Portage Lake Watershed Forever Plan

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Prepared for
Alliance for Economic Success (AES)
Manistee, Michigan

Prepared by
Public Sector Consultants Inc.
Lansing, Michigan
www.pscinc.com

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PURPOSE

The purpose of the Portage Lake Watershed Forever Plan is to engage all interests in the community in developing a *living document* that will ensure the wise use and enjoyment of the Portage Lake watershed for present and future generations. The plan will be used to guide and inform future monitoring, planning, management, and community and economic development efforts within the watershed. It is not regulatory in nature and its associated committees are non-political and do not have regulatory powers. While the Portage Lake Watershed Forever committees will provide coordination, the implementation of the plan largely depends on assistance from and the cooperation of numerous local, state, and federal partners.

VISION

The vision of the Portage Lake Watershed Forever Plan is that the Portage Lake watershed will be preserved *forever* by investing in protection and enhancement of natural and related cultural and historical resources in the watershed to provide economic benefit and to improve the quality of life for present and future residents and visitors.

STAKEHOLDER INVOLVEMENT

The Portage Lake Watershed Forever Plan is truly a community-driven effort, as evidenced by the numerous and diverse stakeholders that have been engaged throughout the three-year process. The process began in 2006, when more than 50 individuals, organizations, agencies, and businesses signed the *Portage Lake Watershed Forever Partnership Agreement.* This agreement contained principles to guide the plan as well as expected outcomes of the process. The Alliance for Economic Success (AES) (formerly the Manistee Economic Development Office) served as a nonprofit, 501 (c)(3) hub for financial, grant, and contract management for the planning process. In 2007, the AES engaged a neutral facilitator, Public Sector Consultants Inc. *(www.pscinc.com)* of Lansing, Michigan, to assist the community in developing the plan. The Portage Lake Watershed Forever Committee and its Executive Committee and Technical Advisory Committee, all of which include representation from diverse watershed interests, guided the planning process. Community citizens established a Portage Lake Watershed Forever Endowment Fund at the Manistee County Community Foundation *(www.manisteefoundation.org*) to provide support for the plan and its long-term implementation.

Public Sector Consultants engaged nearly 150 people through eight community conversations and a community forum and surveyed 250 households in the watershed by telephone to solicit information from all interests about water quality concerns, desired uses, and their vision for the future of the watershed. Numerous additional stakeholder meetings were conducted by members of the Portage Lake Watershed Forever Executive Committee.

DESCRIPTION OF WATERSHED

The Portage Lake watershed is located in the northwest portion of Michigan's Lower Peninsula in Manistee County and encompasses portions of Bear Lake, Brown, Manistee, and Onekama Townships as well as the Village of Onekama. The watershed is approximately 24.6 square miles, or 15,777 acres (MDIT/CGI, LP Watersheds). Portage Lake's surface area is 2,116 acres and comprises 13.4 percent of the total surface area of the watershed (MDIT/CGI, LP Watersheds). It is a natural lake formed by glaciers with maximum depths in two areas of up to 60 feet and a mean depth of 19 feet. Surface water courses drain to Portage Lake and eventually to Lake Michigan through a manmade channel (Portage Lake Channel) on the west side of Portage Lake that requires periodic dredging to maintain navigation between Portage Lake and Lake Michigan. Three other named lakes, seven named tributaries (including several small unnamed creeks and drains), numerous artesian wells, and significant groundwater all flow into Portage Lake.

The Portage Lake watershed is generally bowl shaped with elevations at the outer edges of the watershed reaching as high as 950 feet above sea level (289.6 meters) and sloping toward Portage Lake. The bedrock beneath the glacial deposits in Manistee County consists predominantly of sandstones and shale. The Portage Lake watershed is at the rim of the large geologic sedimentary rock feature covering most of the Lower Peninsula of Michigan that contains significant hydrocarbon deposits. The county ranks second in the state in the total production of both oil and natural gas that began in Michigan in 1925.

There are no state or federally-listed endangered species in the Portage Lake watershed. Three state-listed threatened species include the red-shouldered hawk, the pitcher's thistle, and the Lake Huron locust. The brown walker snail is a state-listed species of concern. There is one federally-listed threatened species in the watershed: the pitcher's thistle.

The Portage Lake Watershed has undergone significant change in land use and land cover since the area was first surveyed and platted in 1836. The beech-sugar maple-hemlock hardwood forests that once dominated the watershed prior to development are now limited primarily to the western portion of the watershed because of forestry and agricultural practices, residential and commercial development, and transportation corridors that have built over the last 170 years. Wetlands and associated conifers that once dominated significant portions of the south side of Portage Lake have been significantly reduced.

The shoreline areas of Portage Lake have been substantially altered by either historical timber-related activities or because of more recent commercial, residential, recreational, and related transportation development. More than 20 percent of the shoreline of Portage Lake has been altered by filling, dredging, seawall construction, and related activities to accommodate current and historical uses. The manmade current outlet of Portage Lake to Lake Michigan constructed in 1871 permanently lowered the water level of the lake by several feet. The new channel outlet provided commercial and recreational boating access to Lake Michigan, increased the productive littoral zone of Portage Lake, and accommodated access to Portage Lake by fish species and other aquatic organisms common to Lake Michigan.

Despite significant changes in land cover, the water quality in Portage Lake and tributary streams remains relatively good, in large part due to the glacial till that dominates the watershed. Direct runoff to watershed lakes and streams is minimized because of infiltration through permeable glacial soils and recharge of groundwater that provides a major source of cool water to Portage Lake and most of the tributary streams. Direct storm water and snowmelt point and nonpoint sources of potential pollutants in the watershed are generally limited to areas where intensive development, transportation corridors, and agricultural activities are immediately adjacent to surface water.

Portage Lake is very popular for fishing, sailing, cruising, waterskiing, and swimming. The Portage Lake Channel and protected harbor provide the opportunity for larger recreational boat owners to move back and forth between Portage Lake and Lake Michigan. Several Great Lake charter-fishing businesses operate out of Portage Lake that target Chinook salmon, Coho salmon, brown trout, and lake trout, and two public boat launches exist on Portage Lake.

Unlike many watersheds in the northern Lower Peninsula, there is very little state or federal public land within the watershed. Private land practices associated with forestry, agricultural, recreational, commercial, industrial, and residential uses have been and will continue to be the major influence on the condition of the subwatershed and the quality of its groundwater and surface water resources.

The estimated current population of the Portage Lake watershed is 2,059. There are approximately 1,351 total housing units including 474 seasonal housing units. Between 1990 and 2000 the population of Onekama Township (including the Village of Onekama), the most densely populated area of the watershed, increased by nearly 20 percent. This population growth rate is nearly three times the state's growth rate of 6.9 percent during the same period.

USES, THREATS, SOURCES, AND CAUSES

State water quality standards for all designated uses in the watershed are currently being met and no protected uses are impaired. The most likely future threats to designated uses, as well as the sources/causes of these threats, are as follows:

- **Public health** threats from
  - pathogens coming from failed septic systems, uncontrolled runoff from farm-raised animals, household pets, and waterfowl; and
  - contaminated fish from air deposition of toxic, bioaccumulative heavy metals and persistent organic compounds; as well as potential, but undocumented, historical industrial releases contained in Portage Lake sediments.

- **Ecosystem health** threats from
  - increased phosphorus loadings due to septic tile field leachate, riparian lawn fertilization, storm water discharges, agricultural practices and resulting excessive plant and algal growth, and associated impairments due to eutrophication[1]; and

[1] A process by which a water body becomes rich in dissolved nutrients, often leading to algal blooms, low dissolved oxygen, and an environment that does not readily support oxygen-dependant aquatic life.

- habitat degradation from wetland destruction, lakeside and streamside development, invasive species, and sedimentation from lake access areas, bridge crossings, and other land disturbance activities.

- **Recreational and fishing access** threats from
  - lack of maintenance dredging of the Portage Lake Channel and
  - lack of adequate and safe boat launching and docking facilities and public swimming and recreational areas due to the limited sites available and low water levels

- **Groundwater contamination** threats from
  - unlawful existing and potential releases of contaminants from spills and
  - leaking underground storage tanks and improperly plugged domestic and industrial wells

Several additional desired uses of the watershed were identified by the community beyond those uses specifically protected under surface water pollution control laws and regulations.

PRIORITY AREAS

Areas in the watershed that are either sources of pollution or are most susceptible to changes that would result in increased input of priority pollutants are defined as priority areas. These areas include:

- a 1,000-foot zone riparian to Portage Lake and a 100-foot zone riparian to all tributaries;
- the non-sewered portion of Portage Lake shoreline;
- the Village of Onekama (storm water runoff),
- and known sites of environmental contamination.

Priority areas in the watershed were identified and mapped to help inform development of goals and objectives and to guide future monitoring, planning, and management efforts.

GOALS AND OBJECTIVES

The following goals were developed, based on various modes of stakeholder input, past studies, and current water quality monitoring.

- **Goal 1—Public Health**: Ensure that participants in water-based recreation are not exposed to pathogens or toxic chemicals, and are not consuming water, wild fish, or wildlife with contaminants in excess of advisories.
- **Goal 2—Aquatic Ecosystem**: Protect the quality of water resources in the Portage Lake watershed, as well as other essential habitats, to maintain the integrity and functions of the aquatic ecosystem.

- **Goal 3—Water-Based Recreation**: Protect and enhance the quality of and access to water-based recreational opportunities within the Portage Lake watershed for people of all ages and abilities.
- **Goal 4—Natural Resource and Cultural Assets**: Invest in protection and enhancement of land-based natural resources and related cultural assets that provide recreational and educational benefits unique to the watershed and contribute to the quality of life and economic well-being of local residents while expanding the vacation experiences of visitors.
- **Goal 5—Local Management and Implementation Institution:** Establish mechanisms to provide sustained local leadership, community engagement, and fundraising needed to assure implementation and updating of the Portage Lake Watershed Forever Plan.

To achieve these goals, 18 objectives and 57 actions were laid out covering a ten-year timeline. Potential partners and estimated costs are identified for each action.

LOCAL PROGRAMS, PROJECTS, AND PLANNING

Planning and zoning documents for each of the five jurisdictions in the watershed were reviewed to assess the effectiveness of each in helping to further watershed plan goals and objectives. Although each jurisdiction had some water quality protection provisions in place, best practices and recommendations for how to strengthen future planning and zoning were outlined. A description of mission statements of various other agencies and community-based organizations provided information on potential partners for plan implementation.

INFORMATION AND EDUCATION PLAN

An information and education plan, based on stakeholder input from community conversations and a household survey, was developed to help increase awareness and understanding about how actions on the land within the watershed can impact water quality. The purpose of the strategy is to establish and promote education programs that support effective implementation of watershed planning goals, objectives, and tasks.

MONITORING AND EVALUATION

Implementation of watershed plan goals and objectives will require routine monitoring. Monitoring is a key component of this plan since the focus is on sustaining current conditions that support designated and other beneficial uses. The proposed monitoring plan will help fill gaps on both habitat conditions and conformance with water quality standards. The intent of the monitoring plan is to identify changes in environmental conditions early enough to develop corrective actions before significant impairments occur. The monitoring plan focuses on the three priorities of the watershed plan: public health, aquatic ecosystem health, and groundwater protection.

Evaluation of monitoring activities will also be necessary to determine the progress and effectiveness of the proposed activities. A measure of success will be that all water quality standards continue to be met and designated uses are protected. Where state

standards are not available, the measure of success will be no evidence of significant deterioration of current environmental conditions.

Successful establishment of the institutional structure to assure implementation of the recommendations of this plan is critical. While volunteers can contribute substantially to the monitoring effort, the Portage Lake Watershed Forever organization needs to formalize its structure and operations to assure that it has staff that can organize and manage the elements in the monitoring plan and evaluate the results.