \$2 \$2\$3 \$2 \$3 \$1\$2	SH S2 S1 S3	G3 G5 G5 G5 G4 G3 G5Q

COMMON NAME	SCIENTIFIC NAME	MI	ON	US C	A SRANI MI	SRANK ON	GRANK	COMMON NAME	SCIENTIFIC NAME	MI	ON	US (A SRANK MI	SRANK ON	GRA
Purple coneflower	Echinacea purpurea	EXT			SX	SE1	G4	Violet wood-sorrel	Oxalis violacea	Т			S 1		G5
Spike-rush	Eleocharis geniculata	T			S?	S1	G5	Ginseng	Panax quinquefolius	T	EN	E	N S2S3	S2	G3G
Engelmann's spike rush	Eleocharis engelmannii	SC			S2S3	S1	G4G5Q	Leiberg's panic grass	Panicum leibergii	T			S2	S2	G5
Horsetail spikerush	Eleocharis equisetoides	SC	EN	E	N S3	S1	G4	Small fruited panic grass	Panicum microcarpon	SC			S2	S2	G5T
Spike-rush	Eleocharis radicans	EXT			SX		G5	Low-forked chickweed	Paronychia fastigiata	SC			SH	S1	G5T
Love grass	Eragrostis capillaris	SC			SH	S1	G5	Smooth beardtongue	Penstemon calycosus	Т			S2	SE1	G5
Small love grass	Eragrostis pilosa	SC			SH	SE1	G4	Pale beard tongue	Penstemon pallidus	SC			S3	SE1	G5
Wahoo	Euonymous atropurpured	us	SC			S3	S3 G5	Wild bean	Phaseolus polystachios	SC			SH		G4
Upland boneset	Eupatorium sessilifolium				S1		G5	Heart-leaved plantain	Plantago cordata	EN	EN	F	N S1	S1	G4
Tinted spurge	Euphorbia commutata	Т			S1	S1	G5	Orange fringed orchid	Platanthera ciliaris	T			S2	SX	G5
Chestnut sedge	Fimbristylis puberula	EXT			SX	S1	G5	Eastern prairie fringed	Tiatanaicia cinaris	•			U.	O/C	UJ
Blue ash	Fraxinus quadrangulata	LXI	SC	S		S3	G5	orchid	Platanthera leucophaea	FN	SC	TF	N S1	S2	G2
Umbrella-grass	Fuirena squarrosa	Т	00		S2	00	G4G5	Bog bluegrass	Poa paludigena	T	00		S2	02	G3
		T			S2	S4			, ,	T			S2	SEH	G5
Showy orchis	Galearis spectabilis						G5	Jacob's ladder	Polemonium reptans						
Downy gentian	Gentiana puberulenta	EN			S1	SX	G4G5	Cross-leaved milkwort	Polygala cruciata	SC			S3	SX	G5
Stiff gentian	Gentianella quinquefolia				S2	S2	G5	Pink milkwort	Polygala incarnata	EXT	EN	E	N SX	S1	G5
White prairie gentian	Gentiana alba	EN	EN	Е		S1	G4	Honey-flowered	Polygonatum						
Pale avens	Geum virginianum	SC			S1S2	S1	G5	Solomon's seal	biflorum var melleum	EXT			SX	SH	G5
Limestone oak fern	Gymnocarpium							Carey's smartweed	Polygonum careyi	T			S1S2	S3S4	G4
	robertianum	T			S2	S2	G5	Swamp cottonwood	Populus heterophylla	EN			S1		G5
Kentucky coffee-tree	Gymnocladus dioicus	SC	Т		S3S4	S2	G5	Vasey's pondweed	Potamogeton vaseyi	Т			SH	S4	G4
Whiskered sunflower	Helianthus hirsutus	SC			S3	SE1	G5	Sand cinquefoil	Potentilla paradoxa				SU	S3	G5
Downy sunflower	Helianthus mollis	T			S2	SE1	G4G5	Bald rush	Psilocarya scirpoides	т			S2		G4
Dwarf bulrush	Hemicarpha micrantha	SC			S3	S1	G5	Pinedrops	Pterospora andromedea				S2	S2	G5
	Hibiscus laevis	SC			SH	SX	G5				EN	Е		S1	G5
Smooth rose mallow								Hoary mountian mint	Pycnanthemum incanum		EIN	t			
Swamp rose mallow	Hibiscus moscheutos	SC			S3S4	S3	G5	Hairy mountian mint	Pycnanthemum pilosum				S2	S1	G5
Panicled hawkweed	Hieracium paniculatum	SC			S2	S2	G5	Shumard oak	Quercus shumardii	SC	SC	5	C S2	S3	G5
Green violet	Hybanthus concolor	SC			S3	S2	G5	Spearwort	Ranunculus ambigens	T			SH	SR	G4
Goldenseal	Hydrastis canadensis	T	T	T	S2	S2	G4	Prairie buttercup	Ranunculus rhomboideus	T			S2	S3	G5
Gentian-leaved								Meadow-beauty	Rhexia virginica	SC			S3	S3S4	G5
St. John's wort	Hypericum gentianoides	SC			S3	S1	G5	Climbing prairie rose	Rosa setigera		T	5	C S2S3	S3	G5
Round-fruited								Tooth-cup	Rotala ramosior	SC	EN	E	N S3	S1	G5
St. John's wort	Hypericum sphaerocarp	um			S1	S1	G5	Hairy ruellia	Ruellia humilis	T			S1		G5
Small whorled pogonia	Isotria medeoloides		EN	T E		S1	G2	Arrowhead	Sagittaria montevidensis				S1S2		G4
Whorled pogonia	Isotria verticillata	Т	EN		N S2	S1	G5	Canadian burnet	Sanguisorba canadensis				S1		G5
		SC	LIV			S4								Co	
Twinleaf	Jeffersonia diphylla				S3		G5	Clinton's bulrush	Scirpus clintonii	SC			S3	S2	G4
Short fruited rush	Juncus brachycarpus	T			S1S2	S1	G4G5	Tall nut-rush	Scleria triglomerata	SC			S3	S1	G5
Vasey's rush	Juncus vaseyi	T			S1S2	S3	G5?	Few-flowered nut-rush	Scleria pauciflora	EN			S1	S1	G5
Water-willow	Justicia americana	T	T	T	S2	S1	G5	Fire pink	Silene virginica	T			S1	SX	G5
False boneset	Kuhnia eupatorioides	SC			S2		G5	Compass plant	Silphium laciniatum	T			S1S2	S1	G5
Woodland lettuce	Lactuca floridana	T			S2	S2	G5	Cup plant	Silphium perfoliatum	T			S2	S2	G5
Legget's pinweed	Lechea pulchella	T			S1S2	S1	G5	White goldenrod	Solidago bicolor	SC			S3	S4?	G5
Least pinweed	Lechea minor	SC			SH	SX	G5	Riddell's goldenrod	Solidago riddellii		SC	5	C S?	S3	G5
Slender bush clover	Lespedeza virginica		EN	Е		S1	G5	Showy goldenrod	Solidago speciosa		EN		N S?	S1	G5
Cliff conobea	Leucospora multifida	SC	214		S?	S1	G5	Prairie dropseed	Sporobolus heterolepis	SC	214		S3	S3	G5
						01	G5			EXT					
Blazing-star	Liatris squarrosa	EXT	_	Т	SX	S2		Blue-eyed grass	Sisyrinchium hastile	SC			S?	S1 S4	G5 G5
Dense blazing star	Liatris spicata	00	T	- 1			G5	Smooth carrion flower	Smilax herbacea	36			S3		
urrowed flax	Linum sulcatum	SC			S2S3	S3	G5	Round-leaved greenbrier	Smilax rotundifolia		T	1		S2	G5
/irginia flax	Linum virginianum	T			S2	S2	G4G5	Trailing wild bean	Strophostyles helvula	SC			S3	S3	G5
Purple twayblade	Liparis liliifolia	SC	EN	E		S2	G5	Wood poppy	Stylophorum diphyllum		EN	E		S1	G5
Narrow-leaved puccon	Lithospermum incisum	EXT			SX	S1	G5	Virginia goat's rue	Tephrosia virginiana		EN	E	N S?	S1	G5
Broad-leaved puccon	Lithospermum latifolium	SC			S2	S3	G4	Virginia spiderwort	Tradescantia virginiana	SC			S2	SE1	G5
Seedbox	Ludwigia alternifolia	SC			S3	S1	G5	Bastard pennyroyal	Trichostema dichotomum				S2	S1	G5
Northern appressed	•							Dropping trillium	Trillium flexipes		EN	F	N S?	S1	G5
clubmoss	Lycopodiella subappress	aSC			S2		G2	Prairie trillium	Trillium recurvatum	Т			S2S3		G5
Swamp candles	Lysimachia hybrida	SC			S2	S1	G5	Toadshade	Trillium sessile	T			S2S3		G4
		00	EN							FN				S5?	
Cucumber tree	Magnolia acuminata		EN	E	N	S2	G5	Painted trillium	Trillium undulatum	ĖN	EN		\$1\$2		G5
Wing-stemmed								Nodding pogonia	Triphora trianthophora		EN	E	N S1	S1	G3
monkeyflower	Mimulus alatus	EXT			SX	S2	G5	Sand grass	Triplasis purpurea	SC			S2	S4?	G4
Bee balm	Monarda didyma	EXT			SX	S3	G5	Corn-salad	Valerianella umbilicata	T			S2	S1	G3
Red mulberry	Morus rubra	T	EN	Е	N S2	S2	G5	Prairie birdfoot violet	Viola pedatifida	T	EN		S1	S1	G5
Mat muhly	Muhlenbergia							Frost grape	Vitis vulpina	Т			S1S2	S1	G5
	richardsonis	Т			S2	S2	G5	Wild rice	Zizania aquatica						
American lotus	Nelumbo lutea	T			S2	S2	G4		var aquatica	Т			S2S3	S4	G5
amortoan totas	reciambo iatea				02	02	UT		vui aquaucd				0200	04	U

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.

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

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

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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.

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All non-credited photographs taken by
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APPENDIX E:

RESOURCES AND ORGANIZATIONS

Below is a list of organizations involved with environmental education and protection in the Lake Huron to Lake Erie Corridor

First Nations

Walpole Island Heritage Center (519) 627-1475 www.bkeiwanong.com

Government - Binational

International Joint Commission (519) 257-6710 www.ijc.org

Government - United States

Army Corps of Engineers Detroit District (313) 226-6767

Belle Isle Aquarium (313) 852-4075 www.ci.detroit.mi.us/recreation/centers/M/belle_isle/belleM.htm

Dossin Great Lakes Museum (313) 852-4050 www.ci.detroit.mi.us/recreation/centers/M/belle_isle/belleM.htm

Huron-Clinton Metropolitan Authority 1-800-477-2757 www.metroparks.com

Michigan Department of Agriculture Environmental Stewardship Division (517) 241-0236 www.mda.state.mi.us /environm/index.html

Michigan Department of Environmental Quality 1-800-662-9278 www.michigan.gov/deg

Michigan Department of Natural Resources (517) 373-1207 www.michigan.gov/dnr

Natural Area Preservation City of Ann Arbor Department of Parks and Recreation (734) 996-3266 www.ci.annarbor.mi.us/framed/parks/nap.htm

National Oceanographic and Atmospheric Administration (NOAA) Great Lakes Environmental Research Laboratory (GLERL) (734) 741-2235 http://www.olerl.noaa.gov

Dakland County Planning & Economic Development Services (248)858-072 http://www.co.oakland.mi.us/peds/ Southeast Michigan Council of Governments (313) 961-4266 www.semcoo.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.qlsc.usqs.qov

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
(110) 074

(519) 354-7310 www.lowerthamesconservation.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

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) 545-2929 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.emeac.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.ummz.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.semircd.org

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

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

stewardshipnetwork

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.crwc.org

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

Huron River Watershed Council (734) 769-5123

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.tellusnews.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.nohlc.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.otg/wherewework/ northamerica/states/michigan

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

West Bloomfield Land Conservancy 7299 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/

Little River Enhancement Group (519) 735-0418 www.litrg.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.suwc.org

Sydenham Field Naturalists P.O. Box 22008 Dufferin Ave. Wallaceberg, 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.lowerthamesconservation.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/pnnp/on/pelee/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.lsa.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) 782-3956 www.metroparks.com

Pine River Nature Center St. Clair County Regional Education Service Agency (810) 325-9106 www.sccresa.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.annarbor.mi.us/Parks/LeslieScience/le slie.htm

Holliday Forest and Wildlife Preserve (734) 261-1900 www.waynecounty.com/parks/ william p holliday.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

Α

abiotic—a nonliving factor in an environment (e.g. light, water, temperature.)

acid-substance with a pH value less than 7.

acidophiles-plants that live in acidic soils.

alkaline—substance with a pH value greater than 7.

anaerobic-lacking oxygen.

aquifer—an underground geological formation or group of formations containing water. Aquifers are sources of groundwater for wells and springs.

autotroph—an organism capable of selfnourishment by using inorganic materials as a source of nutrients and using photosynthesis or chemosynthesis as a source of energy (e.g. plants.)

R

backfill—material, often dirt or broken concrete, used to fill the space behind a retaining wall or other shoreline hardening structure.

barrens—level or slightly rolling land, usually with relatively infertile sandy soil and few trees.

bedrock—the rock underlying soils ranging from zero (when exposed by erosion) to several hundred feet in elevation.

benthic-relating to the bottom of a body of water.

benthic macroinvertebrate—an aquatiinvertebrate animal large enough to be seen with the human eye. Macroinverborates include insects, clams, craylish, snails and worms. An analysis of the types and numbers of macroinverborates present in a stream is a very useful indicator of water quality and habitat conditions.

benthos-the bottom of a river, lake, sea, or ocean.

biodiversity—the variety of organisms living in a particular area or region. This can include diversity within species (genetic), and diversity of ecosystems.

biomass—the total mass of a living material in a given environment.

biome—a large geographic area with somewhat uniform climatic conditions; a complex of communities characterized by a distinctive type of vegetation and maintained under the climatic conditions of the region. biota-animal and plant life of a region.

biotic—the living organisms in a community, including all of the plant and animal life in a community.

bog—peat-accumulating wetland with precipitation as the dominant water source, typically acidic and normally dominated by Sphagnum spp. mosses.

buffer-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.

bulkhead—a retaining structure of timber, steel, or reinforced concrete used for shoreline protection or harbors.

C

calcareous-chalkiness due to the presence of calcium carbonate.

canopy—the cover formed by the tallest, leafy upper branches of trees in a forest.

carnivorous—animals that eat meat; a plant that eats insects.

channelization—human engineering of river channels to enlarge, straighten, embank, or protect existing channels, create new channels, or protect adiacent structures.

clay—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.

climate—general prevailing weather patterns of a region, based on temperature, air pressure, humidity, precipitation, sunshine, cloudiness, and winds.

climax community—a stage in ecological succession in which a community of organisms, especially plants, is stable and capable of perpetuating itself.

community—a group of plants and animals living and interacting with one another in a specific region under relatively similar conditions.

conifer—a plant that bears its seeds in cones; mostly needle-leafed or scale-leafed; mainly evergreen.

connecting 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.)

conservation easement—legal agreement that restricts landowners to uses that are compatible with conservation and environmental values.

region. consumer—an organism that eats plants or animals for its food.

> contaminant—something that makes water, soil, or air unsuitable, unclean, or toxic; a pollutant.

cover—the vegetation, debris, and irregularities of the land that provide concealment, sleeping, feeding, and breeding areas for wildlife.

D

deciduous plant-a plant that sheds all its leaves every year during a certain season.

decomposer-microorganisms, fungus, or insects that convert dead organic materials into inorganic materials.

decomposition—chemical breakdown of a compound into simpler compounds, often accomplished through the aid of microorganisms

delist—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.

delta—a geological formation that occurs where a stream or river deposits sediment into a receiving basin or lake.

deposition—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.)

dike-a human-made barrier built around a wetland designed to control water levels within an enclosed area.

diversity-variety.

dredging—the process of using machinery to remove sediments from the bottom of a waterway.

dune—a sand hill or sand ridge formed by the wind, usually in deserts or near lake and ocean shorelines.

Ε

ecology-the study of relationships between organisms and their environments.

ecosystem—a system defined by the interaction of a community of organisms with their physical environment.

ecotone—the transition zone between two different plant communities, such as between a forest and a prairie. embayment-a bay.

ericaceous—plants of the heath family, such as bog rosemary and leatherleaf, which usually prefer to grown in acid substrates.

erosion—the process by which the surface of the earth is worn away by water, glaciers, winds, and waves, which is often intensified by landclearing practices related to farming, residential, industrial development, road building, or logging.

erosional features—topography and landforms shaped by flowing water and glacial ice.

eutrophication—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.

exotic 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.

F

fauna-animals, collectively.

fen-peat-accumulating wetlands with groundwater as the dominant water source, and a variety of plant species, including grasses and sedges.

floodplain—the land bordering a river or stream that is subject to flooding. The floodplain is built up of sediments from overflow of the stream.

flora-plants, collectively.

food chain—the transfer of food energy from one organism to another as each consumes a lower member and in turn is preved upon a higher member.

food web—the totality of interacting food chains within an ecological community.

forb—a broad-leaved flowering plant, such as black-eyed susan and wild bergamot; a wildflower; does not include grasses, sedges, trees and shrubs.

fossils—any remains, impression, or trace of a living thing from a former geologic age.

fragmentation—the process, usually the result of development or agriculture, in which natural areas, such as a forests or wetlands, are cut away or changed so that only small, isolated remnants of the original community remain.

G

game fish-fish large enough to be caught by recreational sport fishermen; sport fish.

genetic diversity-the chromosomal diversity available within a species.

geology—the science that deals with the dynamics and physical history of the earth, rocks, and the earth's physical, chemical, and biological changes.

grassland—an area in which grasses and wildflowers are the dominant vegetation.

gravel—a sediment type, consisting of small stones and cobble.

Great Lakes Basin—the five Great Lakes plus the watershed land that surrounds them; the largest freshwater system in the world.

Great Lakes coastal marsh—a freshwater wetland ecosystem that occurs along the coast of the Great Lakes, which is highly influenced by fluctuating water levels.

ground water—water beneath the earth's surface that supplies wells and springs. Precipitation that is absorbed into the ground replenishes groundwater.

Н

habitat—the arrangement of food, water, shelter or cover, and space suitable to animals' needs.

headwaters-the origin or upper tributaries of a river.

herb layer—the layer of soft-stemmed (non-woody) plants growing close to the forest floor.

herbaceous vegetation—non-woody vegetation, including ferns, sedges, emergent, submerged, and floating plants.

heterotroph—an organism requiring organic compounds for its principal source of food.

hydrology—the study of the occurrence, circulation, distribution, and property of the natural waters on Earth.

hypsithermal-elevated temperature.

1

impervious surfaces—hard surfaces within a watershed including rooftops, parking lots, streets, sidewalks, and driveways that do not allow water to infiltrate soils.

indicator 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.

invasive 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.

invertebrates-organisms without a backbone.

J

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lacustrine-of, or pertaining to, a lake.

lakeplain-old lake bottom

of the ancestral Great Lakes.

land use planning—the process of deciding appropriate uses of land.

landforms—hills, valleys, low areas, and lakes that comprise the topography of an area; a natural feature of a land surface.

larva-the immature, wingless, feeding stage of an insect.

life history—the developmental history of an individual or group

litter layer—the forest floor characterized by fallen, decomposing leaves, decaying stumps, mosses and lichens.

loam—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.

lowland—land that is low or level in comparison to adjacent terrain.

М

macrophyte—a plant, especially an aquatic plant, large enough to be visible to the naked eve.

marsh-low, wet land, often treeless with open water, generally characterized by grasses, sedges, cattails, and rushes mesic-moderately moist.

microclimate—climates of small specific areas as contrasted with the general climate of the area.

migrate-to pass seasonally from one region or climate to another.

mitigation (of wetlands)—restoration, creation, enhancement, or preservation of wetlands that expressly compensates for unavoidable wetland losses due to development actions.

moraine—an accumulation of gravel, and stone carried and deposited by glaciers, often forming mounds or hills.

Ν

naiad—the juvenile form of the dragonfly, damselfly, or mayfly.

nearshore waters—a band of varying width around the perimeter of a lake between the land and the deeper off-shore waters, as determined by the thermocline; the part of a large lake in which fish spawn, waterfowl feed, and mammals prey.

native species—an animal or plant that originated in a particular place or region.

non-native—in conservation terms, an organism that has been introduced to an area in which it did not originate.

nonpoint source pollution – pollution that comes from many different sources over a broad area. It usually caused by rainfall or snowmeth 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

nuisance species-see invasive species.

1

source pollution.

organic matter-plant and animal matter that is in the process of decomposing.

organism—a living thing; a form of life composed of parts that work together to carry on the various processes of life.

P

PAH-Polyaromatic hydrocarbon.

PCB-Polychlorinated biphenyl.

parent material-rock or glacial sediment from which soils originate.

periphyton—benthic algae that grow attached to surfaces, such as rocks or larger plants.

pesticide—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.

plankton—small, passively floating or weakly mobile aquatic organisms.

point 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.

pollinator—a creature, often an insect, bird, bat, moth or butterfly that conveys a flower's pollen from the anther to the stigma.

pollution—the introduction of harmful substances or products into an environment.

population—the quantity of a certain species living in a certain location.

predator—an animal that kills and eats other animals.

prey-animals that are killed and eaten by other animals.

producer—a green plant or bacterium that uses photosynthesis or chemosynthesis; constitutes the first trophic level in a food chain

Q

relict—a plant, animal, or geological feature that has survived in a considerably changed environment.

remnant—a small, fragmented piece of a previously large, intact natural community. revetment—a wall, often constructed

of masonry or concrete, to protect an embankment from water erosion. **rhizome**—a horizontal underground

stem, usually rooting at the nodes.

riparian-of, situated, or dwelling

on the bank of a river or stream.

riverine—of, or pertaining to, a river.

river mouth—the lower end of a river or stream where water is discharged into a larger body of water, such as a lake.

GLOSSARY

riverine system-rivers, streams, ditches, and drains as well as the adjacent buffers that border them along with the fringe of adjacent unland areas.

runoff-precipitation, snow melt, or irrigation water that runs-off the land into surface water. Runoff can carry pollutants from the air and land into receiving waters.

S

sand—a soil type, consisting of particles between 0.05 and 2.0 mm in diameter.

savanna—a grassland with scattered trees, either as individuals or clumps. A transitional community between prairie and forest.

sediment—fragmented material that originates from weathering of rocks and is transported by, suspended in, or deposited by water or air.

shoreline-the line where shore and water meet.

shoreline hardening—the installation of artificial shoreline structures such as concrete docks, steel breakwalls, berms, and concrete revetments designed to prevent erosion and protect properties from being washed away. In the process, natural vegetation and habitat is eliminated.

shrub layer—the part of a forest floor characterized by shrub growth or young trees (woody vegetation.)

siltation—the deposit of or accumulation of very tiny soil particles (silt.)

silt-a soil particle between 0.05 and 0.002 mm in diameter; a soil type.

snags-dead trees that are still standing or have partially fallen.

slough-a hollow filled with mud and water (e.g. an inlet from a river.)

soil—a dynamic natural body composed of mineral and organic materials and living forms in which plants grow.

spawn—to deposit eggs or sperm directly into water, as fish do.

species at risk-plant and animal species in which populations are declining to low levels; species that are listed as special concern, threatened, or in danger of extinction.

spring ephemerals—forest wildflowers that flower in the spring before nearby trees can produce leaves and block 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.

т

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 elevational pattern 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

п

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

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 backhone.

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-drv

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Z

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.



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