

Wheatley River Improvement Group 2010 Field Season SUPERVISOR'S REPORT

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INTRODUCTION The fieldwork crew of Wheatley River Improvement Group (WRIG) has finished its summer term. With the help of local landowners, the work crew has taken a significant step towards WRIG's ultimate goal of community based riparian stewardship. A combined 28 weeks of full-time work has resulted in trails being built, reaches of stream being reclaimed and improved, native trees being planted, and a complete riparian assessment performed.

TRAILS Approximately 2 kilometers of trail was established around the lower reaches of Wheatley River. It begins at Rackham's Pond and moves up until the river forks, whereupon the trail crosses the water and loops back to Rackham's Pond on the other bank. The trail was installed in late June and provided a challenging hike as well as a natural wildlife-viewing venue. Unfortunately, due to the high rate of growth of *Rubus strigosus* and *Phalaris arundinacea*, coupled with minimal hiker traffic, most parts of the trails have become overgrown. The work put into the trail by the field crew should therefore be viewed as a preliminary rough draft for future field crews to improve upon. The portion between Rackham's Pond parking lot and the Duck's Unlimited Pond is an exception. A week of work established a wide, solid, well-packed path. Ideally, the final trail will resemble this area.

FLORA Over 800 trees and shrubs were planted in the riparian and buffer zones of the lower reaches of the Wheatley River. Some ancient trees (*e.g.*, *Tsuga canadensis* and *Betula alleghanensis*) do grow within the watershed, however, the majority of tree stands are primarily constituted of *Picea alba*, *Acer rubrum*, *Betula alba*, *Abies balsamea* and *Sorbus americana*. Native tree seedlings were planted in existing stands of trees to reinvigorate proper biodiversity. Additionally, reclaimed riverbanks and fields were planted with seedlings to ensure that future tree stands maintain a healthy balance of species.

Every seedling was planted as per its preferred niche (as described by PEI Department of Forestry). Close to the river, in the damp clay, *Acer rubrum*, *Thuja occidentalis*, *Larix laricina*, *Amelanchier alnifolia*, *Cornus sp.* and *Salix sp.* were planted. Parts of the riparian and buffer zones that maintained well-drained soil were planted with *Acer saccharinum*, *Pinus alba*, *Fraxinus americana*, *Quercus rubra* and *Corylus americana*. The planting season was short. It was decided that trees would only be planted in June, when growing conditions were more favorable and there was a greater chance of survival.

The WRIG tree nursery located at Crooked Creek Farm has been disestablished. All trees that were located there have been dug up, and either planted or given to landowners in the Wheatley River watershed.

No invasive plant species were found this year, however a few non-natives were identified (*e.g.*, *Solanum dulcamara*). Rare native species (*Trillium cernuum*, *Smilacina racemosa*, *Arisaema atrorubens*) were identified at multiple sites in the watershed.

RIPARIAN ASSESSMENT A summer student was jointly employed by WRIG and the Hunter/Clyde Watershed to perform stream assessments throughout both watersheds. The focus of the work used the physical characteristics of a given stream site (*e.g.*, water depth, percent sediment, canopy cover, buffer zone size etc.) to provide inference into its relative health. Problem areas (*e.g.*, beaver dams, improper crossings, evident runoff sites etc.) were also identified. Occasionally, members of the work crew would help with stream assessments. The completed assessment of Wheatley River watershed will provide future work crews with a helpful tool to determine which parts of the river require the most immediate work.

The fieldwork crew performed an additional assessment of the river's health based on benthic invertebrate community composition (SEE NOTES).

STREAMWORK Stream work predominated the summer work this year. Over 2 kilometers of clogged stream was reclaimed. Improvement projects took place on both main branches of the Wheatley River. The lower reaches of both feeding tributaries (one flowing from the Little Bungay Road; one flowing from the Art-Ford Cross Road) were active work-sites over the course of the summer.

Alders (*Alnus* sp.) pose a significant barrier to riparian management. They grow in thick stands on the banks and within streams and rivers. Though beneficial in moderation (due to their nitrogen-fixing capabilities as well as providing shelter for fish), alders may cause serious problems in lotic systems. Fierce competition for sunlight between individual plants resulted in most specimens becoming tall and gangly. This morphology is not compatible with the plant's root system (small and shallow root-balls). Ungainly individuals fall into the stream.

At every site that required stream work, hundreds of alders were removed from the stream, where they had caused serious changes in natural flow of the system. Slower water velocity and shifted channels were noted to be directly impacted by fallen alders. All problematic individuals were cut and dragged out of the water. Additionally, alders on the stream bank were removed in eight-foot sections to allow for both better light, and the chance for other species to grow along the river. Any alder that was cut was used for brush-mats: the leafy tops were used directly in the brush-mats, while the limbless trunks were used as stakes.

Brush-mats were installed throughout all the work sites where it was deemed suitable. The inner banks of meanders as well as silt-collecting reaches of the stream were reinforced with brush-mats to collect excess sediment. With the exception of the biodegradable twine used to tie down the brush-mats, all the material used in the construction was taken directly from the around stream (*i.e.*, alders). Work was completed moving from downstream to upstream to ensure that disturbed sediment would be collected in already established brush-mats. Brush-mat size ranged from three meters to over thirty meters; a total of approximately 300 meters of brush-mats was installed.

Immediate improvements were noted after both removing alders from the stream, and installing brush-mats. Water velocity increased, allowing sediment to be washed from the stream bottom, and exposing long stretches of the natural gravel bottom. A massive amount of sediment has already been captured by the installed brush-mats. Perhaps most important: schools of fish (multiple species and age-classes) have been found swimming in improved areas, prior to which they were absent.

ROCKPOOL A day was spent under the supervision of Todd Dupuis (head of the Salmon Federation) constructing a rock pool. The site location was the hanging culvert on the Art-Ford Cross Road. The culvert presented a significant velocity and vertical barrier to fish passage. A work force of seven people moved eight cubic yards of anchoring sandstone and R5 granite into the stream. A large rock was built, which raised the water under the culvert by approximately 25 centimeter. The vertical barrier is mostly diminished, and fish passage is greatly improved.

CONCLUSION Though it feels that the field crew has completed a substantial work-filled summer, there remains enough work for an army. Kilometers and kilometers of the Wheatley River and its tributaries remain to be worked on. Alders need to be cleared, brush-mats installed, trails blazed, garbage picked up and collapsed crossings (*etc.*) removed. More importantly, land-use practices need to change. Sedimentation, nutrient enrichment and forest destruction remain among some of the greatest obstacles to the reestablishment of Wheatley River to its natural state.

Community based improvement groups such as WRIG are perhaps the best solution to redefining the Wheatley River. WRIG and its work crews have made significant progress over the years in their tireless work throughout the Wheatley River watershed. WRIG is an exemplary force for environmental stewardship and ecological protection. It has truly been a privilege and a pleasure to be a part of WRIG.

NOTES Two components have been left out of this year's report, water sampling and garbage collection. The former was not done this year; the latter was done on a daily basis, and no tab was kept on the precise amount of garbage removed from the river.

Trails -- As mentioned, most of the trail system has been overgrown and will require next year's crew to do some reestablishing work. To prevent this in future years, it is advised that the crew maintain the trails at least once per month. Additionally, signs posted at Rackham's pond that show the trail would probably entice more people to go for a hike and thus keep tenacious plants at bay.

Flora -- The best time for tree planting is in the spring and fall. When planted in the heat of the summer, seedlings require watering at least once a day for two weeks. This represents more time than can be spent for the work crew. Tree planting should be the focus of the crew for the first few weeks. As diverse a population of native species should be planted.

A complete assessment of the plant species growing in Wheatley River watershed would be a fun and informative project for future crews. It would provide WRIG with a baseline for species

richness but also a running tab on the presence or absence of rare and/or alien and/or invasive species present.

Some thought should go into the establishment of a littoral zone around Rackham's Pond. Very few species occur in this area. A diverse littoral zone would be beneficial in multiple ways: it would collect silt; it would act as a nursery for all fish species; it would provide habitat for many bird species; it would encourage larger populations of invertebrates and thus provide more food for a larger fish population.

The steep bank near the rapids at Rackham's Pond should be established with plants to hold it from further erosion. Species of *Rosa*, *Cornus*, *Salix* or *Toxicodendron* would all be suitable to hold the erosion in check.

Assessment -- One day was spent attempting an EPT index analysis (including sampling, identification and statistics) of the Wheatley River. This index uses the richness of three insect orders (Ephemeroptera, Plecoptera and Tricoptera) to establish the relative health of a riparian system. These three orders are susceptible to chemical contaminants: a low richness would imply an unhealthy riparian system; a high richness would imply a healthy system. Standard equipment (400µm mesh kick-net) and method (three minute sample time, one hour to pick samples *etc.*) were used.

Table 1. EPT results

These results were not included in the final report as there is too much error for the results to be significant. Due to the number of non-EPT species caught in sample 3, the results are skewed in the Total % EPT, thus giving a false statement for the river's health. But for sample, the results follow the trend as that attained by Purcell study in 2003 (*i.e.*, a relatively healthy richness of EPT species).

If invertebrate sampling is to be done by future crews, significantly more time should be spent in both the sampling and analysis.

Reference: *The River Runs Through It: An Evaluation of the Effects of Agricultural Land Use Practices on Macro-Invertebrates in Prince Edward Island Streams Using Both New and Standard Methods* by Lisa A. Purcell (Master Thesis, UPEI), 2003.