

CHAPTER 8

BUFFALO NIAGARA RIVERKEEPER INTERPRETATION

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8.1 Introduction

Buffalo Niagara Riverkeeper (formerly Friends of the Buffalo Niagara Rivers) submitted this project application to NYSDEC in order to obtain useful and up to date information on the biological and physical characteristics of the Buffalo River. The resulting data and information will now be used by numerous agencies, organizations and local decision makers to help guide the remedial strategy and priorities of the Buffalo River AOC.

As of 2003, Buffalo Niagara Riverkeeper has served as the coordinator of the Buffalo River Remedial Action Plan (RAP) and the Buffalo River Remedial Advisory Committee (RAC). This chapter, however, has been prepared by Riverkeeper based on our own interpretation of the data reported by Buffalo State College and Youngstown State University, and is therefore outside of the RAC recommendations of required actions.

8.2 About Buffalo Niagara Riverkeeper

Buffalo Niagara Riverkeeper (formerly Friends of the Buffalo Niagara Rivers) is a not-for-profit organization dedicated to promoting, preserving and protecting the natural and historical environments of the Buffalo and Niagara Rivers and their environs for the benefit of the local community. Riverkeeper's mission is to improve waterfront access, restore watershed ecology, conserve river heritage, and cultivate river stewardship.

8.3 Water Quality

The water quality evaluation using the Hydrolabs at three fixed sites gave a comprehensive overview of the river's dynamics, and used in conjunction with the weekly observations at the 10 potential habitat restoration sites, Riverkeeper feels confident about the adequacy of the data.

Dissolved oxygen has long been known to be a major cause of use impairments of the Buffalo River, and it has been only recently that the complicated relationship between stratification, system hydraulics, SOD and BOD defined the problem. The results of this study support previous findings that DO levels will continue to fluctuate and frequently drop below state guidelines, unless additional, man-made controls are implemented. Some of these suggested controls include the cessation of navigational dredging and allowing the dredge channel to fill in, the implementation of an artificial aeration system within the dredge channel, and even utilizing the existing infrastructure of the BRIC system to increase flows during low-flow periods.

The increased turbidity levels near the river bed are also consistent with previous findings, and will continue to be a problem due to inputs from the upper watershed. Because of the lack of riparian and aquatic vegetation (i.e.: wetlands) to filter particulates, as well as the shoreline erosion and surface water run-off generated in the upper watershed, turbidity will continue to regularly exceed recommended levels. Additional efforts must be made on a watershed level, possibly through the implementation of TMDLs, to address this issue.

Though not in the original work plan for this study, testing *E. coli* levels proved very useful in experimenting with the user-friendly and inexpensive Coliscan Easygel system. The results were consistent with earlier findings, and therefore demonstrate how this system can be utilized by citizens or other user-groups in the future as part of ongoing river monitoring. The data supports the hypothesis that the majority of bacterial contamination is generated from the upper watershed. Whether the contamination comes from a combination of CSO and SSO outfalls, surface water run-off, or leachate from faulty septic systems, because primary contact and bathing continues to be popular uses of the river by local residents, bacterial contamination remains a high priority in the development of an update remedial strategy. Much more attention and resources need to be dedicated to identify and control the sources from the upper watershed such as failing residential septic systems.

8.4 Fisheries

Riverkeeper believes that fish diversity and health has not improved over the last decade based on the data obtained in 2003-04, and compared to data available from fish surveys of the early 1990s. A non-AOC reference community has not been identified yet to allow a comparison of the DELT anomalies rate, however Riverkeeper strongly believe that “a range of 14-87% frequency for the six most commonly found species” is not a natural condition. The 87% rate for brown bullhead is of special concern because this species lives in contact with bottom sediments. These observations continue to support the belief that fish health is degraded by the presence of contaminated sediments throughout the AOC impact area. The 35% DELT rate for largemouth bass, a species that is often caught and eaten by anglers along the Buffalo River, also raises serious health concerns.

Riverkeeper believes that the conversion of the IBI score into a quality rating for the ten habitat sites is a useful tool for comparing habitat sites. Again, by evaluating these ten sites using the stream rating score, all sites have been identified as being “poor” or “very poor.” While these determinations are based on current conditions and the IBI score, we should emphasize that these results alone should not preclude any of the sites from being considered for restoration efforts. Of special concern is the observed “drop” in IBI score for sites 5 and 6. Both sites lie between the two main meanders of the stream with little active industry or known contaminated sites in the adjacent areas, and therefore it would be expected that these sites should score higher. Further investigation of these two sites may be warranted.

Because the electrofishing surveys were conducted in June and August of 2003 and 2004, the results cannot be easily compared with the species composition observed in May-July of 1993. Regardless of the ability to compare the surveys directly, Riverkeeper feels that the surveys conducted adequately represent the diversity seen in the Buffalo River AOC. Follow-up surveys in the near future would be useful to observe the impact of NYSDEC's Walleye Restoration Project. The data generated from the fish surveys will be used to help establish and monitor delisting criteria and restoration targets for fish populations and fish deformities within the Buffalo River.

The only data set that was not obtained as a part of this project for the fisheries of the Buffalo River was tissue sampling for contaminants. According to NYSDEC, a variety of species that could be consumed were last tested in 1993-94 (including walleye, bass, bluegill, perch, eels, and pike) and determined not to pose a threat to human health. Though fish consumption advisories still exist for carp in the Buffalo River and carp is tested periodically by NYSDEC, Riverkeeper believes it appropriate to re-test other consumed species on a regular basis. This analysis can be conducted in association with angler surveys to confirm if there is a tainting of fish flavor, and if the current fish consumption advisories are adequate.

8.5 Benthic Macroinvertebrates

Degradation of benthos continues to be a major beneficial use impairment of the Buffalo River. Based on the data obtained from the benthic sampling and analysis, Riverkeeper believes that there has been no improvement in macroinvertebrate diversity and health during the last decade. Of great concern is the data that shows in-channel community richness decreasing. Riverkeeper agrees with the assertion by Youngstown researchers that the "post-industrial recovery of the Buffalo River in its present state may remain stalled without active remediation."

Of special concern is the low species richness observed at sites 5 and 6. In addition, site 6 had very high density of the pollution tolerant species (tubificid oligochaetes) with very low densities of chironomids. Viewed independently of other data these sites would not be suspect, but combined with the fish survey results and water quality analysis, Riverkeeper feels that further investigation of these two sites is warranted.

Much of the Buffalo River continues to have low species diversity and is dominated by pollution-tolerant species (oligochaetes), particularly at the sites within the navigation channel. In addition, the *Chironomus* larvae sampled within the navigation channel and analyzed for mouthpart deformity was a shockingly high 54.5%. (Just as surprising and even encouraging is that all of the limited *Chironomus* larvae sampled from shoreline sites had normal mouthparts; however, we recommend additional benthic sampling at the shoreline habitat restoration sites to verify the observed 0% deformity rate). Riverkeeper strongly suspects that the ongoing disturbance of contaminated

sediments associated with navigational dredging is a major factor in the high occurrence of benthic deformities in the channel.

In sites where this data supports contaminated sediment remediation, the information generated will prove useful to the ongoing Feasibility Study for Environmental Dredging. In addition, the data will assist the Buffalo River Remedial Advisory Committee in identifying quantitative restoration targets for benthos as well as defining an updated remedial strategy for the Buffalo River.

8.6 Vegetation

The data collected for the vegetation survey will be useful to the ongoing habitat assessment and study of impervious surfaces in the Buffalo River AOC. The findings were not any different from what has been known about the ecosystem for over a decade, and that is the dominance of invasive and non-native species. Where all invasive species in the AOC need to be addressed, of special concern is the dominance of Japanese knotweed. Not only is the knotweed out-competing the other native vegetation, it is a continuously growing physical barrier to shoreline and aquatic habitat restoration efforts. Riverkeeper has identified invasive species in the Buffalo River AOC as a priority and is investigating pilot programs for phyto-remediation and other eradication efforts at selected sites.

8.7 Use Surveys

The use survey was the first time that researchers have attempted to quantify recreational uses of the Buffalo River. Though Riverkeeper generally agrees with the survey methods and adjustments, we still believe that the primary contact use of the river by local residents has been underestimated (i.e.: swimming estimated at 3% of total activity). Humans can come into direct contact with water through other activities such as wading, fishing, and boat launching. For nearly 20 years, the local communities and residents have communicated to Riverkeeper that swimming in the River occurs on almost a daily basis during the warm weather months.

Since very little historical or baseline information exists regarding recreational use of the waterways, it would be useful to continue the survey process in the future. Recreational usage of the Buffalo River is extremely relevant to the recent economic redevelopment efforts for the Inner Harbor and Ohio Street. Much investment in redevelopment and restoration projects is based on economic impacts, or return on investment. By quantifying angler use, boating use, birding, etc., local decision-makers would have a more accurate picture of the benefits that could arise from the redevelopment and restoration of the Buffalo River. Riverkeeper strongly recommends additional surveys on a much larger scale. Combined with a market analysis, additional surveys will help to accurately depict the level of all current and potential recreational activity within the AOC. The market analysis would clarify current recreational conditions and associated economic impacts of recreational activity; identify

opportunities for improving and increasing recreational opportunities; and help develop a market-based strategy.

8.8 Site Matrix

Riverkeeper strongly supports the ranking and evaluation system that was created for the “Site Characterization Matrix.” Because the data and information will be examined by the scientific community, local leaders, and average citizens, the project partners feel justified in simplifying the ranking system for quick and easy interpretation. However, Riverkeeper wants to emphasize that the ranking system is just one of many tools available to decision-makers when prioritizing sites for restoration. Many parameters have not been considered as part of this project, including local community support, upland land use, contaminated sediments, and resources available.

The final scoring for the 10 sites was not without a few surprises. It was expected that most of the sites within the two main meanders of the river (Sites 3, 4, 7, 8 and 9) were found to have the highest potential for restoration and ranked as the top priority areas. However, Riverkeeper is greatly concerned about the low ranking of sites 5 and 6 (adjacent to Concrete Central and the Katherine Street peninsula), that are also located within the two main meanders of the river. Although sites 5 and 6 have high DO levels and high fish diversity, they also have the highest fish deformity rate, lowest benthic rankings and lowest overall water quality scores. These results can not be explained through the data that is currently available from this study, and therefore Riverkeeper strongly suggests continued investigation in and around these sites which include; sediment analysis, water quality testing for contaminants, SPDES permits investigation, the possible impact of noise pollution or other unknown physical disturbance.

Overall, the matrix gives us a strong set of data to review when prioritizing site restoration. In addition, the break-out of site “positives” and “deficiencies” helps us to begin to identify resources needed as well as remedial options available on a case by case basis.

8.9 Next Steps

The data generated from this study will be immediately analyzed and evaluated by USACE as part of the ongoing Feasibility Study for Environmental Dredging. In addition, Riverkeeper will refer to the final study results as it facilitates the Remedial Advisory Committee’s efforts to establish delisting criteria/restoration targets and an updated remedial strategy for the Buffalo River.

Riverkeeper will coordinate an effort to fully investigate sites 5 and 6 regarding its unexplained poor ratings and high deformities. In addition, Riverkeeper will coordinate with the local efforts dedicated to Inner Harbor revitalization in terms of obtaining additional user surveys and a market analysis of the AOC in the near future.

The site matrix has now given local decision-makers another tool in developing priorities for restoration of the Buffalo River. The next step is to identify possible funding sources, generate local community support, and coordinate partnerships for the implementation of recommended actions- as identified by the Buffalo River Remedial Advisory Committee.