

# Factsheet - Re-designation of the Degradation of Benthos Beneficial Use Impairment



## SUMMARY

- Benthos communities have been negatively affected by pollution and sediment contamination in the Detroit River for decades.
- This contributed to the benthos communities in the Detroit River being considered “impaired”.
- However, recent research indicates that in the Detroit River, sediment contamination has decreased, bioaccumulation potential is minimal, and benthic community composition in most sites is similar to reference sites, indicating improved conditions for benthos within the river.
- Based on this research, it is recommended that the status of the Degradation of Benthos beneficial use impairment be changed from “impaired” to “not impaired”.



the river benthos community. Pollutants such as mercury and polychlorinated biphenyls (PCBs) have accumulated in the sediment and modified the quantity and quality of benthic communities over time.

## WHAT ARE BENTHOS?

Benthos are a group of organisms made up of aquatic worms, insects, and other invertebrates, which inhabit the bottom of lakes and rivers. Many benthos feed on algae, detritus (organic litter) or other benthos, and are a key source of food for fish, frogs, and other wildlife. Since benthos live in or near the sediment at the bottom of lakes and rivers, they respond to changes in sediment quality. Bioaccumulation is the gradual build up of contaminants in organisms.



Benthos

## WHEN WILL THE BENTHOS COMMUNITIES BE CONSIDERED NOT IMPAIRED?

The DRCC established two restoration goals for this BUI and when met, the benthos community within the Detroit River would be considered no longer impaired.

These criteria are:

- 1) *“When the benthic community composition is temporally and spatially identified as non-impaired based on an objective and quantitative community*

## BACKGROUND

The Detroit River and its watersheds have been used intensively for international shipping, industrial and agricultural development, recreation, and drinking water for decades. This has led to environmental degradation and as a result, the Detroit River was listed as an Area of Concern (AOC) in 1987. The Detroit River Remedial Action Plan (RAP) was established to develop and implement actions to clean up the river. Under the RAP, 14 Beneficial Use Impairments (BUIs) were created to measure progress towards the cleanup. A Beneficial Use Impairment (BUI) is a condition that interferes with the ability of humans to use the aquatic environment and for the aquatic environment to support aquatic life. These 14 BUIs must be considered not impaired before the Detroit River can be removed from the list of AOCs. The degradation of benthos BUI was deemed ‘impaired’ under the RAP.

## WHAT WAS THE PROBLEM?

Historically, pollution discharges from the heavily urbanized and industrialized shorelines of the river have contributed to the significant ecological degradation of



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*analysis and/or a comparison to appropriate reference sites within the river."*

- 2) *"When benthic organisms analyzed for persistent, bioaccumulative substances (e.g., PCBs and mercury) are below thresholds to protect fish and wildlife."*

## RESULTS OF RESEARCH & MONITORING

Over the past two decades a series of intensive investigations into the sediment quality and benthos health of the Detroit River were conducted. These investigations took place in 1980, 1999, 2001, 2008-2009, and 2013 by environmental researchers. This monitoring has helped inform the DRCC of the status of the benthic community in the river over time.

Below are the results of the studies examining benthos impairment in the Detroit River:

- Sediment contaminants have declined steadily from 1999-2013.
- Since 1999, the majority of study sites (80/81 or 99%) had sediment contaminant levels that were below levels considered highly polluted and likely to affect benthos.
- Sediment contaminants found in the majority of Detroit River sites were not significantly different from reference sites (i.e., sites that have not been exposed to or have been exposed to only small amounts of contaminants within the Detroit River).
- None of the sites sampled exceeded Canadian guidelines for PCBs in tissues and only one site exceeded guidelines for methyl mercury. This indicates low bioaccumulation potential.

- 36/37 (97%) of sites sampled in 2013 had benthos communities that are unlikely to be impaired.



Researchers conducting benthos assessments

## CONCLUSIONS

A decline in contaminants in sediments in the Detroit River AOC has resulted in the improvement of benthos communities throughout the river. In part, this is because of legislation introduced by both Canadian and U.S. authorities to restrict the discharge of many pollutants into the river. The vast majority of the Canadian side of the Detroit River shows minimal benthos impairment and potential for bioaccumulation. Therefore, benthos communities are considered to have recovered to a point where they meet the criteria which indicates that they are no longer impaired in the Detroit River. No other remedial actions are required to meet BUI criteria.

**For more information or to download the report, please visit [www.detroitriver.ca](http://www.detroitriver.ca).**

The Detroit River Canadian Cleanup implements the Remedial Action Plan on behalf of a community-based partnership working together to protect, restore and enhance the Detroit River ecosystem. The federal, provincial and municipal government, local industries, scientific researchers, local environmental organizations and many dedicated citizens are key partners and play an important role in the cleanup process. The DRCC's member organizations provide leadership in identifying partnerships and funding opportunities to support and implement clean up goals.

Detroit River Canadian Cleanup

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