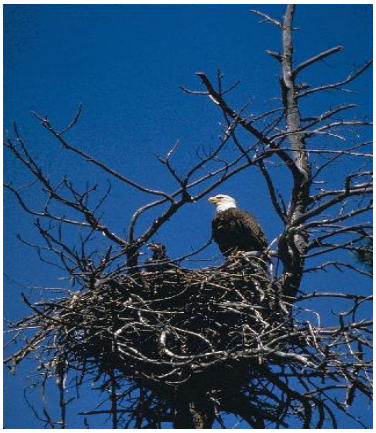
# Stage 2 Remedial Action Plan for the Saginaw River/Bay Area of Concern



Office of the Great Lakes
Great Lakes Management Unit
Michigan Department of Environmental Quality

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## Acknowledgements

The efforts to restore the Saginaw River/Bay Area of Concern are the work of many dedicated and caring individuals over more than two decades. We would like to especially acknowledge the executive board members of the Partnership for the Saginaw Bay Watershed, the Public Advisory Council, for your dedication to the Area of Concern Program. The summary information presented here only touches the surface of the good work carried out by the Partnership, organizations actively working in the Saginaw Bay Watershed, and other individuals who have worked tirelessly to restore the place they call home. We thank you.

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# Stage 2 Remedial Action Plan
# Saginaw River/Bay Area of Concern

## *Purpose of this Document*

The Michigan Department of Environmental Quality (MDEQ) Stage 2 Remedial Action Plan (RAP) for the Saginaw River/Bay Area of Concern (AOC) is intended to serve as the primary tool for identifying actions needed to restore Beneficial Use Impairments (BUIs), and for documenting and communicating restoration progress, within this AOC. Essential to this purpose is the BUI Tracking Matrix, which is intended to present the most current information available on actions needed, actions in progress, and actions completed toward BUI restoration and removal. This document has been prepared by the MDEQ in consultation with the Partnership for the Saginaw Bay Watershed (Partnership) and the United States (U.S.) Environmental Protection Agency (USEPA), Great Lakes National Program Office, and will be updated as needed to ensure that it remains current, relevant, and useful.

The identification of specific, achievable actions needed to restore and remove BUIs is one component of the MDEQ's process for tracking AOC restoration and ultimately delisting AOCs. This process, as well as the state's BUI restoration criteria, are outlined in the MDEQ *Guidance for Delisting Michigan's Great Lakes Areas of Concern* (*Guidance*) (MDEQ, 2008). Additionally, comprehensive background information on the Saginaw River/Bay AOC is available in previously published RAP documents, which are listed in the Reference section of this publication.

## *Disclaimer*

The Great Lakes Water Quality Agreement (GLWQA) is a non-regulatory agreement between the U.S. and Canada, and criteria developed under its auspices are non-regulatory in nature. The actions identified in this document as needed to achieve BUI restoration criteria are not subject to enforcement or regulatory actions by virtue of being listed in this document.

The actions identified in this Stage 2 RAP do not constitute a list of pre-approved projects, nor is it a list of projects simply related to BUIs or generally to improve the environment. Actions identified in this document are directly related to removing a BUI and are needed to delist the AOC. However, in many AOCs, further information is needed to determine all actions required to remove a BUI. Thus, the AOC-specific BUI Tracking Matrix is not necessarily comprehensive and will be updated to reflect additional actions that are needed.

## *Introduction*

In 1987, amendments to the GLWQA were accepted by the federal governments of the United States and Canada. Annex 2 of the amendments listed 14 BUIs which are caused by a detrimental change in the chemical, physical, or biological integrity of the Great Lakes system (International Joint Commission [IJC], 1987). The Annex directed the two countries to identify AOCs that did not meet the objectives of the GLWQA. The RAPs addressing the BUIs were to be prepared for all 43 AOCs identified. The BUIs provided a framework for describing effects of the contamination, and a means for focusing remedial actions.

The Saginaw River/Bay AOC includes the entire 22-mile (35-km) length of the Saginaw River and all of Saginaw Bay (1,143 square miles or 2,960 square kilometers) out into its interface

with open Lake Huron at an imaginary line drawn between Au Sable Point and Point Aux Barques (Figure 1).

The Saginaw River/Bay AOC was listed as an AOC due to contaminated sediments, fish consumption advisories, high bacteria, nutrient enrichment (e.g., phosphorus), sedimentation, degraded fisheries, and loss of significant recreational values (Michigan Department Natural Resources, 1988). The draft 1995 Saginaw River/Bay RAP identified 12 of the GLWQA's 14 beneficial uses as being impaired including: Restrictions on Fish and Wildlife Consumption, Tainting of Fish and Wildlife Flavor, Bird or Animal Deformities or Reproductive Problems, Degradation of Benthos, Restrictions on Dredging Activities, Eutrophication or Undesirable Algae, Restrictions on Drinking Water Consumption or Taste and Odor Problems, Beach Closing, Degradation of Aesthetics, Degradation of Phyto- or Zooplankton Populations, Degradation of Fish and Wildlife Populations, and Loss of Fish and Wildlife Habitat (MDNR, 1994).

In May, 2006, the Saginaw River/Bay Public Advisory Council, known as the Partnership for the Saginaw Bay Watershed (the Partnership), voted to accept the restoration criteria included in the *Guidance* to evaluate the status of the AOC BUIs. The Loss of Fish and Wildlife Habitat BUI and Degradation of Fish and Wildlife Populations BUI are not covered by the *Guidance*, and local criteria were developed for those. Table 1 is a summary of the status of BUI assessments and removals from the Saginaw River/Bay AOC. The 'Assessment in 2012' column indicates those BUIs that will be assessed during the current year.

**Table 1. Saginaw River/Bay BUI Status.**

| Beneficial Use Impairment | Beneficial Use Remains Impaired | Assessment in 2012 | BUI Removed |
|---|---|---|---|
| Restrictions on fish and wildlife consumption | x | | |
| Tainting of fish and wildlife flavor | | | x |
| Bird or animal deformities or reproductive problems | x | x | |
| Degradation of benthos | x | | |
| Restrictions on dredging activities | x | x | |
| Eutrophication or undesirable algae | x | x | |
| Restrictions on drinking water consumption or taste and odor problems | | | x |
| Beach closings | x | x | |
| Degradation of aesthetics | x | x | |
| Degradation of phytoplankton or zooplankton populations | x | x | |
| Degradation of fish and wildlife populations | x | x | |
| Loss of fish and wildlife habitat | x | x | |

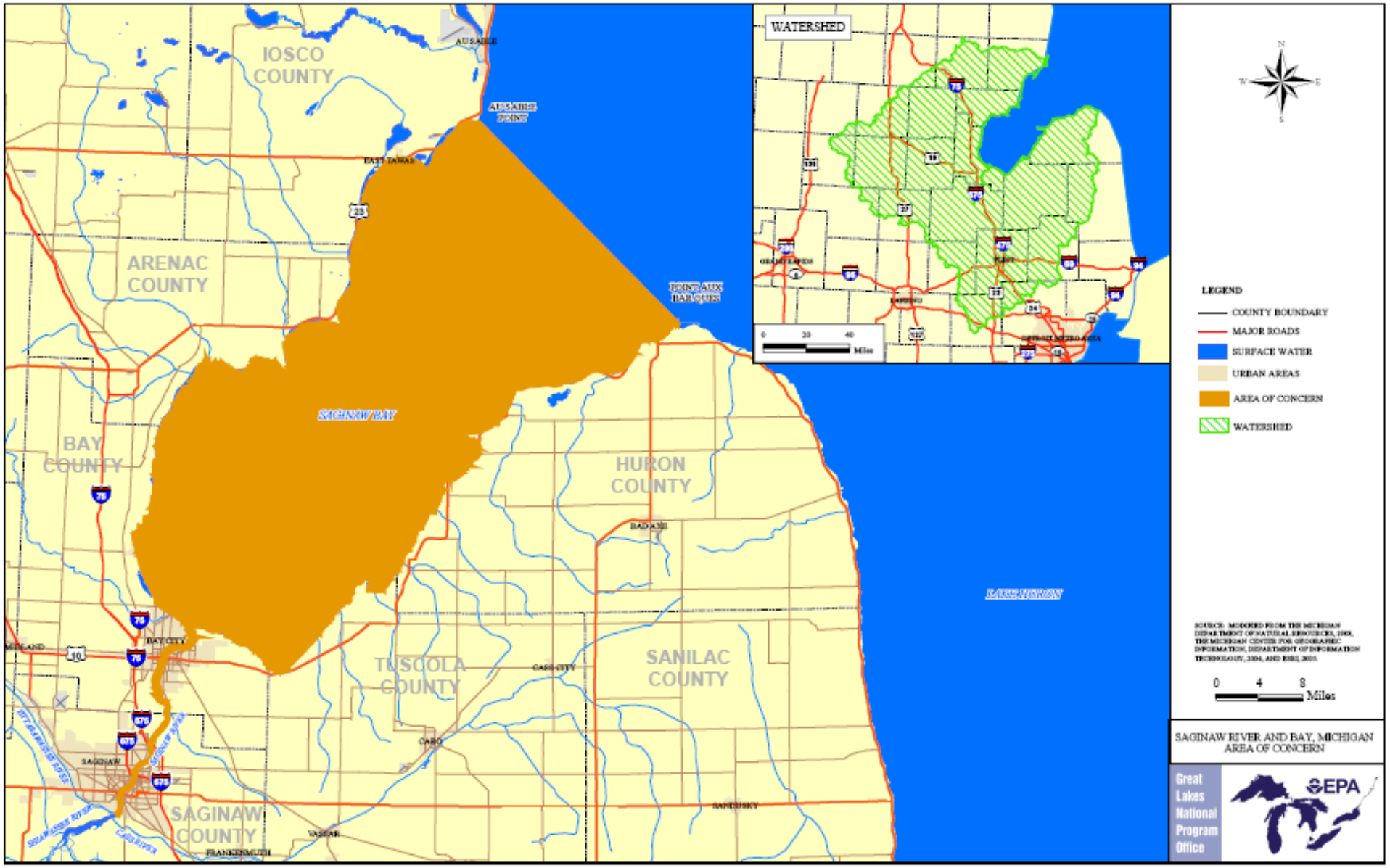


**Figure 1. The Saginaw River/Bay Area of Concern.**

## 1) *Restrictions on Fish and Wildlife Consumption*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), the original cause of this BUI in the Saginaw River/Bay AOC was fish consumption advisories necessitated by contamination from polychlorinated biphenyls (PCBs), dioxin, dichlorodiphenyltrichloroethane (DDT), chlordane, and polybrominated biphenyls (PBBs).

**Restoration Criteria**
The Partnership voted to accept the state's criteria for restoring this beneficial use. The fish consumption advisory in the Saginaw River/Bay AOC is in some cases more stringent than for Lake Huron. Therefore, fish contaminants will need to be assessed using either a comparison study or trend analysis.

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Partnership determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

## 2) *Tainting of Fish and Wildlife Flavor*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), the cause of this BUI was occasional angler reports of off-flavor in fish taken from the Saginaw River. The cause was unknown.

**Restoration Criteria**
The Partnership voted to accept the state's criteria for restoring this beneficial use. This BUI will be considered restored if the MDNR or the MDEQ has not received more than three reports of fish tainting in the AOC for a period of three years; or if more than three reports have been made during the three-year period, an MDEQ-sanctioned taste test determines that the impairment no longer exists.

**Current Status and Actions to be Undertaken**
The Partnership, in consultation with the MDEQ, convened a technical committee to formally assess this BUI. The committee determined the BUI to be restored, and the recommendation to remove it was subsequently approved by the USEPA on September 4, 2008.

## 3) *Bird or Animal Deformities or Other Reproductive Problems*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), this BUI was caused by numerous reproductive failures and developmental deformities in the caspian tern colony on the Saginaw Bay Confined Disposal Facility (CDF), the cause of which was believed to be toxics, principally PCBs and dioxins. There were no reports of unusual occurrences of animal deformities in the watershed.

**Restoration Criteria**
The Partnership has accepted the state's criteria for restoring this beneficial use in the AOC. According to the *Guidance*, restoration of this beneficial use will be demonstrated using one of two approaches. The approach taken will depend on the availability of data. The first approach evaluates restoration based on field assessment of birds and/or other wildlife where MDEQ or other state-approved bird and wildlife data are available. The second approach will be applied where bird or other wildlife data are not available. This approach will use levels of contaminated fish tissue known to cause reproductive or developmental problems as an indicator of the likelihood deformities or reproductive problems may exist in the AOC.

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. The MDEQ began a statewide assessment of this BUI in 2011. This assessment will utilize the criteria's second approach, and the Saginaw River/Bay AOC will be assessed as part of this effort. A technical committee will be convened when the MDEQ and the Partnership determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

## 4) *Degradation of Benthos*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), this BUI was attributed to the fact that the mayfly, *Hexagenia limbata*, historically abundant in Saginaw Bay and an important component of the fish forage base, had become only rarely found in the bay. Moreover, benthic communities in both the Saginaw River and Saginaw Bay were dominated by pollution-tolerant oligochaetes and chironomids. The original causes for this were thought to be pollution and habitat loss, cultural eutrophication and sedimentation, though heavy fish predation was thought to be a major factor inhibiting re-establishment of the *Hexazenia* population.

**Restoration Criteria**
The Partnership accepted the state's criteria for restoring this beneficial use. In this AOC, the state's criteria require that all remedial actions for known contaminated sediment sites with degraded benthos are completed (except for minor repairs required during operation and maintenance) and monitored according to the approved plan for the site.

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Partnership determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

## 5) *Restrictions on Dredging Activities*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), sediments dredged from portions of the federally designated navigational channels within the AOC require confined disposal due to elevated levels of PCBs and heavy metals.

**Restoration Criteria**
The Partnership has voted to accept the state's criteria for restoring this beneficial use. This beneficial use will be considered restored when either there have been no restrictions on routine commercial or recreational navigational channel dredging by the USACE, based on the most recent dredging cycle data available; or, in cases where dredging restrictions exist, a comparison of sediment contaminant data from the commercial or recreational navigation channel (at the time of proposed dredging) in the AOC indicates that contaminant levels are not statistically different from other comparable, non-AOC commercial or recreational navigation channels.

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. The MDEQ began a statewide assessment of this BUI in 2011. This assessment will evaluate the status of each AOC with respect to both parts of the state's criteria, and the Saginaw River/Bay AOC will be assessed as part of this effort.

## 6) *Eutrophication or Undesirable Algae*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), this BUI is attributed to excessive levels of nuisance algae species resulting from nutrient enrichment from point- and non-point sources.

**Restoration Criteria**
The Partnership has accepted the state's criterion for restoring this beneficial use in the AOC. This criterion states that this beneficial use will be considered restored when there are no waterbodies within the AOC included on the list of impaired waters due to nutrients or excessive algal growths in the most recent Clean Water Act Water Quality and Pollution Control in Michigan: Section 303(d) and 305(b) Integrated Report (Integrated Report).

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. The Partnership received a 2011 PAC support grant to conduct a status assessment of this BUI. A technical committee has been formed utilizing MDEQ staff, local technical expertise, and other stakeholders. The technical committee will review the draft assessment and propose a set of restoration activities, if necessary.

## 7) *Beach Closings*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), this BUI is attributed to high bacterial densities and algal debris resulting from combined sewer overflows (CSOs), point- and non-point nutrient sources.

**Restoration Criteria**
The Partnership has accepted the state's criteria for restoring this beneficial use in the AOC. The state's criteria outline a three-tiered approach. Tier 1 states that no waterbodies within the AOC are included on the 303(d) list of impaired waters due to contamination with pathogens in the most recent Integrated Report. If the waterbody is listed due to the presence of CSOs, or is impacted by upstream CSOs, Tier 2 states that this beneficial use will be considered restored when updated information reveals that the CSOs have been eliminated or are being treated. Or, in cases where CSOs still exist and significant progress has been made towards their elimination or treatment, Tier 3 allows monitoring data to be used to document that water quality standards for *E. coli* are generally met, thereby enabling removal of the BUI.

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. However, the Partnership completed a status assessment of this use impairment in 2011 and found that significant progress toward restoration goals has been achieved since beach closings and microbial contamination were identified in historical RAP documents as a concern in the Saginaw River and Bay. The Technical Committee convened found that 95 percent of beaches in the six coastal and riverine counties adjacent to the AOC, and 93 percent of beaches within the AOC, meet restoration goals (Public Sector Consultants, Inc., 2011). In addition to the Partnerships status assessment, the MDEQ is currently in the process of conducting a statewide assessment of this BUI. This assessment will evaluate the status of each AOC with respect to Tier 1 of the state's criteria. Results of the statewide assessment are expected in early 2012. Other relevant work within the AOC includes a number of GLRI or state-funded projects designed to help reduce the bacterial and nutrient loading to the AOC (see the BUI Tracking Matrix, below). Data obtained from all of these efforts/sources will be considered during the statewide assessment of the status of this BUI the AOC.

## 8) *Degradation of Aesthetics*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), this BUI is attributed to organic debris that periodically washes up along the Saginaw Bay shoreline. Commonly referred to as muck, this organic debris may be comprised of decomposing algae, macrophytes, phyto- and zoo-plankton, and can accumulate at levels sufficient to interfere with designated uses. Originally believed to be caused by excessive nutrient inputs, more recent evidence suggests that changes in the food web brought about by invasive species such as zebra and quagga mussels may be a factor.

**Restoration Criteria**
The Partnership accepted the state's criterion for restoring this beneficial use. The criterion require that monitoring data be collected for two successive monitoring cycles to determine whether or not the water bodies in the AOC exhibit persistent, high levels of the following "unnatural physical properties" (as defined by Rule 323.1050 of the Michigan WQS) in quantities which interfere with the state's designated uses for surface waters:

turbidity
color
oil films
floating solids
foams
settleable solids
suspended solids
deposits

In September 2011, however, discussions with the Partnership and other local stakeholders concerning organic debris led the MDEQ to conclude that AOC-specific criteria should be developed to augment the state's criterion. The MDEQ believes that AOC-specific criteria are necessary to help clarify exactly where the issue of organic debris within this AOC fits in the context of the state's BUI restoration and removal framework. The MDEQ will develop these AOC-specific criteria in consultation with the Partnership, interested local stakeholders, and the USEPA.

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. The MDEQ does not routinely monitor the Saginaw River/Bay AOC specifically for degraded aesthetic conditions. However, the MDEQ began a statewide assessment of this BUI in 2011. The Saginaw River/Bay AOC will be assessed as part of that effort in 2012. Assessment in this AOC will be carried out in accordance with AOC-specific criteria to be developed by the MDEQ.

## 9) *Degradation of Phytoplankton or Zooplankton Populations*

**Significance in the Saginaw River/Bay Area of Concern**
The Saginaw River/Bay AOC is the only AOC listed as impaired due to this BUI. According to historical RAP documents (MDNR, 1988; MDNR, 1994), this BUI is attributed to excessive levels of nuisance phytoplankton (e.g., blue green algae) and zooplankton species occurring periodically in Saginaw Bay as a result of nutrient enrichment from point- and non-point sources.

**Restoration Criteria**
The Partnership has accepted the state's criteria for restoring this beneficial use. The state's criteria specify that this BUI will be considered restored when the state's restoration criterion for the Eutrophication or Undesirable Algae BUI has been met in the AOC.

**Current Status and Actions to be Undertaken**
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Partnership determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

## 10) *Loss of Fish and Wildlife Habitat*
## 11) *Degradation of Fish and Wildlife Populations*

**Significance in the Saginaw River/Bay Area of Concern**
According to historical RAP documents (MDNR, 1988; MDNR, 1994), the Loss of Fish and Wildlife Habitat BUI and the Degradation of Fish and Wildlife Populations BUI were attributed to the decline/impairment of fish and wildlife populations – particularly fish-eating birds, from high levels of toxic contaminants in the water and sediments within the AOC; the decline in populations of key recreational and commercial fisheries due to low dissolved oxygen caused by nutrient enrichment within Saginaw River and Bay; the loss/degradation of coastal wetlands from land use change; and the loss/degradation of fish spawning areas in the bay and tributaries as a result of sedimentation and dams.

**Restoration Criteria**
In 2001, the Partnership established habitat restoration targets for BUI removal to protect at least 60 percent of the coastal marsh areas (below the 585-foot contour) and adequate upland buffers representing essential fish and wildlife habitat through public ownership or otherwise permanently protected under agreements with landowners (Public Sector Consultants, Inc., 2002). The habitat restoration target also stated that the most vulnerable portions of the remaining 40 percent of coastal marsh areas should be clearly identified so that protection efforts could be enhanced in these areas. In addition to the habitat targets, the Partnership also established species-specific targets for walleye, perch, sturgeon, bald eagle, and herring gulls.

In 2008, in accordance with the *Guidance*, the Partnership convened a technical committee to review the merit of these pre-existing targets and develop an AOC-specific fish and wildlife BUI restoration plan. The results of the committee's efforts were presented in the Saginaw River/Bay Area of Concern Habitat Restoration Plan (Public Sector Consultants, 2008). In that report, the committee reaffirmed the presumption that completion of specified habitat protection projects will result in increased populations of desirable fish and wildlife species, and thus bring about restoration of both the habitat and populations BUI.

**Current Status and Actions to be Undertaken**

These beneficial uses are currently impaired. During the public review of the 2008 restoration plan, it was recommended that a return to species-specific targets may be warranted due to contaminant concerns and reviewed independent of the habitat BUI. In 2010, as part of the process to potentially decouple the habitat and populations BUI restoration targets, the Partnership conducted a cursory review of the former population targets and concluded that restored conditions related to walleye growth rates and bald eagle reproduction have been met. Moreover, it was recommended by the MDNR Fisheries Division that the Partnership not return to utilizing yellow perch and sturgeon populations as proxies to document restoration due to many ecosystem variables (e.g., foodweb dynamics, invasive species, and tributary dams that block spawning habitat). In addition, while there are still some reproductive concerns for herring gulls at a localized level, broader assessment of herring gull populations is being addressed under the Bird or Animal Deformities or Other Reproductive Problems BUI (see above).

Progress in achieving restoration targets continues in the AOC, the second part of the original habitat target (i.e., prioritization of the remaining 40 percent of wetlands for protection efforts) has been met with the 2009 publication of the *Methodology Report for Prioritizing Saginaw Bay Wetlands* (Schools, 2009). Beginning in November 2009, the Partnership embarked on a project to reassess progress toward meeting the habitat restoration targets in the AOC that were established in 2001 and reaffirmed in 2008. When the 2008 analysis of protected wetlands was conducted, it was determined that the habitat target may be close to being met. The Partnership agreed that until the target is achieved, a biennial review is desirable to assess progress. In 2011, Ducks Unlimited and PSC, Inc. received funding from the U.S. Fish and Wildlife Service to conduct an assessment of the current habitat target and continue to discussions with the technical committee on the need for new or revised species-specific targets. This work is to be completed early in 2012.

## *Actions to Delist: Saginaw River/Bay AOC BUI Tracking Matrix*

The following BUI Tracking Matrix is intended as a simple way to track ongoing progress with the remedial activities identified as being necessary to remove each BUI, and subsequently to delist the AOC entirely. As progress is made, the matrix will be updated to reflect current conditions. Completed activities will remain in the matrix as it is updated, but updates will reflect completed status and completed BUI removals.

The matrix lists each BUI, indicates whether each BUI is scheduled for assessment in the current year, and lists the actions/tasks necessary to advance toward BUI removal. If a funding source has been identified, it is listed along with the targeted start and end dates for each action. Project leads are identified as appropriate, along with the targeted BUI removal date.

The matrix represents the AOC program's current best effort to assess activity in an AOC at the time the document was updated. The matrix does not necessarily commit the listed entities/individuals to any particular activity. Contracts, grant agreements, etc. are the documents governing commitments that have been or will be made.

The dates listed reflect the MDEQ's best estimate of project completion, given currently available information. Work does not always proceed as planned, and the MDEQ recognizes that unforeseen circumstances can arise at any time. The MDEQ is dedicated to facilitating the completion of each of the projects listed in the most timely manner possible.

**Acronyms used in the Saginaw River/Bay AOC BUI Tracking Matrix:**
AOC – Area of Concern
BMPs – Best Management Practices
BUI – Beneficial Use Impairment
MDEQ – Michigan Department of Environmental Quality
DU – Ducks Unlimited
GLRI – Great Lakes Restoration Initiative
MDCH – Michigan Department of Community Health
NOAA – National Oceanic and Atmospheric Administration
Partnership – Partnership for the Saginaw Bay Watershed
PSC – Public Sector Consultants, Inc.
TBD – To be determined
USEPA – U.S. Environmental Protection Agency
USFWS – U.S. Fish and Wildlife Service

| Saginaw Bay/River AOC BUI Tracking Matrix | | | | | | | | | Updated: 3/2/12 |
|---|---|---|---|---|---|---|---|---|---|
| **Area of Concern Name** | **Beneficial Use Impairment Name** | **Assessment in 2011? (Y/N)** | **Actions/Tasks Needed** | **Funding Source** | **Start Date** | **Targeted Completion Date** | **Project Lead** | **Targeted BUI Removal Date** | **Comments** |
| Saginaw River/Bay | Beach Closings | Yes | Implement Lake Huron Beach Sanitary Survey Tool project | 2009 USEPA | Mar-10 | Sep-11 | Briggs (MDEQ) | TBD | |
| Saginaw River/Bay | Beach Closings | Yes | Implement Bay County Beach Monitoring | 2010 USEPA GLRI | Oct-10 | Sep-12 | Briggs (MDEQ) | TBD | |
| Saginaw River/Bay | Beach Closings | Yes | Implement Beach Sanitary Surveys for Bay County project | 2009 USEPA | Mar-10 | Sep-11 | Briggs (MDEQ) | TBD | |
| Saginaw River/Bay | Beach Closings | Yes | Implement Restoring Three Arenac County Beaches project | 2010 USEPA GLRI | Oct-10 | Sep-12 | Briggs (MDEQ) | TBD | |
| Saginaw River/Bay | Beach Closings | Yes | Implement Huron County Health Department Beach Monitoring project | 2010 USEPA GLRI | Oct-10 | Sep-12 | Briggs (MDEQ) | TBD | |
| Saginaw River/Bay | Beach Closings | Yes | Implement Saginaw River Tributary Model & Saginaw Bay Research Forecasting System project | 2009 USEPA | Mar-10 | Dec-12 | Briggs (MDEQ) | TBD | |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Beach Closings | Yes | Identify sources at beaches identified on the 303(d) impaired waterbodies list | TBD | TBD | TBD | Selzer (MDEQ) | TBD | See April 2011 document titled: An Assessment and Status Report of Beach Closings in the Saginaw River/Bay Area of Concern |
| Saginaw River/Bay | Beach Closings | Yes | Remediate sources at beaches identified on the 303(d) impaired waterbodies list | TBD | TBD | TBD | Selzer (MDEQ) | TBD | See April 2011 document titled: An Assessment and Status Report of Beach Closings in the Saginaw River/Bay Area of Concern |
| Saginaw River/Bay | Beach Closings | Yes | Monitor beaches identified on the 303(d) impaired waterbodies list | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Beach Closings | Yes | Assess Beach Closing BUI | TBD | Oct-11 | Sep-12 | Swart (MDEQ) | TBD | Statewide Assessment |
| Saginaw River/Bay | Beach Closings | Yes | Remove Beach Closing BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Dependent on the results of the statewide assessment |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Bird or Animal Deformities or Reproductive Problems | Yes | Identify sources, if necessary, contributing to the Bird or Animal Deformities or Reproductive BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Dependent on the results of the statewide assessment |
| Saginaw River/Bay | Bird or Animal Deformities or Reproductive Problems | Yes | Remediate sources, if necessary, contributing to the Bird or Animal Deformities or Reproductive BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Dependent on the results of the statewide assessment |
| Saginaw River/Bay | Bird or Animal Deformities or Reproductive Problems | Yes | Monitor sites, if necessary, related to Bird or Animal Deformities or Reproductive BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Dependent on the results of the statewide assessment |
| Saginaw River/Bay | Bird or Animal Deformities or Reproductive Problems | Yes | Assess Bird or Animal Deformities or Reproductive BUI | 2010 USFWS GLRI Grant | Jun-11 | Dec-12 | Baker (MDEQ) | TBD | Statewide assessment |
| Saginaw River/Bay | Bird or Animal Deformities or Reproductive Problems | Yes | Remove Bird or Animal Deformities or Reproductive BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Dependent on the results of the statewide assessment |
| Saginaw River/Bay | Degradation of Aesthetics | Yes | Identify aesthetically impaired sites | | Jun-11 | Dec-12 | Riley (MDEQ) | TBD | Sites to be determined in 2012 |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Degradation of Aesthetics | Yes | Monitor aesthetically impaired sites, 2 rounds | | Jun-11 | Dec-12 | Riley (MDEQ) | TBD | Sites to be monitored in 2012 |
| Saginaw River/Bay | Degradation of Aesthetics | Yes | Remediate sources, if necessary, contributing to the Degradation of Aesthetics BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Dependent on the results of the statewide assessment |
| Saginaw River/Bay | Degradation of Aesthetics | Yes | Assess Degradation of Aesthetics BUI | | Jun-11 | Dec-12 | Riley (MDEQ) | TBD | Statewide assessment |
| Saginaw River/Bay | Degradation of Aesthetics | Yes | Remove Degradation of Aesthetics BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Dependent on the results of the statewide assessment |
| Saginaw River/Bay | Degradation of Benthos | No | Identify sites of known sediment contamination related to Degradation of Benthos BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Degradation of Benthos | No | Remediate sites of known sediment contamination related to Degradation of Benthos BUI | TBD | TBD | TBD | TBD | TBD | |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Degradation of Benthos | No | Assess Degradation of Benthos BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Degradation of Benthos | No | Remove Degradation of Benthos BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Degradation of Phytoplankton or Zooplankton Populations | Yes | Assess Degradation of Phytoplankton and Zooplankton BUI | TBD | TBD | TBD | Selzer (MDEQ) | | BUI assessment tied to Eutrophication or undesirable algae BUI |
| Saginaw River/Bay | Degradation of Phytoplankton or Zooplankton Populations | Yes | Remove Degradation of Phytoplankton and Zooplankton BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | BUI assessment tied to Eutrophication or undesirable algae BUI |
| Saginaw River/Bay | Eutrophication or Undesirable Algae | Yes | Conduct preliminary status assessment of Eutrophication or Undesirable Algae BUI | 2011 PAC Support Grant | Jun-11 | Mar-12 | Partnership | TBD | |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Eutrophication or Undesirable Algae | Yes | Identify sources, if necessary, contributing to the Eutrophication or Undesirable Algae BUI | TBD | TBD | TBD | Selzer (MDEQ) | | Priority subwatershed identified: Swartz Creek, Sebewaing River, Kawkawlin River, Sturgeon River, and the S. Branch of the Flint River |
| Saginaw River/Bay | Eutrophication or Undesirable Algae | Yes | Implement, if necessary, source control projects related to Eutrophication or Undesirable Algae BUI | TBD | TBD | TBD | Selzer (MDEQ) | | |
| Saginaw River/Bay | Eutrophication or Undesirable Algae | Yes | Assess Eutrophication or Undesirable Algae BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Eutrophication or Undesirable Algae | Yes | Remove Eutrophication or Undesirable Algae BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Update and assess the 585-foot contour using CARL GIS layer for the Saginaw Bay | NOAA | Jul-11 | Jun-12 | DU | TBD | |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Acquire 54-acre coastal lands adjacent to Pinconning Park (Bay County) | 2011 NOAA | Oct-11 | Apr-13 | Bay County | TBD | |
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Conduct preliminary status assessment of Loss of Fish and Wildlife Habitat BUI | USFWS | Jul-11 | Jun-12 | Public Sector Consultants | TBD | |
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Acquire additional lands, if necessary, to meet Loss of Fish and Wildlife Habitat BUI restoration criteria | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Assess Loss of Fish and Wildlife Habitat BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Remove Loss of Fish and Wildlife Habitat BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Assess Degradation of Fish and Wildlife Population BUI | 2011 USFWS GLRI | TBD | TBD | Public Sector Consultants | TBD | Assessment tied to Loss of fish and wildlife habitat BUI |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Loss of Fish and Wildlife Habitat | Yes | Remove Degradation of Fish and Wildlife Population BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | BUI removal currently tied to Loss of fish and wildlife habitat BUI |
| Saginaw River/Bay | Restrictions on Dredging Activities | Yes | Identify sources contributing to the Restrictions on Dredging Activities BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Restrictions on Dredging Activities | Yes | Remediate sources contributing to the Restrictions on Dredging Activities BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Restrictions on Dredging Activities | Yes | Assess Restrictions on Dredging Activities BUI | | Jun-11 | Dec-12 | Swart (MDEQ) | TBD | Statewide assessment |
| Saginaw River/Bay | Restrictions on Dredging Activities | Yes | Remove Restrictions on Dredging Activities BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Restrictions on Drinking Water Consumption or Taste and Odor Problems | N/A | Removed Restriction on Drinking Water Consumption, or Taste and Odor Problems BUI | N/A | N/A | N/A | N/A | N/A | BUI removed June 2008 |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Restrictions on Fish and Wildlife Consumption | No | Identify sources contributing to Restrictions on Fish and Wildlife Consumption BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Restrictions on Fish and Wildlife Consumption | No | Remediate, if necessary, sources contributing to Restrictions on Fish and Wildlife Consumption BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Restrictions on Fish and Wildlife Consumption | No | Monitor, if necessary, contaminant levels to assess Restrictions on Fish and Wildlife Consumption BUI | TBD | TBD | TBD | Bohr (MDEQ) | TBD | |
| Saginaw River/Bay | Restrictions on Fish and Wildlife Consumption | No | Assess Restrictions on Fish and Wildlife Consumption BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | Statewide assessment currently being conducted by MI Dept of Community Health |

| Area of Concern Name | Beneficial Use Impairment Name | Assessment in 2011? (Y/N) | Actions/Tasks Needed | Funding Source | Start Date | Targeted Completion Date | Project Lead | Targeted BUI Removal Date | Comments |
|---|---|---|---|---|---|---|---|---|---|
| Saginaw River/Bay | Restrictions on Fish and Wildlife Consumption | No | Remove Restrictions on Fish and Wildlife Consumption BUI | TBD | TBD | TBD | Selzer (MDEQ) | TBD | |
| Saginaw River/Bay | Tainting of Fish and Wildlife Flavor | N/A | N/A | N/A | N/A | N/A | N/A | N/A | BUI removed Sept 2008 |

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