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## BIBLIOGRAPHY

- American Aggregates Inc.  
2011 2041 State Highway M-140, Niles, MI 49120. Emissions Data Set.
- Bergman, Eva, and Larry A. Greenberg  
1994 *Competition between a planktivore, a benthivore and a species with ontogenetic diet shifts*. Ecology, Vol. 75, No. 5, pp 1233-1245). Ecological Society of America. Available on the Internet at <<http://www.jstor.org/stable/1937449>>. July.
- Borough of Poole Commissioners  
2004 Poole Harbour Approach Channel Deepening and Beneficial Use of Dredged Material, Environmental Statement. Chapter 14. Prepared by Royal Haskoning. November.
- Brock, K.J.  
1997 Birds of the Indiana Dunes. Michigan City: Shirley Heinze Environmental Fund.  
  
2011 Email correspondence. Walkerton, Indiana. May 25.
- Chicago Wilderness  
1999 Chicago Wilderness Terrestrial Community Classification System. Chicago: Chicago Wilderness.
- Clapp, D.F., P.J. Schneeberger, R.P. O'Neal, T.J. Lychwick, B. Belonger, and S.M. Shroyer  
2005 "Inshore Fish Community." In *The State of Lake Michigan in 2000*. Edited by M.E. Holey and T.N. Trudeau. Great Lakes Fish. Comm. Spec. Pub. 05-01, pp. 49-58. Available on the Internet at <[http://www.glfsc.org/pubs/SpecialPubs/Sp05\\_1.pdf](http://www.glfsc.org/pubs/SpecialPubs/Sp05_1.pdf)>.
- Daniel, G.  
1984 *Dune Country*. Athens: Swallow Press.
- Detmers, J.M., C.P. Madenjian, P. J. Allen, S.A. Pothoven, and T.F. Nalepa  
2008 "Lake Michigan's tributary and nearshore fish habitats." In *The State of Lake Michigan in 2005*. Edited by D.F. Clapp and W. Horns. Great Lakes Fish. Comm. Spec. Pub. 08-02. pp. 7-18. Available on the Internet at <[http://www.glfsc.org/pubs/SpecialPubs/Sp08\\_2.pdf](http://www.glfsc.org/pubs/SpecialPubs/Sp08_2.pdf)>.
- Dillon, C.  
2011 Mount Baldy Management Actions. Porter: NPS.
- Edsall, T., and M. Charlton  
1997 *State of the Lakes Report: Nearshore Waters of the Great Lakes*. ISBN 0-662-26031-7. Available on the Internet at [http://www.epa.gov/glnpo/solec/solec\\_1996/Nearshore\\_Waters\\_of\\_the\\_Great\\_Lakes.pdf](http://www.epa.gov/glnpo/solec/solec_1996/Nearshore_Waters_of_the_Great_Lakes.pdf).
- Foster, David S., and David W. Folger  
1994 *The Geologic Framework of Southern Lake Michigan*. Internat. Assoc. Great Lakes Res. J. of Great Lakes Res. 20(1):44-60
- Garza, Eric L., and Richard L. Whitman  
2004 *The Nearshore Benthic Invertebrate Community of Southern Lake Michigan and its Responses to Beach Nourishment*. J. Great Lakes Res. 30(1):114-122. International Assoc. Great Lakes Res. Available on the Internet at <[http://www.glfsc.usgs.gov/\\_files/reports/MtBaldyReport.pdf](http://www.glfsc.usgs.gov/_files/reports/MtBaldyReport.pdf)>.

BIBLIOGRAPHY

- GE/Housatonic River, US Environmental Protection Agency New England  
 2009 "Appendix A: Carbon Footprint/Greenhouse Gas Inventory Analysis for Sediment, Floodplain, and Treatment/Disposition Alternatives." Response to EPA Interim Comments on CMS Report *Housatonic River – Rest of River*. Available on the Internet at <[http://www.epa.gov/ne/ge/thesite/restofriver/reports/cms/447141\\_Appendix\\_A.pdf](http://www.epa.gov/ne/ge/thesite/restofriver/reports/cms/447141_Appendix_A.pdf)>
- Glowacki, G.A.  
 2005 Status of the Eastern Massasauga Rattlesnake at Indiana Dunes National Lakeshore. *Great Lakes Network Report*, 40.
- Grannemann, Norman  
 2004 "Lake Michigan." Presentation for the State of the Lakes Ecosystem Conference. Available on the Internet at <[http://www.epa.gov/solec/solec\\_2004/presentations/Lake\\_Michigan\\_\(Grannemann\).pdf](http://www.epa.gov/solec/solec_2004/presentations/Lake_Michigan_(Grannemann).pdf)>.
- Gravens, M., B. Ebersole, T. Walton, and R. Wise  
 2008 Beach Fill Design. In: Coastal Engineering Manual, Part V, Coastal Project Planning and Design, Chapter IV-4, Engineer Manual 1110-2-1100, U.S. Army Corps of Engineers, Washington, D.C.
- Greenberg, J.  
 2002 *A Natural History of the Chicago Region*. Chicago: The University of Chicago Press.
- Hayhoe, K., J. VanDown, T. Corley II, N. Schlegal, and D. Wuebbles  
 2010 "Regional climate change projections for Chicago and the US Great Lakes." *Journal of Great Lakes Research* 36 (Supplement 2), 7-21.
- Holeck, K., E. Mills, H. MacIsaac, and A. Ricciardi  
 2009 "Nonindigenous Species (NIS)." In *Nearshore Areas of the Great Lakes 2009*. State of the Lakes Ecosystem Conference 2008 Background Paper. Environment Canada and USEPA. Available on the Internet at <[http://binational.net/solec/sogl2009/SOGL\\_2009\\_nearshore\\_en.pdf](http://binational.net/solec/sogl2009/SOGL_2009_nearshore_en.pdf)>.
- Homoya, M.  
 1997 The Natural Regions of Indiana: An Introduction. In M. Homoya, *The Natural Heritage of Indiana* (pp. 158-160). Bloomington: Indiana University Press.
- Homoya, M.A.  
 1985 The Natural Regions of Indiana. In M. A. Homoya, *The Natural Regions of Indiana* (pp. 245-268). Bloomington: Indiana Academy of Science.
- Horvath, T., R. Whitman, L. Last, and M. Nevers  
 1999 Evaluation of Beach Nourishment Activities on Bottom Fauna and Yellow Perch in Near Shore Areas of Mount Baldy, 1996-98. Report to U.S. Army Corps of Engineers, Chicago District, in fulfillment of MIMPRI# W81G6693165796. U.S. Geological Survey (USGS), Lake Michigan Ecological Research Station, Great Lakes Science Center, Porter, IN.
- Hubbs, Carl L., and Karl F. Lagler  
 1964 *Fishes of the Great Lakes Region*. The University of Michigan Press, Ann Arbor, MI.

- Indiana Department of Natural Resources (IDNR)  
 2011 *High Quality Natural Communities of Indiana*. Retrieved April 25, 2011, from Indiana Heritage Data Center. Available on the Internet at  
<http://www.in.gov/dnr/naturepreserve/4743.htm>;  
<http://www.natureserve.org/explorer/ranking.htm>.
- Indiana Department of Natural Resources (IDNR) and the Cities of East Chicago, Gary, Hammond, Portage and Whiting  
 2005 Indiana's Lakeshore Reinvestment Strategy. The Marquette Plan.
- Indiana Department of Natural Resources (IDNR) Division of Water  
 1994 *Water Resource Availability in the Lake Michigan Region, Indiana - Executive Summary*. Available on the Internet at  
[http://www.in.gov/dnr/water/files/lakemich\\_basinsums.pdf](http://www.in.gov/dnr/water/files/lakemich_basinsums.pdf).
- Indiana Lake Michigan Coastal Program, Indiana Department of Natural Resources  
 2010 Coastal Zone Management Section 309 Enhancement Grant Program, Assessment and Multi-Year Strategy 2011-2015. N.p.
- Kuhns, Linda A., and Martin B. Berg  
 1999 Benthic Invertebrate Community Responses to Round Goby (*Neogobius melanostomus*) and Zebra Mussel (*Dreissena polymorpha*) Invasion in Southern Lake Michigan. *J. Great Lakes Res.* 25(4): 910-917, Internat. Assoc. Great Lakes Res.
- Last, Laurel, Richard Whitman, and Paul Gerovac  
 1995 "Occurrence and relative abundance of benthic invertebrates in shallow submerged sediments offshore of Mt. Baldy, LaPorte Co., Indiana." Report to U.S. Army Corps of Engineers, Chicago District. U.S. Lake Michigan Ecological Research Station, National Biological Service, Porter, IN.
- Madenjian, C.P., G.L. Fahnenstiel, T.H. Johengen, T.F. Nalepa, H.A. Vanderploeg, G.W. Fleischer, P.J. Schneeberger, D.M. Benjamin, E.B. Smith, J.R. Bence, E.S. Rutherford, D.S. Lavis, D.M. Robertson, D.J. Jude, and M.P. Ebener  
 2002 "Dynamics of the Lake Michigan food web, 1970-2000." National Oceanic and Atmospheric Administration / Great Lakes Environmental Research Laboratory. Available on the Internet at  
<http://www.glerl.noaa.gov/pubs/fulltext/2002/20020015.pdf>.
- Mason, Doran  
 2009 "Impact of Exotic Invertebrate Invaders on Food Web Structure and Function in the Great Lakes: a Network Analysis Approach." National Oceanic and Atmospheric Administration / Great Lakes Environmental Research Laboratory. Available on the Internet at  
[http://www.glerl.noaa.gov/res/Task\\_rpts/2002/nsmason10-1.html](http://www.glerl.noaa.gov/res/Task_rpts/2002/nsmason10-1.html).
- Mid-Atlantic Regional Air Management Association, Inc. (MARAMA), Mid-Atlantic Diesel Collaborative  
 2010 *Anti-Idling*. Available on the Internet at  
<http://www.marama.org/diesel/Anti-Idling.htm>.

BIBLIOGRAPHY

- Minton, S.A.  
 2001 *Amphibians and Reptiles of Indiana*. Indianapolis: Indiana Academy of Science.
- National Academy of Sciences, National Academy of Engineering, Institute of Medicine, National Research Council (National Academy of Sciences)  
 2008 Great Lakes Shipping, Trade, and Aquatic Invasive Species. Report in Brief.
- National Oceanic and Atmospheric Administration / Great Lakes Environmental Research Laboratory  
 2009 *Lake Michigan Food Web*. Available on the Internet at <<http://www.glerl.noaa.gov/pubs/brochures/foodweb/LMfoodweb.pdf>>.
- National Park Service, U.S. Department of the Interior (NPS)  
 n.d. Indiana Dunes National Lakeshore website. Available on the Internet at: <<http://www.nps.gov/indu/>>.
- 1997a *General Management Plan, Indiana Dunes National Lakeshore*. August.
- 1997b *General Management Plan Amendment, East Unit, Indiana Dunes National Lakeshore*. August.
- 2001 Director's Order #12: *Conservation Planning, Environmental Impact Analysis and Decision-making, and Handbook*. Washington, DC. Available on the Internet at <<http://www.nps.gov/policy/DOrder12.html>>.
- 2004 *Indiana Dunes National Lakeshore Fire Management Plan*. Indiana Dunes National Lakeshore. Porter, IN. July. Available on the Internet at: <[http://www.nps.gov/indu/parkmgmt/upload/fire\\_management\\_plan.pdf](http://www.nps.gov/indu/parkmgmt/upload/fire_management_plan.pdf)>.
- 2006 *Management Policies 2006*. Washington, DC. Available on the Internet at <<http://www.nps.gov>>.
- 2008 Procedural Manual #77-1: Wetland Protection. Washington, DC.
- 2010 Interim Guidance for Impairment Determinations in NPS NEPA Documents. U.S. Department of the Interior, NPS.
- 2011a Memorandum: "Mount Baldy Management Actions." Indiana Dunes National Lakeshore. Sender: Superintendent of Indiana Dunes National Lakeshore. Written at Indiana Dunes National Lakeshore.
- 2011b Compatibility of Beach Nourishment Materials for INDU Shoreline Management Plan.
- 2011c Guidance for Impairment Determinations and the NPS NEPA Process, U.S. Department of the Interior, NPS. October 31.
- 2011d Indiana Dunes National Lakeshore Invasive Plant Management Strategy. Porter; National Park Service.
- Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture  
 2010 *Understanding the Science of Climate Change, Talking Points – Impacts to the Great Lakes*. Fort Collins, CO. n.p.

- The Office of Underwater Science, Indiana University  
 2000 *Assessment and Management Recommendations for Historic Shipwrecks Located in Indiana Territorial Waters of Southern Lake Michigan*, by Charles D. Beeker. [Bloomington, IN]: n.p.
- Pielou, E.C.  
 1991 *After the ice age: The return of life to glaciated North America*. Chicago: University of Chicago Press.
- Pothoven, S., G. Fahnenstiel, H. Vanderploeg, and T. Nalepa  
 2009 Long Term Trends in the Pelagic Foodweb in Lake Michigan. National Oceanic and Atmospheric Administration Great Lakes Environmental Research Laboratory (GLERL). Available on the Internet at <[http://ww.grel.noaa.gov/res/archive/task\\_rpts/2008/aispothoven04-1.html](http://ww.grel.noaa.gov/res/archive/task_rpts/2008/aispothoven04-1.html)>.
- Przybyla-Kelly, K. and R. Whitman  
 2006 "Benthic Invertebrate Response to Beach Nourishment in Nearshore Habitats along the Southern End of Lake Michigan in the Vicinity of Mt. Baldy, Indiana Dunes National Lakeshore, Indiana." Report to U.S. Army Corps of Engineers, Chicago District, in fulfillment of MIPR# W81G6660970684. U.S. Geological Survey (USGS), Lake Michigan Ecological Research Station, Great Lakes Science Center, Porter, IN.
- Rocky Mountain Climate Organization  
 2011 Great Lakes National Parks in Peril, The Threats of Climate Disruption. Natural Resource Defense Council.
- Rutherford, E.S.  
 2008 "Lake Michigan's tributary and nearshore fish habitats." In *The State of Lake Michigan in 2005*. Edited by D.F. Clapp and W. Horns. Great Lakes Fish. Comm. Spec. Pub. 08-02. pp. 7-18. Available on the Internet at <[http://www.glf.org/pubs/SpecialPubs/Sp08\\_2.pdf](http://www.glf.org/pubs/SpecialPubs/Sp08_2.pdf)>.
- Simon, T.P. and Morris, C.C.  
 2011 Evaluation of Reference Conditions for Coastal Sand Habitats of Southern Lake Michigan at Indiana Dunes National Lakeshore. GLRI#94 Task Agreement #J 6300100405. National Park Service, Fort Collins, Colorado.
- Sparks, D.W.  
 2005 Foraging Habitat of the Indiana Bat (*Myotis sodalis*) in an Urban-rural Interface. *Journal of Mammalogy*, 713-718.
- Swink, Floyd, and Gerould Wilhelm  
 1994 *Plants of the Chicago Region*. Lisle: The Morton Arboretum.
- Truemper, Holly A., Thomas E. Lauer, Thomas S. McComish, and Rod A. Edgell  
 2006 "Response of Yellow Perch Diet to a Changing Forage Base in Southern Lake Michigan, 1984-2002." *J. Great Lakes Res.* 32:806-816. Internat. Assoc. Great Lakes Res.
- U.S. Army Corps of Engineers (COE)  
 1986 Indiana Dunes National Lakeshore, Mt. Baldy Pre-Nourishment Assessment and Recommended Monitoring Plan. Great Lakes Coastal Research Laboratory, School of Civil Engineering, Purdue University.

BIBLIOGRAPHY

- 1989 Environmental Engineering for Coastal Protection. EM 1110-2-1204. Washington, DC 20314-1000. Available on the Internet at <<http://140.194.76.129/publications/eng-manuals/em1110-2-1204/entire.pdf>>.
- 2004 Calumet Harbor & River, Illinois & Indiana. Available on the Internet at <[http://www.lrc.usace.army.mil/coo/Cal\\_Hbr.htm](http://www.lrc.usace.army.mil/coo/Cal_Hbr.htm)>. August.
- 2010 Burns Waterway Harbor, Indiana. Shoreline Damage Mitigation Reconnaissance Study 905(b) Analysis Report.
- 2011a Bucaro, David, personal communication.
- 2011b Accessed Internet at <<http://www.lrc.usace.army.mil/>>. November 2011.
- 2011c Calumet Harbor, IL and IN, Great Lakes Navigation System. October.
- U.S. Department of Agriculture (USDA) / U.S. Department of the Interior
- 1998 Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide. 124 pp.
- U.S. Department of the Interior
- 1996 Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes
- U.S. Environmental Protection Agency (EPA)
- 1971 Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, NTID300.1. December 31.
- U.S. Environmental Protection Agency (EPA), Office of Air and Radiation, Climate Protection Partnerships Division
- 2008 "Direct Emissions from Mobile Combustion Sources." EPA430-K-08-004. Available on the Internet at <[http://www.epa.gov/climateleaders/documents/resources/mobilesource\\_guidance.pdf](http://www.epa.gov/climateleaders/documents/resources/mobilesource_guidance.pdf)>.
- U.S. Fish and Wildlife Service (FWS)
- 2002 Pitcher's Thistle Recovery Plan. Fort Snelling.
- 2003a Recovery Plan for the Great Lakes Piping Plover (*Charadrius melodus*). Fort Snelling.
- 2003b Karner Blue Butterfly Recovery Plan. Fort Snelling.
- 2005 *Endangered Species*. Retrieved July 5, 2011, from U.S. Fish and Wildlife Service Midwest Region. Available on the Internet at <[www.fws.gov/midwest/endangered](http://www.fws.gov/midwest/endangered)>.
- 2007a *Indiana Bat Draft Recovery Plan*. Fort Snelling.
- 2007b "Bank Swallows Nest on Industrial Property Along Detroit River." U.S. Fish and Wildlife Service Journal. Accessed at: <<http://www.fws.gov/FWSJournal/regmap.cfm?arskey=21867>> on December 22, 2011. July 10.
- U.S. Global Change Science Research Program (USGCRP)
1996. The ecological effects of global warming on North American birds and butterflies. Overview: Terry Root. Seminar, 22 October 1996. Available on the Internet at <<http://www.usgcrp.gov/usgcrp/seminars/961010DD.html>>. Accessed June 26, 2007.

- Vanderploeg, Henry  
2011 "Changes in the Pelagic Food Web of Southern Lake Michigan." National Oceanic and Atmospheric Administration/Great Lakes Environmental Research Laboratory. Available on the Internet at <[http://www.glerl.noaa.gov/res/Ta sk\\_rpts/1994/nsvander10-2.html](http://www.glerl.noaa.gov/res/Ta sk_rpts/1994/nsvander10-2.html)>.
- W.F. Baird and Associates (Baird)  
2000 *Feasibility Study for Lakebed Armoring*. Prepared for the U.S. Army Corps of Engineers.  
2004 Evaluation of Dredged Material Management Plans for Michigan City. Prepared for the U.S. Army Corps of Engineers. October.
- Whitaker, J.O.  
1994 *Mammals of Indiana Dunes National Lakeshore*. National Park Service Monograph NPS/NRINDU/NRSM-94/24.
- Whitaker, J.J.  
1998 *Mammals of the Eastern United States*. Ithaca: Cornell University Press.
- Whitman, R.L.  
1997 Status, Trends, and Potential of Biological Communities of the Grand Calumet River Basin. Chicago: U.S. Army Corps of Engineers, Environmental and Social Analysis Branch.
- Wilhelm, G.  
1990 *Special Vegetation of the Indiana Dunes*. Porter: Indiana Dunes National Lakeshore.
- Yatskievych, K.  
2011 Indiana's Threatened and Endangered Species. (C. JFNew, Interviewer). May 1.



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## GLOSSARY

**A-weighted decibels(dBA)** – An expression of the relative loudness of sounds in air as perceived by the human ear.

**accretion** – The process of growth or enlargement by a gradual buildup of sediment.

**accretion area** – A portion of the shoreline at which coastal sediments return to the visible portion of the beach, gradually increasing its size.

**adaptive management** – A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Its most effective form, "active" adaptive management employs management programs that are designed to experimentally compare selected policies or practices, by implementing management actions explicitly designed to generate information useful for evaluating alternative hypotheses about the system being managed.

**aeolian transport** – Movement and weathering of sand particles behind and parallel to the shoreline caused by wind. It is the first process of coastal dune formation.

**anadromous** – Migratory fishes which spend most of their lives in the sea and migrate upstream to fresh water to breed.

**anoxia** – A total decrease in oxygen levels.

**anthropogenic effects** – Effects which are caused by or attributed to humans. As used within this document, they are factors that cause stress in natural systems.

**attributes** – Any living or nonliving feature or process of the environment that can be measured or estimated and that provide insights into the state of the ecosystem. The term indicator is reserved for a subset of attributes that is particularly information-rich in the sense that their values are somehow

indicative of the quality, health, or integrity of the larger ecological system to which they belong.

**benthic** – Living at, in, or associated with structures on the bottom of a body of water.

**berm** – A mound of earth or sand formed into a narrow shelf, path, or ledge which is typically located at the top or bottom of a slope.

**biomass** – Represents the entire community of living biological organisms in a given area or ecosystem at a certain point in time.

**biome** – A complex biotic community extending over a large geographic area and characterized by distinctive plant and animal species and the prevailing climate.

**blowout** – A sandy depression in a sand dune ecosystem caused by the removal of sediment by wind. This usually occurs when a patch of protective vegetation is lost.

**boreal relic** – A group of plants with characteristics similar to those found in northern Boreal forests that are remnants of historical ecological conditions and are unlike the current surrounding vegetation.

**calcareous** – Mostly or partly composed of calcium carbonate, or containing lime and being chalky.

**clay sill** – A tabular igneous intrusion that parallels the bedding of the surrounding sedimentary or metamorphic rock.

**chart datum** – The lowest astronomically predictable tide level, this level is used as a reference level on nautical charts; the maps of the lake and lakebed.

**demersal** – Living near, deposited on, or sinking to the bottom of a body of water.

**dreissenid** – A small, aquatic bivalve mollusk which attaches to stones or any other hard surface in freshwater.

**dune succession** – The process of a dune changing from inorganic and unpopulated, to a dune that has organic components and is highly populated. It is the evolution of a dune beginning with its development as a foredune close to the beach with little established vegetation, to the final stage as a wooded dune farther back from the beach.

**dynamically stable** – A dynamic equilibrium where the shoreline shape is relatively constant over a period of months or years. Although the shoreline shape is constant, in response to varying winds, waves and currents, the position of the shoreline at any particular time will vary about the average.

**ecological restoration** – Highlights the recovery of pre-disturbance biotic communities and native species composition. It attempts to return an ecosystem or natural community to historic, pre-disturbance conditions. In its broadest sense, ecological restoration is the process of assisting the recovery of a degraded, damaged, or severely altered ecosystem. Example: Remove invasive species from an otherwise intact habitat, such as a panne.

**ecological preservation** – The act or process of applying the measures necessary to sustain the existing form, function, and integrity of an ecosystem or natural area. Preservation focuses on protection and avoids degradation altogether. Example: Early Detection and Rapid Response.

**ecological indicator** – Measurable attributes of the environment that provide insights regarding (1) the functional status of one or more key ecosystem processes, (2) the status of ecosystem properties that are clearly related to these ecosystem processes, and/or (3) the capacity of ecosystem processes or properties to resist or recover from natural disturbances and/or anthropogenic stressors. In the context of ecosystem health, key

ecosystem processes and properties are those that are most closely associated with the capacity of the ecosystem to maintain its characteristic structural and functional attributes over time (including natural variability).

**embayment** – A bay or a formation resembling a bay or the formation of a bay.

**embryonic dunes** – Dry beach features resembling miniature dunes, formed by wind-deposited sand on and leeward of objects that decrease wind velocity, such as driftwood and vegetation.

**endemic** – Flora, fauna, or other distinctive characteristics that are exclusively found in a defined geographic location.

**entrainment** – The process by which sediment from the surface is incorporated into a fluid flow, such as air or water, as part of the process of erosion.

**eroded parabolic dune** – A U-shaped dune with elongated arms formed as a result of a blowout area.

**fen** – A type of wetland characterized by neutral or alkaline water chemistry with high dissolved mineral levels but few other plant nutrients and fed by mineral-rich surface water or groundwater.

**fillet beach** – A beach formed by accretion processes, or retained by a coastal protection structure.

**foraging** – The act of searching for and exploiting food resources.

**foredune** – Low, very active dunes that run parallel to the shoreline of a large lake or ocean and are stabilized by vegetation. They are often the smallest and youngest dunes along a coast and are located just shorewards of embryonic dunes.

**hardened structures** – Navigational and industrial structures as well as other materials installed to armor the shoreline, including revetment walls and sheet piling.

**high floristic quality** – A quantitative indicator of good ecosystem health based on the Floristic Quality Assessment. Individual, native species are ranked with a Coefficient of Conservatism based on their likelihood to occur in a landscape relatively unaltered from those of pre-settlement times. A higher ranking indicates a lower likelihood of that species appearing in a given setting due to its high ecological requirements, so if many species of high floristic quality are present, the ecosystem is more likely to be healthy and meet those ecological requirements.

**homogenous** – Having the same composition throughout; of uniform make up.

**infaunal** – Aquatic animals that live in the substrate of a body of water, especially in a soft sea bottom.

**interstitial space** – An empty space or gap between spaces full of structure or matter.

**lacustrine** – Of or relating to lakes.

**lake substrate** – The earthy material that exists at the bottom of a lake, such as dirt, rocks, sand, or gravel.

**lakebed down-cutting** – The gradual erosion of cohesive soil, such as clay or glacial till, from a shoreline due to wave interaction.

**lee side** – The side of something that is sheltered from the wind.

**leeward** – On or toward the side sheltered from the wind; downwind.

**littoral** – Of or pertaining to the shore of a large body of water.

**longshore transport** – The sediment movement with a direction parallel to the shoreline; alongshore.

**low water datum** – The base elevation for Lake Michigan, used as a reference level for measurement of water depth.

**macroinvertebrate** – An invertebrate that is large enough to be seen without a microscope.

**maintenance dredging** – The routine removal of accumulated sediment from the bottom of a waterway to ensure continued ease of navigation or the holding capacity of reservoirs or lakes.

**marl** – Lake sediments which have been hardened over time to create a calcium carbonate or lime-rich mud or mudstone which contains variable amounts of clays and aragonite, or crystalized calcium carbonate.

**meiofauna** – Small, aquatic invertebrates that live on or within the substrate on the bottom of a large body of water.

**mesic** – A type of habitat with a moderate or well-balanced supply of moisture.

**mesophytic** – Grown in or adapted to a moderately moist environment.

**mitigation measures** – Steps taken to moderate, or reduce the severity of, a quality or condition in force or intensity.

**net transport rate** – The net amount of sediment movement in the predominant direction; expressed in cubic yards per year.

**oligotrophic** – A lake with low primary biological productivity as a result of low nutrient content. These lakes have very clear water, high drinking-water quality, ample oxygen, and support a wide variety of fish species due to relatively low levels of algae.

**open-water placement** – Placing of dredged sediment in an open-water section of the lake, away from the dredging location. This sediment must be clean and meet set federal guidelines to qualify for open-water placement.

**overflight** – An air flight over a specific area, country or territory.

**pannes** – A series of shallow ponds located among sand dunes.

**pelagic** – Occurring in or over open water and away from the bottom.

**phytoplankton** – Photosynthesizing microscopic organisms which inhabit the upper sunlit layer of most water bodies. If they are present in a large quantity, they can make the water body appear green.

**piscivorous** – Fish-eating.

**pseudofeces** – Wastes released by filter-feeding bivalve mollusks that are comprised of suspended particles which have been rejected as unsuitable for food.

**recolonization** – The reestablishment of flora and fauna in an ecologically disturbed area. Vegetative recolonization begins with hardy species such as grasses and progresses with more sensitive species as the area recovers environmentally.

**refugia** – Any local environments that have escaped regional ecological change and therefore provide habitats for threatened or endangered species.

**revetment** – Sloping structures placed on banks or cliffs in such a way as to absorb the energy of incoming water

**sandscape** – A landscape dominated by sand.

**sediment budget** – A coastal management tool used to balance the sediment volumes entering or exiting a particular section of coast. This can be used to predict changes to the form and structure of a coastline over time.

**sediment deficit** – A net loss of sediment from a coastline, based on the sediment budget. This can be remedied by physically

adding sediment to a coastline to combat widespread erosion.

**seedbank** – A stockpile of seeds which acts as a source for planting in case seed reserves elsewhere are destroyed.

**sheet piling** – A cylindrical or flat member of wood, steel, concrete, etc., often tapered or pointed at the lower end, hammered vertically into soil to form part of a foundation or retaining wall. They are driven side by side to retain earth, etc., or to prevent seepage into an excavation.

**social trails** – A path developed by erosion caused by footfall. The path usually represents the shortest or most easily navigated route between an origin and destination. The width and amount of erosion of the line represents the amount of demand.

**soundscapes** – An atmosphere or environment created by or with sound.

**spawning** – To deposit eggs or sperm directly into the water, as fishes.

**swash zone** – A turbulent layer of water that washes up on the beach after an incoming wave has broken. The swash action can move beach material up and down on the beach, which results in the cross-shore sediment exchange.

**taxa** – Taxonomic categories, as a species or genus.

**tectonic activity** – Movement associated with the earth's structural features.

**terrestrial fauna** – The aggregate of animals that inhabit dry land.

**thermoregulatory** – Tending to maintain a body at a particular temperature whatever its environmental temperature.

**trophic level** – The position an organism occupies on the food chain.

**viewshed** – An area of land, water, or other environmental element that is visible to the human eye from a fixed vantage point.

**zooplankton** – Heterotrophic (sometimes detritivorous) plankton. Plankton are organisms drifting in oceans, seas, and bodies of fresh water.

