

Beneficial Use Impairments Restoration Goals and Milestones

Name:

(BUI #6)

Excessive Loading of Sediments and Nutrients to Lake Superior

Reason for listed:

High sediment/nutrient load from AOC to Lake Superior

Comments:

None

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 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

Adaptation of IJC Criterion to Fit Local Conditions:

High nutrient and sediment levels in the St. Louis River estuary lead to excessive loadings to Lake Superior, although these high nutrient levels do not seem to be expressed as eutrophication in the Area of Concern

SLR RAP Rationale for Listing:

Prior to the improvements in wastewater treatment in the late 1970's 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.

Proposed Restoration Goal:

Nutrient and sediment levels in the St. Louis River estuary should not result in excessive loadings to Lake Superior. Nutrient and sediment levels should not impair habitat, and should not restrict recreation, including fishing boating or body contact recreation in the estuary and within western Lake Superior.

Proposed Restoration Milestones:

- Average annual total phosphorous concentration, as measured at three representative locations in the estuary, is reduced 50% by 2015 and 75% by 2030.

Delisting Criteria:

50% reduction in average annual total phosphorus concentration, from current conditions, is achieved for 5 consecutive years.

Rationale for Removing from the List:

No rationale for removing from the list at this time.

Note:

Phosphorous is used as an indicator because phosphorous concentration is related to sediment loading, phosphorus is the primary nutrient of concern, and phosphorus is measurable and quantifiable.