

## **Milwaukee Estuary Area of Concern Beneficial Use Impairments**

### **Restrictions on Fish & Wildlife Consumption:**

Fish consumption advisories for PCBs are in effect for resident and migratory fish species in the AOC. The WDNR updates fish advisory information annually and publishes an advisory informational booklet that is available at WDNR offices statewide and online at:

<http://dnr.wi.gov/org/water/fhp/fish/pages/consumption/index.html>.

A waterfowl advisory issued for certain species harvested in the Milwaukee Estuary AOC suggests consumption of mallard, black ducks, scaup and ruddy ducks from the Milwaukee area should be restricted. Because the targeted waterfowl migrate through the Great Lakes region and along flyways from Canada to the Gulf of Mexico and Atlantic Ocean, more data are needed to identify the role of the AOC in contaminating waterfowl.

### **Degradation of Fish & Wildlife Populations:**

Fish species diversity in the AOC is low, with many tolerant species present. Several species identified are seasonal migrants to the AOC. The lack of natural features in the AOC in conjunction with installation of steel pilings, channelization and concrete lining, urban runoff and high sediment input lead to poor quality habitat for fish foraging and spawning.

Sufficient evidence is not available to show that chemical contamination or water quality problems have diminished wildlife abundance and diversity in the AOC, but these causes are suspected. Regardless of water quality problems, the declines in wildlife populations and decreases in species diversity can be attributed in part to urban development. Nearly all the wetlands that existed were filled in the AOC as development proceeded. Remaining wildlife habitat is concentrated in and around existing parklands and other open areas.

### **Fish Tumors or Other Deformities:**

Detailed studies of possible deformities in Milwaukee AOC fish populations have not been conducted, however concentrations of fluoranthene, pyrene, benzo(a)anthracene and benzo(a)pyrene found in AOC sediments are similar to concentrations found at other sites where fish have high cancer rates (Baumann et. al, 1991). Because these concentrations correspond to dose/response tables provided by Baumann, fish tumors are considered an impaired use in the AOC.

### **Bird or Animal Deformities or Reproductive Problems:**

Insufficient data are available to show whether contaminants are causing these problems in the AOC. The Stage I document considered this use unimpaired because of lack of information. Since organochlorine contaminants (e.g. PCBs, dieldrin, DDT) and heavy metals (e.g. cadmium, mercury and lead) found in the AOC are shown to impair reproduction and development in wildlife elsewhere (King and Krynitsky, 1986; Scheuhammer, 1987), this use should be considered impaired. Studies are needed to determine the extent of this impairment.

### **Degradation of Benthos:**

The results of several benthic organism surveys prior to 1990 reveal that the benthos were lacking in diversity, and were dominated by pollution tolerant species including large populations of oligochaetes. Because of this lack of diversity and prevalence of pollution tolerant organisms, this use is considered impaired.

### **Restrictions on Dredging Activities:**

The concentrations of toxic contaminants contained in AOC sediments restrict the options for disposal of dredged materials. The confined disposal facility (CDF) along the shoreline in the southern portion of the Outer Harbor has been operating since 1975 and is projected to be at

capacity by early in the next century. Options for extending the life of the facility are being studied by the Army Corps of Engineers. Sediment contamination will likely continue to cause sediment disposal restrictions until all major sources of contamination are brought under control and the heavily contaminated sediments are remediated.

**Eutrophication or Undesirable Algae:**

The AOC is considered excessively eutrophic as a result of high phosphorus and nitrogen concentrations. Total phosphorus in the AOC exceeded concentrations suggestive of eutrophic conditions in 40 to 75 percent of the samples taken from the Inner Harbor, and 10 to 25 percent of the samples taken from the Outer Harbor.

**Beach Closings:**

Beach closings often occur after large rainfall (runoff) events in the Milwaukee area. Since bacteria levels in the lower rivers often exceed recreational standards, the waters are classified as supporting partial body contact (e.g. boating, canoeing, fishing, and incidental contact) rather than full body contact.

**Degradation of Aesthetics:**

After storms, considerable debris can be seen in the rivers, which enters through the storm sewer system. A river skimmer was employed for many years to clean up the debris in the river, but costs of operating and maintaining the vessel were prohibitive. The skimmer ceased operation in 1994. A new skimmer was purchased in 1998 and operates during the summer months.

**Degradation of Phytoplankton & Zooplankton Populations:**

The dominance of attached diatoms in the outer harbor, various spectral analyses, and water chemistry data indicate that the three rivers draining to the Milwaukee Estuary have a significant influence on the phytoplankton community in the outer harbor. High nutrient loading from the three rivers, nonpoint source pollution, municipal and industrial wastewater discharges support the present phytoplankton assemblages. Zooplankton populations studied indicate a decline of species richness and a dominance of pollution tolerant species in the outer harbor.

**Loss of Fish & Wildlife Habitat:**

Lack of suitable habitat is a major limiting factor for fish and wildlife in the AOC. With the exception of the area just downstream from the former North Avenue Dam, no natural or near-natural streambanks are found in the Milwaukee River portion of the AOC. Very few natural areas exist on adjacent streambanks in the harbor or along the other rivers. From a water quality perspective, contaminated sediments and poor ambient water quality impair fish and aquatic habitat.