MICHIGAN

DEPARTMENT OF NATURAL RESOURCES · MICHIGAN · DNR ™

2015 - 2025

OPEN DUNES & SAND-COBBLE SHORES

Wildlife Action Plan

Today's Priorities, Tomorrow's Wildlife

WHAT ARE OPEN DUNES & SAND-COBBLE SHORES?

Open Dunes occur near the shorelines of the Great Lakes and are characterized by sand and some interspersed grass and shrubs. These ecosystems are driven by lake winds. The natural processes that influence species composition and community structure include wind-mediated sand deposition and erosion, sand burial and abrasion, desiccation, and infrequent fire. The greatest concentration of Open Dunes occurs along the eastern and northern shorelines of Lake Michigan, with the largest dunes along the eastern shoreline due to the prevailing southwest winds.

Sand and Cobble Shores are sparsely vegetated ecosystems that occur along the Great Lakes shoreline. Substrates include sand and gravel, limestone cobble, sandstone cobble, and volcanic cobble. Vegetation is typically sparse because storm waves are prevalent and soil development and suitable substrates for plant growth are limited. Natural processes that influence species composition and community structure include wind and wave action, Great Lakes water level fluctuation, winter ice scour, and desiccation.

– Adapted from Cohen et al. 2015

PLAN CONTRIBUTORS

Detroit Zoological Society

Michigan Department of Natural Resources

The Nature Conservancy - Michigan

U.S. Fish and Wildlife Service

Lake Huron Locust

Common Tern

WHAT USES OPEN DUNES & SAND-COBBLE SHORES?

WHY ARE OPEN DUNES & SAND-COBBLE SHORES IMPORTANT?

With over 3,000 miles of Great Lakes coastline, Michigan is home to the world's largest freshwater coastline. Lined with sand and pebble beaches and rolling sand dunes, our coast is a popular vacation destination and contributes to the state's 22.8 billion dollar tourism industry. Beaches and dunes attract swimmers, sunbathers, beachcombers, and sightseers as well as providing important habitat for fish, wildlife, and plants found nowhere else. Conservation efforts taken now on this fragile boundary between the water and the land will bear long term dividends for rare wildlife, healthy waters, and thriving communities, while reducing the chances of having to address much more costly problems down the road. We have an opportunity to preserve a portion of Michigan's natural heritage and support the state's economy today so that tomorrow will still see ample opportunities for hunting, fishing, wildlife viewing, and, more importantly, building sand castles.

WHAT IS THE HEALTH OF OPEN DUNES & SAND-COBBLE SHORES?

Natural communities are tracked in the state's Natural Heritage Database, which provides information about their location, their quality, and often the plants and wildlife found there. This data provides an index of the overall health of Open Dunes and Sand-Cobble Shores across the state. In Michigan between 2005 and 2015, an additional 7 Open Dunes were added to the Natural Heritage Database for a total of 49 tracked ecosystem occurrences; about half of them (n=26) were assessed between 2005 and 2015 to determine quality or health of the ecosystem. Of those assessed 15% were upgraded in quality, and 31% were downgraded. In Michigan between 2005 and 2015, an additional 23 Sand-Cobble Shore natural communities were added to the Natural Heritage Database for a total of 36 tracked ecosystem occurrences. Five of these were assessed between 2005 and 2015 to determine quality or health of the ecosystem; of those assessed one was upgraded in quality, and two were downgraded.

An element occurrence is the basic unit of record for documenting and delimiting the presence and geographic extent of a species or natural community on the landscape in the state's Natural Heritage Database. Element occurrences are defined as an area of land and/or water where a species is, or was, present, and which has practical conservation value; species element occurrences commonly reflect populations or subpopulations.

GOALS

- Maintain and/or increase habitat at known Piping Plover nesting sites. [PP]
- Maintain or improve habitat quality at known Common Tern sites. [CT]

Dwarf lake iris
(Iris lacustris)

Houghton's goldenrod
(Solidago houghtonii)

Lake Huron tansy
(Tanacetum huronense)

Pitcher's thistle
(Cirsium pitcheri)

ASSOCIATED RARE PLANTS

WHAT ARE THE OPEN DUNES & SAND-COBBLE SHORES FOCAL SPECIES?

Where we are now and what we think we can realistically achieve over the next 10 years.

Piping Plover
(Charadrius melodus)
Federally and State Endangered

Piping Plovers are small shorebirds that nest on sand, gravel, or cobble beaches. People and dogs walking along the beach can disturb these birds and cause them to abandon their nests. Piping Plover prefer wide, sandy, open beaches with sparse vegetation and scattered cobble along the Great Lakes (Hyde 1999). Piping Plover conservation is a priority for the U.S. Fish and Wildlife Service, the Upper Mississippi River and Great Lakes Region Joint Venture, and Michigan's Department of Natural Resources. Management efforts are ongoing as their populations are still critically low. As of 2015, there were 57 breeding pairs in the state that fledged 100 chicks, an average of 1.75 chicks per pair. The species remains vulnerable to extirpation in the Great Lakes Region despite gains made due to intense conservation efforts (Cuthbert 2011).

GOALS

- Increase the number of breeding pairs in Michigan to 65. [PP]
- Increase the total number of adults to 160. [PP]
- Maintain the average number of chicks fledged per pair above 1.5. [PP]

Common Tern
(Sterna hirundo)
State Threatened

Common Terns are colonial waterbirds with gray bodies, glossy black capped heads, red bills, and deeply forked tails. They fly gracefully and often swoop along the water to drink (Cornell University 2015). They hover and dive to capture small fish. Both adults share in constructing the nest, incubating eggs, and feeding young (Hyde 1997). Terns nest on sand, gravel, or cobble substrates with scatterered vegetation, typically between 10-40% coverage. In Michigan, this species uses both natural sites (often low lying small sand or gravel bars) or artificial sites. At natural sites, most nests are placed less than 100 meters inland from the water's edge and less than 4 meters elevation above the water surface but outside the wave-wash zone (Soulliere et al. 2007). Many protection opportunities are available at Michigan's artificial sites but the natural sites are difficult to manage because they are small and subject to flooding. Population numbers appear to be relatively stable in the U.S. Great Lakes in recent years, but the overall population remains lower than reported in earlier decades. Common Tern are also a priority and focal species for the Upper Mississippi River and Great Lakes Region Joint Venture. The Great Lakes population nests primarily in Michigan and New York where threats to colonies remain high and many colonies often fail (F. Cuthbert Pers. Comm.; Norwood 2011). Since 2011, 16 active colony sites have been recorded in Michigan. Currently, nesting only occurs at sites in the Great Lakes; no inland lakes have been reported with nesting terns.

GOALS

- Maintain or increase number of nesting pairs in Michigan.
- Manage at least 3 sites to reduce threats and ensure annual productivity.

HOW VULNERABLE ARE FOCAL SPECIES TO CLIMATE CHANGE?

Hoving et al. (2013) determined climate vulnerabilities for focal species. See threats section for more specific information about how climate change may affect species and habitats.

Climate vulnerabilities are based on projected changes in the abundance or range of a species by 2050 - moderate = likely decrease.

	Climate Vulnerability
Piping Plover	Moderate
Common Tern	Moderate

WHAT ARE THE CONSERVATION THREATS & ACTIONS?

Major threats that need to be addressed and key actions that need to be implemented over the next 10 years.

THREATS to Habitat

Invasive & Other Problematic Species, Genes & Diseases

- Invasive species encroachment, as well as native species and woody vegetation encroachment when there isn't natural beach scour, can remove or degrade needed open areas for nesting habitats (Kost et al. 2007).

Residential & Commerical Development

- Incompatible development and use can alter habitats and prevent natural erosion processes. Beach grooming can be a threat or an opportunity depending on timing and extent (USFWS 2003; Kost et al. 2007).
- Increases in coastal property values often decrease the opportunities for land protection through acquisition and easements.

Transportation & Service Corridors

- Dredging river mouths during low water levels can cause loss of sand replenishment.

Human Intrusions & Disturbance

- Perceptions of dune erosion and the lack of understanding about natural processes that maintain dunes and beaches.
- Challenges to the Critical Dune Act for shoreline access or development can remove or fragment habitats.
- Unrestricted beach-goers and ORVs can introduce invasive species and destabilize habitats (USFWS 2003; Kost et al. 2007).

Natural Systems Modifications

- Installation of breakwalls and jettys can affect dune and beach ecosystem processes.
- Loss of natural disturbance or lack of management that sets back succession; lack of management can be due to inaccessibility or willingness of landowners.

Conservation ACTIONS for Habitat

Land & Water Management

H1. Conduct habitat management to set back succession and control invasive species at known and potential nesting sites. [PP-1.3; LSBCS-6.8, LMBCS-6.3; TNC, WCA; CT; TIS]

H2. Work with agencies and industry to make dredge projects more wildlife-friendly.

Raising Awareness

H3. Develop and promote educational materials about natural processes of dunes and responsible dune recreation. [LHBCS-4.3; TNC; WCA; PP-1.3, 5.1]

H4. Support and participate in partnership of Michigan Dune Alliance, and expand across Lake Michigan coast or Great Lakes wide. [TNC]

H5. Educate policy-makers on the value and importance of dune and beach ecosystems and how to protect them. [LHBCS-4.1; TNC]

H6. Educate policy-makers and beach monitoring groups on the value and importance of dune and beach ecosystems and how to protect them. [LHBCS 4.3; TNC; LC]

Conservation Designation & Planning

H7. Use conservation easements and acquisition to increase long-term viability of restored habitats. [PP-1.3; TNC; CT]

Research & Monitoring

H8. Monitor management at sites to evaluate results, and share lessons learned. [TNC]

H9. Use and promote the Midwest Invasive Species Information Network (MISIN) to monitor invasive species. [CC-7.3; TIS]

THREATS to Piping Plover

Human Intrusions & Disturbance

- Disturbance from unrestricted recreationists such as dogs not on leashes, beach-goers, kite flyers, kite boarders, fireworks, and ORVs. This can cause adults to abandon nests or crush eggs (USFWS 2003; Kost et al. 2007).

Invasive & Problematic Species, Pathogens & Genes

- Predation of chicks after hatching by mammals and birds. Predation of adults by Merlins, mammals, Great Horned Owls, and other predators can cause abandonment of nests (USFWS 2003).
- Because population numbers are so low, diseases like Type E Botulism and Avian Influenza can have significant impacts (USFWS 2009).

Climate Change & Severe Weather

- Climate change may have a variety of impacts including: sea-level rise on the wintering grounds that will restrict habitat, changes in food availability due to timing of insect emergence, temperature changes, and increases in invasive species (Hoving et al. 2013). Impacts of lake level changes within the Great Lakes are unclear.
- High lake levels can flood habitats or wash out nests during storms (Cuthbert et al. 2003).

Conservation ACTIONS for Piping Plover

Species Management

PP1. Continue predator management at Piping Plover sites using lethal and nonlethal techniques as needed and as permitted; explore using electric fencing and other options to exclude predators. [LSBCS-2.5; PP-1.2; FRD; FRD2]

PP2. Continue nest site identification, protection, and monitoring for Piping Plovers. [PP-1; FRD; FRD2]

PP3. Continue salvage captive rearing program for Piping Plovers and continue to evaluate and modify the program as needed to increase effectiveness. [PP-7.2]

Raising Awareness

PP4. Continue and expand Piping Plover education and outreach efforts; consider installing nest cams in the wild or at captive nests, or conducting open houses to gain local support, etc. [PP-5; WCA]

Conservation Designation & Planning

PP5. Develop and implement long-term regional management plans for Piping Plover nesting areas that provide specific management guidance at current, historical, and potential sites. [LHBCS-2.6 & 4.1; WCA]

PP6. Revise and implement the Piping Plover Recovery Plan, and include a disease response plan.

Research & Monitoring

PP7. Use new technology, as it becomes available, to increase efficiency of work and quality of data for monitoring, planning, and evaluations (e.g., geolocators to monitor birds during their full life cycle). [PP-4.3, 4.4; WCA, TNC]

PP8. Use existing citizen science efforts, such as eBird, to find new nesting sites of Piping Plover. [PP-1.2]

PP9. Continue ongoing efforts to monitor and respond to Type E Botulism.

PP10. Continue color banding of Piping Plovers to determine population demographic information and movements. [PP-1.1, 4.1]

Institutional Development

PP11. Develop a Piping Plover business plan with partners to create short- and long-term budgets that address resources needed to continue conservation post-delisting of Piping Plover. [LHBCS-3.1]

THREATS to Common Tern

Human Intrusions & Disturbance

- Disturbance by people and boats.

Invasive & Problematic Species, Pathogens & Genes

- Very susceptible to total colony abandonment due to predation (Cuthbert et al. 2003).
- Competition with other colonial nesters, such as Gulls, Caspian Terns, and Cormorants (Cuthbert et al. 2003).

Climate Change & Severe Weather

- With higher lake levels, habitat can be lost on islands and piers, or nests can be washed out during storms (Cuthbert et al. 2003; Hughes et al. 2014).
- Climate change could have a variety of impacts: higher lake levels could decrease available habitat, colonies could be swamped due to increased precipitation or intense storms, intense storms can also cause high chick mortality (Cuthbert et al. 2003; Hoving et al. 2013).

Conservation ACTIONS for Common Tern

Species Management

CT1. Continue predator management at Common Tern sites using lethal and nonlethal techniques as needed and as permitted. Explore using electric fencing and other options to exclude predators. [LSBCS-2.5; CT]

Conservation Designation & Planning

CT2. Develop and implement long-term regional management plans for Common Tern nesting areas that provide specific management guidance at current, historical, and potential sites. Consider pontoon boats as artificial habitat at low survival or productivity sites, where feasible. [LHBCS-2.6 & 4.1; WCA; CT]

CT3. Manage access and types of access in known and potential nesting areas during nesting season. [CT]

CT4. Work with local governments and private land-owners to protect colonies on artificial sites. [CT]

Research & Monitoring

CT5. Use new technology as it becomes available to increase efficiency of work and quality of data for monitoring, planning, and evaluations (e.g., geolocators to monitor birds during their full life cycle). [WCA, TNC]

CT6. Use existing citizen science efforts, such as eBird, to find new nesting sites of Common Tern. [CT]

CT7. Use data from different sources to assess Common Tern populations and colonies. [JV; WCA; CT]

WHAT ADDITIONAL CONSERVATION ACTIONS ARE NEEDED?

These additional conservation actions were identified by partners and should be addressed as resources become available.

Species Management

1. Implement exclusion procedures (e.g., early disturbance, poles and wires) to reduce competition from other colonial nesters at key Common Tern nesting sites.
2. Explore areas that can be developed for nesting terns and use established methods (e.g., decoys, sound systems) to establish colonies in protected sites.

Raising Awareness

3. Install and maintain educational signs at Common Tern nesting colony sites.

Research & Monitoring

4. Continue and expand remote sensing long-term modeling of shoreline ecosystems to aid planning for on the ground management, monitoring, and restoration as well as to evaluate threats (e.g., invasive plants).
5. Continue research efforts on population demographics, emerging threats, migration pathways and overwintering areas, and recovery strategies. [PP-4; JV; WCA]
6. Determine limiting factors for Common Tern; bioenergetics studies on potential food shifts due to aquatic invasive species may be important. [JV; WCA]

Law & Policy

7. Work with local units of government to provide legal protections for critical dune and beach areas for focal species using ordinances and zoning.

WHERE ARE THERE PLACES FOR PARTNERSHIP?

This map was designed by partners to help them connect around important places for focal species. Working together on conservation actions on a voluntary basis provides great benefits to wildlife and people.

Priority areas for conservation actions

This map is based on focal species occurrences by county.

HOW WILL WE MONITOR?

Assessing status and measuring progress towards goals.

HABITAT

- Continue to survey and update quality rankings for Dunes and Sand-Cobble Shore natural communities in the state's Natural Heritage Database.

PIPING PLOVER

- Continue to use existing monitoring and research (color-bands) program. [PP-1.1]
- Use citizen science programs, such as eBird, to look for potential new nesting sites.

COMMON TERN

- Continue decadal Great Lakes colonial waterbird survey.
- Develop a monitoring strategy for Common Tern based on current efforts, and implement. [JV; WCA; CT]

HOW DOES THIS PLAN LINK WITH OTHER CONSERVATION PLANS?

There has been a multitude of relevant planning efforts across the state and country over the past ten years. Bracketed superscripts throughout the Wildlife Action Plan indicate where the conservation action, goal, or monitoring strategy aligns with those from another plan. For conservation plans with distinct objectives, the objective or strategy number is also included. This linking of plans is meant to facilitate the expansion of partnerships.

[CC]. National fish, wildlife and plants climate adaptation strategy (National Fish, Wildlife and Plants Climate Adaptation Partnership 2012)

[CT] Status assessment and conservation recommendations for the common tern (*Sterna hirundo*) in the Great Lakes Region (Cuthbert et al. 2003)

[FRD] Northern Lower Peninsula regional state forest management plan (DNR 2013b)

[FRD2] Eastern Upper Peninsula regional state forest management plan (DNR 2013a)

[JV] Upper Mississippi River and Great Lakes Region Joint Venture Waterbird Habitat Conservation Strategy (Soulliere et al. 2007)

[LC] Land Conservancy of West Michigan's Strategic Plan 2014-16 (Land Conservancy of West Michigan 2014)

[LHBCS] The Sweetwater Sea: An international biodiversity conservation strategy for Lake Huron – Technical Report (Lake Huron Biodiversity Conservation Strategy Core Team, 2010)

[LMBCS] Michigami: great water. Strategies to conserve the biodiversity of Lake Michigan. Technical Report (Pearsall et al. 2012)

[LSBCS] A biodiversity conservation strategy for Lake Superior: a guide to conserving and restoring the health of the world's largest freshwater lake (Lake Superior Binational Program 2015)

[PP] Recovery Plan for the Great Lakes Piping Plover (*Charadrius melodus*) (USFWS 2003)

[TIS] Michigan Terrestrial Invasive Species State Management Plan (DNR in draft)

[TNC] Eastern Lake Michigan Conservation Business Plan (The Nature Conservancy)

[WCA] Waterbird conservation for the Americas: the North American waterbird conservation plan, version 1 (Kushlan et al. 2002)

FOR MORE INFORMATION/REFERENCES

Cohen, J.G., M.A. Kost, B.S. Slaughter, and D.A. Albert. 2015. A field guide to the natural communities of Michigan. Michigan State University Press, East Lansing, MI. 362 pp.

Cornell University. 2015. All About Birds (web application). Accessed on 08/31/2015 at http://www.allaboutbirds.org.

Cuthbert, F.J., L.R. Wires, and K. Timmerman. 2003. Status assessment and conservation recommendations for the common tern (Sterna hirundo) in the Great Lakes Region. U.S. Fish and Wildlife Service, Ft. Snelling, MN. 90 pp.

Cuthbert, F. 2011. Piping Plover (Charadrius melodus). in A.T. Chartier, J.J. Baldy, and J.M. Brenneman, editors. 2011. The Second Michigan Breeding Bird Atlas. Kalamazoo Nature Center. Kalamazoo, Michigan, USA.

Hoving, C.L., Y. Lee, P.J. Badra, and B.J. Klatt. 2013. Changing climate, changing wildlife: a vulnerability assessment of 400 species of greatest conservation need and game species in Michigan. Wildlife Division Report No. 3564. Lansing, MI. 82 pp.

Hughes, K.D., D.J. Moore, and P.A. Martin. 2014. An assessment of breeding populations of common terns and black terns in the St. Marys River Area of Concern (Ontario). Environment Canada. 12 pp.

Hyde, D.A. 1997. Special animal abstract for Sterna hirundo (Common Tern). Michigan Natural Features Inventory, Lansing, MI. 3 pp.

Hyde, D.A. 1999. Special animal abstract for Charadrius melodus (Piping Plover). Michigan Natural Features Inventory, Lansing, MI. 4 pp.

Kost, M.A., D.A. Albert, J.G. Cohen, B.S. Slaughter, R.K. Schillo, C.R. Weber, and K.A. Chapman. 2007. Natural communities of Michigan: classification and description. Michigan Natural Features Inventory, Report No. 2007-21, Lansing, MI.

Kushlan, J.A., M.J. Steinkamp, K.C. Parsons, J. Capp, M.A. Cruz, M. Coulter, I. Davidson, L. Dickson, N. Edelson, R. Elliot, R.M. Erwin, S. Hatch, S. Kress, R. Milko, S. Miller, K. Mills, R. Paul, R. Phillips, J.E. Saliva, B. Sydeman, J. Trapp, J. Wheeler, and K. Wohl. 2002. Waterbird conservation for the Americas: The North American waterbird conservation plan, Version 1. Waterbird Conservation for the Americas, Washington, DC, U.S.A., 78pp.

Land Conservancy of West Michigan. 2014. Land Conservancy of West Michigan's strategic plan 2014-16.

Lake Huron Biodiversity Conservation Strategy Core Team. 2010. The Sweetwater Sea: An international biodiversity conservation strategy for Lake Huron – Technical Report. Developed in cooperation with the Lake Huron Binational Partnership.

Lake Superior Binational Program. 2015. A biodiversity conservation strategy for Lake Superior: a guide to conserving and restoring the health of the world's largest freshwater lake. Developed in cooperation with The Nature Conservancy of Canada.

LIAA. 2014. Climate change adaptation & local planning for Michigan's coastal wetland resources. 31 pp. Accessed at http://www.greatlakeswetlandadaptation.org/uploads/2/6/5/3/26539851/final_wetlands_report_sept_2014.pdf. 10/14/2015

Michigan Department of Natural Resources. 2013a. Eastern Upper Peninsula regional state forest management plan. Michigan Department of Natural Resources, Lansing MI.

Michigan Department of Natural Resources. 2013b. Northern Lower Peninsula regional state forest management plan. Michigan Department of Natural Resources, Lansing MI.

Michigan Department of Natural Resources. Draft Michigan Terrestrial Invasive Species State Management Plan. Michigan Department of Natural Resources, Lansing MI. Manuscript in preparation.

National Fish, Wildlife and Plants Climate Adaptation Partnership. 2012. National Fish, Wildlife and Plants Climate Adaptation Strategy. Association of Fish and Wildlife Agencies, Council on Environmental Quality, Great Lakes Indian Fish and Wildlife Commission, National Oceanic and Atmospheric Administration, and U.S. Fish and Wildlife Service. Washington, D.C.

Norwood, G.J. 2011. Nest-site selection, nocturnal nest desertion, and productivity in a common tern (Sterna hirundo) colony at Detroit River, Michigan. Master's Theses and Doctoral Dissertations. Paper 346. 63 pp.

Pearsall, D., P. Carton de Grammont, C. Cavalieri, P. Doran, L. Elbing, D. Ewert, K. Hall, M. Herbert, M. Khoury, S. Mysorekar, S. Neville, J. Paskus, and A. Sasson. 2012. Michigami: great water. Strategies to conserve the biodiversity of Lake Michigan. Technical Report. A joint publication of The Nature Conservancy and Michigan Natural Features Inventory. 309 pp. with Appendices.

Sauer, J.R., J.E. Hines, J.E. Fallon, K.L. Pardieck, D.J. Ziolkowski Jr., and W.A. Link. 2011. The North American Breeding Bird Survey, results and analysis 1966-2010. Version 12.07.2011. USGS, Patuxent Wildlife Research Center, Laurel, Maryland, USA. www.pwrc.usgs.gov/bbs/results

Soulliere, G. J., B. A. Potter, D. J. Holm, D. A. Granfors, M. J. Monfils, S. J. Lewis, and W. E. Thogmartin. 2007. Upper Mississippi River and Great Lakes Region Joint Venture Waterbird Habitat Conservation Strategy. U.S. Fish and Wildlife Service, Fort Snelling, MN. 68 pp.

The Nature Conservancy. Eastern Lake Michigan Conservation Business Plan.

U.S. Fish and Wildlife Service (USFWS). 2003. Recovery Plan for the Great Lakes Piping Plover (Charadrius melodus). Ft. Snelling, Minnesota. Viii+141 pp.

U.S. Fish and Wildlife Service (USFWS). 2009. Piping Plover (Charadrius melodus) 5-year review: summary and evaluation. Hadley, MA and East Lansing, MI. 206 pp.

Young, B., E. Byers, K. Gravuer, K. Hall, G. Hammerson, and A. Redder. 2011. Guidelines for using the NatureServe climate change vulnerability index, Release 2.1. NatureServe, Arlington, VA.

Photo Credits

Front Cover & page 16 – Habitat by MNFI, Dave Cuthrell

All Piping Plovers by Roger Eriksson

Page 3, 6, 13, 16 – Common Tern by Caleb Putnam

Page 2 – Spotted Sandpiper by Brad Silet

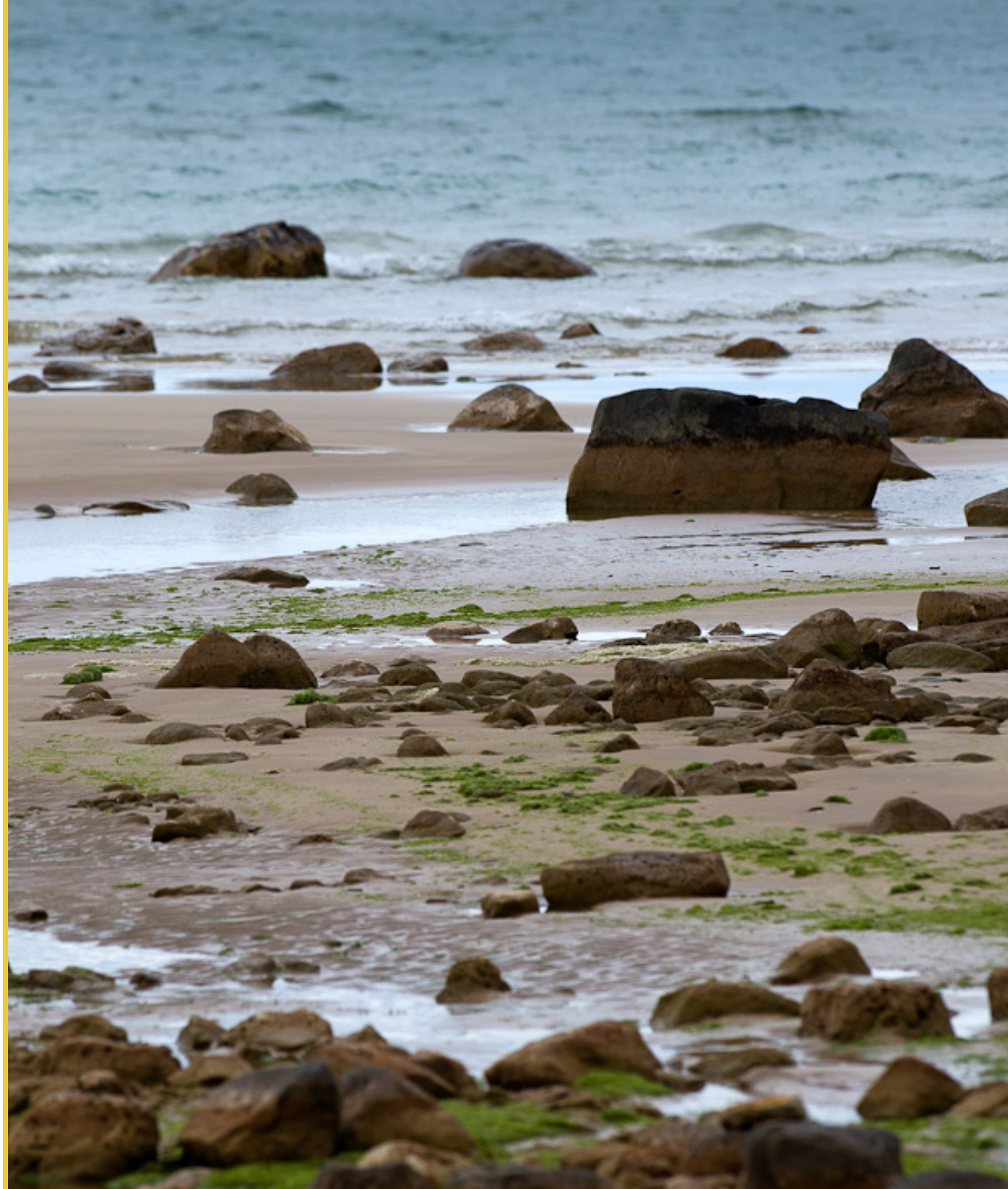
Page 3 – Lake Huron Locust by MNFI, Dave Cuthrell

Page 4 – Dwarf Lake Iris by MNFI, Brad Slaughter, Lake Huron Tansy by MNFI, Pitcher's Thistle by MNFI, Jesse Lincoln

Page 9 – Habitat by MNFI, Dave Cuthrell

Page 13 – Flying Common Tern by Roger Eriksson

Recommended Citation
Derosier, A.L., S.K. Hanshue, K.E. Wehrly, J.K. Farkas, and M.J. Nichols. 2015. Michigan's Wildlife Action Plan. Michigan Department of Natural Resources, Lansing, MI. www.michigan.gov/dnrwildlifeactionplan



ABOUT THE WILDLIFE ACTION PLAN

Today's Priorities, Tomorrow's Wildlife

Every state has a Wildlife Action Plan, which taken together create a national conservation strategy for safeguarding wildlife and their habitats for current and future generations. Each state's action plan is uniquely designed to serve the needs of that state. These plans provide a framework for proactive conservation and management of fish and wildlife before they become imperiled, which is more straightforward, cost-efficient, and effective.

Michigan's Wildlife Action Plan was developed by conservation partners across the state. It provides information about those species in greatest conservation need. The plan is organized by chapters or mini-plans. Each mini-plan outlines priorities for the next 10 years. The mini-plans detail priority habitats and focal species of greatest conservation need, status of species and habitats, critical threats, needed conservation actions, places for partnerships, monitoring needs, and goals. This is one of 15 mini-plans. For more information about how the plan was built and to read other mini-plans, please visit: www.michigan.gov/dnrwildlifeactionplan.