CHAPTER 7:
Constraints

A multitude of factors will need to be addressed in order to move forward with the implementation of the Onondaga Creek Conceptual Revitalization Plan (OCRP) including flood management, safety issues, rural development and impacts of the urban zones through which the creek flows. This chapter surveys constraints and data gaps that will influence steps toward revitalization on Onondaga Creek. Constraints restrict the ability to act. The challenge for the community is to turn existing constraints into opportunities. Constraints and associated opportunities are summarized in Table 7.1.

In many instances, the failure to act is a direct result of missing information. Sometimes, the lack of understanding is so profound, even the questions are unknown. The ongoing watershed characterization of Onondaga Creek affords the opportunity to identify where gaps in collective knowledge exist about the watershed.[1] Identifying data gaps highlights areas where more information will be needed before complete revitalization can be accomplished. Identification of constraints and data gaps leads to solutions for revitalization, as illustrated in Figure 7.1.

[1] Watershed characterization is defined in Chapter 1.

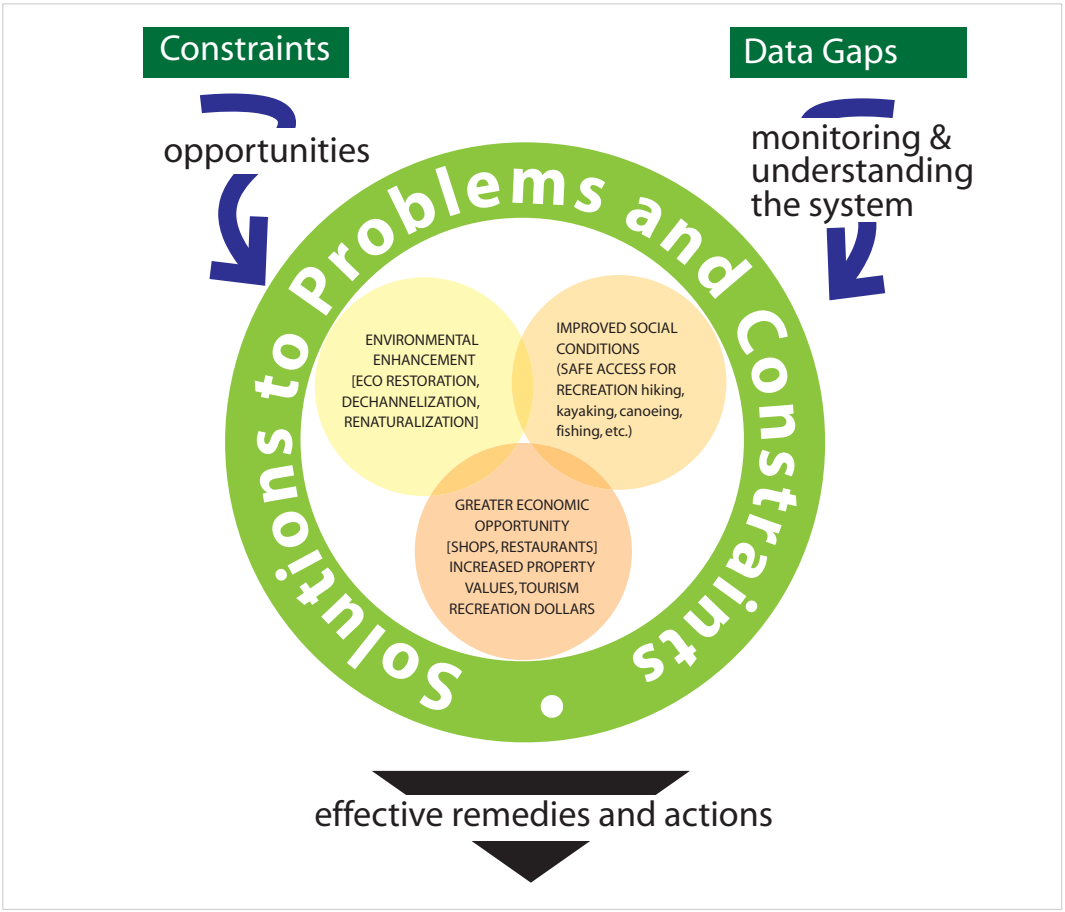

Figure 7.1 Identification of constraints and data gaps can lead to solutions for creek revitalization.

Constraints

Social and Economic Constraints

Fragmented government: jurisdiction, management, liability and land use challenges

The Onondaga Creek watershed is situated within the boundaries of several governmental *jurisdictions* (see Figure 1.3); no single agency is dedicated to regulatory control of Onondaga Creek.

Although the entire watershed is within the historical lands of the Onondaga Nation, and that of environmental concern under the Onondaga Land Rights Action (2005), the current sovereign territory of the Onondaga includes the central portion of the watershed.

No single federal, state, or local agency has regulatory authority over all environmental aspects of Onondaga Creek. Multiple government entities work in the watershed with varied levels of coordination.

Currently no single or umbrella organization exists for the sole purpose of managing the Onondaga Creek watershed. No comprehensive plan exists for the Onondaga Creek watershed.

Several plans, reports and design workshops have considered parts of the corridor or focused on certain aspects of revitalization. They are described in Appendix K. However, past government leadership did not appear to value the linkages between environmental, social and economic conditions. There has been a lack of resources and commitment to develop a comprehensive plan or management effort for Onondaga Creek.

The Onondaga Lake Partnership (OLP) is responsible for managing and overseeing the cleanup of Onondaga Lake; however, minimal attention and resources have been dedicated to the tributaries. The current OLP Management Plan for Onondaga Lake incorporates the Amended Consent Judgment (ACJ) with those sections of the **1993 Plan of Action**[2] that are not pertinent to sewer improvement projects. Recommendations in the current plan for the lake have potential to influence the tributaries. However, the primary focus of the OLP has been implementation of the ACJ. The many projects of the ACJ are intended to meet ambient *water quality standards* in Onondaga Lake.

Notable exceptions are mudboil control and **Agricultural Environmental Management** (AEM) projects. The Natural Resources Conservation Service and the Onondaga County Soil and Water Conservation District conduct a rural AEM program that implements best management practices to reduce nonpoint source pollution (sediments, fertilizers, pesticides) from farms throughout the Onondaga Lake watershed including that of Onondaga Creek. The AEM program does not address urban runoff. The OLP has sponsored, maintains, and is planning additional remedial measures to mitigate mudboil sediment discharges to Onondaga Creek, in cooperation with the U.S. Geological Survey (USGS) as technical advisor (see Chapter 3).

The OLP has authorized the U.S. Army Corps of Engineers to conduct an Onondaga Lake watershed study, which incorporates the watersheds of several lake tributaries, including Onondaga Creek. The study is ongoing.

Aversion to risk, municipal liability and rigid government policies constrain creative solutions to revitalization.

The current channel configuration presents a drowning hazard and sewer releases are a health concern. Legal *liability* hinders municipal incentive to make improvements to the creek corridor. Potential liability may increase as citizens take advantage of improvements and the corridor is more heavily used. Concerns for drowning hazards and associated liability have led the City of Syracuse to strictly control access to the creek.

Historically government agencies have displayed a low level of risk tolerance for the natural process of flooding. This perpetuates the channelized form of Onondaga Creek. The mowing regime in the flood control channel constrains riparian habitat. Policies that include practices such as the stocking of non-native fish for recreational fishing constrain native fish populations, such as brook trout.

No comprehensive or consolidated land use approach currently exists for the Onondaga Creek watershed.

No municipality within the Onondaga Creek watershed possesses *zoning regulations* designed

[2] The **1993 Plan of Action** was drafted under the auspices of the Onondaga Lake Management Conference and was never authorized as mandated by congressional statute.

to protect the ecological integrity of the creek or aesthetic value of rural valleys. Unchecked development in the floodplain, environmentally-sensitive areas, and valley walls has and will continue to degrade water quality, habitat, and landscape views should existing land use policies continue into the future. Conventional building practices increase impervious cover and avoid managing the detrimental effects of runoff. Municipalities often are reluctant to exert land use control measures. Finding a balance between preserving owner property rights and imposing restrictions for the public benefit is a difficult task. Nevertheless, zoning is a tool that municipalities can apply for environmental protection.

Agricultural lands are at risk due to economic pressures resulting in unplanned suburban sprawl. Agricultural lands can be banked, which means land is set aside or not developed for other uses. Federal, state and private land trusts can bank agricultural land through farmland preservation programs.[3] Many farmers cite the banking program incentives are not comparable to future economic development returns.

Fragmented community: lack of capacity to implement meaningful environmental revitalization

Communications are limited both among diverse stakeholders and between geographical neighborhoods along the Onondaga Creek corridor.

The Onondaga Creek watershed is home to a multitude of cultures, people from diverse religious and socio-economic background, and ethnicity. Time constraints and lack of trust among individuals often negatively affects organizations, institutions, and communities. There are limited opportunities for the community to find a common forum to work together, "think like a watershed", and coordinate environmental improvement.[4]

Input gathered from goals and concerns solicitation meetings revealed that Central New Yorkers realize that creek restoration can be an instrument for broader community revitalization. The community in general, however, struggles to capitalize on the connection between environmental enhancement and social improvement.

Many pressing societal needs confront the watershed community, especially in the City of Syracuse. Most community groups and religious organizations are focused on specific missions, for example, housing, public health, and education, without leveraging environmental improvements to enhance their efforts. There are many exceptions, such as the Partnership for Onondaga Creek, the Zen Center of Syracuse, the Dunbar Center, the Neighbors of Onondaga Nation and the Syracuse Peace Council, and the many sport and environmental organizations in the area.

Further, limited coordination between organizations with an environmental mission, including several working within the Onondaga Creek watershed can be identified as a constraint to revitalization, as this prohibits coordination of efforts and pooling of resources.

Budgetary priorities

Current funding priorities constrain implementation of revitalization in the Onondaga Creek corridor. Beyond SUNY College of Environmental Science and Forestry (SUNY ESF)-based research projects, no current funding is dedicated to *channel reconfiguration* and *renaturalization* of Onondaga Creek.[5]

Existing projects pertaining to Onondaga Creek improvements are limited in geographic range (i.e. rural AEM program) and scope (Creek Walk).[6] A flexible, comprehensive funding strategy will be needed over the long term to accomplish creek revitalization that successfully reflects community goals (see Chapter 8).

Historically, economic development projects have overlooked the long-term benefits of repairing existing environmental damage; infrastructure projects have not considered potentials for ecological restoration.

Development throughout the corridor ignores the potential of Onondaga Creek as a waterfront property. Recent building designs along Onondaga Creek fail to capitalize on the economic, social, and environmental benefits observed in other cities that have revitalized their waterways. Current projects, such as the Near Westside Initiative, the Connective Corridor and the Metropolitan Development Association's Creative Communities program have begun to incorporate these concerns into their planning efforts (see Chapter 6). The City of Syracuse plans to implement the Local Waterfront Revitalization Program and develop three sites along the creek.

[3] Some of these programs are described in Chapter 8.

[4] This phrase is inspired by a video documentary of community-based restoration work on the Mattole River in Humboldt County, California.

[5] In particular, research conducted by Dr. Ted Endreny and Dr. Don Leopold and their graduate students.

[6] The Onondaga Creek Walk is funded via New York State Department of Transportation monies that limit the scope of improvements to those that can be considered transportation amenities.

Table 7.1 Transforming constraints into opportunities.

Constraint	Opportunity
Multiple government jurisdictions	• Intermunicipal cooperation • Coordinating watershed group • Implementation of OCRP
Lack of coordinating entity in the watershed	
Lack of comprehensive plan	
Lack of comprehensive land use approach	
Risk aversion/rigid government policies	
Limited communication among watershed stakeholders	
Limited coordination among organizations working in watershed	
Lack of dedicated funding for dechannelization and renaturalization	
Linking economic conditions and ecological integrity of Onondaga Creek	
Municipal legal liability	• Renaturalization and channel reconfiguration • Basin-wide "green" practices to manage storm water: green infrastructure, best management practices • *Infrastructure* improvements (e.g., roads, sewers) • Increase monitoring and assessment
Pathogen contamination	
Fish contamination	
Turbidity and sediment	Mudboil and erosion remediation
Channelization	Channel reconfiguration

Environmental Constraints

Environmental constraints are derived from current conditions in the Onondaga Creek watershed. Chapter 3 provides more detail about current environmental conditions in the watershed.

Water quality/chemistry

The potential for pathogen contamination and turbidity (see sediment quality) restrict human contact with water. Fish contamination constrains human consumption. Multiple combined sewer overflows (CSOs) discharge raw sewage during storm events. The Midland Avenue Regional Treatment Facility is designed to mitigate CSOs, yet will still release partially-treated wastewater into Onondaga Creek when capacity is surpassed during large storm events. Discharge frequency to Onondaga Creek is unknown, however, the potential for release of wastewater containing nitrogen, phosphorus, and small quantities of byproducts of *chlorination* and dechlorination will impact water chemistry of the creek after some storm events.

Sediment quality

Suspended sediment constrains visibility into the creek, preventing swimming and hindering boating and fishing. Fine sediment beds constrain aquatic biota by degrading their habitat, limiting nesting sites and precluding reproduction.

Channelization

Channelization alters or eliminates natural stream habitat and constrains the natural exchange between riparian and aquatic habitats. Lack of riparian vegetation precludes aquatic and riparian biota (e.g., birds, insects, amphibians, plants, reptiles, and mammals). Channelization, combined with *impervious cover*, creates an urban water flow regime that restricts access and ability of aquatic biota to withstand high water flow events.

Acknowledging that constraints exist is the first step towards revitalization. The challenge is to turn them into opportunities. Solutions for transforming constraints into opportunities are proposed in Table 7.1. Opportunities suggested are based on Working Group watershed recommendations listed in Chapter 5.

Data Gaps

The OCRP was developed to translate a community vision for the Onondaga Creek corridor into schematic ideas to 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 are summarized in Chapter 3 of the OCRP. Further detail is provided in a series of fact sheets contained in Appendix B.

In Appendix M, **Data Gaps**, 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 ecological character of the Onondaga Creek watershed. Design data gaps represent unknowns that may be confronted during design of implementation projects. The data gaps range from unknowns regarding invasive species to the impacts of climate change on the Onondaga Creek watershed.

The Advantages of Monitoring

Watershed monitoring is a critical aspect of revitalization. Monitoring provides information about watershed health and function and the impacts of human activity. Monitoring identifies specific threats and impairments to watershed health. Watershed groups use monitoring information to prioritize their efforts (USEPA 2001).

Monitoring and research are also imperative for measuring success of restoration projects (see Chapter 8). Sometimes, information is transferable from other systems. Frequently, information needs to be watershed specific. In spite of obvious advantages, monitoring is not universal. In a recent evaluation, only ten percent of river restoration efforts in the United States were found to have any form of monitoring or assessment (Bernhardt et al. 2005). This can be attributed to draining of project resources by the end of construction or installation, so that post-monitoring is abandoned (Gillilan et al. 2005). However, without it, restoration managers are unable to determine what needs fixing and what types of projects are accomplishing their stated goals (Bernhardt et al. 2005).

In addition to project monitoring, the data gaps presented in Appendix M illustrate the need for more and better data about the Onondaga Creek watershed. This is prevalent throughout the United States. A 1998 survey found that only twenty-three percent of the nation's rivers and streams are monitored (USEPA 2001). Existing data can be uncoordinated and inconsistent. Finally, biological monitoring is the least common type of monitoring, as reflected in Onondaga Creek watershed data gaps. Biological monitoring assesses the diversity of living organisms and is considered to be the most complete measure of watershed health (USEPA 2001).

In the course of producing the OCRP, much has been learned about the natural and human history of the Onondaga Creek corridor. Learning will continue, particularly with dedicated resources and cooperation. Even though constraints and data gaps exist, much can be done based on what is currently known. More knowledge is not a luxury, but necessary for some steps in the process. The lack of information should not be used to stop progress, but to identify information needs for the future.


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