

Saginaw River/Bay Area of Concern
*Habitat Restoration Plan Update
and Target Review*

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Prepared for
The Partnership for the Saginaw Bay Watershed
Bay City, Michigan

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

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Executive Summary

Beginning in November 2009, the Partnership for the Saginaw Bay Watershed embarked on a project to reassess progress toward meeting the habitat restoration targets in the Saginaw River/Bay Area of Concern (AOC) that were established in 2000. When the 2008 analysis of protected wetlands was conducted the Partnership agreed that until the targets are achieved a biennial review is desirable to assess progress. Once the habitat targets are met the Partnership can petition the U.S. Environmental Protection Agency for formal delisting of this Beneficial Use Impairment (BUI).

In 2010, the Partnership for the Saginaw Watershed, with the assistance of Public Sector Consultants, conducted an assessment of the current Habitat BUI and activities accomplished to move to delisting; meetings with stakeholders; and development of a coarse-level delisting strategy for the remaining BUIs in the AOC. The Technical Work Group, established previously, was convened to review assess conservation and restoration activities that have occurred in the last two years.

STATUS OF HABITAT RESTORATION GOAL

In 2001, the Partnership established a habitat target for BUI delisting 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 protected under agreements with landowners. Furthermore, the goal 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. While coastal marshes were intended as a focus for protection efforts, the goal included important wetlands in the watershed that occur outside of the AOC boundary (e.g., Saginaw River).

That year progress on the first part of the habitat goal was assessed by Ducks Unlimited (DU) and suggested that approximately 20–30 percent of coastal wetlands toward the 60 percent target were protected by fee-simple acquisitions or permanent easements (PSC 2002). Since then, conservation and restoration activities have continued.

In 2007, DU reassessed this target (PSC 2008) and found that approximately 58 percent of the wetlands areas below the 585-foot contour have been protected under public ownership and permanent easements. This current effort has documented discrepancies in this figure due to two factors—a miscalculation in the 2007 analysis and modification of the data—which suggest that the total amount of protected wetlands was slightly lower than 58 percent in 2007.

Forty-six records were double-counted in 2007; correcting this error yields a total of 56.6 percent (not 58 percent). Based on this 2010 reanalysis, the current percentage of protected coastal wetlands is 56.9 percent, which suggests that protected wetlands have increased by 0.3 percent since 2007; however, minor changes to the data have also likely contributed to the revised number. The National Wetlands Inventory (NWI) has had 41 out of 1,843 records modified in some way, and nearly three-fourths of the Conservation and Recreation Lands Database (CARL) records (71 out of 103 records) have been

modified since the original analysis. The recent analysis suggests that 1,329 additional acres would need to be protected in order to reach the 60 percent goal.

Since the 2007 assessment, additional wetlands have been protected that are not included in the CARL database and, as a result, PSC recommends that the Partnership work with Ducks Unlimited to update the database and reanalyze protected wetlands to ensure the accuracy and completeness of the data.

The second part of the original habitat goal (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 et al. 2009).

DECOUPLING FISH AND WILDLIFE POPULATIONS TARGETS

Previous activity to reach delisting of the fish and wildlife populations BUI included species-specific targets (e.g., walleye growth rates, bald eagle reproduction). These were later dropped and the BUI was coupled with the habitat BUI target with the understanding that complex food-web alterations and ecosystem changes related to invasive species and other factors may limit the ability to utilize single species as good proxies for demonstrating ecosystem recovery. It was determined that if the habitat targets could be met, by extension, the stage would be set for species recovery across a spectrum of fish and wildlife populations. However, recent input from the Michigan Department of Natural Resources and Environment (MDNRE) suggests that a return to species-specific targets is prudent and should be reviewed independent of the habitat BUI.

As part of the process of decoupling the habitat and populations BUIs, the Partnership, with the assistance of PSC, conducted a cursory review of the former populations targets and concluded that restored conditions related to walleye growth rates and bald eagle reproduction have been met. Moreover, it is recommended that the Partnership not return to utilizing yellow perch and sturgeon populations as proxies to document restoration due to many ecosystem variables (e.g., invasive species, tributary dams that block spawning habitat). In addition, while there are still some reproductive concerns for herring gulls at a localized level due to the confined disposal facility near the mouth of the Saginaw River, broader assessment of herring gull populations is warranted. The Technical Work Group and the Partnership's Executive Committee discussed utilizing mink, otter, and mayflies as potential surrogates to measure population recoveries. Resources were not included in this project to further assess decoupling and reinstating the Populations Targeted Restored Condition (TRC).

As habitat BUI delisting activities continue to move forward, consideration should be given to the following issues when considering single species as targets for delisting:

- Availability of baseline data to assess trends and establish a recovery threshold
- Determining who will collect data
- Cost of future data collection to assess recovery
- Timelines for carrying out proposed assessment and monitoring activities

COARSE-LEVEL ASSESSMENT OF REMAINING BUIs

The Partnership and PSC also conducted a coarse-level assessment of the remaining BUIs to help identify and develop the information necessary to prioritize next steps and set forth a strategy for delisting activities in the AOC. Two of the 12 original BUIs have been delisted officially: Tainting of Fish and Wildlife Flavor and Restrictions on Drinking Water Consumption/Taste Odor. Each of the ten remaining BUIs were examined; timelines for specific activities updated; and detailed actions noted where possible. With sufficient funding, it is possible that five of the remaining ten BUIs could be positioned for delisting in three years

- Loss of Fish and Wildlife Habitat
- Beach Closings (exposure to water-borne human pathogens)
- Degradation of Aesthetics
- Bird and Animal Deformities or Reproductive Problems
- Eutrophication or Undesirable Algae

The remaining five BUIs will require longer term assessment and remediation activities of at least five years

- Restrictions on Dredging Activities
- Degradation of Phytoplankton or Zooplankton Populations
- Restrictions on Fish and Wildlife Consumption
- Degradation of Benthos
- Degradation of Fish and Wildlife Populations

CONCLUSION

Remedial actions are being taken in the Saginaw River/Bay AOC; studies are under way to fill important data gaps; and coordination efforts continue among local, state, and federal organizations. However, work remains to be done. As with most AOCs, available funds have not been sufficient to support desired levels of effort. Consequently, though some actions are currently being implemented, few of these are being implemented fully.

Due to past funding limitations, BUI work has often been carried out on a piecemeal basis and approached independent of other BUIs. PSC recommends that the Partnership should make a concerted effort to pursue Great Lakes Restoration Initiative (GLRI) funding to continue with delisting activities. PSC recommends the development of a comprehensive proposal that would allow a more thorough assessment of these ongoing activities; target existing projects occurring throughout the watershed to delisting activities; and help initiate delisting proposals when appropriate.

Status of Land Acquisition for Habitat BUI

HISTORY OF HABITAT BUI AND

In the 2000 PSC report, *Measures of Success*, and PSC's 2001 Remedial Action Plan (RAP) update for the AOC, coastal wetlands were identified as a priority for preserving and restoring lost habitat for fish and wildlife within the AOC. The primary goal identified for habitat protection and enhancement was to protect existing fish and wildlife habitat, particularly wetlands and other spawning and nursery areas. Restoration of critical habitat—particularly coastal marshes and wet prairies—to make up for previous loss of wetlands was identified as a secondary goal for the AOC.

The *habitat restoration targets* identified in these previous documents were as follows:

- At least 60 percent of the coastal marsh areas (below the 585-foot contour) and adequate upland buffers representing essential fish and wildlife habitat are preserved through public ownership, covered under conservation easements, or otherwise protected under agreements with landowners; and
- the most vulnerable portions of the remaining 40 percent of the essential coastal marsh areas have been clearly identified so that governmental agencies, local conservation/ environmental organizations, and concerned citizens can monitor their status, enhance enforcement of existing laws, and conduct public educational programs to better protect these areas (PSC 2000).

In 2001, progress on this goal was assessed by Ducks Unlimited (DU). That research suggested that approximately 20–30 percent of coastal wetlands were protected at that time (PSC 2002). In 2007, DU conducted another assessment of this target (PSC 2008) and found that approximately 58 percent of the wetlands areas below the 585-foot contour have been protected under public ownership and permanent easements.

As mentioned above, when DU repeated the analysis during this most recent effort, a discrepancy was identified that appears to lower the percentage of protected wetlands identified in 2007. Two factors seem to be responsible for the discrepancy: (1) In 2007, 46 records were double-counted in 2007, lowering the percentage of protected wetlands to 56.6 percent (not 58 percent). (2) Since the original analysis, there have been minor changes to the data, which are likely contributing to the revised number. In the National Wetlands Inventory (NWI), 41 out of 1,843 records have been modified in some way, and 71 out of 103 records in the Conservation and Recreation Lands Database (CARL) have been modified since the original analysis. .

The current analysis shows a total of 56.9 percent of protected wetlands, or an increase of 0.3 percent since 2007 (see Exhibit 1).

EXHIBIT 1
Protected Wetlands in the Saginaw Bay Watershed, 2010

Protection type	Wetland type (Acres)						Totals*
	Forested	Emergent	Shrub	Open water	Aquatic bed	Other	
Federal	1,841	2,480	452	92	0	1,154	6,019
State	5,637	8,543	2,417	80	17	406	17,100
County	2	60	109	0	0	41	212
Local	10	10	42	35	0	31	128
Nongovernmental organizations	47	79	19	0	0	0	145
Private—Conservation easement or wetlands reserve program	8	243	8	5	0	29	293
Private—Sportsman's/gun/hunting/fishing club	226	58	1	0	0	14	299
Protected wetlands	7,771	11,473	3,048	212	17	1,650	24,171
Unprotected wetlands	5,078	6,050	2,378	595	1	3,901	18,328
Total wetlands	12,849	17,848	5,426	807	18	5,551	42,499
Percentage protected	60%	66%	56%	26%	94%	30%	57%

SOURCES: Ducks Unlimited/TNC CARL layer for Michigan (see <http://glaro.ducks.org/CARL>). Wetland Type was determined from Ducks Unlimited's updated National Wetlands Inventory (NWI) layer (see <http://glaro.ducks.org/NWI>).

*Totals may not equal sum of columns due to rounding.

NOTE: The 585-foot contour line was created from USGS Digital Elevation Models (DEMs) and Michigan Department of Environmental Quality shoreline data sets.

The recent analysis suggests that 1,329 additional acres would need to be protected in order to reach the 60 percent goal. Since the CARL database was last updated in 2007, many parcels have been acquired through fee simple acquisition and protected by permanent easement. In fact, the goal may have already been attained. As conservation groups, nongovernmental organizations, government units and individuals continue to preserve lands through fee-simple acquisitions, deed restrictions, and conservation easements, the CARL database is always in need of updating. Preserved lands are rarely removed from conservation, but new lands are frequently acquired. It is thus likely that the total amount of eligible preserved wetlands has increased since the land area was last calculated in 2007, perhaps reaching the target of 60 percent. This possibility highlights the need to update the CARL database to include all newly acquired and protected wetlands and recalculate preserved wetland totals.

CARL DATABASE AND WETLAND INVENTORY

Eligible and total preserved wetlands have been determined through geographic information system (GIS) modeling. Ducks Unlimited and The Nature Conservancy (TNC) jointly maintain and update the Conservation and Recreation Land (CARL) database that spatially depicts identified preserved lands. Wetlands relative to the

Saginaw Bay AOC were identified by cross-referencing the CARL database with National Wetland Inventory Maps, U.S. Geological Survey Digital Elevation Models, and MDNRE shoreline data sets to determine both total and preserved wetlands below the 585-foot contour.

Status and Trends

The Technical Work Group and the Partnership as a whole have identified individual parcels that have been acquired since the 2007 assessment that likely meet the criteria for habitat restoration targets. Eligible lands include coastal wetlands and marsh areas below the 585-foot contour and adequate upland buffers relative to the AOC boundary. It is recommended that the Partnership pursue funding and work with Ducks Unlimited to update the CARL database to reflect acquisitions and easement-protected land since the 2007 analysis was conducted. The CARL database is the best available and most appropriate data repository to assess progress on the Habitat TRC and should be updated at often as resources allow.

MDNRE WETLAND PRIORITIZATION INITIATIVE

The second target for delisting the habitat BUI requires identifying the most vulnerable portions of the remaining 40 percent of the essential coastal marsh areas. This goal has been met through an MDNRE project that identifies and priorities wetlands for preservation through fee-simple acquisition or other means (Schools et al. 2009). This system can be used to prioritize wetlands by a number of criteria (categorized as either ecological or social and biological) to develop an index that ranks sites for acquisition and preservation.

Decoupling Habitat and Populations BUIs

RATIONALE

Recent activity in the watershed related to the Dow Natural Resource Damage Assessment and input from the MDNRE suggests that habitat restoration alone will not ensure wildlife population recovery. While habitat preservation and restoration enables and influences wildlife populations, many additional factors influence populations. Thus, a return to population-based indicators is prudent.

FISH AND WILDLIFE TARGETS

In previous reports, fish and wildlife species-specific targets were developed in order to measure restoration. In 2008, the Technical Work Group determined that species-specific restoration targets were no longer considered reliable indicators of achievable restoration in the AOC due to increasingly complex ecosystem changes caused by invasive species and food web alteration. This determination resulted in the coupling of fish and wildlife population restoration targets with habitat targets. Since that time, it has been noted that while restoring wetland habitat will benefit fish and wildlife populations in general, it does not necessarily document that populations are in fact restored. Thus, with input from the MDNRE and the technical committee, a return to species-specific targets has been recommended.

Previous determinations identified species-specific restoration targets for three fish species: walleye, yellow perch, and lake sturgeon, which were identified as good proxies for assessing recovery of conditions necessary to sustain general fish populations in the bay. Bald eagle reproduction rates and PCB levels in herring gulls were also identified as previous indicators of ecosystem health as these species are fish-eating and can biomagnify contaminants of concern.

Fisheries Status and Trends

Updated population targets and indicator species have yet to be determined and should be based on previous targets, availability of trend data, and continued monitoring activities. Potential indicator species discussed by the Technical Work Group and the Partnership's Executive Committee include bald eagles, walleye, mink, and otter. No final decisions have been made on which species will be utilized as proxies for restoration. However, as a result of the decision to decouple the populations restoration target from the habitat target, PSC conducted a cursory review of their current status.

Walleye

Targeted Restored Condition: Increase abundance in the bay, ultimately through natural reproduction, such that growth rates approximate more closely statewide averages for this species and reflect improved use of available forage in the bay.

Status: Based on information provided by MDNRE fish biologists, walleye growth rates have fallen below 110 percent of the statewide growth rates and more closely match statewide averages, which reflect improved use of the available forage in the bay. Based on this information, the TRC has been met (Fielder and Thomas, 2006).

Yellow Perch

Targeted Restored Condition: A sustained annual harvest of 750,000 pounds per year with increasing abundance of larger, faster-growing individuals.

Status: While yellow perch have shown heightened reproductive capacity over the last several years, recruitment problems beyond young-of-the-year age persists. This suggests that the ongoing invasion of invasive species and the dynamic nature of the bay's fisheries may preclude this original target from being met. It is recommended that this target not be used as a proxy for broader fishery restoration.

Sturgeon

Targeted Restored Condition: Documented evidence of natural reproduction in the Saginaw River.

Status: While an occasional sturgeon appears in the Saginaw River, spawning has not been documented. Due to the extirpation of this species from the watershed, population recovery may take years and need to be augmented with fish stocking. Genetics play a key role in current sturgeon stocking efforts, which should be approached in a manner consistent with Great Lakes basin-wide efforts to ensure best chances for success. As a result, sturgeon are not recommended to be utilized for documenting broader restoration successes.

Wildlife Status and Trends (Bird or Animal Deformities or Reproductive Problems)

Bald Eagles

Targeted Restored Condition: The reproductive success of bald eagles in the Saginaw Bay area is equivalent to that found in other Lake Huron costal areas in Michigan.

Status: In 2002, bald eagle reproduction was above the goal set for recovery in the Saginaw River (PSC 2002). Recent evidence suggests that reproduction along the bay continues to improve and is consistent with areas outside of the AOC (Bowerman 2010). PSC recommends that data sources be reviewed to firmly establish that the goal has been attained.

Herring Gulls

Targeted Restored Condition: PCB levels in herring gull eggs taken from Saginaw Bay–area nest sites are not significantly higher than those found in other Lake Huron sampling locations.

Status: While continued population-level problems appear to remain at the highly contaminated Saginaw Confined Disposal Facility, ongoing monitoring has occurred and additional review of this data is necessary to adequately assess recovery beyond this site.

Additional Populations Targets Discussed

In addition to the targets discussed above, the Technical Work Group and the Partnership Executive Committee discussed additional candidates for consideration. When

considering new indicators to assess overall population health, key questions must be addressed, including:

- Who will do the monitoring?
- How often will monitoring occur?
- How much money is necessary and appropriate?
- Where will the money come from? and,
- What level of recovery will be considered acceptable?

These questions are fundamental to prioritizing future AOC assessment and delisting efforts.

The following species were discussed as potential surrogates to measure for the population BUI:

- **Mayflies:** In 2000, mayflies (*Hexagenia limbata*) were previously identified as a TRC for the Degradation of Benthos BUI (PSC 2000). The TRC is that samples of mayfly nymphs collected in the open waters of Saginaw Bay exceed 30/m² for two consecutive years, based upon established sampling methods. While anecdotal evidence suggests occasional “hatches” of mayflies occurring in the bay, such observations have not been verified by benthos sampling. Moreover, mayfly populations are dependent on adequate dissolved oxygen levels and other variables (e.g., sedimentation rates). PSC recommends that due to the potential costs and other considerations noted above, mayflies should remain as a TRC for Degradation of Benthos, but are not necessarily a good proxy under the populations BUI.
- **Otters:** Otters are a direct link to organic and heavy metal concentrations in the food chain. Contaminants are a potential and existing problem for many otter populations throughout the Great Lakes. Changes in the species population and range are also representative of anthropogenic riverine and habitat alterations. The 2009 State of the Lakes Ecosystem Conference (SOLEC) indicates that primary areas of population suppression still exist in Southern Lake Huron. PSC recommends additional review of information is necessary to determine whether or not the otter would be appropriate as a new species for measuring progress, including the questions identified above.
- **Mink:** Mink are widely distributed, abundant, and regularly trapped in temperate, aquatic ecosystems, and this makes them an excellent model to address issues in environmental pollution on both temporal and spatial scales. As a high trophic level, fish-eating mammal, mink can bioaccumulate appreciable concentrations of certain pollutants and have been shown to be sensitive to their toxic effects. Research derived from mink can bridge and integrate multiple disciplines, and the information collected from this species has allowed environmental health scientists to better understand and characterize pollution effects on ecosystems. PSC recommends additional review of information is necessary to determine whether or not the mink would be appropriate as a new species for measuring progress, including the questions identified above.

As the food web continues to change due to invasive species and other factors (e.g., nutrient loading) the use of selected indicator species may need to be reevaluated. However, large-scale ecosystem changes are likely to be faced throughout the Great

Lakes such that measuring a population in the AOC relative to the entire Great Lakes ecosystem may remain a suitable proxy. If large-scale ecosystem changes occur throughout the basin with a substantial impact on a selected indicator species, continued use of that species may need to be reevaluated.

NEXT STEPS

Continued changes in the ecosystem and food web alterations due to invasive species and other factors have made prior delisting targets unrealistic. Returning to species-specific targets requires evaluation of potential indicator species and new goal setting. Development of targets for indicator species targets should recognize the Partnership's capacity. In determining the selected indicator species, consideration should be given to the availability of trend data and the likeliness of continued monitoring by groups other than the Partnership, in addition to the representation of the species to the ecosystem. Targets should be developed that recognize that delisting requires restoration to levels equivalent to current conditions of Lake Huron as a whole, not pristine or pre-settlement conditions. Potential indicator species include bald eagles, walleye, mink, and otter based on these and other considerations. Conversations with experts who are familiar with populations monitoring data suggest progress in walleye and bald eagle population restoration.

Action Steps for Populations Delisting Targets

1. Determine availability of data and continued monitoring of potential indicator species.
2. Assess potential costs related to data collection and analysis.
3. Select indicator species.
4. Set new delisting targets/ reevaluate existing targets.

Coarse-Level Assessment of Remaining BUIs

On behalf of the Partnership, PSC conducted a coarse-level assessment of the remaining BUIs to help identify and develop the information necessary to prioritize next steps. Two of the 12 original BUIs have been officially delisted: Tainting of Fish and Wildlife Flavor and Restrictions on Drinking Water Consumption/Taste Odor. With sufficient funding, it is possible that five of the remaining ten BUIs could be positioned for delisting in the next three years. The remaining five BUIs will require longer term assessment and remediation activities of at least five years. Exhibit 2 summarizes this assessment.

EXHIBIT 2
Status of Beneficial Use Impairments (BUIs), October 2010

Beneficial Use Impairment (BUI)	Assessment in progress (Y/N)	Phase*	Actions under way	Timeline	Status
Restrictions on drinking water consumption or taste and odor problems	BUI Delisted		None		BUI removed 6/2008.
Tainting of Fish and Wildlife Flavor	BUI Delisted		None		BUI removed 9/2008.
Loss of Fish and Wildlife Habitat	Yes	Documentation/ Assessment	Protect 60% of the coastal wetlands below the 585-foot contour.	1–2 years	Proposal development under way for Ducks Unlimited to update the CARL database with recent land acquisitions and easements to determine whether 60% of wetlands below the 585-foot contour are now protected. Prioritization of the remaining 40 percent of wetlands for future acquisition and protection has been completed.
Degradation of Aesthetics	No	Monitoring	Analyze existing data and conduct assessment of current BUI status.	1–3 years	MDNRE prepared Great Lakes Restoration Initiative proposal for a statewide assessment.
Bird and Animal Deformities or Reproductive Problems	Yes	Documentation/ Assessment	Analyze existing data	1–3 years	An MDNRE statewide assessment of this BUI will determine any monitoring and restoration needs.
Eutrophication or Undesirable Algae	Yes	Monitoring/ Assessment	Control sources including implementing site-specific projects, monitor, and assess related restoration activities related to this BUI.	1–3 years	Specific remedial actions have been identified by state and local stakeholders in state and federally approved sub-watershed management plans and other relevant documents. Review of these plans will be needed to determine which actions specifically address contamination contributing to this BUI.
Beach Closings	Yes	Planning/ Design, Remedial Action, Monitoring, Documentation/ Assessment	Control sources including implementing site-specific projects in the Saginaw Bay watershed, and monitor <i>E. coli</i> levels related to this BUI.	2–3 years	Specific remedial actions have been identified by state and local stakeholders in state and federally approved sub-watershed management plans and other relevant documents. Review of these plans will be needed to determine which actions specifically address contamination contributing to the Beach Closing BUI. MDNRE proposing a statewide assessment for this BUI.

Beneficial Use Impairment (BUI)	Assessment in progress (Y/N)	Actions under way			Status
		Phase*	Timeline		
Additional Beach Closings BUI Activities	Yes	Monitoring, Documentation/ Assessment	Saginaw Bay Sanitary Survey Projects	2–3 years	The USEPA is currently providing funding for beach sanitary surveys at 5 beaches: Singing Bridge Beach in Arenac county (impacted by the Whitney drain); Whites Beach in Arenac County (impacted by a series of canals); Bay City Recreation Area in Bay County (impacted by multiple factors including the Kawkawlin and Saginaw River and possibly the Tobico Marsh); Caseville Beach in Huron County (impacted by the Pigeon River); and Port Crescent State Park beaches in Huron County (impacted by the Pinnebog River).
Additional Beach Closings BUI Activities	Yes	Remedial Action, Monitoring	Bay County Sanitary Survey Project	2–3 years	The MDNRE and Bay County Health Dept. will conduct sanitary surveys and monitor 5 high-priority beaches located on Saginaw Bay. This project will expand the frequency and duration of beach monitoring efforts, and increase the number of beaches regularly monitored with beach sanitary surveys to reduce bacterial contamination.
Additional Beach Closings BUI Activities	Yes	Remedial Action, Monitoring	Control sources and monitor <i>E. coli</i> levels related to this BUI. Restoring Three Arenac County Beaches.	2–3 years	The MDNRE and the Central Michigan Health Dept. will monitor 3 high-priority beaches located on Saginaw Bay. This project will expand the frequency and duration of beach monitoring efforts, and increase the number of beaches regularly monitored with beach sanitary surveys to reduce bacterial contamination.
Additional Beach Closings BUI Activities	Yes	Remedial Action, Monitoring	Saginaw AOC Regional Septic Remediation/Source Elimination	2–3 years	This is a regional project on behalf of 4 Saginaw Bay coastal communities and their health departments to identify and eliminate illicit discharges from on-site septic systems that have a direct hydrological discharge connection to surface waters of the Saginaw Bay.
Additional Beach Closings BUI Activities	Yes	Remedial Action, Monitoring	Control sources and monitor <i>E. coli</i> levels related to this BUI— Saginaw Bay/River AOC Beach Forecast Modeling Project	2–3 years	Project currently being funded by the USEPA's Great Lakes National Program Office.

Beneficial Use Impairment (BUI)	Assessment in progress (Y/N)	Actions under way			
		Phase*		Timeline	Status
Restrictions on Dredging Activities	No	Planning/Design	Remediate contaminated sediment in the navigation channel—routine Corps of Engineers maintenance dredging and known site-specific contaminated sediment remediation required.	5+ years	MDNRE proposing a statewide assessment. Source identification and project scoping of contaminated sites is required. Per Corps fact sheet dated 2/10, the mouth of Saginaw River requires annual dredging and the upper Saginaw River requires dredging every 2–3 years. Recovery Act funds will be used to dredge the river in 2010.
Degradation of Phytoplankton or Zooplankton Populations	No	Planning/Design	See Eutrophication or Undesirable Algae BUI.	5+ years	Actions needed to remove the Eutrophication are expected to contribute toward removing this BUI.
Restrictions on Fish and Wildlife Consumption	No	Monitoring	Monitor fish contaminants.	5+ years	State to take lead.
Degradation of Benthos	No	Planning/Design	Remediate known contaminated sediment sites in the Saginaw River and Bay.**	5+ years	Source identification and site-specific project scoping is required.
Degradation of Fish and Wildlife Populations	No	Documentation/Assessment	Reassessment of fish and wildlife proxies for delisting.	5+ years	The Partnership has agreed to decouple the population BUI from the Habitat BUI and revert to two previous population targets: Walleye growth rates and bald eagle reproductive success. River otter and others will also be considered.

* Phases are Planning/Design, Remedial Action, Monitoring, Documentation/ Assessment.

** This action has not yet been initiated

Summary and Recommendations

Substantial progress has been made in identifying delisting targets and in taking steps to achieve those goals. Specifically, significant progress has been made in terms of the habitat and populations BUIs. Additional efforts are underway to advance delisting of other BUIs. Of total eligible wetlands 57 percent can be documented as preserved; the actual number of eligible preserved wetlands is likely higher, perhaps reaching the delisting target of 60 percent.

A return to species-specific indicators regarding the Fish and Wildlife Populations BUI is prudent based on recent activity in the watershed. cursory research suggests that walleye and bald eagle populations are make progress towards prior delisting targets. Additionally, once habitat restoration goals and populations targets are met, a significant case can be made to apply for delisting the BUI.

RECOMMENDATIONS

PSC recommends that the Partnership:

- Seek funding to update the CARL database and calculate updated estimates of preserved wetlands below the 585-foot contour to determine whether the delisting target for protected wetlands has been met
- Determine the reporting criteria that will be required by the U.S. Environmental Protection Agency (USEPA) to achieve delisting once habitat targets have been reached (i.e., what the USEPA will require, how thorough the Partnership will have to be in its petition to delist)
- Develop a comprehensive proposal for GLRI funding that encompasses multiple BUIs and related restoration remediation and monitoring activities

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