Appendix C—Planning Team Summary

Over the duration of the General Management Planning process, the Planning Team held three on-site team meetings and three virtual meetings. These meetings were critical to the development of the General Management Plan and particularly the creation of the 20-Year Management Zones and the 10-Year Action Goals. Additionally, the meetings were an opportunity to review input received from stakeholders and the public.

Overview of Planning Team Meetings

Team Meeting #1 Ludington State Park (March 26, 2015) – The Planning Team's kick-off meeting was an opportunity for Planning Team members to introduce themselves to one another, review the General Management Plan schedule, receive an overview and tour of Ludington, discuss the park and its significance features, review the resource maps, gather ideas on survey questions to ask the public, and review the Supporting Analysis.

Team Meeting #2 Ludington State Park (April 30, 2015) –The Planning Team met and began discussion with the supporting analysis and potential stakeholders to include for the future open house. They also suggested questions for the public input survey. Additionally, the Planning Team completed a first draft of the Management Zones and began brainstorming 10-year action goals for the park.

Team Meeting #3 Ludington State Park (May 28, 2015) – The Planning Team met and reviewed the Statements of Significance, Management Zone Map, and Action Goals. The Planning Team also finalized revisions to the online survey and the stakeholder list.

Team Meeting #4, Go-To-Meeting (September 1, 2015) – The Planning Team reviewed the input received from the stakeholder meeting and the online survey. The Significance Statements and Management Zone Maps were reviewed and revised. The Team also refined and made additions to the Draft Action Goals, taking into account the stakeholder and public input received. Discussion of the upcoming Public Open House confirmed the date and location.

Team Meeting #5, Go-To-Meeting (September 28, 2015) – The Planning Team met and reviewed updates to the Public Input Summary and debriefed on meetings. The Management Zone and Amenities maps were discussed with revisions. The Action Goals were reviewed and became more defined. The Team discussed the internal review process and the format for the upcoming Open House.

Team Meeting #6, Go-To-Meeting (November 30, 2015) –The Planning Team met and discussed the input received from the Public Input Open House, and how those topics could be reflected in the plan. Minor revisions to the Action Goals and maps were made. The Team received an overview of the final steps in the process, as well as projected timeline.

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Ludington State Park
General Management Plan

Kick-Off Meeting Summary
Thursday, March 26, 2015
9:00 - 3:30 PM
Ludington State Park

Attendees: Jim Gallie (Unit Manager), Dan Adams (Unit Supervisor), Debbie Jensen (Management Plan Administrator), Matt Lincoln (Planning Assistant/ Grant Coordinator), Tim Schreiner (District Supervisor), Annamarie Bauer (Regional Planner), Glenn Palmgren (Ecologist), Lisa Gamero (Cultural Resources Analyst), Mark Tonello (Fisheries Biologist), Officer Kyle Publiski (LED), Alan Wernette (Park Interpreter), Peter Rose (Geologist), Dean Anderson (State Archeologist), Dave Birchler and Mardy Stirling (Clearzoning)

1. Welcome and Introductions

2. Ludington State Park Management Plan Schedule was presented by D. Birchler.

3. Overview Management Planning Process was presented by D. Jensen. She noted that this was a CZM funded project with a project deadline of December 31st and summarized the associated reporting requirements. The team reviewed the different types of management zones and the intensity of use and level of protection for each designation.

4. Ludington State Park Overview and History was presented by J. Gallie.
   - Ludington State Park contains 5,300 acres between Hamlin Lake and Lake Michigan. There are seven miles of Lake Michigan shoreline. Hamlin Lake contains approximately five miles of shoreline.
   - Hamlin Lake (5,000 acres) is controlled by a dam.
   - The mining company located to the south of the state park was dormant for approximately 20 years. Sargent Sand recently reopened to mine sand.
   - In 1852, Charles Mears purchased land along the Big Sable River, in search of a mill location. The mouth of "Big Sable Lake," with its narrow stream to Lake Michigan seemed the ideal location. Mears built the first wooden dam and established a sawmill in 1856. This dam was located a few hundred feet downstream from the present-day dam, and raised the lake 12-15 feet. A smaller, wooden dam in the

lower Sable held back water to create a large holding pond for logs...thus the creation of Hamlin Lake.

- In 1860, Mears renamed his Little Sable settlement *Lincoln* and the Big Sable settlement and lake *Hamlin,* in honor of Mears' choice
- In 1852, Charles Mears, a lumbar baron, purchased land along the Big Sable River in search of a mill location. The Big Sable settlement later became the Village of Hamlin. Mears constructed three dams which contained the water's flow between Lake Hamlin and Lake Michigan – all three washed out. In 1988 the Village of Hamlin was washed out and destroyed. A lifesaving station was constructed in 1870 approximately one mile south of the lighthouse. The station was active until the 1950s.
- The park was dedicated in 1936. The tax reverted land was acquired through fund raising assistance by the Izaak Walton League.
- In 1933 a CCC camp was located at the Hamlin Lake day use area. The CCC was responsible for the roads, trails and buildings, including the construction of the north Michigan Beach House in 1935. Many of the original trails and roads constructed by the CCC exist in the park today.
- The park is home to several nesting pairs of Piping plover and provides habitat for the Pitcher's thistle.
- The Big Sable River is a main river corridor between Hamlin Lake and Lake Michigan. The river provides recreation opportunities for tubing and kayaking, fishing, and birding. The river has open water even during the winter, creating habitats for wildlife.
- The river hosts approximately 4 miles of canoe trail, with many portages along the way.
- Hamlin Dam was leased from the residents of Hamlin Lake Association for 99 years, beginning in 1936. The lease agreement, requires changes to the lake levels from December when first ice occurs to October. The DNR checks the water levels daily. The DNR maintains the dam, monitors lake levels and adjusts lake levels per the lease agreement. Lake levels are adjusted seasonally – water levels take approximately 4 to 6 weeks to adjust to the seasonal level. The adjustment of the lake levels has created issues for the DNR with those seeking recreational opportunities wanting lake levels to remain higher for a longer period of time and lake side property owners concerned about the lake levels and damage to their sea walls. Issues with the lake levels date back to 1936.
- It was recommended that information related to the dam, e.g. lease or deed be included in the Appendix section of the GMP.
- Active interpretive program that offers opportunities to learn about the park

- Recreational opportunities within the park, includes:
  - Beach on Lake Michigan
  - Designated swimming beach on Hamlin Lake, with picnic shelters and restrooms
  - Picnic area and playground equipment
  - 25 Miles of trails with accessible trails
  - Paved bike paths (two miles)
  - Cross-Country Trails (groomed)
  - Boating and canoeing – boat launch is a two lane
  - Unimproved access points on Hamlin Lake and the Big Sable River and Lake Michigan
  - Fishing from fishing docks, shoreline, and by boat on Hamlin Lake, the Big Sable River and Lake Michigan
- Accommodations – Three major campgrounds
  - Cedar Campground (modern amenities –camp store), Beechwood Campground (147 sites close to Hamlin Lake), The Pines Campground (99 sites), and Jack Pine Campground (walk-in sites with vault toilet and hand pump), Three mini-cabins are available year-round with electric, heat, and microwave; one per campground.
- Buildings/Structures
  - Historic Beach House – interpretive center, modern restrooms, and concessionaire
  - Big Sable Point Lighthouse - hiking or access by bike (open May to October)
  - Hamlin Dam
  - Three locations for concessionaires – provide sundries, tubes and rafts for boating, bicycles, gifts, etc.
- A proposed dedicated Natural Area of 2,000 acres protecting the park's coastal dune ecosystem and interdunal wetlands
- Programs – Popular programs include
  - Recreation 101
  - Learn to Fish
  - Fly a kite
  - Amphitheater seats up to 200 with the Friends Group providing funding for programs
  - Cross country ski trail/snowshoe making program. Night snow shoe hike.
  - Lighthouse keeper program
- Staffing
  - 6 year-round staff, including the park interpreter

7 seasonal staff and 25 summer workers (operations, maintenance, and plover program)

- Major Capital Projects
  - Water system
  - Pines Campground electric
  - Beach House restoration
  - Extended seawall south to protect lighthouse from high water
  - Accessible beach walkway (a second is planned)
  - Cedar Campground septic field
  - Big Sable bank restoration
  - New sanitation station

5. Park Tour, Significant Features and Issues
   Recent rising water levels on Lake Michigan
   Beechwood Campground needs improvements to the electrical system
   General infrastructure improvements
   Beach House parking deficiencies
   Sargent Sand mining operation

6. Tour Debrief. It was noted that there used to be a visitor's center on the south side of the river that was constructed around 1977. In March 2009, the building collapsed under heavy snow. The visitor's center was popular with some but it was not in a good location – with over 850,000 visitors to the park, the visitor's center had approximately 35,000. It was suggested that the Beach House could function as the interpretive center for the park.

7. Significance Statement Exercise. The team was asked to write down features that they believe make Ludington State Park unique and significant. These features were then categorized into topic areas.

8. Discussion regarding the Supporting Analysis.

A.3	History of Ludington State Park:	Stirling/Gamero/Gallie
	Identify how many passengers use the ferry system if possible and verify the dates.	
A.4	Land Ownership and Acquisition:	Jensen
A.5	Relationship to other Recreation Resources:	Stirling/Gallie/Adams
A.6	Legal Mandates	Jensen/Stirling

Add NEPA 45 of 2010 and Fisheries Order - consider adding to the Appendix the following documents: Sargent Extraction (Sand and Gravel) Easement, Lease Agreement with Big Sable Point Light House, Transfer document for light house, Deed for Dam, DEQ Permit for underground storage, reclamation plan.

A.7 Natural Systems and Resources: Palmgren/Victory

A.8 Cultural Resources: Gamero

Archeological information included. Verify Historic structures and districts.

A.10 Recreation Resources: Palmgren/Gallie/Adams

Palmgren to provide map of hunting area. It was noted that there would be a new trail map available in May.

A.11 Issues and Opportunities: Team/Next meeting

Issues:
Mining operation possible impact on the park's dunes
Invasive species
Quantity of Visitors and the impact on the natural and cultural resources
Recent rising water levels on Lake Michigan
Beechwood Campground needs improvements to the electrical system
General infrastructure improvements
850,000 visitors – parking is inadequate
Park access needs work
Toilet buildings need work
Oak wilt
Pedestrian/vehicular congestion and conflicts

Opportunities:
Close ties to Ludington community
Acquisition of land within dedicated boundary
North 60-120 acres is critical
Hamlin Lake warms early creating a natural habitat

A.12 Park Use Statistics: Jensen/Stirling

A.13 Resource Maps: Stirling/Starks

Change scale of topo map, label roads on resource map, check for wetlands – map doesn't represent total area of wetlands

9. Schedule Team Meetings #2 and #3: Please put a hold on your calendar for April 30 and May 28

Ludington State Park
General Management Plan

Planning Team Meeting #2 Summary
Thursday, April 30, 2015
9:00 - 3:00 PM
Ludington State Park

Attendees: Jim Gallie (Unit Manager), Dan Adams (Unit Supervisor), Debbie Jensen (Management Plan Administrator), Matt Lincoln (Planning Assistant/ Grant Coordinator), Tim Schreiner (District Supervisor), Annamarie Bauer (Regional Planner), Lisa Gamero (Cultural Resource Analyst), Mark Tonello (Fisheries Biologist), Alan Wernette (Park Interpreter), Dean Anderson (State Archeologist), Dave Birchler and Mardy Stirling (Clearzoning)

1. Review Planning Team Meeting Summary #1 for March 26, 2015.

2. Statement of Significance Review Exercise. Based on input from the team at their first meeting, draft statements were presented that addressed several of the team's ideas. The Planning Team reviewed the statements and made revisions. M. Tonello offered to revise the significance statement related to fishing.

3. Review Resource Maps. The Planning Team reviewed the resource maps and recommended revisions. The trail map is currently being updated and will be replaced with the more current version when available. It was also suggested that a note be included on the critical habitat resource map indicating that the Piping plover nesting habitat encompasses a larger area and includes the entire LSP shoreline.

4. Draft Management Zone Activity. The Planning Team split into two groups. Using resource maps the two teams identified zones based on the Park and Recreation management zone descriptions. Planning Team One limited the Developed Recreation area to the existing developed area of the park and the active area of the Sargent Sand mining operation. There was discussion within the team regarding an Education Zone and using a Cultural Resource Overlay for the CCC core area. Planning Team Two proposes Scenic Zone for the coastline and at key locations in the park. They also suggested a larger Developed Recreation area to permit possible expansion.

5. Review of Stakeholder List. The Planning Team added to a master stakeholder list throughout the meeting.

6. Review of Supporting Analysis. The Planning Team reviewed the draft Supporting Analysis and recommended revisions including addressing the issues and concerns as

part of the action goals exercise, incorporating additional maps throughout the resource sections. The Planning Team also discussed the reclamation plan, additional legal resources and

7. Action Goals Wish List Activity. A preliminary wish list of 10-year action goals was developed by the Planning Team through a brainstorming exercise.

8. Public Input Survey Brainstorming Exercise. The Planning Team addressed what they would like to learn from people that either visit or don't visit Ludington State Park. Some of the questions recommended by the Team included:

- Why do you choose Ludington State Park over other campgrounds?
- What are your favorite things to do in the park?
- What are your favorite programs in the park?
- What programs would you like to see in the park?
- Do you walk to the beach or do you drive to the beach – how do you access the beach?
- Why do you drive to the beach?
- Would you use a shuttle service to the beach?
- Would you use a shuttle service to Ludington?
- Dog beach (land use order)
- Do you use the park year around?
- Do you realize the park has year round programs?
- How do you learn about programs in the park? (internet, newspaper, facebook)
- What is your favorite trail in the park?
- Are you aware that there is a Friends Group for Ludington State Park?
- The Planning Team has developed a list of infrastructure improvements. From the list below what do you feel is a priority? (pick three) – other
- Do you fish when you visit the park?
- What is your favorite species to fish for at Ludington State Park?
- Do you prefer to fish Hamlin Lake, Lake Michigan or Big Sauble River?
- Do you fish the shoreline, surf fishing, pier fishing or by boat?
- How many people come to the park to hunt or trap?
- What do you prefer to hunt or trap (deer, turkeys, water fowl, small game)
- What recreational opportunities are you interested in?
- Beach safety topic – rip currents, signage, red flags,
- How do you access weather information – do you know what to do in a case of emergency?

9. The next Planning Team Meeting is scheduled for May 28, 2015 at Ludington State Park.

Ludington State Park
General Management Plan

Planning Team Meeting #3 Summary
Thursday, May 28, 2015
9:00 AM – 3:00 PM
Ludington State Park

Attendees: Jim Gallie (Unit Manager), Dan Adams (Unit Supervisor), Debbie Jensen (Management Plan Administrator), Tim Schreiner (District Supervisor), Annamarie Bauer (Regional Planner), Glenn Palmgren (Ecologist), Lisa Gamero (Cultural Resource Analyst), Mark Tonello (Fisheries Biologist), Alan Wernette (Park Interpreter), Dean Anderson (State Archeologist), Joel Simpson (Student Intern), Dave Birchler and Mardy Stirling (Clearzoning)

1. Review and revise Planning Team Meeting Summary #2, April 30, 2015.

2. Statements of Significance Review. The Planning Team reviewed the Statement of Significance and recommended revisions. There was consensus to include the Friends of Ludington State Park and the Sable Point Light House Keepers. It was also decided to use the expanded statement that described the fishing opportunities as provided by M. Tonello.

3. Draft Management Zone Review. The Planning Team reviewed the Management Zone exercise from Team meeting #2. Using Team 2 conceptual zone map, the Team concurred on the following changes:

   - Include cultural overlay over the entire park with the exception of the quarry.
   - Modify the southwest corner of the park land to Natural Resource Recreation Zone from Developed Recreation Zone and Scenic Zone – thereby protecting the entrance of the park while still allowing a less intense level of development.
   - Change the between the road and the shoreline, south of the proposed Developed Recreation Zone (campgrounds/Beach House), from Scenic Zone to Natural Resource Recreation Zone. The Planning Team expressed a desire to allow flexibility to permit the installation of some minor infrastructure/buildings in this area while maintaining an appropriate level of natural resource protection.
   - Change the area between the service drive and the shoreline, north of the proposed Developed Recreation zone (campgrounds/Beach House), from Scenic Zone to Backcountry Zone.
   - Include a corridor or buffer along the park road/service drive to the lighthouse to address the level of activity necessary through the proposed Backcountry Zone (proposed).
   - Include the lighthouse along with the land area as described in the lease as Cultural Landscape Zone.
   - Change the area north of the lighthouse, between the shoreline and the edge of the area designated as critical coastal habitat from Scenic Zone to Primitive Zone. The Team also requested that the Primitive Boundary align with the proposed Natural Area or designated critical habitat areas.
   - Remove designation for Scenic Zone and include a Scenic Overlay for the entire shoreline.

- Modify the areas on the north side of the inlet along Hamlin Lake from the proposed Developed Recreation Zone to Natural Resource Recreation Zone and follow the contour line along the north side of the camping area, thereby expanding the area for Natural Resource Recreation.
- Change the area on the south side of the inlet along Hamlin Lake, east of the mouth of the Big Sable River from Natural Resource Recreation to Developed Recreation to accurately reflect the level of use and infrastructure in the area.

4. Draft Action Goals Activity. Based on input from the Planning Team during their meeting in April, action goals were developed and presented for comment. The Planning Team reviewed and revised the action goals and provided additional goals for specific zone designations within the park.

5. Review/Finalize Public Input Survey. The Team suggested revisions to the survey.

6. Review Supporting Analysis. The Team noted sections that needed additional information. The respective team member(s) will email revisions to M. Stirling to be incorporated into the document for final review by the Planning Team.

7. Review Stakeholder List. D. Jensen noted that some of the names were not included on the list submitted in the packet. M. Stirling will review for any updates and incorporate as needed.

8. Schedule Stakeholder Focus Group/Venue. The Team suggested holding the stakeholder meeting in July. J. Gallie will check availability at Ludington City Hall for the meeting.

Team Member	Action	Target Date
J. Gallie	Check with Ludington City for available meeting room in July/August	July 1, 2015
M. Stirling	Prepare Meeting Minutes Update Significance Statement, Stakeholder List, Action Goals Reclamation Plan Prepare Invitation for Stakeholder Focus Group	June 15, 2015
G. Palmgren	Submit information for supporting analysis/contact for stakeholder	May 30, 2015
L. Gamero	Contact information for stakeholder	May 30, 2015
D. Jensen	Stakeholder finalize Additional information for mapping/real estate	
S. Starks	GIS/Zone Maps	June 10, 2015

Ludington State Park
General Management Plan

Planning Team Meeting #4 Summary
Tuesday, September 1, 2015
1:00 PM – 4:00 PM
Go-to-Meeting

Attendees: Jim Gallie (Unit Manager), Dan Adams (Unit Supervisor), Debbie Jensen (Management Plan Administrator), Matt Lincoln, (Planning Assistant), Annamarie Bauer (Regional Planner), Mark Tonello (Fisheries Biologist), Alan Wernette (Park Interpreter), Dave Birchler, Mardy Stirling, and Karen Zarowny (Clearzoning)

1. Planning Team Meeting #3 Summary of May 28, 2015. The Team approved with minor revisions.

2. Stakeholder Input Summary. The Team reviewed the stakeholder input summary and made minor revisions. There was a general discussion and reflection on the input received at the meeting. M. Stirling reported that a phone meeting was held with Dr. Anderson representing Mason County Cultural Trails.

3. Survey Results and the Summary of Public Input Survey. The Team reviewed the survey results, discussed recurring trends, and brainstormed on the most effective way to present the results in the General Management Plan. The Team also made minor revisions to the Summary of Public Input Survey.

4. Significance Statements and Management Zone Map Review. The Team reviewed and revised the Statements of Significance. The Team discussed adding a reference to the Nordhouse Dunes and drafted language which should be verified by G. Palmgren. The Team also made the following changes to the Management Zone Map:
    - Designate the island located north of the day use area on Hamlin Lake as Backcountry and include it in the park boundary.
    - The Natural Resource Recreation corridor of the service drive should end at the Cultural Zone.
    - The Team suggested changes to the map layout and requested that trails (general) be added.
    - The Team discussed showing the proposed boundary on an inset map and removing it from the larger management zone map. It was also suggested that a separate map be created showing the area within the Developed Recreation Zone in more detail.

5. Draft Action Goals Review. The Team reviewed, revised, and developed the following action goals:

- General
  - Add a references to the Island Trail for stabilization of Hamlin Lake shoreline
  - Complete Michigan Forest Inventory cover type mapping for the park
  - Work with partners to develop access points and amenities along the Lake Michigan water trail
  - Work with regional partners to identify potential physical, economic, and marketing connectivity between the Park and the Mason County community
  - Continue efforts to achieve greater visitor accessibility in all development opportunities
  - Review all earthwork activities for their potential impact on historical and cultural resources
- Primitive
  - Work with USFS to maintain integrity and protection of the wilderness and primitive zone
  - Provide information to the public regarding differences in the administrative rules between the State Park and USFS lands
- Backcountry
  - Maintain historic trail structures
- Natural Resource Recreation
  - Install shade shelters, benches, and distance markers along road to the Big Sable Point Lighthouse

  The Team also discussed three possible action goals related to circulation improvements along M-116 (pedestrian, bicycle, and vehicle circulation). D. Jensen and A. Bauer are meeting with MDOT to discuss the developing General Management Plan and how the agencies can work together on current and future plans to enhance circulation.
- Developed Recreation
  - Continue to work with partners with the tree replacement program
  - Identify and provide interpretive opportunities along the Hamlin Dam trail
- Cultural Landscape
  - Provide ways for visitors with mobility limitations to experience the views from the lighthouse
  - Complete Historic Structures Report for the Big Sable Point Lighthouse
  - Implement recommendations of Historic Structures Report for the Big Sable Point Lighthouse

6. Public Input Open House/Venue. The Team selected early November to hold the Public Open House. M. Stirling will check availability of the Ludington Public Library. The Team also discussed holding meeting #5 (Go-To-Meeting) at the end of September. The Planning Team will be polled for possible dates.

Ludington State Park
General Management Plan

Planning Team Meeting #5 Summary
Monday, September 28, 2015
1:00 PM – 4:00 PM
Go-to-Meeting

Attendees: Jim Gallie (Unit Manager), Dan Adams (Unit Supervisor), Alan Wernette (Park Interpreter), Debbie Jensen (Management Plan Administrator), Tim Schreiner (District Supervisor), Matt Lincoln, (Grants Coordinator), Glenn Palmgren (Ecologist), Lisa Gamero (Cultural Resources Analyst), Mark Tonello (Fisheries Biologist), Dave Birchler, Mardy Stirling, and Karen Zarowny (Clearzoning)

1. Planning Team Meeting #4 Summary of September 1, 2015. The Team approved with minor revisions.

2. Stakeholder Input and Online Survey Summary. The Team reviewed the summaries and made minor revisions. *Clearzoning will include additional infographics in the survey summary, tally responses to question #26 related to the most popular visitor attractions in the area, and reorganize/reformat the survey for easier viewing (separating questions by page).*

3. Michigan Department of Transportation. A. Bauer, , J. Gallie, , and D. Jensen met with A. Green, Muskegon TSC Manager, Patty O'Donnell, Transportation Planner North Region and Dennis Kent, Transportation Planner Grand Region to discuss the General Management Plan (GMP) and the ongoing relationship and partnership with the MDOT. The congestion at the park entrance, parking along M-116 and non-motorized access along M-116 between the State Park and the City of Ludington were discussed. *D. Jensen will prepare a brief summary of the meeting for incorporation into the public input portion of the GMP.*

4. Management Zone Map Review. The Team discussed the use of an inset for the Project Boundary Map. The Team decided to use the inset as presented with a change to the title. The title should read "Project Boundary" with a subtitle "2004 NRC Approved." The Team reviewed and revised the Management Zone Map and the associated Amenities Map as follows:

   - *Modify the extent of the Developed Recreation Zone between the Cedar Campground and the Coast Guard Trail to address the existing wetland location (Clearzoning).*
   - *Modify the extent of the Administrative Zone between the contact station/entrance and the service/access drive – change the southerly portion to Developed Recreation Zone (Clearzoning).*
   - *New trails will be added (Clearzoning) to all maps, as appropriate, after review of the GIS trail's layer by J. Gallie. GIS information will be sent to Clearzoning upon approval.*
   - *Extend the Developed Recreation Zone south of the river alongside M-116*

- *G. Palmgren and D. Jensen will review the Management Zone Map to ensure that all zone boundary lines are consistent with the natural resource areas within the park. Clearzoning to send GIS shape files.*

5. Amenities Zoning Map. *J. Gallie will provide a mark-up showing the accurate location of the amenities that should be shown on this map*

6. Draft Action Goals Review. The Team reviewed and refined the Action Goals with additions to the completion dates, program input from and responsible program position. Items that require further review or actions included:

   General Action Goals:

   - Develop a special projects endowment fund in cooperation with the Friends of Ludington State Park and community partners. *The Team discussed the use of the term "endowment" and questioned whether that was accurate terminology for the type of funding being proposed. D. Jensen will confirm.*
   - Update, improve, and replace trail signs. *Moved from the Backcountry Zone to General Action Goals.*

   Natural Resource Recreation:

   - Work with the MDOT to conduct a study on vehicle and non-motorized access and parking along M-116. *A. Bauer, D. Jensen, J. Gallie will review and revise/confirm the action goal.*
   - Develop a second canoe trail along Lost Lake near Beechwood Campground. *Moved from Backcountry Zone to Natural Resource Recreation Zone.*

7. Supporting Analysis. The Team discussed the Supporting Analysis. M. Stirling requested additional photos to incorporate into the document and noted some additions that were made. A draft of the Supporting Analysis will be sent to the Team for review.

8. Discussion of Public Input Open House. The Team briefly discussed the Public Input Open House. The open house will begin with a brief presentation, display of the Management Zones and Action Goals and an opportunity for participants to prioritize and comment on goals.

Ludington State Park
General Management Plan

Planning Team Meeting #6 Summary
Monday, November 30, 2015
1:00 PM – 4:00 PM
Go-to-Meeting

SUMMARY

Attendees: Jim Gallie (Unit Manager), Dan Adams (Unit Supervisor), Alan Wernette (Park Interpreter), Debbie Jensen (Management Plan Administrator), Emily Meyerson (Trails Coordinator), Glenn Palmgren (Ecologist), Peter Rose (Geologist), Dave Birchler, Mardy Stirling, and Karen Zarowny (Clearzoning)

9. Planning Team Meeting #5 Summary of September 28, 2015. The Team reviewed and approved the meeting summary.

10. Review of the Public Input Open House Summary. The Team reviewed the comments received at the public input open house, comments received by email prior to the meeting, and the prioritization of the draft action goals. It was determined that the majority of comments from the meeting were already addressed in the General Management Plan. In response to this input, the Team added an action goal (general) related to working with cycling association to examine additional opportunities, will review the wetland area east of Piney Ridge Road, and will include historical information on the State's acquisition of property from the mining operation in the Supporting Analysis.

11. Review of the Management Zone Map. The Team discussed the area east of Piney Ridge Road that is part of the 2004 Project Boundary Approved by the NRC. It was suggested that wetland areas should be designated as Backcountry. D. Jensen will work with Clearzoning to determine the extent of the change from Developed Recreation to Backcountry. It was requested that the lake on the Sargent Sand property be digitized from aerial photography to get a better representation of the area. Other modifications included adjusting the inset of the 2004 Proposed NRC boundary to show the full extent of the park, enhancing the trail layer for better visibility, and adding a label for Nordhouse Dunes Wilderness Area.

12. Review of the 10-Year Action Goals. The Team made changes to the Action Goals based on public input. This included providing an additional goal under the General Action Goals to work with biking organizations to consider additional opportunities for off-road cycling in appropriate areas of the park. It was recommended that the proposed language regarding the water trail be reviewed by E. Meyerson, Trails Coordinator, and the goals related to the circulation study and

master plan be reviewed by A. Bauer, Regional Planner. Clearzoning will email the information for review and comment.

13. Review Draft General Management Plan. Clearzoning made reference that the Draft General Management Plan is available online to the public. Upon revision and review by the Team, the draft plan on the project website will be updated.

14. Next Steps. D. Jensen stated she is still awaiting feedback from the Little River Band on the General Management Plan. She expects she will be able to present this plan to the Section Chiefs in January.

Appendix D—Lighthouse Lease and Land Patent

The Department of Natural Resources currently leases the Sable Point Lighthouse to the Sable points Lighthouse Keepers Association (SPLKA). The currently lease is valid for 25 years, executed November 1, 2002 until October 31, 2027. Attached is the lease document and land patent that outlines the terms and conditions that apply.

L-9326

LEASE AMENDMENT

Between

Sable Points Lighthouse Keepers Association (SPLKA)
as Lessee

And

THE STATE OF MICHIGAN
as Lessor

covering operations at
BIG SABLE POINT LIGHTHOUSE

The State of Michigan, **Department of Natural Resources,** (Lessor), and the **SPLKA,** (Lessee), whose address is P.O. Box 673, Ludington, MI 49431 do hereby agree to the terms and conditions of this Amendment to the Lease between the above stated parties executed on **November 1, 2002.** Where the Lease may conflict with this Amendment, the Amendment shall control the Lease between the parties.

1. Section 1.01, 'Lease', shall be amended as follows:

The Lessor, in consideration of the covenants and representations made in this Lease, grants the Lessee, the right to maintain and operate the "Premises" which includes the Big Sable Point Lighthouse, Lightkeepers Residence, as well as the grounds immediately surrounding the building designated in **ATTACHMENT A,** the parcel that the Residence #2 sits on, and the right of ingress and egress, subject to the terms and conditions of Article III, Section 3.03 of this Lease.

2. Section 1.02, 'Term', shall be amended as follows:

The term of this Lease shall be twenty-five(25) years for the Lighthouse grounds, and five(5) years for the Residence #2 grounds. It shall begin at 12:01 am on **November 1, 2002** and end in it's entirety at midnight, on **October 31, 2027.** The Residence #2 lease term shall expire five (5) years from the date this Amendment is signed and executed.

3. Section 1.04, 'Premises', shall be amended as follows:

The Premises includes the following areas:

- The Big Sable Point Lighthouse and Lightkeepers Residence at Ludington State Park and the approximate fifteen (15) acres

surrounding said buildings, more specifically described on **ATTACHMENT A.**

- Residence #2, including a rectangular perimeter yard area which is fifty (50) feet south of the residence, thirty (30) feet to the woods line west of the residence, approximately ninety (90) feet to the service entrance road north of the residence including the paved parking half-circle, and to thirty (30) feet east of the residence.

4. Section 2.01, 'Operation, Restoration, and Maintenance Plan', shall be amended as follows:

Lessee will submit an annual Operation, Restoration and Maintenance Plan, covering the terms of the Lease related to the Big Sable Point Lighthouse, the Lightkeepers Residence, and Residence #2 to the Department Representative and the State Historic Preservation Office (SHPO) for review. Lessee agrees that no work, other than routine maintenance, will be done on any of the Premises without the prior written approval of the Department Representative and the SHPO as required. This plan will be reviewed by the Lessee, Department Representative and the SHPO prior to renegotiations/renewal of the Lease.

5. Section 2.03, 'Historic Property Restrictions', shall be amended as follows:

(a) The Lessee shall ensure that all of its activities involving the Big Sable Point Lighthouse portion of the Premises are in compliance with the National Historic Preservation Act including, but not limited to, Section 106 of that Act, and with the requirements of part 800 of Title 36 of the Code of Federal Regulations. In addition to the SHPO requirements of 2.01 above, the Lessee may also be required to comply with the Local Historic District Act, MCL 399.201, *et seq.*, if applicable.

6. Section 2.04, 'Alterations', shall be amended as follows:

Alterations to the facilities may be made by the Lessee at the expense of the Lessee, but only with specific prior written approval of the Lessor and SHPO, as required. Any additions or improvements made to the Premises shall become the property of the Department upon installation.

7. Section 3.01, 'Authorized Uses of the Premises', shall be amended as follows:

The primary purpose for leasing the Premises is for Lessee to maintain, interpret and restore the Premises as a historical landmark and to provide for short-term lodging of volunteers engaged in providing lighthouse restoration, interpretation or operational services. A designated area within the Premises may be used as a gift shop, providing a retail outlet for lighthouse memorabilia and lighthouse

interpretive information. Lessee may host special events with the prior written approval of the Department Representative.

(a) Lessee may use the Premises for the following purposes:

(1) to maintain and preserve the Big Sable Point Lighthouse in accordance with the Secretary of the Interior's Standards for Rehabilitation and Guidelines for the Rehabilitation of Historic Buildings. (N.P.S., 1990)

(2) to operate a gift shop/museum and provide for public access to the Big Sable Lighthouse tower, within the Premises. Funds raised will be used for the support of the SPLKA's restoration, maintenance, preservation and operational efforts. The SPLKA may sell non-alcoholic beverages and small pre-packaged snack food items at the Lighthouse Keepers Residence but not at Residence # 2.

(3) to use the Premises for educational and scientific seminars/conferences.

(4) to provide short-term lodging at Residence #2, for volunteers engaged in restoration or operation of the Big Sable Point Lighthouse.

(b) Lessee shall obtain the prior written consent, which may include an approved Use Permit, from the Department Representative before using the Premises for any other purpose.

8. Section 3.06, 'Prohibited Activities' shall be amended as follows:

In order to maintain the historic atmosphere and protect the buildings and area, the Department prohibits the following activities:

(a) Smoking in any of the buildings

(b) Dogs or other animals in any of the buildings at any time, except personal service/dogs animals

(c) Display of any pictures, books, magazines or other products at the light station that do not relate to or enhance the mission of interpretation of maritime history or the cultural and historic aspects of the area

(d) Firearms, bows and arrows (except during established hunting seasons following all applicable laws), air guns, sling shots, fireworks of any kind

(e) Installation of mechanical rides, pinball machines, coin-operated amusement machines or similar devises in or about the Leased Premises

(f) Sale of alcoholic beverages or tobacco products
(g) Gambling
(h) Consumption of alcoholic beverages except as follows:
1. Resident Keepers may consume alcoholic beverages in their private living quarters
2. Alcoholic beverages may be served at special events as long as Lessee obtains:
(a) all necessary permits/licenses
(b) Event Liability Insurance in an amount consistent with Lessor's guidelines for liability insurance for user groups, and the prior written approval of the Department Representative.
3. Lessor reserves the right to immediately halt any activities that may adversely impact park operations.
(i) Naming of Premises features without DNR approval.

9. Section 3.12, 'Lessee Residence #2 Requirements', shall be added as follows:
(a) Lessee accepts structure in its "as is" condition.
(b) Structure will be maintained as a residence.
(c) Items to be repaired/replaced as needed, include but are not limited to:
- Re-roof building and repair any leaks
- install propane tank including metered hook-up
- install telephone service
- stain/paint interior and exterior
- repair/replace interior flooring
- re-plumb/repair building
- install fire extinguishers and smoke detectors
- install necessary appliances.

(d) Maintain/replace as needed, propane furnace, hot water heater, water supply including pump, and septic tank/field.
(e) Arrange and pay for required water sampling.
(f) Arrange and pay for required servicing of fire extinguishers.
(g) Change locksets on structure. (copies of keys/lock combinations must be provided to Department Representative)
(h) Provide at its sole cost, all personal property necessary to outfit the residence for housing volunteers. Items may include: furniture, kitchen cooking utensils, curtains, linens, appliances.

(i) Upon expiration or termination of the Lease Section pertaining to Residence #2, Lessee shall retain possession of all personal property excluding appliances and those items affixed to the building.

(j) As various facility repair/upgrades occur, Lessee will be responsible for moving towards making the Residence ADA compliant.

(k) Obtain permits and inspections as required. Copies of which must be given to the Department Representative within seven (7) days of receipt.

(l) Lessee acknowledges the close proximity of Residence #2 to the park administrative and maintenance service area, and public visitor use areas. There shall be an expectation of reduced privacy due to work activities of park employees, and a general presence and inquiries by park visitors. The Lessee shall be prepared to field inquiries by the public, as they would at the Big Sable Point Lighthouse, and make appropriate referrals to park staff as needed.

(m) Lessee accepts responsibility for restoration of all features of the Big Sable Point Lighthouse Premises, including but not limited to, utility services to structures on the Premises.

10. Section 3.13, 'Lessor Residence #2 Requirements', shall be added as follows:

(a) Lessor will mow grass, maintain walkways and parking areas within the designated perimeter as amended in Section 1.04.

11. Section 4.02, 'Annual Reports', shall be amended as follows:

Lessee shall submit an Annual Report to the Department Representative regarding the activities and programs conducted on the Premises, within ninety (90) days after the end of each calendar year. Also, a Financial Summary must be submitted each year within thirty (30) days after completion.

LESSOR

WITNESS TO LESSOR

Witness

Yolanda Taylor
(please print)

Witness Signature 3-31-08 *Date*

Witness

(please print)

Witness Signature *Date*

STATE OF MICHIGAN
BY THE
DEPARTMENT OF NATURAL RESOURCES
Director or Designee

Ronald A. Olson, Chief
DNR Parks and Recreation
(please print)

Signature 3/31/08 *Date*

State of Michigan, County of Ingham

The foregoing instrument was acknowledged before me on this 31, day of March, 2008, by Ronald A. Olson, for the Michigan Department of Natural Resources.

VICTORIA LISCHALK
NOTARY PUBLIC - STATE OF MICHIGAN
COUNTY OF INGHAM
My Commission Expires Sept. 24, 2012
Acting in the County of

Victoria Lischalk, Notary Public
State of Michigan,
County of: Ingham
My Commission expires: September 24, 2012

Acting in the County of: Ingham

_____ INIT

PR0600 (11/16/2004)

WITNESS:

Carol Rodwell

LESSEE:
SABLE POINTS LIGHTHOUSE KEEPERS ASSOCIATION

By: D. Craig Perry
Title: BSPLKA EXECUTIVE DIRECTOR

Date: 03/18/08

STATE OF MICHIGAN)
)ss.
COUNTY OF Mason)

The foregoing instrument was acknowledged before me this 18th day of March, 2008 by Andrea Oppenhuizen on behalf of the Sable Points Lighthouse Keepers Association.

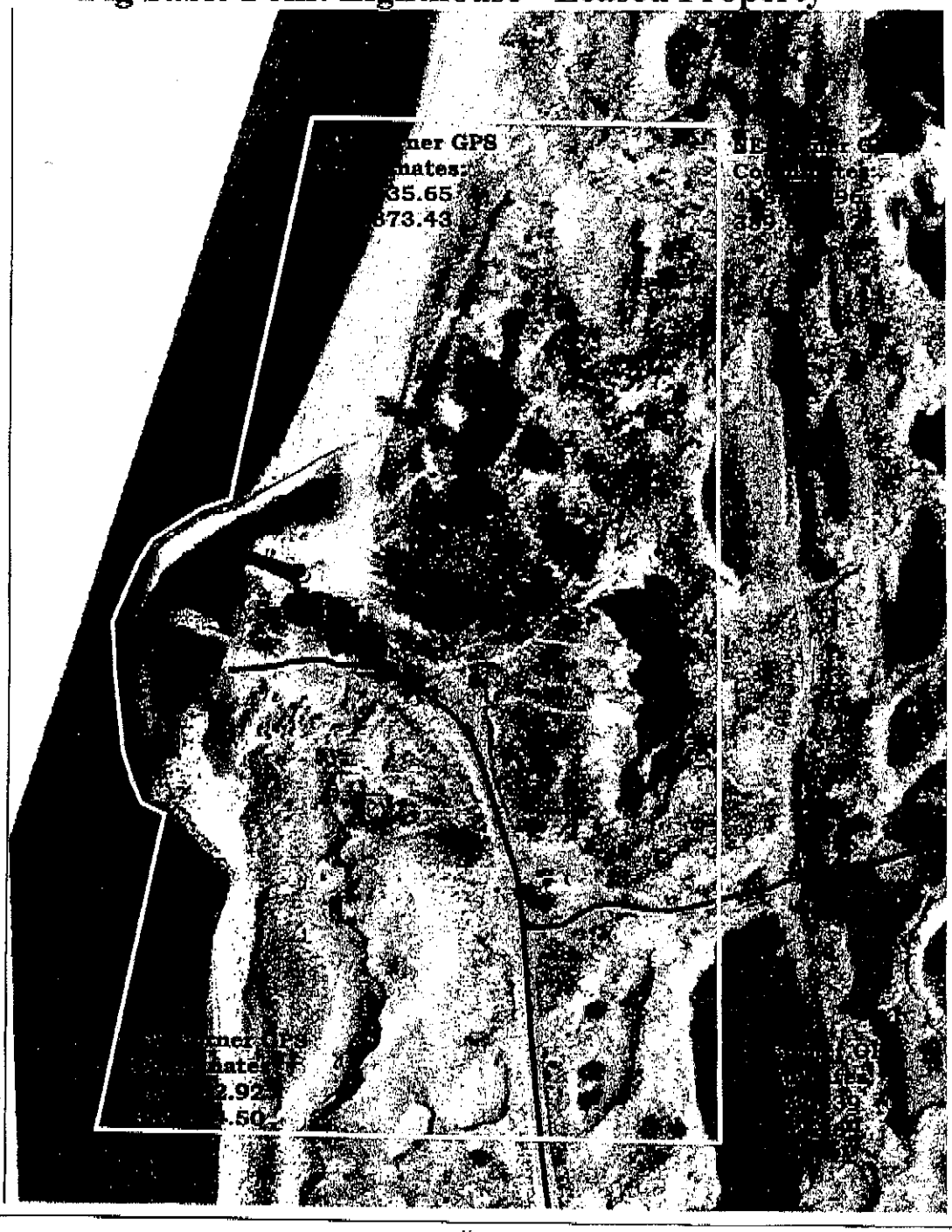
Notary Public, Mason County, Michigan.
Acting in Mason County.

My Commission Expires: 6/20/2014

ANDREA OPPENHUIZEN, Notary Public
State of Michigan
County of Mason
My Commission Expires June 20, 2014
Acting in the County of Mason

Attachment A

Ludington State Park
Big Sable Point Lighthouse - Leased Property



Leased Property Boundaries

N

0 200 400 Feet

Legal Description: Starting at the intersection of Sections 7, 8, 17 and 18 of Township 19 North, range 18 West, Meridian, Michigan, proceed due West along the boundary of Sections 7 and 18 a distance of 2640 feet. Thence due North a distance of 2640 feet to the center of Section 7. Thence: due West a distance of 689 feet to a point of beginning on the Eastern Boundary of the plot retained. Thence: due South a distance of 625 feet; Thence: due West a distance of 697 feet plus or minus to the shore of Lake Michigan; Thence, Northeasterly meandering along the shore of Lake Michigan to an East-West line 1240 feet plus or minus North of the point of beginning; Thence: due East 460 feet plus or minus; Thence: due South a distance of 618 feet to the point of beginning. Total area 15.8 acers (6.4 Hectars)

Ludington State Park Trails

Michigan DNR
Michigan Department of Natural Resources
Parks & Recreation Bureau
State Park Stewardship Program

Leased Boundaries: Digitized from GPS markers by REC, 2001
GPS Coordingates: Michigan GeoRef
Digital Orthophoto: MDOT, 1997
November 16, 2001 (REC)

Form 1860-8
(January 2001)

The United States of America

To all to whom these presents shall come, Greeting:

Eastern States 48653-02

WHEREAS,

State of Michigan, Department of Natural Resources (DNR)

is entitled to a land patent pursuant to the Recreation and Public Purposes Act of June 14, 1926 (44 Stat. 741), as amended and supplemented (43 U.S.C. 869; 869-1 to 869-4), for the following described land:

Michigan Meridian, Michigan

T. 19 N., R. 18 W.,
sec. 7, S½ lot 1 and lot 2.

containing 57.50 acres.

NOW KNOW YE, that the **UNITED STATES OF AMERICA**, in consideration of the premises, and in conformity with the said Act of Congress, **HAS GIVEN AND GRANTED**, and by these presents **DOES GIVE AND GRANT** unto the said State of Michigan, Department of Natural Resources (DNR), the tract above described, as an addition to Ludington State Park; **TO HAVE AND TO HOLD** the same, together with all the rights, privileges, immunities, and appurtenances, of whatsoever nature, thereunto belonging, unto the same State of Michigan, Department of Natural Resources (DNR), forever; and

EXCEPTING AND RESERVING TO THE UNITED STATES:

All mineral deposits in the lands so patented, and the right of the United States, or persons authorized by the United States, to prospect for, mine and remove such deposits from the same under applicable laws and regulations as the Secretary of the Interior may prescribe.

The unrestricted right to keep the aid to navigation and associated equipment on the property and the unrestricted right to relocate or add any aids to navigation and associated equipment or make any changes on any portion of the property as may be necessary for navigation purposes. The term "aid to navigation" shall include electronic navigation equipment, communications equipment and any other associated lighthouse or navigational equipment.

An easement to enter upon and have access to the property, including the right to enter the property at anytime, without notice, for the purpose of operating and maintaining any aid to navigation and associated equipment in use on the property.

Patent Number 61-2003-0002

A negative easement over and upon the property for the purpose of preserving the arc of visibility for any lighted aid to navigation located upon the property, including the right to remove all vegetation, man made structures of any kind and any other objects that may impair, obscure or obstruct the arc of visibility. The term " arc of visibility" is defined as the portion of the horizon over which a lighted aid to navigation is visible from seaward.

An easement to install, operate and maintain utility lines upon the property to service the aids to navigation.

SUBJECT TO:

All aids to navigation located on or associated with the property shall remain the personal property of the United States, and shall continue to be operated and maintained by the United States for as long as they are needed for this purpose.

The patentee, or its successor in interest, may not interfere with or allow interference in any manner with the aids to navigation without the express written permission from the Commandant, United States Coast Guard or his delegate.

All historical artifacts, including any lens or lantern, located on or associated with the property shall remain the personal property of the United States.

The patentee, or its successor in interest, shall comply with all the provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations and relevant orders of the Secretary of Labor. Neither patentee nor patentee's subcontractors shall maintain segregated facilities. The patentee may not restrict or permit restriction on the use of any of the lands conveyed or facilities thereon because of race, creed, color, sex, age or national origin.

The patentee, or its successor in interest, shall comply with all the provisions of the American Disabilities Act of July 26, 1990, the Architectural Barriers Act of 1968 and section 504 of the Rehabilitation Act of 1973, as amended. These Acts require that programs and public facilities constructed or renovated be accessible to and usable by person with disabilities.

Provided, the above described property, along with the rights, title and interest, shall immediately revert to the United States, after notice and opportunity for a hearing, upon a finding that:

I. the patentee, or its successor in interest, attempts to transfer title to or control over the property to another;

II. the property is devoted to a use other than that for which it was conveyed without the consent of the Bureau of Land Management;

III. the property has not been used for the purpose for which it was conveyed for a 5-year period;

IV. the patentee, or its successor in interest, has failed to follow the approved development plan or management plan;

V. the property ceases to be maintained in a manner consistent with the provisions of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.). The patentee, or its successor in interest, shall not undertake, nor be permitted to undertake any construction, alteration, or remodeling activity or any other thing on the property which would affect the structural integrity or appearance of the property without the express prior written permission of the State Historic Preservation Officer;

VI. the patentee, or its successor in interest, has failed to preserve and maintain the property in accordance with the recommended approaches in the most recent version of the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (National Park Service, 1990) in order to preserve and enhance those qualities that make the property eligible for listing in the National Register of Historic Places.

Provided further, that the Secretary of the Interior may take action to revest title in the United States if the patentee directly or indirectly permits its agents, employees, contractors, or subcontractors (including without limitation lessees, sublessees, and permittees) to prohibit or restrict the use of any part of the patented lands or any of the facilities thereon by any person because of such person's race, creed, color, sex, national origin, or handicap.

The grant of the herein described lands will also be subject to the following reservations, conditions, and limitations:

(1) The patentee or its successor in interest shall comply with and shall not violate any of the terms or provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 241), and requirements of the regulations, as modified or amended, of the Secretary of the Interior issued pursuant thereto (43 CFR 17) for the period that the lands conveyed herein are used for the purpose for which the grant was made pursuant to the act cited above, or for another purpose involving the provision of similar services or benefits.

2) If the patentee or its successor in interest does not comply with the terms or provisions of Title VI of the Civil Rights Act of 1964, and the requirements imposed by the Department of the Interior issued pursuant to that title, during the period during which the property described herein is used for the purpose for which the grant was made pursuant to the act cited above, or for another purpose involving the provision of similar services or benefits, the Secretary of the Interior or his delegate may declare the terms of this grant terminated in whole or in part.

(3) The patentee, by acceptance of this patent, agrees for itself or its successors in interest that a declaration of termination in whole or in part of this grant shall, at the option of the Secretary or his delegate, operate to revest in the United States full title to the lands involved in the declaration.

(4) The United States shall have the right to seek judicial enforcement of the requirements of Title VI of the Civil Rights Act of 1964, and the terms and conditions of the regulations, as modified or amended, of the Secretary of the Interior issued pursuant to said Title VI, in the event of their violation by the patentee.

(5) The patentee or its successor in interest will, upon request of the Secretary of the Interior or his delegate, post and maintain on the property conveyed by this document signs and posters bearing a legend concerning the applicability of Title VI of the Civil Rights Act of 1964 to the area or facility conveyed.

(6) The reservations, conditions, and limitations contained in paragraphs (1) through (5) shall constitute a covenant running with the land, binding on the patentee and its successors in interest for the period for which the land described herein is used for the purpose for which this grant was made, or for another purpose involving the provision of similar services or benefits.

(7) The assurances and covenant required by sections (1) - (6) above shall not apply to ultimate beneficiaries under the program for which this grant is made. "Ultimate beneficiaries" are identified in 43 CFR 17.12(h).

IN TESTIMONY WHEREOF, the undersigned authorized officer of the Bureau of Land Management, in accordance with the provisions of the Act of June 17, 1948 (62 Stat. 476), has, in the name of the United States, caused these letters to be made Patent, and the seal of the Bureau to be hereunto affixed.

Given under my hand, in Ludington, Michigan
the First day of November
in the year of our Lord two thousand and two
and the Independence of the
United States the two hundred and Twenty-sixth.

By_____
Michael D. Nedd
State Director

Patent Number 61-2003-0002

Appendix E—Fisheries Report for Hamlin Lake

The Department of Natural Resources produced a Status of the Fishery Resource at Hamlin Lake in 2012. This report accounted for the environment of the location, history of the area, present conditions, and management direction. The report also includes the types and population estimates of the fish stocked at Hamlin Lake. The following attachment is the official report.

Hamlin Lake

Mason County
Big Sable River watershed, surveyed 2010

Mark A. Tonello, Senior Fisheries Biologist, Cadillac

Environment

Hamlin Lake (Figure 1) is 5,350 acres in size and located approximately five miles north of Ludington, in western Mason County, Michigan, in the northwestern Lower Peninsula. Hamlin Lake was originally a "drowned river mouth lake" located approximately one mile upstream of Lake Michigan, with the Big Sable River flowing through it. In the 1850s, a wooden sawmill dam was constructed on the outlet of the lake. That dam failed in 1888, but was rebuilt. It failed again in 1912 and was replaced with a concrete dam. Currently, the dam is a 20-foot high concrete structure that raises the water level of Hamlin Lake by about 12 feet. The dam is operated by the Michigan Department of Natural Resources (DNR) and is located within Ludington State Park. It was most recently renovated in 2007. Upstream of Hamlin Lake, the Big Sable River is a designated trout stream with populations of brown and brook trout. The river rises from several spring-fed lakes in western Lake County and flows for approximately 40 miles before entering Hamlin Lake, which is the largest lake in the Big Sable River watershed and in Mason County.

Hamlin Lake has two major basins separated by a narrows (Figure 1). The lower (or western) basin is the larger and deeper of the two, with depths nearing 80 feet. The upper, (eastern) basin is shallower, only reaching approximately 34 feet in depth. The east portion of this basin is shallow and swampy near where the Big Sable River enters. Hamlin Lake also has a number of small "bayous" that were created when the water level was raised by the dam. Some of the more prominent bayous include South, Middle, North, Rupert, and Indian Pete. Due its shallow nature, the upper basin has heavy concentrations of aquatic plants, some of which are controlled using chemical treatments on an annual basis. Chemical aquatic vegetation treatments are also conducted in some bayous and shoal areas in the lower basin.

The land surrounding the upper basin is mostly privately owned, with public access limited to Victory and Wilson Hill Township parks on the southern side. The extreme eastern tip of the lake where the Big Sable River flows in is surrounded by Manistee National Forest land. In that area, there is a boat launch on the north side of the lake known as the Hamlin Marsh access site. The Nordhouse Dunes Wilderness Area, also part of the Manistee National Forest, lies just to the north and east of Hamlin Lake. The eastern shore of the lower basin is mostly privately owned, with only Long Skinny Park, located ½ mile north of the South Bayou, offering shore fishing access. However, much of the western shore of the lower basin is owned by the State of Michigan as part of Ludington State Park. Also, a one-mile reach of the Big Sable River between the dam and Lake Michigan flows entirely through state land. Ludington State Park offers tremendous access to Hamlin Lake, including a boat launch, two handicapped accessible fishing piers, and miles of undeveloped shoreline.

The terrain to the east of the lake is a relatively flat residential area with larger, wooded lots. Further east, agriculture becomes the primary land use. To the north and west, Ludington State Park combines with the Nordhouse Dunes Wilderness Area to create one of the largest contiguous tracts of public land

in the western lower peninsula. The landscape is rolling sand hills and dunes, with both deciduous and coniferous forests present. Several miles to the south lies Lincoln Lake (Fig. 1), which is a "drowned river mouth" of the Lincoln River.

There have been a number of citizen-led groups dedicated to Hamlin Lake over the years (Kent Gage, Hamlin Lake Preservation Society, personal communication). The first was the Hamlin Dam Association, formed in 1912 to help construct the first concrete dam in 1913. The association was disbanded when the dam was sold to the state in 1935. Another group was the Hamlin Lake Improvement Association. This group was active from the late 1940s through the early 1970s, and served to promote tourism. In the early 1990s, the Hamlin Lake Improvement Board was formed. It was active for a number of years in the 1990s, when it was responsible for conducting a study of Hamlin Lake. The Hamlin Lake Improvement Board was never officially disbanded, but has been inactive for a number of years. There are currently two active citizen-led organizations dedicated to Hamlin Lake, the Hamlin Lake Association and the Hamlin Lake Preservation Society. The Hamlin Lake Association was formed in 1986, primarily to focus on environmental issues including unregulated development on the lake, oil and gas drilling, and the establishment of the Nordhouse Dunes Wilderness. This group is now mostly dormant, but remains closely allied with the Hamlin Lake Preservation Society, which was formed in 1997 and remains the most active citizen-led group on Hamlin Lake. Another organization with interest in Hamlin Lake is the Big Sable Watershed Restoration Committee, although that organization focuses primarily on the Big Sable River itself upstream from Hamlin Lake.

History

While Hamlin Lake was originally dammed for the lumber industry in the 1850s, by the late 1800s it had become important as a tourist destination. After construction of the concrete dam in 1913, a large number of resorts and lodges were built on the lake, many of which are still active. There are also a number of marinas offering boat rentals. Sport fishing-based tourism remains very important to the local economy, as it has for over a century.

One recurring issue in the Hamlin Lake file is that of winter lake levels. Many riparian landowners were in favor of a winter drawdown to protect infrastructure from ice damage, while sportsman's groups favored maintaining a stable, year-round water level, based on the principle that a stable water level would maintain better fish populations. Over the years, the DNR has been mostly neutral in the debate. Carbine (1942) stated that the maximum productivity in most lakes would probably be obtained with stable water levels. However, he qualified this by acknowledging the position of the riparian landowners. He also stated that while some species might benefit from stable water levels, other species might not.

Fish Stocking

The first recorded fish stocking in Hamlin Lake was in 1897 when lake trout were stocked (Table 1). Largemouth bass were stocked in 1905 and 1909, and walleye were stocked in 1910. In the 1930s and early 1940s, species including bluegill, largemouth bass, smallmouth bass, walleye, and yellow perch were stocked in varying numbers by the State of Michigan.

In the late 1920s or early 1930s, a program began in which volunteers (primarily from the Mason County Chapter of the Izaak Walton League and the Mason County Fin and Feather Club) captured fish with seines below the dam and transferred them up into the lake (Hubbs 1931). This activity primarily took place in spring, with walleye, northern pike, and steelhead being the most commonly transferred species. The first official records available are in 1936, with records available for 1936-1942 and 1953-1955 (Table 1), although transfers may have been done in other years. These transfers were apparently discontinued after 1955. The adult walleye stocked from 1956-1958 (Table 1) were apparently fish purchased by the Hamlin Lake Improvement Association from Lake Michigan commercial fishermen and stocked into the lake. File correspondence indicates that many of the transferred walleye were tagged upon stocking. Apparently anglers caught some of the fish in Hamlin Lake, but others migrated out of the lake back into Lake Michigan and were caught in places like Pere Marquette Lake and the Muskegon River.

Starting in 1969, the Michigan Department of Conservation (MDOC) began a tiger-muskellunge stocking program (Table 1). This program continued until 1988, when the tiger muskellunge program was cancelled statewide. Although a few walleye were stocked into Hamlin Lake in the early 1970s, a consistent walleye stocking program began in 1989. Since then, spring fingerling walleye have been stocked in 14 of the past 22 years, creating an extremely popular walleye fishery. Most walleye stocked in the last 20+ years have come from ponds cooperatively run by the DNR and the Mason County Walleye Association. In 2005, a northern muskellunge stocking program was commenced. Since then, a total of 42,682 muskies have been stocked in 2006, 2008, 2010, and 2011. The only other fish stocking in recent years has been the sporadic stocking of hybrid bluegill by the Hamlin Lake Preservation Society.

Fisheries Surveys

The first fisheries report on Hamlin Lake was written in 1932 (Hubbs and Eschmeyer 1932) by the Michigan Department of Conservation (MDOC; the precursor to today's Department of Natural Resources). Although netting was apparently conducted, no data was included in the report. According to the authors, game fish present at that time included largemouth bass, smallmouth bass, yellow perch, muskellunge, northern pike, walleye, rock bass, black crappie (referred to as "calico bass"), pumpkinseed sunfish, and bluegill (Table 2). It is likely that the muskellunge collected in 1932 and 1942 were naturally reproduced Great Lakes muskellunge. In a separate report, Hubbs (1933) indicates that muskellunge were native to Hamlin Lake. Other species mentioned in Hubbs and Eschmeyer (1932) as present include suckers (probably white sucker) and "mullet" (likely meaning redhorse, species unknown), catfish (likely channel catfish), carp, sheepshead (freshwater drum), longnose gar, bowfin (referred to as "dogfish"), spottail shiners, sand shiners, trout-perch, and bluntnose minnows. Some of the prominent issues discussed included winter lake-levels, fish stocking (including transferring fish over the Hamlin Lake Dam), vegetation control, and fisheries habitat. In particular, the authors recommended lowering the water level in winter, stocking walleye, yellow perch, largemouth bass, smallmouth bass, and bluegill, and continuing to do fish transfers over the dam.

In the winter of 1935-36, a creel census study was conducted (Eschmeyer 1936). According to the report, ice fishing was sporadic that winter, with very little angler effort expended. The author concluded that the winter catch was so meager that it likely did not have any effect on summer catch.

Another comprehensive fisheries report was written in 1942 (Brown and Kilpela 1942). This report was on assessment netting conducted in late June and early July of 1942 and also some earlier creel census work (Clark 1940, 1941). The assessment netting conducted included the use of fyke nets, gill nets, and seines. The report contains a list of fish species that had been documented for Hamlin Lake either through the netting survey or creel census (Table 2). The authors also identify 28 different species of aquatic plants as present. The authors also mention that fishing pressure has increased "several hundred percent" in the past 20 years. In their recommendations, they advise not continuing with the fish transfers, stating that "the small number of fish added to Hamlin Lake by these operations certainly does not justify the effort involved".

Minor fisheries surveys were conducted in 1948 and 1953 by MDOC personnel. The 1948 survey was conducted in September, and included gill netting and seining. The 1953 survey was conducted in August of 1953 and consisted entirely of seining. Several fish species were caught (Table 2). No writeups or reports were completed for these surveys.

The next comprehensive fisheries survey was conducted in August of 1956 (Crowe 1956), using trap nets. This survey captured 1,323 fish, representing 18 different species (Table 2). Panfish, including bluegill, black crappie, and pumpkinseed were the most commonly caught species. Walleye were also common, while smallmouth bass, northern pike, and largemouth bass were caught in smaller numbers. Growth for most species was deemed to be "good". The author concluded that the fish populations were in good shape and had not changed appreciably since the initial 1932 survey. Similar to Carbine in 1942, Crowe took a middle-of-the-road stance on the water level issue, which was clearly still a major issue in the mid-1950s. Aquatic vegetation control on the upper basin was also a controversial issue at that time.

Another fisheries survey was conducted on the lower basin in 1967, but was only partially completed due to inclement weather. Trap nets, fyke nets, and electrofishing were used. Sixteen different species were captured (Table 2). Although no official report was produced from the 1967 survey, the following comments were recorded: "Northern pike appear to be fairly abundant, but believe heavy pressure in winter cropping off large fish. Walleyes going down hill fast. Have good populations of bluegill and crappie. Believe sample is low- should continue survey on upper lake".

The next DNR fisheries survey was conducted in late summer of 1973. Survey gear consisted of trap and gill nets. Catch data for the basins were kept separate, but no report was ever completed. A total of 21 different species were caught (Table 2).

In the early 1970s, one controversial issue on Hamlin Lake was that of winter spearing for northern pike. Some felt that this practice was responsible for poor northern pike fishing. Because of that, the DNR made a proposal to place a spearing ban on the lake. However, file correspondence indicates that "vociferous objection from the community" led to the proposal being dropped. In the 1970s, angler reports indicated that the tiger muskie fishery improved significantly as they began to attain catchable size. Many large tiger muskies were caught or speared through the ice. At one point Hamlin Lake even held the state record for tiger muskie.

The next fisheries survey of Hamlin Lake was conducted in 1983 (Hay 1984; Hay 1984a). As in 1973, catch data was kept separate for the two basins. Eighteen different species were caught (Table 2).

According to Hay (1984), the lower basin provided a good population of northern pike, although they were growing slowly. Yellow perch were very numerous in the lower basin, but they were small in size and growing slowly. Hay (1984a) reported similar results for the upper basin. He also mentioned that anglers were concerned about the excessive aquatic vegetation present in the upper lake and that they would like to see improvement in the walleye fishery; a total of only three walleye were caught in the survey. In file correspondence from 1984, Hay referred to Hamlin Lake as "one of the better panfish lakes in the area".

A consistent walleye stocking program began in 1989, when just over 100,000 walleye fingerlings were stocked (Table 1). Another comprehensive fisheries survey was conducted in 1992, in part to look at progress of the walleye program (Rozich 1992). A total of 2,071 fish representing 20 species (Table 2) were caught in the survey, which used fyke, inland gill, and Great Lakes gill nets. Also, scale samples from over 100 walleye caught by volunteer anglers in the summer of 1992 were analyzed and showed that the vast majority of the walleye were from the 1989 and 1990 year classes, and therefore were likely stocked fish. Rozich concluded that the stocking program was working and necessary to maintain a viable fishery, despite the fact that some natural reproduction was occurring. He also concluded that "the diverse fish community sampled appears to be well-distributed and growing well on the average".

In 1994, an attempt was made to conduct a fall walleye survey. Fall walleye surveys are done by electrofishing (Serns 1983, 1984) targeting age-0 and age-1 walleye to determine year class strength. However, due to heavy winds and dangerous conditions, the survey was not completed. Unfortunately, this is a recurring theme in the history of Hamlin Lake fisheries surveys. Due to its size and proximity to Lake Michigan, the lake is prone to extremely heavy winds and dangerous conditions. A number of surveys (fall walleye surveys in particular) have been aborted or cut short due to such conditions.

Another netting survey was conducted in April of 1997, using large-mesh fyke and inland gill nets. A total of 975 fish representing 17 species (Table 2) were caught. The well-represented species included largemouth bass, northern pike, rock bass, and yellow perch. All species were growing well except for northern pike and yellow perch, which were well below the state average length at age. Bluegill catch was very low, with only 57 caught, although those that were caught did have a very large average size (7.9 inches). The low bluegill catch may also have been due to low water temperatures, as the survey was conducted in late April. Although no report or write-up was completed for the survey, September 1997 file correspondence from Fisheries Biologist Tom Rozich indicates that the bluegill population had declined in recent years. This was attributed the decline to overfishing, based on reports from Conservation Officer Jim Gallie. The correspondence also mentioned that the "walleye population in Hamlin Lake is excellent and provides a quality fishery". Field notes from the 1997 survey indicate that zebra mussels were present in large numbers all over the lake.

Due to the poor growth and size structure in the northern pike population, in 1999, the DNR changed the regulations for northern pike from a 24" minimum size limit to no minimum size limit. The logic behind this regulation change was that if anglers harvested large numbers of smaller pike, those that remained might grow better. Even if better growth did not occur, it would allow anglers to harvest northern pike without harming the fish community structure. However, the no minimum size limit on northern pike was removed in 2006, due to the muskellunge stocking program which started in 2005. It

was felt that if the no minimum size limit remained, anglers would mistakenly harvest small muskellunge in addition to small northern pike.

In 2003, another attempt was made to conduct a fall walleye survey, but heavy winds and dangerous conditions caused the survey to be aborted. Only two stations were completed, but a total of 41 walleye between 6 and 8 inches were caught. These fish were likely age-0 walleye that had been stocked in the spring of 2003. The catch rate for the completed portion of the survey was 10.25 age-0 walleye per mile. The presence of these fish indicated probable good survival for 2003 walleye stocking effort.

The next comprehensive survey was conducted in 2004, with fyke, trap, and inland gill nets, and electrofishing. A total of 3,464 fish representing 18 species were caught (Tables 3 and 4), the largest number of fish that had been caught in any survey to date. The majority were caught by nets (Table 3), with smaller numbers caught by electrofishing (Table 4). Most abundant were rock bass and bluegill, with brown bullhead, largemouth bass, pumpkinseed sunfish, and yellow perch also prevalent. The bluegill population was particularly impressive, with 902 individuals from 2 to 9 inches. Of those, fully 94% exceeded 6 inches in length. Growth rates for most species were good (Tables 5 and 6), including northern pike, which were growing 1.4 inches faster than the state average length at age. This was the first time in the fisheries survey history of Hamlin Lake where northern pike exhibited growth rates better than the state average.

Creel census surveys were conducted in the summer of 2008 and the winter of 2009 (DNR Fisheries Division, unpublished data). In the summer creel survey, it was estimated that 128,502 fish were caught, with 83,022 of those released. Bluegill was the most commonly caught species, with 27,264 kept and 29,495 released. One striking feature of the summer creel survey was the relatively small number of sport fish that were kept: only 275 walleye were kept while 397 were released; only 1,614 largemouth bass were kept while 29,387 were released; only 15 northern pike were kept while 5,292 northern pike released. The total summer angler effort was 110,386 angler hours (28,968 anger trips). Of that, only 11,704 angler hours were generated by anglers fishing from shore. Clearly, most anglers fish Hamlin Lake via boat in the summer.

In the winter 2009 creel data, an estimated 12,745 fish were caught, with 6,692 released. Bluegill were the most commonly caught species, with 4,454 kept and 4,971 released. The total winter effort was 11,345 angler hours (3,027 angler trips). The combined effort for these two creel surveys was 121,731 angler hours or 31,995 angler trips. Based on a value of $24/day for daily angler expenditures (U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau 2006) the Hamlin Lake fishery is worth at least $767,880 to the local economy on an annual basis.

From 1994-2011, a total of 236 exceptional fish, representing 20 species, caught from Hamlin Lake have been entered into the DNR Fisheries Division Master Angler program (Table 7). Bluegill, freshwater drum, brown bullhead, yellow bullhead, rock bass, bowfin, and channel catfish were the most commonly represented species, with at least fifteen entries per species. Notable entries include a 24.75 inch smallmouth bass caught and released in 2008, a number of channel catfish in excess of 20 lbs, and a 45 inch, 20 lb muskellunge that was speared in 2003 (prior to the beginning of the muskellunge stocking program). The large number of Master Angler entries for Hamlin Lake exemplifies the popularity of this fishery.

Current Status

The most recent comprehensive fisheries survey was conducted in the summer of 2010 using status and trends netting protocols (Wehrly et al. 2009) The survey netting portion took place from June 7 through June 10, 2010 and included four trap nets (11 net-nights), and three experimental graded-mesh inland gill nets (9 net-nights). Seining and electrofishing were conducted on July 14, 2010. A total of six seine hauls were completed, along with three ten-minute electrofishing transects conducted with an electroshocking boat. The primary purpose of this survey was to assess the status of all fish populations in Hamlin Lake, although a secondary goal included assessing the walleye stocking program.

During the netting survey, a total of 947 fish were caught (Table 8), representing 21 different species (Table 8). Bluegill (157 from 3-9 inches), pumpkinseed sunfish (135 from 4-9 inches), and rock bass (171 from 4-10 inches) were the most frequently collected species. They represented 49% of the total catch by number. Other panfish species present included black crappie and yellow perch. Other sportfish species caught included largemouth bass (46 from 6-16 inches), northern pike (42 from 15-29 inches), smallmouth bass (15 from 13-18 inches), and walleye (37 from 11-25 inches). Other species captured included: black bullhead, bowfin, brown bullhead, common carp, channel catfish, freshwater drum, golden redhorse, longnose gar, muskellunge, shorthead redhorse, white sucker, and yellow bullhead.

During the July seining and electrofishing portion, a total of 658 fish were caught, representing 20 different species (Table 9). Juvenile yellow perch (averaging 2.9 inches in length) were the most frequently collected species, with a total of 221 caught, representing 34% of the total catch by number. Other species caught by seining and electrofishing included banded killifish, black bullhead, bluegill, bluntnose minnow, bowfin, brook silverside, freshwater drum, golden shiner, Johnny darter, lake chubsucker, largemouth bass, logperch, mimic shiner, pumpkinseed sunfish, rock bass, sand shiner, smallmouth bass, spottail shiner, and white sucker.

Fish growth was fair. Fish that were netted exhibited growth that was near the state average length-at-age (Table 10), with the exception of black crappie, northern pike, and yellow perch, which were all growing at least 1.0 inches slower than the state average. Bluegill and pumpkinseed sunfish were growing slightly faster than the state average, while largemouth bass, rock bass, smallmouth bass, and walleye were growing slightly slower than the state average. Only enough yellow perch were captured from any one age class, by electrofishing and seining, to make any statistical inferences regarding age and growth (Table 11), and that species was growing 0.8 inches slower than the state average.

Fish species that were not caught in 2010 and had been reported in previous surveys included blackchin shiner, blacknose shiner, brook stickleback, brown trout, central mudminnow, common shiner, Iowa darter, least darter, longear sunfish, rainbow darter, rainbow trout, sculpin, tadpole madtom, tiger muskellunge, trout-perch, and white bass (Tables 2, 8, 9). No new species that had not been previously recorded were caught in 2010.

Shoreline data was collected in July and August, 2010 (Table 12). Data included the number of docks, submerged trees, and houses found per kilometer of shoreline, as well as how much of the shoreline is

armored or hardened with a structure in order to prevent erosion. Hamlin Lake averaged 8.6 docks per kilometer, 48.7% shoreline armoring, 56.6 submerged trees per kilometer, and 7.7 houses per kilometer.

Analysis and Discussion

One of the reasons for conducting the 2010 survey of Hamlin Lake was to evaluate the walleye stocking program. Walleye have been regularly stocked since 1989 (Table 1), although there was a lull between 2006-2011. During that time, only limited walleye stocking was conducted in Michigan due to the threat of Viral Hemorrhagic Septicemia (VHS). By 2011, walleye testing and rearing practices had been refined enough that the threat of stocking infected fish had subsided and stocking was resumed. While the walleye catch in the 2010 survey was not overly large, at 37 fish, seven different year classes were represented. Also, the walleye catch per unit effort in gill nets was 3.7 walleye per net-night, indicating a good abundance for an inland lake in Michigan (MDNR unpublished data). Of those seven year classes found, four were years in which walleye were stocked, while three were not. The presence of fish from non-stocked year classes indicates that low-level natural reproduction continues to occur in many years. While this is encouraging, the strongest year class represented was the 2006 year class, which had been stocked. Clearly, stocking continues to play a critical role in the walleye fishery. Therefore, the DNR should continue to work with the Mason County Walleye Association to stock walleye into Hamlin Lake on a regular basis.

Hamlin Lake has received stockings of northern-strain muskellunge since 2005. More desirable would be Great Lakes strain muskellunge, since they were originally native to the lake (Hubbs 1933). While only one muskellunge was caught in the 2010 survey, angler reports of muskellunge catches have been received. Hamlin Lake has a diverse fish population with numerous cyprinid (common carp) and catostomid (white sucker, redhorse) species that will provide adequate forage for muskellunge.

The 2010 DNR fisheries survey showed that the lake has generally healthy fish populations. Largemouth bass in particular were numerous and are a keystone predator. The smallmouth bass catch was smaller, but they remain an important component of the fish community. Hamlin Lake has a reputation as one of the best bass fishing lakes in the western lower peninsula. While the northern pike catch from the 2010 survey was numerically adequate, the below average growth rate was discouraging, particularly when the northern pike growth rate from the 2004 survey was so good. It is possible that the return to a 24 inch minimum size limit and 2 fish bag limit may be limiting harvest, thereby promoting interspecific competition and slow growth for northern pike. However, the 24 inch minimum size limit is in place to protect the stocked muskellunge and should remain.

Bluegill are the most commonly pursued species and Hamlin Lake has an excellent reputation as one of the best bluegill fishing lakes in Michigan. While bluegill catches have varied based on fisheries surveys over the years (Table 13), growth rates have consistently been greater than state averages. The Schneider Index (Schneider 1990) is a ranking scale for inland lake bluegill populations based on the proportions of larger bluegill captured during fisheries surveys. The scale for the Schneider Index is from 1 to 7, with a score of 1 (very poor) indicating a population with many small bluegill and a score of 7 (superior) indicating a population with many large bluegill. The bluegill population has been consistently rated above average since 1992. According to the Schneider Index using the 2010 catch data, the bluegill population ranked as a 5.5, between "Good" and "Excellent". When combined with

the above average growth displayed by bluegill, it is clear that there continues to be a very good bluegill fishery.

Many other fish species were also captured (Tables 8 and 9). Bluntnose minnow, mimic shiner, sand shiner, golden shiner, and spottail shiner are all important forage for largemouth bass and walleye. White sucker, redhorse, and common carp provide forage for northern pike and muskellunge. Yellow perch and bluegill are also likely important prey items for walleye.

The shoreline data collected showed that Hamlin Lake has a very heavily armored shoreline (48.7%) when compared with other large, deep, inland lakes in Michigan (average=24.2%). This is due to Hamlin Lake being an impoundment with artificially high water levels. Riparian landowners have armored their shorelines to protect against ice damage and erosion from the heavy winds. The lake is not significantly more developed with docks and dwellings than other lakes in Michigan (Table 12) with 8.6 docks per kilometer of shoreline, while the average large deep lake in Michigan had 4.3 docks per kilometer (Wehrly et al. 2010). There were 7.7 dwellings per kilometer, compared to 9.2 dwellings per kilometer for other large deep lakes in Michigan. However, Hamlin Lake also had more submerged woody structure (56.5 trees/km) than other large lakes in Michigan (average =8.4 trees/km). Much of this wood is found on the western shoreline, which is part of Ludington State Park and in a natural, undeveloped state for the most part. The extreme upper end of the upper lake, which is surrounded by Manistee National Forest Land, is also in a natural undeveloped state.

Treatment of aquatic macrophytes remains, and likely will always remain, an issue on Hamlin Lake. There is no one statutory lake board or other entity that oversees the treatments. Instead, individuals or groups of individuals from different areas of the lake apply for permits and then conduct treatments on "their" area of the lake. In 2011 for example, ten different treatment permits were issued, with ten different treatments presumably conducted (Eric Bacon, DEQ Water Resources Division, personal communication). Treatments of native aquatic plants are not recommended by the DNR.

Management Direction

Hamlin Lake remains as one of the best and most popular fishing lakes in the western lower peninsula with a large, diverse fish population that is healthy. Native species like bluegill, pumpkinseed sunfish, rock bass, largemouth bass, and smallmouth bass should continue to thrive in Hamlin Lake without direct management efforts. While northern pike in Hamlin Lake grow slowly, natural reproduction supports the population, and some larger individuals are present. At times in the past, hybrid sunfish have been stocked into Hamlin Lake by the Hamlin Lake Preservation Society. However, none of the stocked hybrid sunfish have ever been caught in any fisheries surveys. Also, the stocking of hybrid sunfish into Hamlin Lake could have negative effects on native bluegill populations, including the potential for competition, reduced bluegill growth, and compromised genetic structure from interbreeding. Therefore it is recommended that hybrid sunfish not be stocked into Hamlin Lake.

At this point, the walleye fishery appears to be heavily dependent upon stocking, despite the presence of naturally reproduced fish in most years. Therefore, spring fingerling walleye (Muskegon River strain) should continue to be stocked into Hamlin Lake, at a rate of 28/acre (150,000 fish) every other year. Since a full complement of walleye was stocked in 2011, they should again be stocked in the spring of 2013. Fall walleye electrofishing surveys should be conducted in years when walleye are

stocked to assess the survival of these stocked fish. By looking at older walleye in addition to age-0 fish, the contribution of natural reproduction from non-stocking years can also be determined. Walleye stocked into Hamlin Lake will likely come from the Mason County Walleye Association rearing pond.

Comprehensive fisheries surveys of Hamlin Lake should be conducted by the DNR at least once every 10 years. Future fisheries surveys should continue electrofishing and seining efforts. While netting is often the most effective technique for catching panfish and sport fish, the electrofishing and seining efforts often catch juvenile and smaller minnow-type species providing a better picture of the overall fish community. Future survey efforts also should target stocked muskellunge, in order to assess the stocking program. DNR Fisheries personnel will continue to work with Hamlin Lake citizens groups and anglers to monitor the fishery.

The DNR should also continue to stock muskellunge on a regular basis. The next stocking event should be in 2013, with 10,700 fall fingerlings, repeating this in 2016. It is preferable that muskellunge stocked into Hamlin Lake be the Great Lakes strain. If the Great Lakes strain is not available, the northern strain muskellunge can be substituted.

Winter lake level continues to be an issue, as it has been since at least the 1930s. There is no court-mandated lake level. The lake level is controlled at the Hamlin Lake Dam, which is operated by Ludington State Park. The current Ludington State Park Hamlin Lake Dam Operation Plan calls for the lake level to be lowered by two feet (to an elevation of 592.20') on the fourth Monday in October, and then raised to the summer level (elevation 594.20') in spring of each year. As ice-out dates are unpredictable and vary widely from year to year, no hard and fast refill date is specified in the plan. Instead, the plan states that "refilling to summer level should commence after all of the ice goes off the lake, which normally occurs around the first week of April". The logic behind lowering the lake level is to protect riparian infrastructure from severe storms in late fall and ice damage in the winter. However, as in the past, not all agree with the current lake level management. Some believe that lowering the water level at the end of October negatively effects late fall fishing and waterfowl hunting in addition to potentially affecting fish populations. From a purely fisheries perspective, a year-round stable water level would probably be best, although the need to balance fisheries issues with those of riparian landowners is understood.

Any remaining riparian wetlands adjacent to Hamlin Lake should be protected as they are critical to the continued health of the lake's aquatic community. Future riparian development and wetland loss may result in deterioration of the water quality and aquatic habitat. Healthy biological communities require suitable natural habitat. Human development within the lake watershed, along the shoreline, and in the lake proper has a tendency to change and diminish natural habitat. Appropriate watershed management is necessary to sustain healthy biological communities, including fish, invertebrates, amphibians, reptiles, birds, and aquatic mammals. Generally for lakes this includes maintenance of good water quality, especially for nutrients; preservation of natural shorelines, especially shore contours and vegetation; and preservation of bottom contours, vegetation, and wood structure within a lake. Guidelines for protecting fisheries habitat in inland lakes can be found in Fisheries Division Special Report 38 (O'Neal and Soulliere 2006).

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Fig. 1. Hamlin Lake, Mason County, Michigan.

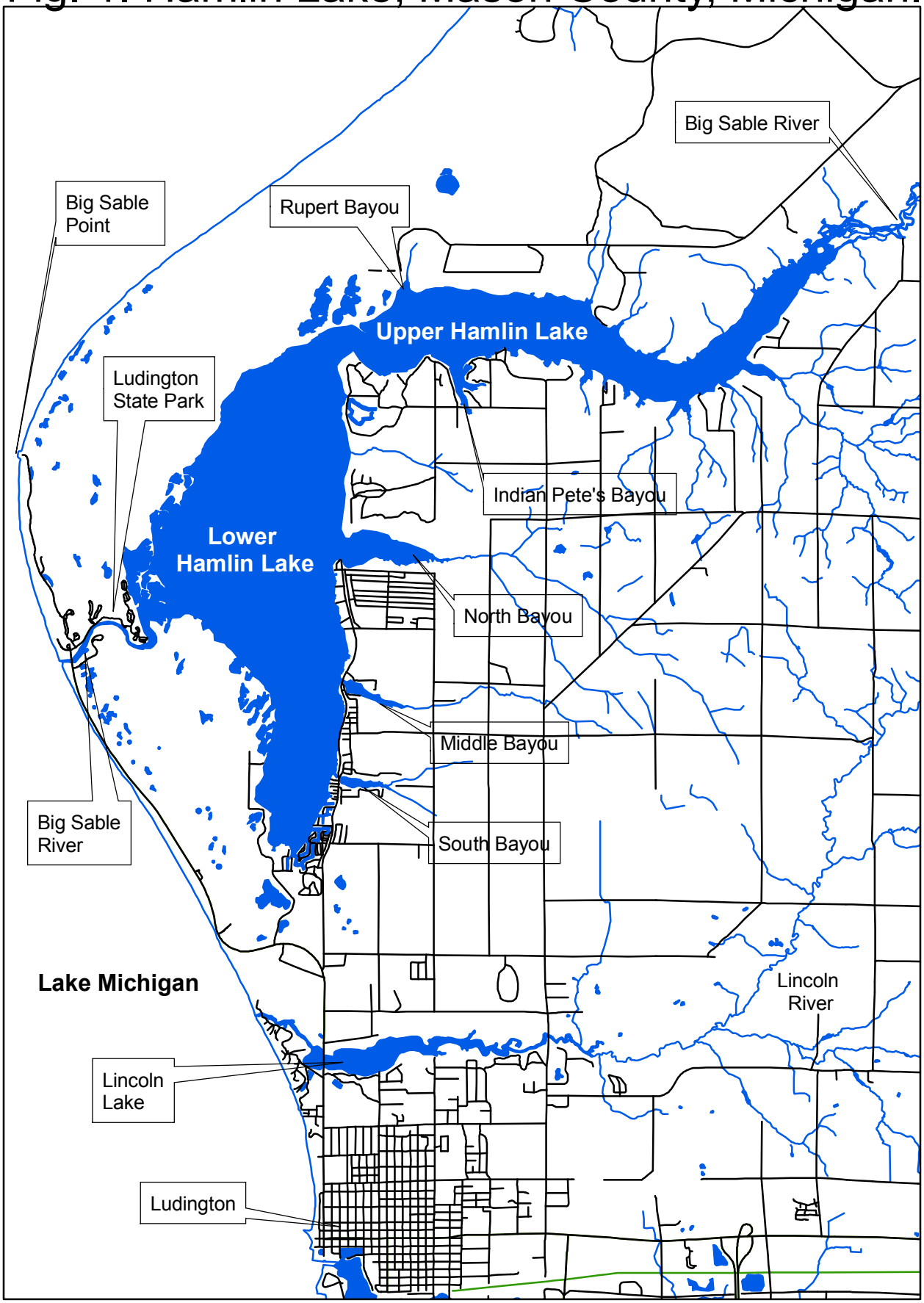


Table 1. Fish stocked in Hamlin Lake, Mason County, 1897-2011.

Year	Species	Number	Size/age	Strain
1897	lake trout	15,000	unknown	
1905	largemouth bass	1,500	fingerling	
1909	largemouth bass	4,000	fingerling	
1910	walleye	375,000	fry	
1934	bluegill	1,020	4 mo.	
	bluegill	800	adults	
1936	largemouth bass	1,500	yearlings	
	rainbow trout	40	adults-transfer	
	smallmouth bass	31	adults-transfer	
	walleye	233	adults-transfer	
1937	black crappie	312	adults-transfer	
	bluegill	8,000	5 mo.	
	bluegill	2	adults-transfer	
	brook trout	1	adults-transfer	
	brown trout	1	adults-transfer	
	smallmouth bass	30	adults-transfer	
	northern pike	30	adults-transfer	
	rainbow trout	49	adults-transfer	
	rock bass	1	adults-transfer	
	walleye	281	adults-transfer	
	yellow perch	231	adults-transfer	
1938	black crappie	22	adults-transfer	
	bluegill	2	adults-transfer	
	largemouth bass	5,000	4 mo.	
	northern pike	26	adults-transfer	
	rainbow trout	51	adults-transfer	
	smallmouth bass	19	adults-transfer	
	walleye	307	adults-transfer	
	yellow perch	112	adults-transfer	
1939	bluegill	30,000	3 mo.	
	bluegill	38	adults-transfer	
	northern pike	48	adults-transfer	
	rainbow trout	80	adults-transfer	
	smallmouth bass	1,000	4 mo.	
	smallmouth bass	54	adults-transfer	
	walleye	515,000	fry	
	walleye	301	adults-transfer	
	yellow perch	9,000	7 mo.	
	yellow perch	196	adults-transfer	
1940	bluegill	8,000	3 mo.	
	largemouth bass	500	3 mo.	
	northern pike	48	adults-transfer	
	rainbow trout	51	adults-transfer	
	rock bass	5	adults-transfer	
	smallmouth bass	23	adults-transfer	
	walleye	200,000	fry	
	walleye	302	adults-transfer	
	yellow perch	65	adults-transfer	

Table 1 continued

Year	Species	Number	Size/age	Strain
1941	bluegill	5,000	3 mo.	
	largemouth bass	1,000	3 mo.	
	northern pike	40	adults-transfer	
	rainbow trout	47	adults-transfer	
	smallmouth bass	1,000	3 mo.	
	smallmouth bass	15	adults-transfer	
	walleye	381	adults-transfer	
1942	largemouth bass	300	4 mo.	
	northern pike	12	adults-transfer	
	rainbow trout	36	adults-transfer	
	smallmouth bass	3,000	3 mo.	
	smallmouth bass	2	adults-transfer	
	walleye	200,000	fry	
	walleye	282	adults-transfer	
1953	rainbow trout	5	adults-transfer	
	walleye	4	adults-transfer	
	northern pike	19	adults-transfer	
1954	rainbow trout	3	adults-transfer	
	smallmouth bass	3	adults-transfer	
	walleye	25	adults-transfer	
	northern pike	10	adults-transfer	
1955	rainbow trout	1	adults-transfer	
	smallmouth bass	3	adults-transfer	
	walleye	13	adults-transfer	
1956	walleye	360	adults-transfer	
1957	walleye	228	adults-transfer	
1958	walleye	18	adults-transfer	
1969	tiger muskellunge	216	fall fingerlings	Hybrid
1970	tiger muskellunge	9,920	fall fingerlings	Hybrid
1971	tiger muskellunge	6,000	fall fingerlings	Hybrid
	walleye	1,002	fall fingerlings	
1972	tiger muskellunge	4,352	fall fingerlings	Hybrid
	walleye	3,684	fall fingerlings	
1973	walleye	742	fall fingerlings	
1975	tiger muskellunge	5,330	fall fingerlings	Hybrid
1976	tiger muskellunge	5,000	fall fingerlings	Hybrid
1977	tiger muskellunge	10,000	fall fingerlings	Hybrid
1978	tiger muskellunge	13,000	fall fingerlings	Hybrid
1979	tiger muskellunge	6,000	fall fingerlings	Hybrid
1980	tiger muskellunge	12,096	fall fingerlings	Hybrid
1981	tiger muskellunge	7,093	fall fingerlings	Hybrid
1982	tiger muskellunge	25,000	fall fingerlings	Hybrid
1983	tiger muskellunge	2,300	fall fingerlings	Hybrid
1984	tiger muskellunge	10,000	fall fingerlings	Hybrid
1985	tiger muskellunge	8,000	fall fingerlings	Hybrid
1986	tiger muskellunge	10,000	fall fingerlings	Hybrid
1987	tiger muskellunge	10,000	fall fingerlings	Hybrid
1988	tiger muskellunge	9,000	fall fingerlings	Hybrid

Table 1 continued

Year	Species	Number	Size/age	Strain
	walleye	300	fall fingerlings	
1989	walleye	100,561	spring fingerlings	Bay De Noc
	walleye	1,910	fall fingerlings	Bay De Noc
1990	walleye	138,734	spring fingerlings	Bay de Noc
	walleye	212	fall fingerlings	Bay de Noc
1991	walleye	125,586	spring fingerlings	Muskegon
1994	walleye	137,451	spring fingerlings	Bay de Noc
	walleye	108	fall fingerlings	Bay de Noc
1996	walleye	1,942	spring fingerlings	Bay de Noc
1997	walleye	28,861	spring fingerlings	Bay de Noc
1998	hybrid bluegill	4,350	adults	private plant
	walleye	38,527	spring fingerlings	Muskegon
1999	walleye	13,115	spring fingerlings	Muskegon
	walleye	51,237	spring fingerlings	Bay de Noc
2000	walleye	115,219	spring fingerlings	Muskegon
2001	hybrid bluegill	3,300	adults	private plant
	walleye	83,825	spring fingerlings	Muskegon
2003	walleye	163,081	spring fingerlings	Muskegon
2004	walleye	4,410	fall fingerlings	Muskegon
2005	muskellunge	12,510	fall fingerlings	Northern
2006	muskellunge	5,000	fall fingerlings	Northern
	walleye	156,254	spring fingerlings	Muskegon
	walleye	413	fall fingerlings	Muskegon
2008	hybrid bluegill	3,000	adults	private plant
	muskellunge	12,500	fall fingerlings	Northern
2010	muskellunge	5,653	fall fingerlings	Northern
2011	hybrid bluegill	8,600	adults	private plant
	muskellunge	7,019	fall fingerlings	Northern
	walleye	152,250	spring fingerlings	Muskegon

Table 2. Presence/absence of fish species in historical fisheries surveys of Hamlin Lake.

Species	1932	1942	1948	1953	1956	1967	1973	1983	1992	1997	2004	2010
Banded killifish		x	x	x								x
Black bullhead		x			x							x
Black crappie	x	x	x	x	x	x	x	x	x	x	x	x
Blackchin shiner		x		x								
Blacknose shiner		x										
Bluegill	x	x	x	x	x	x	x	x	x	x	x	x
Bluntnose minnow	x	x	x	x							x	x
Bowfin	x	x			x	x		x	x	x	x	x
Brook silversides		x		x								x
Brook stickleback		x										
Brown bullhead		x	x	x			x	x		x	x	x
Brown trout					x	x			x			
Bullhead spp.						x			x			
Central mudminnow		x										
Channel catfish	x				x				x			x
Common carp	x	x			x			x	x	x	x	x
Common shiner						x	x					
Freshwater drum	x	x			x	x	x	x	x	x	x	x
Golden redhorse		x										x
Golden shiner		x	x				x			x		x
Iowa darter		x	x	x								
Johnny darter		x		x								x
Lake chubsucker				x			x					x
Largemouth bass	x	x	x	x	x	x	x	x	x	x	x	x
Least darter		x										
Logperch		x	x									x
Longear sunfish		x										
Longnose gar	x	x	x		x		x	x	x	x	x	x
Mimic shiner		x										x
Muskellunge	x	x										x
Northern pike	x	x	x	x	x	x	x	x	x	x	x	x
Pumpkinseed sunfish	x	x	x	x	x	x	x	x	x	x	x	x
Rainbow darter				x								
Rainbow trout		x										
Redhorse spp.	x	x			x	x	x	x	x	x		
Rock bass	x	x	x	x	x	x	x	x	x	x	x	x
Sand shiner	x	x										x
Sculpin		x										
Shorthead redhorse		x									x	x
Smallmouth bass	x	x	x		x	x	x	x	x	x	x	x
Spottail shiner	x	x					x					x
Tadpole madtom		x		x								
Tiger muskellunge							x	x	x			
Trout-perch	x						x	x	x			
Walleye	x	x			x	x	x	x	x	x	x	x
White bass		x			x							
White sucker	x	x	x			x	x	x	x	x	x	x
Yellow bullhead		x					x				x	x
Yellow perch	x	x	x	x	x	x	x	x	x	x	x	x

Table 3. Number, weight, and length of fish collected from Hamlin Lake with large mesh fyke nets, trap nets, and inland gillnets on May 11- May 14, 2004.

Species	Number	Percent by number	Weight (Pounds)	Percent by weight	Length range (inches)[1]	Average length	Percent legal size[2]
black crappie	103	3.2	56.1	2.9	4-13	9.4	82 (7")
bluegill	875	27.1	254.5	13.4	4-9	7.3	96 (6")
bowfin	15	0.5	73.3	3.9	17-28	23.6	
brown bullhead	343	10.6	255.4	13.4	8-13	11.7	100 (7")
common carp	6	0.2	41.9	2.2	19-31	24.2	
freshwater drum	10	0.3	65.9	3.5	20-28	23.8	
largemouth bass	163	5.1	215.4	11.3	8-20	13.3	32 (14")
longnose gar	12	0.4	27.4	1.4	14-33	28.6	
northern pike	69	2.1	153.8	8.1	13-29	21.3	15 (24")
pumpkinseed sunfish	271	8.4	73.3	3.9	4-9	6.8	85 (6")
rock bass	977	30.3	345.3	18.2	4-11	7.7	95 (6")
shorthead redhorse	12	0.4	21.9	1.2	6-19	15.9	
smallmouth bass	1	0.0	1.9	0.1	15-15	15.5	100 (14")
walleye	11	0.3	31.7	1.7	11-26	20.0	91 (15")
white sucker	95	2.9	231.7	12.2	6-21	18.1	
yellow perch	236	7.3	32.8	1.7	4-11	6.8	36 (7")
yellow bullhead	26	0.8	19.5	1.0	8-15	11.5	100 (7")
Total	3,225	100	1901.8	100			

[1]Note some fish were measured to 0.1 inch, others to inch group: e.g., "5"=5.0 to 5.9 inch, 12=12.0 to 12.9 inches; etc.

[2]Percent legal size or acceptable size for angling. Legal size or acceptable size for angling is given in parentheses.

Table 4. Number, weight, and length of fish collected from Hamlin Lake by electrofishing on June 28, 2004.

Species	Number	Percent by number	Weight (Pounds)	Percent by weight	Length range (inches)[1]	Average length	Percent legal size[2]
black crappie	1	0.4	0.1	0.1	5-5	5.5	0 (7")
bluegill	27	11.3	3.8	2.7	2-7	5.6	37 (6")
bluntnose minnow	1	0.4	0	0.0	3-3	3.5	
brown bullhead	2	0.8	0.8	0.6	9-9	9.5	100 (7")
largemouth bass	106	44.4	101.1	73.0	4-18	11.7	17 (14")
northern pike	4	1.7	6.1	4.4	18-20	19.3	0 (24")
pumpkinseed sunfish	17	7.1	3.1	2.2	4-7	6	47 (6")
rock bass	24	10.0	7.3	5.3	3-8	7.2	79 (6")
smallmouth bass	2	0.8	4.1	3.0	11-18	15.0	50 (14")
walleye	16	6.7	9.3	6.7	7-19	10.6	19 (15")
yellow perch	39	16.3	2.7	2.0	2-9	5.0	10 (7")
Total	239	100	138.4	100			

[1]Note some fish were measured to 0.1 inch, others to inch group: e.g., "5"=5.0 to 5.9 inch, 12=12.0 to 12.9 inches; etc.

[2]Percent legal size or acceptable size for angling. Legal size or acceptable size for angling is given in parentheses.

Table 5. Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from Hamlin Lake with trap nets, fyke nets, and inland gill nets, May 11-14, 2004. Number of fish aged is given in parenthesis. A minimum of five fish per age group is statistically necessary for calculating a Mean Growth Index, which is a comparison to the State of Michigan average.

	Age										Mean Growth Index
Species	I	II	III	IV	V	VI	VII	VIII	IX	X	
Black crappie	5.0 (2)	6.0 (19)	8.1 (9)	9.4 (14)	10.0 (12)	10.9 (8)	12.1 (5)	11.7 (6)	12.0 (1)	12.1 (1)	+0.7
Bluegill			4.9 (2)	5.6 (7)	7.1 (31)	7.8 (9)	9.4 (1)	9.1 (1)			+0.2
Largemouth bass		8.1 (3)	10.2 (9)	12.3 (32)	14.0 (14)	14.7 (20)	16.1 (3)	17.3 (4)	19.0 (1)	10.6 (1)	+0.8
Northern pike	15.5 (7)	18.6 (13)	21.6 (30)	23.5 (16)	27.3 (2)						+1.4
Pumpkinseed sunfish			4.9 (7)	5.6 (12)	7.1 (13)	7.0 (16)	8.1 (3)				+0.7
Rock bass			4.7 (4)	5.6 (11)	6.5 (14)	7.6 (42)	8.8 (18)	9.8 (2)	10.3 (2)		+0.6
Smallmouth bass					15.6 (1)						-
Walleye		11.1 (1)		18.3 (3)		20.1 (2)	19.8 (1)	23.5 (1)	22.4 (2)	26.3 (1)	-
Yellow perch			5.8 (6)	6.5 (53)	7.8 (10)	9.8 (3)	10.0 (1)	11.7 (1)			-0.8

Table 6. Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from Hamlin Lake by electrofishing, June 28, 2004. Number of fish aged is given in parenthesis. A minimum of five fish per age group is statistically necessary for calculating a Mean Growth Index, which is a comparison to the State of Michigan average.

	Age										
Species	I	II	III	IV	V	VI	VII	VIII	IX	X	Mean Growth Index
Black crappie	5.8 (1)										
Largemouth bass	5.2 (8)	8.0 (13)	10.4 (4)		16.5 (1)			18.2 (1)			-0.5
Northern pike		18.9 (3)									-
Smallmouth bass				11.3 (1)			18.6 (1)				-
Walleye	8.39 (11)	11.4 (2)		16.2 (3)							+0.2
Yellow perch	4.1 (1)	4.5 (9)			9.4 (2)						-1.2

Table 7. Michigan DNR Master Angler awards issued for fish caught from Hamlin Lake, Mason County, 1994-2011.

Species	Number of Master Angler awards issued
Black bullhead	8
Black crappie	5
Bluegill	27
Bowfin	23
Brown bullhead	38
Channel catfish	16
Freshwater drum	45
Largemouth bass	3
Longnose gar	2
Muskellunge	1
Quillback	1
Pumpkinseed	10
Redear sunfish	1
Rock bass	15
Smallmouth bass	4
Tiger Muskellunge	1
Walleye	1
White sucker	5
Yellow bullhead	29
Yellow perch	1
Total:	236

Table 8. Number, weight, and length of fish collected from Hamlin Lake with trap nets, and inland gillnets on June 7-10, 2010.

Species	Number	Percent by number	Weight (Pounds)	Percent by weight	Length range (inches)1	Average length	Percent legal size2
black bullhead	16	1.7	12.5	1.1	10-13	11.8	100 (7")
black crappie	35	3.7	9.6	0.8	4-12	7.4	49 (7")
bluegill	157	16.6	41.7	3.6	3-9	7.0	75 (6")
bowfin	28	3.0	161.2	14.0	21-28	25.2	
brown bullhead	73	7.7	76.8	6.7	9-18	12.8	100 (7")
channel catfish	2	0.2	9.9	0.9	22-26	24.5	100 (12")
common carp	16	1.7	98.5	8.6	18-28	23.3	
freshwater drum	23	2.4	117.4	10.2	7-29	20.0	
golden redhorse	2	0.2	2.8	0.2	11-18	15.0	
largemouth bass	46	4.9	65.3	5.7	6-16	13.7	48 (14")
longnose gar	12	1.3	32.6	2.8	24-37	30.2	
muskellunge	1	0.1	1.5	0.1	19-19	19.5	
northern pike	42	4.4	88.1	7.7	15-29	20.9	10 (24")
pumpkinseed sunfish	135	14.3	46.7	4.1	4-9	7.3	95 (6")
rock bass	171	18.1	58.2	5.1	4-10	7.5	87 (6")
shorthead redhorse	17	1.8	39.2	3.4	11-20	17.8	
smallmouth bass	15	1.6	25.0	2.2	13-18	14.7	87 (14")
walleye	37	3.9	74.2	6.5	11-25	17.7	92 (15")
white sucker	67	7.1	175.4	15.3	14-24	18.5	
yellow bullhead	10	1.1	5.3	0.5	9-11	10.3	100 (7")
yellow perch	42	4.4	6.6	0.6	5-9	6.7	24 (7")
Total	947	100	1148.5	100			

[1]Note some fish were measured to 0.1 inch, others to inch group: e.g., "5"=5.0 to 5.9 inch, 12=12.0 to 12.9 inches; etc.

[2]Percent legal size or acceptable size for angling. Legal size or acceptable size for angling is given in parentheses.

Table 9. Number, weight, and length of fish collected from Hamlin Lake with seines and electrofishing on July 15, 2010.

Species	Number	Percent by number	Weight (Pounds)	Percent by weight	Length range (inches)1	Average length	Percent legal size2
banded killifish	6	0.9	0.0	0.0	2-3	2.7	
black bullhead	3	0.5	2.3	6.5	11-12	11.9	100 (7")
bluegill	11	1.7	0.4	1.1	2-4	3.4	0 (6")
bluntnose minnow	148	22.5	1.1	3.1	1-3	2.6	
bowfin	1	0.2	5.2	14.6	24-24	24.5	
brook silverside	6	0.9	0.0	0.0	1-4	2.7	
freshwater drum	1	0.2	1.3	3.7	14-14	14.5	
golden shiner	15	2.3	0.2	0.6	3-4	3.6	
johnny darter	31	4.7	0.1	0.3	0-2	2.2	
lake chubsucker	1	0.2	0.0	0.0	3-3	3.5	
largemouth bass	31	4.7	5.1	14.4	1-13	3.7	0 (14")
logperch	12	1.8	0.1	0.3	2-3	2.7	
mimic shiner	78	11.9	0.4	1.1	1-3	2.5	
pumpkinseed sunfish	4	0.6	0.6	1.7	2-7	5	50 (6")
rock bass	27	4.1	6.4	18.0	2-9	6.3	44 (6")
sand shiner	42	6.4	0.2	0.6	1-2	2.4	
smallmouth bass	1	0.2	0.0	0.0	2-2	2.5	0 (14")
spottail shiner	13	2.0	0.2	0.6	2-4	3.4	
white sucker	6	0.9	9.2	25.9	3-20	12.5	
yellow perch	221	33.6	2.7	7.6	1-5	2.9	0 (7")
Total	658	100	35.5	100			

[1]Note some fish were measured to 0.1 inch, others to inch group: e.g., "5"=5.0 to 5.9 inch, 12=12.0 to 12.9 inches; etc.

[2]Percent legal size or acceptable size for angling. Legal size or acceptable size for angling is given in parentheses.

Table 10. Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from Hamlin Lake with trap nets and inland gill nets, June 7-10, 2010. Number of fish aged is given in parenthesis. A minimum of five fish per age group is statistically necessary for calculating a Mean Growth Index, which is a comparison to the State of Michigan average.

	Age											Mean Growth Index
Species	I	II	III	IV	V	VI	VII	VIII	IX	X	XIII	
Black crappie		5.5	7.9	8.7	10.1	11.4		12.9				-1.0
		(17)	(9)	(4)	(3)	(1)		(1)				
Bluegill		3.8	5.0	6.5	7.3	7.4	8.3		9.4	9.2	9.4	+0.2
		(3)	(18)	(6)	(9)	(5)	(11)		(1)	(1)	(1)	
	6.4	8.1	10.7	12.9	13.6	14.1	15.0	15.8	16.2			-0.3
Largemouth bass	(1)	(1)	(2)	(6)	(12)	(4)	(8)	(3)	(2)			
Northern pike		16.7	19.4	21.9	23.9							-2.3
		(6)	(10)	(22)	(5)							
Pumpkinseed		4.3	4.8	5.9	6.3	6.7	7.5	8.2	8.5	8.4		+0.1
sunfish		(2)	(2)	(4)	(5)	(7)	(8)	(7)	(5)	(1)		
Rock bass		4.0	5.3	6.1	7.0	7.5	8.3	9.1	9.6			-0.3
		(3)	(12)	(4)	(10)	(6)	(12)	(7)	(3)			
				13.8	14.4	15.2	18.3					-0.3
Smallmouth bass				(4)	(9)	(1)	(1)					
Walleye		12.3		16.1	16.7	18.8	20.8	24.3		25.4		-0.5
		(2)		(17)	(4)	(7)	(2)	(1)		(3)		
Yellow perch			6.2	6.5		9.1						-1.0
			(8)	(18)		(2)						

Table 11. Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from Hamlin Lake by seining and electrofishing, July 14, 2010. Number of fish aged is given in parenthesis. A minimum of five fish per age group is statistically necessary for calculating a Mean Growth Index, which is a comparison to the State of Michigan average.

	Age										
Species	I	II	III	IV	V	VI	VII	VIII	IX	X	Mean Growth Index
Bluegill		3.5 (4)									
Largemouth bass	6.5 (3)			11.4 (1)							
Rock bass		4.1 (3)									
Yellow perch	3.5 (12)	4.7 (1)									-0.8

Table 12. Shoreline data for Hamlin Lake, Mason County. Sampling was conducted by DNR Fisheries personnel in July and August, 2010.

	Total docks per km	Percent shoreline armoring	Submerged trees per km	Dwellings per km
Hamlin Lake	8.6	48.7	56.6	7.7

Table 13. Comparison of bluegill data from four DNR Hamlin Lake fisheries surveys.

Survey year	# Bluegill Caught (trap nets and fyke nets only)	Effort	Catch Rates (# bluegill caught/net-night)	Growth Rate (compared with State average length at age)	Schneider Index and Rank
1992	272	24 fyke net lifts	11.3	+0.5	6.75, Excellent
1997	49	24 fyke net lifts	2.0	+1.1	7.0, Superior
2004	872	15 trap net lifts, 16 fyke net lifts	28.1	+0.2	6.25, Excellent
2010	156	11 trap net lifts	14.2	+0.2	5.5, Good

Appendix F—Natural Area Documentation

There are two different Natural Area protections in place at Ludington State Park. The northern portion of the park, north of the lighthouse, was proposed for legal dedication under the Wilderness and Natural Areas Act in 1987. Memorandum to the Natural Resources Commission requesting approval for the Dedication follows.

The majority of the undeveloped area in Ludington State Park is enrolled in The Nature Conservancy's Natural Areas Registry. This is a voluntary agreement to manage and protect natural features, and includes notification provisions for changes in management or property transfer. Extracts from the agreement follows.

BIG SABLE DUNES AND SWALES
LUDINGTON STATE PARK

MICHIGAN NATURAL AREAS REGISTRY

The sand dunes and interdunal swales of Ludington State Park in Mason County are enrolled in the Michigan Natural Areas Registry by the Parks Division of the Michigan Department of Natural Resources and The Nature Conservancy. Two state-threatened plants, Pitcher's thistle (Cirsium pitcheri) and sand-cancer root (Orobanche fasciculata) grow in the area, which includes approximately 3670 acres of open sand dunes and interdunal wetlands in Sections 4, 5, 6, 7, 8, 9, 17, 18, 19, 20, 21, 28, 29, 32, and 33 of T19N, R18W.

The Michigan Natural Areas Registry promotes the preservation of important natural areas through non-binding, non-regulatory agreements between public land managers and The Nature Conservancy. It informs public land managers of the existence of rare species of biological communities on their properties and invites them to register those lands for protection. Participants are recognized for their commitment to safeguarding elements of our state's rich natural heritage.

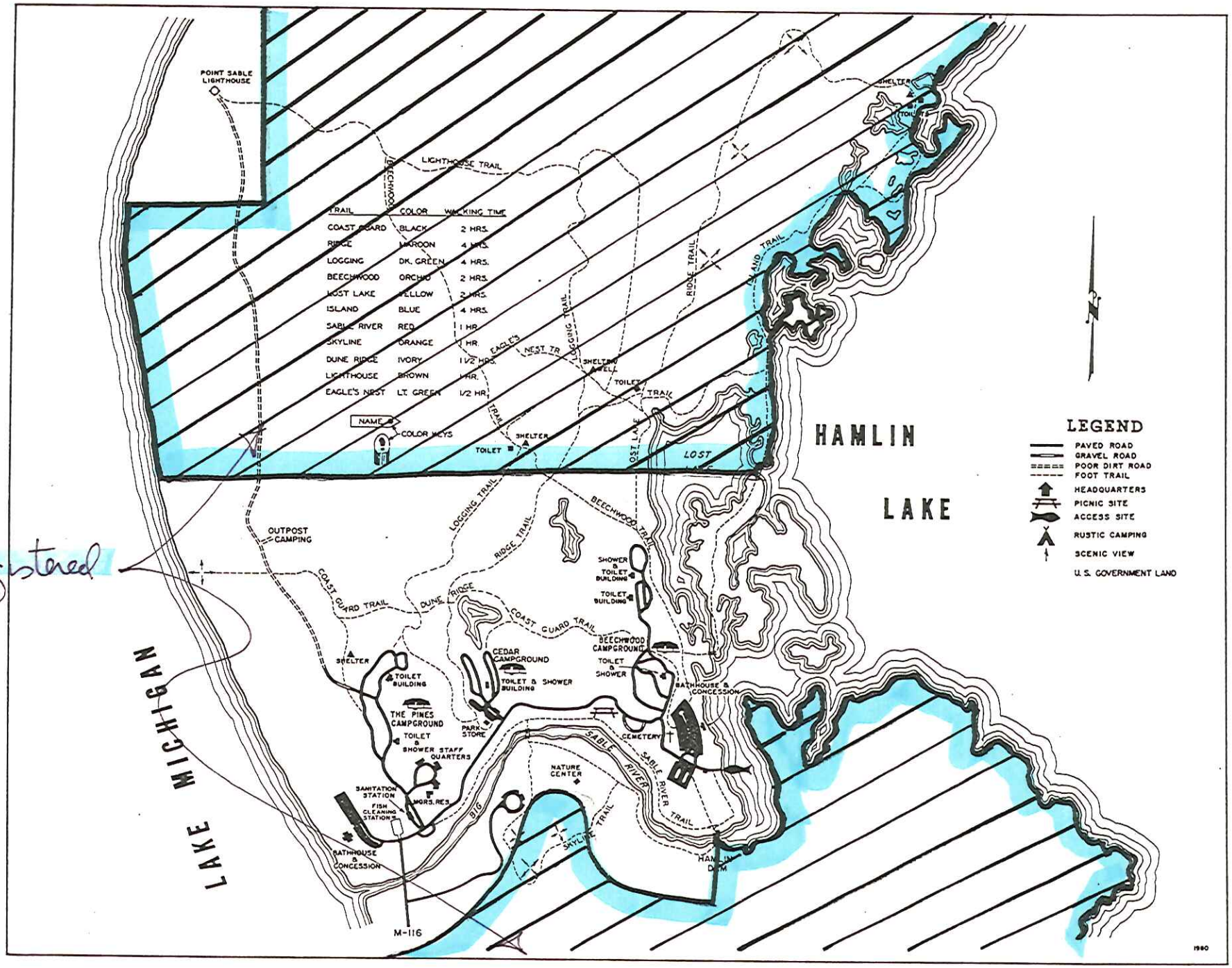
Through the Registry, the Parks Division of the Michigan Department of Natural Resources has made a commitment to:

1. manage the registered area in a manner that will sustain and foster the continued protection of the natural features in voluntary preservation through cooperation;
2. notify The Nature Conservancy of changes in existing management practices (such as sale of mineral rights, surface mining, dredging, filling, recreational developments including parking lots, buildings, structures, and other improvements) which might threaten the registered area;
3. inform The Nature Conservancy of any intent to sell or transfer ownership of the property.

The Registry commitment is not binding and may be cancelled by the Parks Division at any time, although the Division is asked to give 30-days notice before terminating the registration.

Management assistance for the registered area is available from The Nature Conservancy at 2840 East Grand River, Suite 5, East Lansing, MI 48823 (517) 332-1741.

LUDINGTON STATE PARK

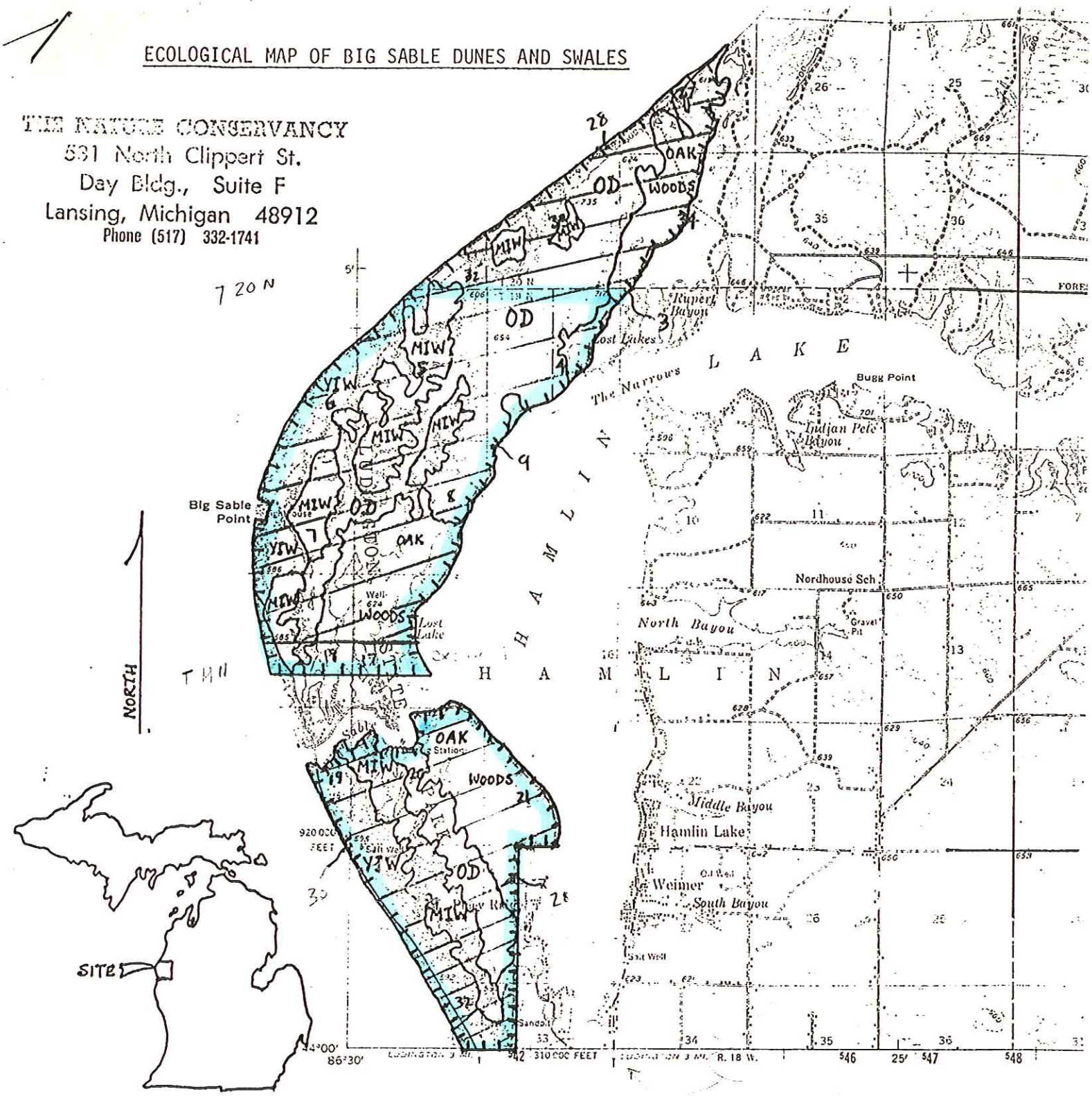


Area Registered

1

ECOLOGICAL MAP OF BIG SABLE DUNES AND SWALES

THE NATURE CONSERVANCY
531 North Clippert St.
Day Bldg., Suite F
Lansing, Michigan 48912
Phone (517) 332-1741



LEGEND

YIW OPEN DUNES AND YOUNG INTERDUNAL WETLAND

MIW MATURE INTERDUNAL WETLANDS AND JACK PIN

OD OPEN DUNES

SITE ECOLOGICAL BOUNDARY

(LOCATION OF CIRSIUM PITCHERI, OROBANCHE FASCICULA, CYPRIPEDIUM ARIETINUM DESCRIBED IN SITE ECOLOGICAL SUMMARY.)

OWNERSHIP BOUNDARY (OVERLAY)

SCALE

1 inch = 5208 feet

0 5208' 10416'

Christie Fox
ST Eve
373-1950

The L.H. Prop must Not Have Been included
We did NOT own in 1988

DEC. 26 RECD

12-3 , 19 87
MICHIGAN NATURAL RESOURCES COMMISSION
Barbara E. McGuire
(EXECUTIVE ASSISTANT)

Ludington S.P.

November 11, 1987

Memorandum to the Natural Resources Commission

SUBJECT: Request for Tentative Approval for Dedication of the Ludington Dunes Natural Area

Authority

Act 241 of the Public Acts of 1972 authorizes the Natural Resources Commission to establish and regulate wilderness, wild, and natural areas on State owned, Department managed lands.

Discussion and Background

The proposed natural area is an approximately 1,699 acre tract located in the northern portion of Ludington State Park in Mason County. The site is ecologically part of the Big Sable Dunes complex, which includes the Nordhouse Dunes (proposed for Federal wilderness designation) to the north of the State Park. The Ludington Dunes contain distinctive natural communities endemic to the Great Lakes Region, including interdunal wetlands, forested dunes and Great lakes barrens. Two State threatened plants and two plants of special concern are known to occur in the proposed dedication, including one of the best known populations of the State threatened, Great Lakes endemic Pitcher's thistle.

The Wilderness and Natural Areas Advisory Board, the Land and Water Management Division, and Parks Division support the dedication of this site under the Wilderness and Natural Areas Act.

On May 14, 1987, the Natural Resources Commission approved a request to hold a public hearing on the proposed dedication. Notice of the public hearing was published in the Detroit News, Marquette Mining Journal, and Ludington Daily News. The Office of Public Information issued a press release to newspapers, radio and television stations throughout the State.

The public hearing was held on Wednesday, September 2, 1987, in the Mason Lake Intermediate Development Center near Ludington.

Seven individuals attended the public hearing, and six letters were received. No negative comments regarding the dedication were received, and all the letters were supportive.

Attached is a location map, the draft administrative rule legally describing the site as proposed for inclusion under the Wilderness and Natural Areas Act, 1972 PA 241, and the Administrative Rules Report from the Public Hearing.

Recommendation

Staff is recommending that the Natural Resources Commission grant tentative approval for the proposed dedication of the Ludington Dunes Natural Area under the provisions of the Wilderness and Natural Areas Act.

The recommendation to dedicate this area has the concurrence of Parks Division, which has the administrative responsibility for the site, and the Land and Water Management Division.

Jack Butterfield HL

JACK BUTTERFIELD, CHIEF
Parks Division

DENNIS J. HALL, CHIEF
Land and Water Management Division

I have analyzed and discussed this recommendation with the Deputy Directors and staff and we concur.

GORDON E. GUYER
Director

Policy Number 2704
Procedure Number 2704.4

DEPARTMENT OF NATURAL RESOURCES

COMMISSION OF NATURAL RESOURCES

WILDERNESS AND NATURAL AREAS

Filed with the Secretary of State on
This rule takes effect 15 days after filing with the Secretary of State

(By authority conferred on the natural resources commission by section 4 of Act No. 241 of the Public Acts of 1972, being §322.754 of the Michigan Compiled Laws)

Regulation No. 53, Mason county.

R 322.53.1. Ludington dunes natural area.

Rule 1. The following described area in Ludington state park is dedicated as a natural area under the designation Ludington dunes natural area: west ½ of section 4; entire section 5; entire section 6; north ½ of section 7, except any federal land in government lot 1; north ½ of section 8, except a .45-acre parcel in private ownership in the southwest ¼ of the northeast ¼; entire section 9, T19N, R18W, Hamlin township, Mason county, containing 1,699 acres, more or less.

June 1, 1987