

St. Louis River Area of Concern

Complete Delisting Targets

The Great Lakes Areas of Concern (AOCs) are severely degraded geographic areas within the Great Lakes. A total of 43 AOCs have been designated; 26 in the U.S., 17 in Canada (5 are shared between the two countries). The St. Louis River was designated as an Area of Concern in 1987. The Great Lakes Water Quality Agreement (GLWQA) charged each of the AOCs, including the St. Louis River AOC, with developing Remedial Action Plans to identify specific management strategies to control sources of pollution, abate environmental contamination already present, and restore beneficial uses in the AOC. The GLWQA defines a beneficial use impairment (BUI) as a change in the chemical, physical, or biological integrity of the Great Lakes system.

Nearly all of the BUIs for the St. Louis River AOC are tied to historic habitat loss from the extensive filling of wetlands and dredging of shallow aquatic habitat, and to releases of harmful chemicals that contaminated the sediments and water in the estuary. Since 1861, nearly 3,000 acres of wetlands have been filled, and 4,000 acres have been dredged or deepened for navigation (Lower St. Louis River Habitat Plan. p. 15). The Area of Concern also contains several sites that have been known historically to contain hazardous wastes and chemical contaminants.

Many of these contaminated sites are being addressed by regulatory and resource management programs for the states of Minnesota and Wisconsin, such as state hazardous waste remediation programs, or federal programs, such as the CERCLA (“Superfund”) program, since specific federal and state dollars necessary to maintain an active RAP program are uncertain (see *Wisconsin’s Great Lakes AOCs*). Several contaminated sites in the AOC have been or are being addressed by these programs, including the Superfund site of St. Louis River Interlake Duluth Tar and U.S. Steel Duluth Works well as the former site of Koppers Company Superior Plant. In 2006, Great Lakes Legacy Act funds, which are funds specifically designated to clean up U.S. Areas of Concern, were used to remediate 40,000 cubic yards of petroleum-contaminated sediment and soil from Hog Island Inlet and Newton Creek in the Wisconsin portion of the St. Louis River AOC. Additionally, the state of Wisconsin created the St. Louis River Streambank Protection Area in 1995 by purchasing 6,900 acres of land upstream from Oliver, WI, including five miles along the St. Louis River and 13 miles along the Red River and its tributaries.

The restoration of the chemical, physical and biological integrity of the St. Louis River AOC will be implemented by removing beneficial use impairments and, ultimately, delisting the AOC. The partners will utilize the following principles in the BUI removal process.

1. The states will seek appropriate concurrence of the Fond du Lac Band of Lake Superior Chippewa for any Beneficial Use Impairment (BUI) removal or AOC delisting.

2. Beneficial Use Impairment delisting will occur based on scientific merit as reviewed and approved by state staff expertise.

3. The following BUIs are closely tied with the presence of contaminated sediments. Removal of these BUIs will occur only when the related sediment contamination has been addressed. These BUIs are: Fish Consumption Advisories, Degraded Fish and Wildlife Populations, Fish Tumors and Deformities, Degradation of Benthos, Restrictions on Dredging, Beach Closings and Body Contact, and Degraded Fish and Wildlife Habitat.

4. The states view partners, such as the St. Louis River Alliance and the Fond du Lac Band, as being valuable in the delisting process and will continue to collaborate, as appropriate, with them.

In 2008, the states of Minnesota and Wisconsin submitted a list of planning targets for the St. Louis River AOC to the U.S. EPA. These targets were drafted by the two states with input from local stakeholders and establish what the long-term goals are for the AOC. The remaining portion of this document contains valuable information for potential partners who are interested in working on issues related to the AOC. For each impairment, there is a the target (“Target”), which is the desired outcome that should be attained before delisting can occur, the International Joint Commission (IJC) guidelines that were established by that agency for a particular BUI listing (“IJC Criteria”), the basis for why a particular impairment was listed for the AOC (“Rationale for Listing”), and the basis for why the particular target was chosen (“Rationale for Removal”). Each of these descriptors provides insight into the recent history of a particular impairment.

BUI 1. Fish Consumption Advisories

Target: There are no Area of Concern-specific fish consumption advisories issued for the St. Louis River by the State of Minnesota or the State of Wisconsin. Tissue concentrations of contaminants of concern in representative samples of resident fish are not significantly elevated from regional background samples.

IJC Criteria: An impairment will be listed when contaminant levels in fish or wildlife populations exceed current standards, objectives or guidelines, or public health advisories that are in effect for human consumption of fish or wildlife. Contaminant levels in fish and wildlife must be due to contaminant input from the watershed.

Rationale for Listing: Fish samples taken from the St. Louis River and Lake Superior exceed standards established by Minnesota and Wisconsin for the unrestricted consumption of sport fish. Each of the two states issues consumption advisories for various population groups, based on fish species and size classes. Advisories are collectively issued for the presence of mercury and polychlorinated biphenyls (PCBs). Fish tissue residues of mercury and polychlorinated biphenyls also exceed the 0.5 mg/kg and 0.1 mg/kg standards established in the 1978 Great Lakes Water Quality Agreement for the protection of aquatic life and fish consuming birds.

Rationale for Removal: A certain level of contamination is understood for all water bodies from uncontrollable sources, such as mercury from atmospheric deposition. There are, and have been, however, additional fish consumption advisories for the St. Louis River for the last few decades. This target's aim is to ensure that fish caught from the St. Louis River are no more contaminated than fish caught in other similar areas outside of the Area of Concern. The removal of this BUI is therefore linked to cleaning up contaminated sediments in the Area of Concern. The target is also limited to the St. Louis River portion of the AOC because even though the AOC includes part of Lake Superior, fish consumption advisories for Lake Superior are caused by contamination from many other sources besides those from the St. Louis River AOC.

This impairment acknowledges the benefits of certain cultural and lifestyle diets associated with fish consumption. Educating the public about safe consumption patterns will be a strategy incorporated into removing this impairment.

BUI 2. Degraded Fish and Wildlife Populations

Target: In consultation with their federal, tribal, local, and nonprofit partners, state resource management agencies concur that diverse native fish and wildlife

populations are not limited by physical habitat, food sources, water quality, or contaminated sediments.

IJC Criteria: An impairment will be listed when fish and wildlife management programs have identified degraded fish or wildlife populations due to a cause within the watershed. In addition, this use will be considered impaired when relevant, field-validated, fish or wildlife bioassays with appropriate quality assurance/quality controls confirm significant toxicity from water column or sediment contaminants.

Rationale for Listing:

1. Fish Populations-Since 1979, fish populations have been recovering because of improved water quality that resulted from more complete wastewater treatment after formation of the Western Lake Superior Sanitary District (WLSSD), construction of the WLSSD wastewater treatment plant, and improvement of City of Superior wastewater treatment. However, fish populations are still adversely affected by alterations and loss of habitat, proliferation of exotic species, and possibly by exposure to toxic substances (for further detail, refer to Stage I Report, pp. IV-18-26).
2. Wildlife Populations-Little population data is available for wildlife with the exception of colonial nesting birds, herons, and gulls. Populations of the common tern and the piping plover (threatened and endangered species) have declined, the heron population has been declining, and gulls and mallards have experienced die-offs in the recent past. These problems are due to alteration or loss of habitat and possibly toxic contamination (for further detail, refer to Stage I Report, pp. IV-23-28).

Rationale for Removal: Originally, this target was focused on population metrics (for further detail, refer to *Wisconsin Proposed Delisting Targets*, p. 23). However, because of the complexity and dynamics of fish and wildlife populations, resource managers expressed that taking a consensus-based approach among multiple agencies and entities to determine when fish and wildlife populations were diverse would be a better method. This current target does not delve into or try to list all the different factors that resource managers would consider because it would not be practical to capture all the facets of expert knowledge in BUI removal. Rather, factors like habitat, water quality, and food sources necessary to enable self-sustaining populations of native fish and wildlife will be part of a dialog among the different agencies and entities, with the states ultimately deciding when this impairment should be removed.

BUI 3. Fish Tumors and Deformities

Target: Incidence rates of contaminant-related internal and external tumors and deformities in resident benthic fish species, including neoplastic or preneoplastic liver tumors, do not exceed incidence rates from unimpaired areas elsewhere in the Great Lakes basin.

IJC Criteria: An impairment will be listed when incidence rates of fish tumors or other deformities exceed rates at unimpacted control sites or when survey data confirms the presence of neoplastic or preneoplastic liver tumors in bullheads or suckers.

Rationale for Listing: Observations suggest that fish tumors and deformities represent an impaired use in the St. Louis River estuary. However, at present, there are no studies that document the incidence rates of tumors in fish. Additional work is needed to fully determine the incidence of fish tumors and deformities in the Area of Concern.

Rationale for Removal: This BUI was listed based on anecdotal and incomplete information suggesting that fish caught in the estuary may have a high incidence of tumors that may be caused by contamination. The resurgence of the fishery in the SLR and the improvement of water quality over the last 20 years requires a baseline evaluation of fish health. Research is needed to definitively determine if contaminant-related tumor incidence is greater in the St. Louis AOC than in other similar areas that are not AOCs.

Future Great Lakes fish tumor studies, when available, will provide comparison reference sites regarding unimpaired areas. Studies being performed at Pennsylvania State University may contribute to a standard level for AOC work. The link between the causes of tumors and deformities, including how they are manifested, (neoplastic/preneoplastic) needs to be defined and addressed by the IJC and the AOCs.

BUI 4. Degradation of Benthos

Target: The benthic community in historically degraded areas (e.g., chemically, biologically, or physically degraded areas) of the AOC does not significantly differ from unimpacted sites of comparable characteristics within the AOC. Benthic communities' characteristics including native species richness, diversity, abundance, and functional groups will be considered when comparing sites.

IJC Criteria: An impairment will be listed when benthic macroinvertebrate community structure significantly diverges from unimpacted control sites of comparable physical and chemical characteristics. In addition, this use will be considered impaired when toxicity (as defined by relevant, field-validated, bioassays with appropriate quality assurance/quality controls) of sediment-associated contaminants at a site is significantly higher than controls.

Rationale for Listing: Reduced benthic invertebrate density, diversity, and species richness have been reported in areas of the estuary that are subject to physical disturbance or in close proximity to known contaminated sites. In some studied areas, the benthic community is dominated by oligochaetes and chironomids, which are relatively tolerant of organic pollution (Stage I Report, pp. IV-29 to IV-35). In evaluating sediment quality throughout the AOC, the Wisconsin DNR and Minnesota PCA have used the triad approach that combines sediment chemistry, toxicity tests and *in situ* benthic diversity to give a composite picture of overall sediment “health”. The triad approach has demonstrated that the benthic community has been degraded, as evidenced by the lack of species diversity and preponderance of pollutant-tolerant species.

Rationale for Removal: Criteria for removal of this BUI are based upon benthic community health. Impacts to health must be demonstrated to have a cause/effect relationship associated with anthropogenic stresses (contaminants, sediment loading, invasive species, habitat alteration, etc.) in the AOC. The quality of benthic community health may be measured using the triad method (benthic invertebrate community structure, sediment toxicity, and sediment chemistry) and comparison to reference sites with similar physical and biological characteristics.

BUI 5. Restrictions on Dredging

Target: All contaminated sediment hotspots within the AOC have been identified and implementation actions to remediate contaminated sites have been completed. There are no special handling requirements of material from routine navigational dredging due to contamination originating from controllable sources within the AOC.

IJC Criteria: An impairment will be listed when contaminants in sediments exceed standards, criteria, or guidelines such that there are restrictions on dredging or disposal activities.

Rationale for Listing: Restrictions on dredging is a use that can be clearly identified as impaired in the St. Louis River AOC. Sediments in many parts of the AOC exceed guidelines developed by regulatory agencies to characterize in-place sediments and contain a variety of toxic, bio-accumulative contaminants that have been shown to cause adverse effects to aquatic and terrestrial organisms. Serious economic and social consequences are also imposed upon some resource users through special dredging requirements and obligations for long-term sediment containment.

Rationale for Removal: This BUI focuses on the elimination of special handling and disposal requirements related to dredging of contaminated sediments in commercial or recreational navigational channels by the U.S. Corps of Engineers and/or private parties. Several contamination studies carried out in the AOC

have identified areas that have high levels of toxic contaminants (“contaminated sediment hotspots”). Contamination is a factor in how sediments are handled and disposed because of the impacts certain contaminants have on human health; however, Regulatory processes related to permits, sediment testing, and disposal are not considered “restrictions”.

BUI 6. Excessive Loading of Nutrients and Sediments

Target: Nutrient and sediment levels have not been shown to impair water quality and habitat, and do not restrict recreation, including fishing, boating, or body contact in the estuary and within western Lake Superior based on the following criteria:

1. All federal, state, and local point source and nonpoint source discharge permits in the Area of Concern are in compliance with regard to controlling sources of nutrients (particularly nitrogen and phosphorous), organic matter, and sediment; and
2. Total phosphorus concentrations in the Lake Superior portion of the AOC do not exceed 0.010 mg/l (upper limit of oligotrophic range); and
3. There are no exceedances of the most protective water quality standard for either state in the western basin of Lake Superior due to excessive inputs of organic matter or algal growth attributed to loadings from wastewater overflows into the St. Louis River; and,
4. Total phosphorus concentrations within the St. Louis River portion of AOC do not exceed an interim guide of 0.030 mg/l (upper limit of mesotrophic range) or the most restrictive water quality standards. This ensures that anthropogenic sources and activities in the St. Louis River Area of Concern do not result in excessive productivity and nuisance conditions within the St. Louis River Estuary.

IJC Criteria: An impairment will be listed when there are persistent water quality problems (e.g., dissolved oxygen depletion of bottom waters, nuisance algal blooms or accumulation, decreased water clarity, etc.) attributed to cultural eutrophication. (Although persistent water quality problems associated with eutrophication have not been observed in the estuary in the recent past; however, the high levels of nutrients and sediments being delivered to Lake Superior is an important concern. Therefore, we will use a modification of the IJC eutrophication criterion to reflect local conditions.)

Rationale for Listing: Prior to the improvements in wastewater treatment in the late 1970s in this area, water quality and biological investigations characterized the St. Louis estuary as eutrophic. At this time, the Western Lake Superior

Sanitary District (WLSSD) treatment plant was built and the Superior wastewater treatment plant was upgraded. Since that time, many indicators of trophic status have shown improvements. For instance, concentrations of total phosphorus, ammonia, and organic nitrogen have decreased in the St. Louis Bay. The loading of phosphorus to the estuary from point sources has been reduced substantially. Further work is needed to ascertain the effects of nonpoint source loadings to the system and to Lake Superior. Despite the reductions in point source loadings, phosphorus concentrations in the estuary remain at levels where eutrophic conditions might be expected. However, algal biomass has been lower than would be expected given these high phosphorus concentrations. Chlorophyll-a concentrations measured in the estuary have been similar to levels found in mesotrophic or oligotrophic waters. Several investigators have proposed that reduced light penetration due to turbidity and color may be a limiting factor for algal growth in the estuary. Although persistent water quality problems associated with eutrophication are not observed currently in the estuary, the high levels of nutrients and sediments being delivered to Lake Superior is an important concern. Therefore, the RAP will use a modification of the IJC eutrophication criterion to reflect local conditions.

Rationale for Removal: There are several regulatory program standards for water quality that must be met for nutrient and sediment loading. The concern in the AOC is that the current mesotrophic/oligotrophic states are maintained such that the current trophic level is maintained.

BUI 7. Beach Closings and Body Contact

Targets: Sources of stormwater and wastewater discharge to the St. Louis River Area of Concern have been identified and measures to reduce the risk of human exposures to disease causing microorganisms have been implemented.

There are no body contact advisories due to the presence of harmful chemicals at contaminated sites.

No water bodies within the AOC are included on the list of non-attaining waters due to controllable sources of disease causing microorganisms or chemicals in the most recent State of Wisconsin and State of Minnesota Section 303(d) programs.

IJC Criteria: An impairment will be listed when waters, which are commonly used for total-body contact or partial-body contact recreation, exceed standards, objectives, or guidelines for such use.

Rationale for Listing: Water quality data indicate that improvements have been made in the St. Louis River and bay since the late 1970's. However, there are still sources of potential microbial contamination. Sewage bypasses have

occurred into the Area of Concern in both Minnesota and Wisconsin during storm events. In addition, localized problems with microbial contamination could occur due to discharge of inadequately treated wastewater by marine traffic. Because of the sewage bypasses in both Minnesota and Wisconsin, body contact recreation is an impaired use.

Rationale for Removal: This BUI was listed because of concern not just about biological pathogens, but also for concern about body contact with harmful chemicals from contaminated sites. For this reason, the target focuses on both stormwater/wastewater discharges, including sewer system overflows, to the AOC and ensuring that there are no harmful chemicals in the water column or in sediments that result in body contact advisories.

BUI 8. Degradation of Aesthetics

Target: There are no verified persistent occurrences of objectionable properties in the surface waters of St. Louis River Estuary during the previous five year period. "Persistent occurrences" are defined as objectionable properties that occur more than two times per year and are greater than ten days in duration.

IJC Criteria: An impairment will be listed when any substance in water produces a persistent objectionable deposit, unnatural color or turbidity, or unnatural odor (e.g., oil slick, surface scum).

Rationale for Listing: The aesthetic values of the St. Louis River AOC are impaired in some locations. A systematic collection of evidence and data is recommended to determine the specific locations of degraded areas and the sources and types of degrading materials (i.e., oil slicks, chemical and tar residues, taconite pellets on shorelines, rotting grain scum on water surface, etc.). Hog Island Inlet and Stryker Bay are two areas that have repeated reports of oil, chemical, and tar residues on the water's surface. Complaints have also been registered about smells emanating from the sediments and water of Newton Creek and Hog Island Inlet (MPCA, WDNR Complaint Logs 1980-1990). Shoreline aesthetics will be addressed separately and will be remediated through actions taken with riparian interests.

Rationale for Removal: Although not limited to defined harbor superfund sites, this BUI was primarily listed for reports of foul odors and unnatural sights on the surface waters associated with these sites on the St. Louis River. Using the state's nuisance laws, erosion control practices and emergency spill response programs the intent is to reduce the occurrence of "objectionable properties in surface waters", which may include: high turbidity, unnatural color, oil films floating solids, foams, and/or noxious odors.

BUI 9. Loss of Fish and Wildlife Habitat

Target: State resource management agencies concur, in consultation with their federal, tribal, local, and nonprofit partners, that a reasonable amount of fish and wildlife habitat, given the presence of industrial development in the estuary, that is currently degraded is enhanced, rehabilitated, and protected against further loss of habitat.

The following benchmarks could be used as an interim guide:

1. All contaminated sediment hotspots within the AOC have been identified, implementation actions to remediate contaminated sites have been completed; and
2. Programs are in place to discourage further proliferation and to prevent further introduction of non-native invasive species; and
3. At least 50% of known degraded aquatic habitat acreage (approx. 1700 acres) is rehabilitated through implementation of projects, such as those outlined in the Lower St. Louis River Habitat Plan (SLRCAC, 2002), Appendix 9 – Habitat Plan Implementation Strategy Worksheets (SLRCAC, 2009); and
4. Additional aquatic or hydrologically connected habitat throughout the AOC watershed has been successfully protected and rehabilitated sufficiently to maintain healthy fish and wildlife populations through implementation of projects, such as those outlined in the Lower St. Louis River Habitat Plan (SLRCAC, 2002), Appendix 9 – Habitat Plan Implementation Strategy Worksheets (SLRCAC, 2009).

IJC Criteria: An impairment will be listed when fish and wildlife management goals have not been met as a result of loss of fish and wildlife habitat due to perturbation in the physical, chemical, or biological integrity of the waters, including wetlands.

Rationale for Listing: Fish and wildlife habitat in the AOC is threatened by development and by exotic vegetation. In addition, the contaminated sediments in the river and estuary and the high sedimentation rates in the AOC may contribute to the loss of habitat (for further detail, refer to the Stage I Report, pp. IV-66 to IV-72).

Rationale for Removal: The rationale for removal of this BUI is similar to the rationale provided for Degraded Fish and Wildlife Populations. This BUI removal focuses on implementing the Lower St. Louis River Habitat Plan goals with respect to protecting and enhancing critical habitat sites throughout the estuary. The Plan (2002) was created by the St. Louis River Citizens Action Committee with input from private citizens, city, county, state, and federal partners. A component of addressing contaminated sediment hotspots was also added

because of the RAP's emphasis on contaminants as a limitation of habitat. The strategy for this BUI, therefore, involves addressing both contamination and habitat rehabilitation.