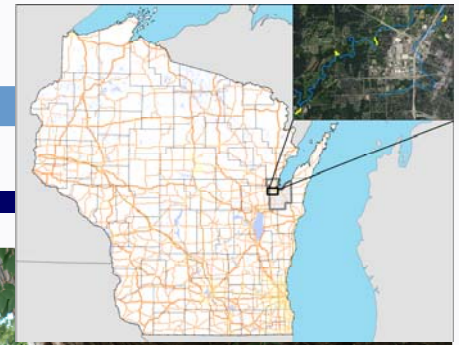


Wisconsin Water Quality Handout

Lower Duck Creek 2015 (EGAD 3200-2018-66)



Watershed Details

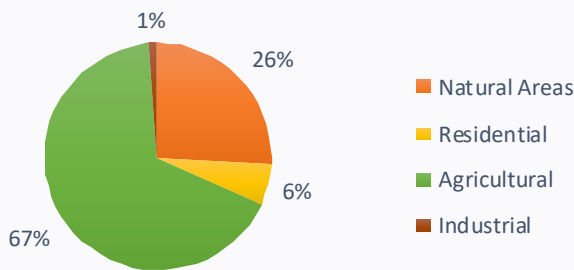
The Duck Creek watershed in Brown County is predominantly agricultural in the upper regions and becoming more residential and urban near the mouth in Green Bay. In 1996, a priority watershed plan was developed for the Duck, Apple, Ashwaubenon Creek watersheds, to address potential non-point sources of phosphorus and sediment.

Monthly water chemistry samples were collected by citizen monitoring volunteers from May to October. In addition, habitat, fish and macroinvertebrates surveys were conducted by the Wisconsin DNR at sites throughout the watershed to assess the physical and biological conditions of streams in the watershed.



Walleye on Duck Creek at Pamperin Park.

Duck Creek Watershed Land Use



Physical Habitat

Streams in Lower Duck Creek are located in areas of urban and residential land use. Fine sediments dominate the substrate in most places. Fish cover is lacking at Memorial Drive and STH 54. Habitat scores rated as good at all locations in the Lower Duck Creek.

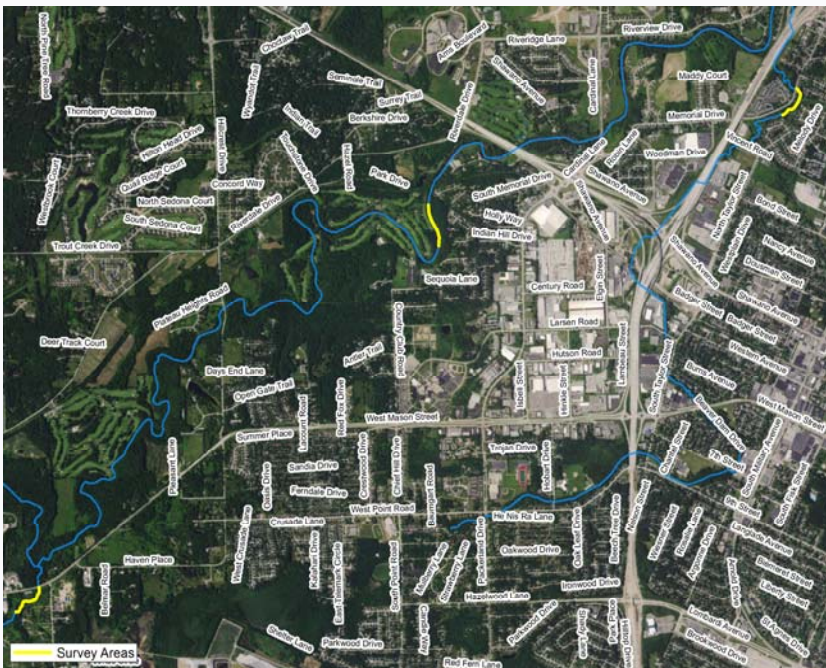
Chemical

Monthly Total Phosphorus concentrations at Pamperin Park were all above Wisconsin's Water Quality Standard of 0.075 mg/L. In June, a high concentration of Total Suspended Solids was likely sampled around a storm event, indicating sediment delivery to the stream. Dissolved Phosphorus constituted a significant portion of the Total Phosphorus concentration.

Biological

The three survey locations of the Lower Duck had a total of 24 fish species. Rock Bass and Smallmouth Bass, which were captured in this area, are intolerant to environmental degradation. Gamefish captured in the surveys also include Northern Pike, Largemouth Bass, and Walleye. Non-native, Invasive Round Gobies are well established in Lower Duck Creek. Indexes of biological integrity (IBI) of fish data ranged from good to excellent. Macroinvertebrate samples were collected at all three locations and the Macroinvertebrate IBI rated from Fair to Good showing some signs of stressors that are impacting the macroinvertebrate community.

Map of Lower Duck Creek



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Management Recommendations

Soil Health principles should be adopted to improve infiltration along with sediment and nutrient retention on agricultural lands in the watershed. Construction site erosion control needs to be properly planned and maintained to adequately prevent erosion and soil losses during events. Urban storm water best management practices should continue to properly site treatment ponds and consider additional infiltration practices to reduce the rate of storm water delivery to the streams. Re-establishment of adequate vegetative buffers along stream corridors could include the removal of undesirable species such as box elder and buckthorn allowing for the management of more desirable tree species. Providing a thinned tree canopy along the stream bank would allow establishment of native shrubs and grasses that would further help to stabilize exposed soil in the understory. Conservation practices to improve infiltration and decrease dissolved phosphorous should be a high priority in this sub-watershed.

| Duck Creek at Pamperin Park | May | Jun. | Jul. | Aug. | Sep. | Oct. | 90% LCI-M* | WI WQ-STD |
|-------------------------------|--------|-------|--------|--------|-------|--------|------------|-----------|
| Total Phosphorus mg/L | 0.094 | 0.314 | 0.172 | 0.122 | 0.159 | 0.0967 | 0.111 | 0.075 |
| Orthophosphate DRP mg/L | 0.0433 | 0.141 | 0.0914 | 0.0735 | 0.111 | 0.0466 | | |
| Total Suspended Sediment mg/L | 7.2 | 61.6 | 13.4 | 11.7 | 11.3 | 4.75 | | |

*Wisconsin applies the lower 90% confidence interval around the median for Total Phosphorus impairment decisions.

Fish and Habitat Ratings

| Stream Site | Fish IBI | Habitat Rating | Macro invertebrate IBI |
|------------------------------------|-----------|----------------|------------------------|
| Duck Creek at Pamperin Park | Excellent | Good | Fair |
| Silver Creek at STH 54 | Excellent | Good | Good |
| Beaver Dam Creek at Memorial Drive | Fair | Good | Fair |



Above: Silver Creek above STH 54.

Left Top and Bottom: Beaver Dam Creek at Memorial Drive.