

## **Beneficial Use Impairments Restoration Goals and Milestones**

**Name:**

(BUI #3)

Fish Tumors and Other Deformities

**Reason for listed:**

Observations in 1991 (harbor) and 1985 (Crawford Creek)

**Comments:**

Data on incidence of tumors and deformities is needed

**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 confirm the presence of neoplastic or preneoplastic liver tumors in bullheads or suckers.

***SLR RAP 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.

**Proposed Restoration Goal:**

Incidence of tumors and deformities is no greater than in nearby but less impacted Lake Superior tributaries.

**Proposed Restoration Milestones:**

- Monitor to determine if impairment exists before removing from list.

***Rationale for Removing from the List:***

No rationale for removing from the list at this time.

**Note:**

Continue to monitor. Hold for results from recent monitoring conducted by USFWS before determining if impairment exists.

***Supporting Documentation:***

*Current fish studies*

The USFWS conducted a fish study in select areas of the St. Louis River in 2001 and 2002 in which several fish from the area of concern exhibited preneoplastic liver tumors. Several fish also exhibited external deformities, fin erosion, and lesions. Data analysis from this study is currently in progress; while we cannot yet comment regarding the incidence rates of fish tumors or other deformities, it is certain that fish from the St. Louis River exhibited preneoplastic liver tumors. Therefore, USFWS recommends that this beneficial use impairment criteria is not eliminated, as it seems premature to do so at this time. Further, the USFWS recommends that a scientifically sound approach be developed for the entire St. Louis River AOC to determine exactly what is the status of rates of fish tumors and deformities, consistent with the original RAP recommendation.

*Lake Sturgeon Fin Deformities*

The Wisconsin and Minnesota Departments of Natural Resources initiated a lake sturgeon reintroduction program in 1983. A total of 780,700 fry and 142,700 fingerlings have been stocked during 14 years from 1983 through 2001. Subsequent sampling has shown that lake sturgeon have a deformity of the pectoral fin in the form of a curled ray. Percentage of lake sturgeon exhibiting fin deformities for 168 fish sampled in 2000, 2002 and 2003 was 11%, 8% and 10%, respectively. Deformities of lake sturgeon pectoral fin rays were not recorded from years prior to 2000. However, Minnesota DNR field crews have reported that rate of deformities was higher in the early 1990's (John Lindgren, personal communication).

The exact cause of lake sturgeon fin deformities is unknown. However, it has been speculated that fins were deformed during intensive culture at hatcheries in Wisconsin and Minnesota. Fin deformities are common in other intensively cultured fish such as rainbow trout. The deformities are caused by repeated abrasion against tank walls.

*General Fish Parasites, Tumors and Lesions*

The Minnesota DNR has conducted 16 fisheries investigations of the St. Louis River estuary from 1980 through 2003. Samples are collected in July with 250 foot experimental gillnets. A total of 32 fish species have been sampled. Sampled fish are individually observed for external parasites, lesions and tumors. Parasites such as neascus and yellow grub are reported as a percentage of total fish observed and external lesions and tumors are reported as comments in lake survey reports. Frequency of external parasites, lesions and tumors in fish from the estuary is considered low (John Lindgren, personal communication). A more detailed analysis can be obtained by reviewing lake survey reports at Minnesota DNR, Duluth Area Fisheries Office.