onondaga creek

CONCEPTUAL REVITALIZATION PLAN

appendix m: data gaps

Onondaga Environmental Institute

DATA GAPS

The plan was developed for practical reasons: to translate a community vision for the Onondaga Creek corridor into schematic ideas that can be implemented to transform this vital part of the county and city and serve as a foundation for future revitalization. Consequently, there was a need to characterize the physical, biological, and human attributes of the Onondaga Creek corridor. The resulting data is summarized in Chapter 3 of the OCRP. Further, fact sheets in Appendix B show much of this data in further detail.

On the following pages, tables M.1 and M.2 summarize data gaps identified during watershed characterization. Two tables are presented: ecological data gaps and design data gaps. Ecological data gaps represent what is not known about the ecology of the Onondaga Creek watershed. Design data gaps represent unknowns that may be confronted during design of implementation projects.

This is a summary of "unknowns", therefore this compilation is by definition imperfect and incomplete. Limited data may be anecdotal rather than systematic. Data may be unpublished or not available to the public, and may simply be known to exist based on the collective knowledge of Onondaga Environmental Institute (OEI) staff. OEI welcomes additions and corrections to these tables.

Onondaga Creek is divided into segments in the tables (see Figure M.1). Lower Onondaga Creek stretches from the Inner Harbor to Temple Street in the City of Syracuse. Middle Onondaga Creek stretches from Temple Street to the southern Syracuse city boundary (near Dorwin Avenue), and Upper Onondaga Creek stretches from the city boundary to the headwaters at the southern end of Tully Valley and near Vesper, New York. The West Branch of Onondaga Creek is considered its own segment from its headwaters to the confluence with the main branch of Onondaga Creek on the Onondaga Nation.

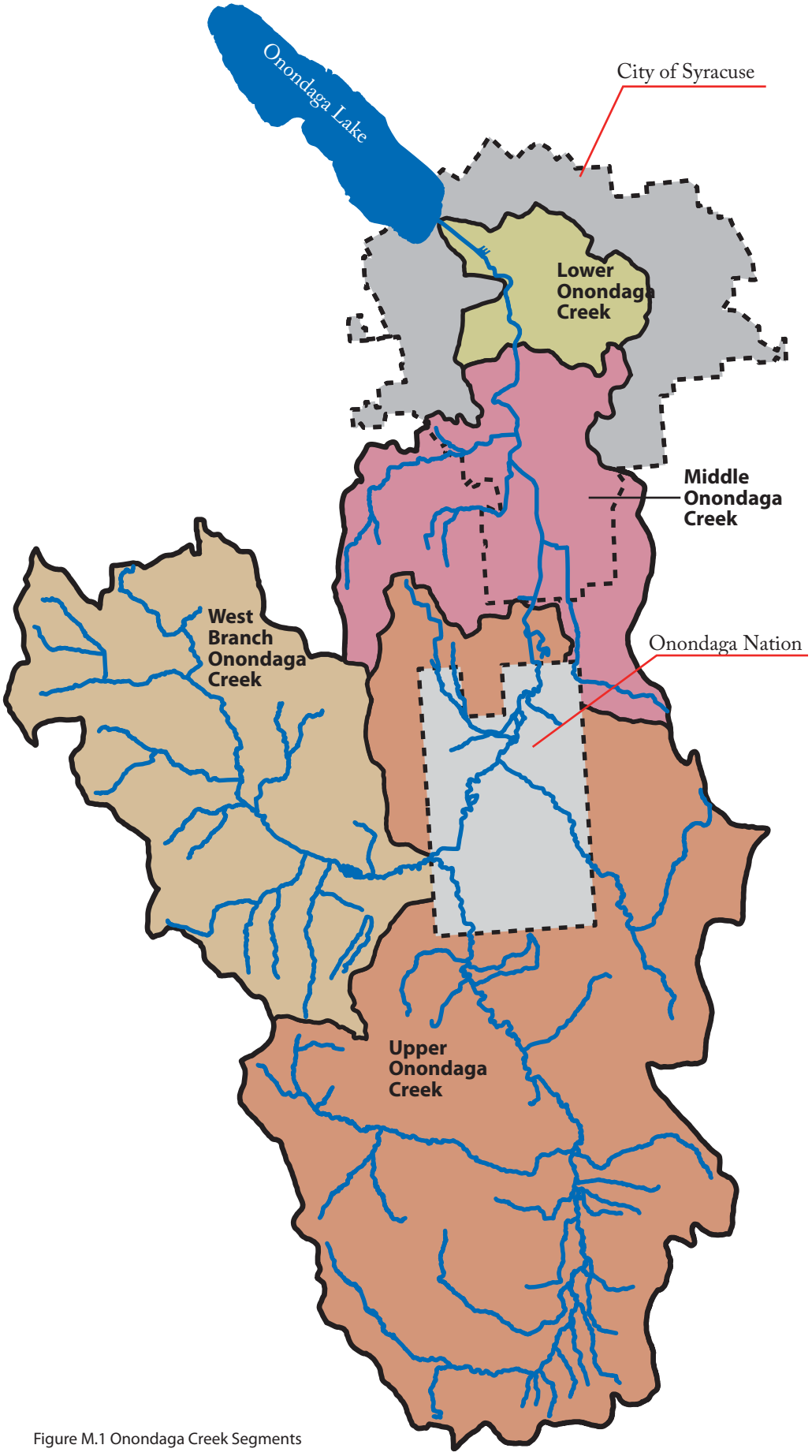

Figure M.1 Onondaga Creek Segments

Table M.1 Ecological Data Gaps

well-documented | limited data | little data

	Onondaga Creek Segment			
Ecological Data Gaps	**Lower**	**Middle**	**Upper**	**West Branch**
Flow stage height				
Water quality parameters (for example, dissolved oxygen and temperature)				
Water chemistry				
Metals (for example, copper)				
Organics (for example, pesticides)				
Sediments				
Metals				
Organics				
Toxicity testing				
Aquatic biota- contaminant body burden[1]				
Benthic macroinvertebrates[2]				
Fish communities				
Aquatic biota- biological assessment				
Benthic macroinvertebrates				
Fish communities				
Aquatic plant communities				
Periphyton communities[3]				
Riparian and wetland biota - biological assessment				
Plant communities				
Avian (bird) communities				
Amphibian communities				
Reptile communities				
Mammal communities				
Invertebrate communities				
Habitat assessment				
Aquatic				
Riparian, wetland, and floodplain				
Watershed (basin-wide)				
Watershed assessment of invasive species				
Pre-1950 hydrology, biology and water chemistry baseline data				

[1] Contaminant body burden is a measure of total amount of toxic substances that have built up over time in the body of an organism.

[2] Benthic macroinvertebrates are aquatic animals without backbones, living in or on sediments, which can be seen without a microscope. Worms, mayfly larva, and crayfish are examples.

[3] Periphyton communities are an assemblage of algae, macroinvertebrates, and bacteria firmly attached to solid surfaces under water.

Table M.2 Design Data Gaps **well-documented** **limited data** **little data**

	Onondaga Creek Segment			
Design Data Gaps	**Lower**	**Middle**	**Upper**	**West Branch**
Adequate safety measures				
Creek corridor access				
Crime prevention				
Extent of legal liability				
Lighting without ecological harm				
Identification of native plant species for natural barriers				
Identification of effective safety systems				
Locations of historic sites and structures				
Riparian buffer/green infrastructure/best management practices (BMPs)				
Land available to mitigate effects of runoff				
Landowner cooperation				
Municipal policy/regulatory support				
Characterization of the drainage system: stormwater and sewersheds				
Menu of locally-appropriate BMPs, green infrastructure remedies; assessment of effectiveness				
Potential open space network				
New residential/business development planned in ecologically sensitive areas				
Channel reconfiguration/renaturalization				
Adequate flood prevention/stream network analysis				
Landowner cooperation				
Municipal policy/regulatory support				
Climate change impact [4]				

[4] More modeling of climate change impacts on local water resources is needed, including dissemination of results. Helpful reports summarizing impacts on water resources at a larger scale are available from the Union of Concerned Scientists (UCS) Northeast Climate Impacts Assessment collaboration (www.northeastclimateimpacts.org), including the 2007 report, *Confronting Climate Change in the U.S. Northeast: Science, Impacts and Solutions* and the 2006 report, *Climate Change in the U.S. Northeast: A report of the Northeast Climate Impacts Assessment*; UCS and Ecological Society of America's *Confronting Climate Change in the Great Lakes Region: Impacts on our Communities and Ecosystems* (2003, updated 2005) available from www.ucsusa.org/greatlakes/; and Palmer et al. 2008. *Climate change and the world's river basins: anticipating management options*, in Frontiers in Ecology and the Environment 6(2):81-89. Also pertinent to creek revitalization, the Urban Land Institute documents research on combating climate change by altering urban development patterns in their 2007 report, *Growing Cooler: The Evidence on Urban Development and Climate Change*, available from www.uli.org. The US Department of Agriculture (USDA) Forest Service's Northern Research Station supports an on-line climate change atlas for tree and bird species at http://nrs.fs.fed.us/atlas/.

The following four excerpts are from Onondaga Environmental Institute's (OEI) **Onondaga Lake Tributary Assessment** submitted to New York State Department of Environmental Conservation, the Onondaga Nation and U.S. Environmental Protection Agency on February 22, 2008.[5] Source files from the document are listed in each excerpt. The **Onondaga Lake Tributary Assessment** is based on literature review. This information is provided as a descriptive, technical supplement to Table M.1, Ecological Data Gaps. It addresses aquatic data gaps only, in relation to chemical contaminant monitoring in Onondaga Creek.

Lower Onondaga Creek Data Gap Evaluation
(Source file: *Chap 6A-lowerOnonCr v04bb***)**

The following critical information was not located by OEI in available sources and/or would merit supplementing in future field work:

- The most recent fish tissue data are from 1989. More up-to-date data for PCBs, mercury and other pollutants are urgently needed.[6] Data are lacking for known contaminants in the sediments, including: PAHs, non-metals (arsenic) and metals (cadmium, chromium, copper, iron, lead, mercury, silver, zinc).[7]
- Sediment samples are concentrated in a single area. More spatial coverage, and more recent data are recommended.
- The only information regarding chemicals in macroinvertebrates stems from a crayfish and a caddisfly collected in 1990. These organisms serve as useful indicators of local pollution. Sampling of macroinvertebrates for a broad range of contaminants would help define the current geographic extent of bioaccumulative substances within Onondaga Creek, and would not be confounded by the influence of Onondaga Lake.
- Onondaga County conducts regular monitoring of basic water chemistry (DO, pH, TDS, etc.) and trace metals at Kirkpatrick Street. However, there is no regular monitoring of trace organic compounds such as PCBs and PAHs. This is certainly warranted given the known sediment contamination. Monitoring at upstream locations appears to be warranted as well.
- Sediment toxicity testing data were not located.

West Branch of Onondaga Creek Data Gap Evaluation
(Source file: *West Branch Onondaga Creek - narrative summary v05 djg***)**

The following critical information was not located by OEI in available sources and/or would merit supplementing in future field work:

- OEI did not locate any results of contaminant analyses in fish, macroinvertebrates, sediments, or surface water for the West Branch of Onondaga Creek.
- OEI did not locate any regular monitoring data for standard water quality parameters (e.g., DO, pH, TDS) for the West Branch of Onondaga Creek.
- Sediment toxicity testing data were not located.
- Biological community and habitat assessment data are very sparse and should be augmented.

Middle Onondaga Creek Data Gap Evaluation
(Source file: *Chap 6B-mid OnonCr v06djg.doc***)**

The following critical information was not located by OEI in available sources and/or would merit supplementing in future field work:

- OEI was unable to locate any fish or macroinvertebrate tissue analysis data for this segment.
- OEI was unable to locate any sediment sampling data for this segment.
- Onondaga County conducts regular monitoring of basic water chemistry (DO, pH, TDS, etc.) and trace metals at Dorwin Avenue. However, there is no regular monitoring of trace organic compounds of any type.
- Sediment toxicity testing data were not located.

[5]This document is available upon request from OEI in compact disk format.

[6]Polychlorinated biphenyls (PCBs), synthetic organic chemicals once used industrially, are persistent environmental contaminants.

[7]Polynuclear aromatic hydrocarbons (PAHs), found in coal, petroleum and byproducts of combustion, are persistent environmental contaminants.

Upper Onondaga Creek Data Gap Evaluation
(Source file: *Chap 6C-upper OnonCr v05bb***)**

The following critical information was not located by OEI in available sources and/or would merit supplementing in future field work:

- Surface water contaminant data is very sparse in Upper Onondaga Creek, limited to a single sample at Webster Road. in 1990. Considering the elevated metals in that sample, and elevated PCBs and mercury in fish in 1989, a sampling program for chemicals in water is warranted throughout the Upper Onondaga Creek segment.
- OEI was unable to locate any sediment sampling data for this segment.
- Contaminant data in biota (fish and macroinvertebrates) were very sparse.
- Considering the findings of elevated PCBs and mercury in fish tissue, a survey of all media throughout the Upper Onondaga Creek watershed is warranted.
- Sediment toxicity testing data were not located for this segment.