

Project Summary: Trophic status of water from selected sites in the Les Cheneaux Islands. 2001-2005.

R.A. Smith
Environmental Group Chair

A five-year survey of ten sites in the Les Cheneaux channels was conducted to assess the quality of our waters for recreational use. Using standards and techniques developed by limnologists an extensive, quantified database has been established that rates our Les Cheneaux waters as excellent for recreational use.

Results of our survey have been condensed into the accompanying graphic. Even the lowest test site rating is of a quality that any resort community in North America would envy.

Trends have come into focus during the project that show we have a demarcation between an Outer Channel Zone and an Inner Channel Zone differentiated by phosphorus and algae levels that are indicative of varied nutrient and temperature ranges. The Outer Channel Zone is defined by lower temperatures and fewer nutrients to support weed and algae growth whereas the Inner Channel Zone is characterized by higher temperatures and increased nutrient levels.

One aspect of the project was to identify alternatives to deal with the suspected nutrient overload in Cedarville Bay. We now have extensive data to support moving forward with an action plan to address the issue of excess nutrients and the eutrophication, or premature aging, of Cedarville Bay. Our long term survey also brought into focus an apparent elevated phosphorus level that has occurred in Hessel Bay during the past two years. This issue, too, can be addressed.

Neither Cedarville Bay nor Hessel Bay is at the stage where excess nutrients have created an adverse ecological dilemma. It is simply that we recognize the treasure we have in our pristine Les Cheneaux environment and we wish to protect and preserve an area that so many have cherished for such a long time. The Les Cheneaux Islands have a unique geology and ecology. It is our collective responsibility to make certain that our environment remains as attractive to future inhabitants as it has been for us.

Other community benefits from the LCIA-sponsored study include the beginning of an effort to reduce the excess nutrients contained in lagoon discharge water from the Clark Township Wastewater Treatment Plant. Based on experimental results Clark Township has placed a DEQ-approved iron chloride pump station at the wastewater treatment plant. Addition of iron chloride is expected to significantly reduce the form of phosphorus that is most readily used by algae.

Following up on undocumented reports, two separate studies by students from Lake Superior State University showed that *E. coli* levels are far below any concentrations that would trigger a public health concern. In reality the *E. coli* levels recorded were at background levels expected for a woodland creek. Results for *E. coli* concentrations

recovered from Cedarville Bay were similar to levels recovered from Pearson Creek and pose no public health concern.

Finally, a proposal is presently being drafted to determine the most ecologically sound manner in which to address major issues regarding Cedarville Bay. The issues are:

- (1) Nutrient overload due to enriched lagoon water.
- (2) Excess weed growth.
- (3) Invasive weed species, primarily Eurasian milfoil.
- (4) Sediment buildup.

Actions to be taken based on this proposal will be:

- (1) Interview a panel of environmental experts on the preferred methods to deal with the above issues. A Michigan DEQ representative will be one of the panel members to help streamline subsequent action plans in accordance with DEQ practice.
- (2) Establish a project plan and a timeline to fund and execute issues of concern.

Recommendations based on findings from our five-year trophic analysis:

- (1) Implement Cedarville Bay action plan to stop premature aging of the bay.
- (2) Quantify epiphytes in Cedarville Bay to address questions about phosphorus budget.
- (3) Track Hessel Bay phosphorus anomaly.
- (4) Repeat and update the present survey at three-year intervals using the same parameters measured during the original project.

Acknowledgment.

Appreciation is expressed to Mike Grant, Univ. Michigan, and to Fred Moore, LCIA Director, for their critical review of this report. Thanks is given to Professor David Szlag, Lake Superior State University, for encouraging his students to become engaged in our research. Gratitude is further expressed to the Les Cheneaux Islands Association for their support of this project.

Most important, data for this report could not have been generated without those who helped collect more than 250 sets of samples over the five years. A special thanks goes to Mary Baker, Pat Carr, Fred and Joyce Moore, and my wife, Barbara.

Your participation, recommendations and funding to help protect and preserve our Les Cheneaux heritage has been and continues to be appreciated.

The full 40 page report entitled: "Trophic status of water from selected sites in the Les Cheneaux Islands, 2001-2005" is available from either the Engles (lcia@cedarville.net) or myself (robsmith9@earthlink.net).

Project Summary

Recreational quality of Les Cheneaux waters
based on nutrient and algae growth data from
a five year study: 2001 – 2005.

Highly desirable, minimal nutrient impact	(a) ● ● ● ● ◐	Mqt Bay TS-1 Strongs-Boot TS-8 McKay Bay TS-9
Desirable, minor nutrient impact	● ● ● ●	Hessel Bay TS-2 Scammons Hbr TS-7
Desirable, moderate nutrient impact	● ● ● ◑	Snows Channel TS-3 Muskie Bay TS-4 Muskie Bay TS-4a Cove Gov't Bay TS-6
Desirable, elevated nutrients	● ● ● ◒	Cedarville Bay TS-5

(a) Greater number of dots indicates better ranking. Five dots is the best rating.

Ranking values (dots) are based on phosphorus and chlorophyll-a data calculated using the Carlson Trophic Status Index (Carlson, 1977). For derivation of rating system see Appendix, p 39.