

1.4.3 Lower Brown’s Creek Ravine (Gorge)

The gradient of Brown's Creek changes dramatically as it descends into the St. Croix River valley downstream of the historic Stone Arch Bridge. Within this reach, Brown’s Creek flows through a deep valley where the creek channel has cut into the Tunnel City Group bedrock formation, hence the name Lower Gorge. It is within this reach that cold groundwater provides a major component of the base flow to Brown’s Creek, thus providing one of the key elements necessary to support a coldwater fishery. The direct drainage area within this subwatershed is limited to a relatively small drainage area adjacent to Brown's Creek. Most of this drainage area is forested with scattered large-lot residential development. The Lower Gorge generally consist of two types of vegetative communities: maple-basswood forest, and mixed hardwood seepage swamp.

Native Plant Community Description

The natural communities within this area are located within the ravine. There are good quality mesic oak forests and maple-basswood forests within the ravine. There is also a dry oak forest along the top of the ravine to the north. These natural communities help protect Brown’s Creek by preventing erosion of the steep slopes and by shading the water.

The Rare Features Value for this site section of the creek is high. Several communities within the ravine are mapped on the Natural Communities and Rare Species Map for Washington County, including Kittentails, a state-listed Threatened plant. In 2015 surveys were conducted in high quality vegetation communities identified in the MLCCS mapping and as site 6D in the 2001 NRI.

In 2015 one site in the headwaters area was surveyed. Table A-19 summarizes the findings of this survey.

Table A-19. Lower Ravine Natural Communities Surveyed in 2015

Site ID (as identified in the 2001 NRI)	2015 Site Description	Results/2001 to 2015 Comparative Analysis*
6D		In 2015 two sample sites were selected based on landscape position and ease of access. Two MNDNR releve data sheets including natural community descriptions and plant species lists document findings of the 2015 survey. Vegetation data from 2015 confirm a diverse plant community exists although both buckthorn and Tartarian honeysuckle were found in 2015 and not documented in the 2001 survey.

* Two MNDNR releve data sheets including natural community descriptions and plant species lists document findings of the 2015 survey. These data sheets can be found in the Unique Species Inventory (2016).

Bird Habitat Description

Three bird species that have a preference for mature forests associated with streams include the Louisiana waterthrush (*Parkesia motacilla*), Acadian flycatcher (*Empidonax vireescens*), and Cerulean warbler (*Setophaga cerulea*). These three species are listed by the MNDNR as “species of special concern” and also listed as Species of Greatest Conservation Need (SGCN). In 1988, the Minnesota County Biological Survey (MCBS) documented a pair of Louisiana waterthrushes along the Brown’s Creek gorge. Although no nest was found during the survey, the surveyors concluded there was good evidence of breeding occurring in the area. There has been no documented evidence of Acadian flycatcher and Cerulean warbler within the lower gorge, but it is possible sufficient habitat exists to support these species during the breeding season. It should be noted that all three of these species have been observed at Falls Creek SNA in northern Washington County. Falls Creek SNA is similar to the Brown’s Creek gorge since both areas contain steep wooded ravines with swift flowing creeks. The relative proximity of these two areas increases the likelihood of these species utilizing the Brown’s Creek corridor during the breeding season and migration.

Macroinvertebrate Habitat Description

Macroinvertebrates were sampled from several habitat types within the Brown’s Creek Gorge. Of the three sites sampled for the Unique Species Inventory (Headwaters, Central, and Gorge), the Gorge site contained the lowest taxon richness (26 taxa represented). The Gorge site contained one Perlodid stonefly, and large numbers of Uenoidae and Limnephilidae caddisflies. These taxa have a low pollution tolerance and are indicative of good water quality and sufficient dissolved oxygen. The single Perlodidae stonefly was the only specimen collected from all three sites.

The Met Council has collected macroinvertebrate samples in the Brown’s Creek Gorge near the Highway 96 crossing dating back to 2001. The following is an excerpt from the Met Council Report: Comprehensive Water Quality Assessment of Select Metropolitan Area Streams Brown’s Creek- December 2014: *The results from the biological monitoring suggest that Browns Creek has a diverse, healthy macroinvertebrate community and good water quality. While the FBI (Family Biotic Index) scores indicated the presence of some organic pollution during most years of monitoring, there were pollution intolerant taxa present in every sample except 2002. All of the M-IBI scores were above the upper confidence level and the threshold of impairment, with the most recent score (2011) the highest calculated over the period of study. Overall, the monitored stream reach habitat and water quality were able to sustain the needs of aquatic life.*

Fish and Fresh Water Mussel Habitat Description

The following is from an excerpt from the 2001 Natural Resource Inventory: The lower reaches of Brown’s Creek are designated as Trout Waters by the MNDNR (MN Rules 7050.0420). The lower reach is stocked annually with 800 yearling Brown trout (*Salmo trutta*) by MNDNR Fisheries. Based on MNDNR surveys, little natural regeneration of trout has occurred in recent years. Most likely, poor natural reproduction is due to warm stream temperatures. Other fish species documented during MNDNR surveys include: creek chub (*Semotilus atromaculatus*), fathead

minnow (*Pimephales promelas*), brook stickleback (*Culaea inconstans*), pearl dace (*Semotilus margarita*) and long-nosed dace (*Rhinichthys cataractae*). Interestingly, while conducting the mussel survey in 2015, a Rainbow darter (*Etheostoma caeruleum*) was captured and photographed in the Brown's Creek gorge. This individual represents the 2nd record of this species in Brown's Creek. The first known record of a Rainbow darter in Brown's Creek was sampled by the MNDNR in 1976.

The mussel survey was conducted in the Brown's Creek gorge on October 13, 2015. Survey efforts focused on riffles in the lower gorge where the potential for mussel occurrence would be greatest. No live specimens of mussels were found, but numerous fingernail clams in the family Sphaeriidae were observed in the riffles. This is a common species found in many Minnesota streams. Interestingly, an old mussel valve (shell) was found upstream of the Highway 96 box culvert. Regional malacologists from the MNDNR concluded that the identity of this specimen was likely a Plain pocketbook (*Lampsilis cardium*). The origin of this specimen is unknown, but it is possible Brown's Creek once supported at least one species of native mussel in the lower gorge. If host fish from the St. Croix River are able to freely swim upstream into the lower gorge of Brown's Creek, it is possible glochidia from certain mussel species could be dispersed by their fish hosts and colonize the riffles that occur in the lower gorge.

Amphibian and Reptile Habitat Description

The steep wooded bluffs, rock outcroppings, riparian and groundwater seepage habitats provide an excellent assemblage of habitats that support a high diversity of herpetiles. In particular some of the less common/rare snake species as well as lizards may utilize the wooded areas and outcrops. The ephemeral wetlands and mesic forests support species such as salamanders and less common frog species. This reach does not provide significant habitat for Blanding's turtles.



Brown's Creek Gorge