

Landfill Habitat Monitoring

WETLAND AND AQUATIC IMPACT ASSESSMENT PROJECT

Site Location: Northeastern Connecticut
Client: Confidential Client
Date: 2007 – ongoing

The landfill is bounded by a pond and brook to the north, and a river to the east. An assessment of riparian and aquatic habitats is required to meet specific groundwater permit conditions. The site has been sampled for seven years across 17 sample plots. O'Reilly, Talbot & Okun (OTO) is presently in the third year of monitoring



Within each sample plot, plants were identified to the lowest practicable taxonomic distinction (species) and assigned an estimated percent cover. For each plot sampled, two descriptive metrics were reported including (1) plant species richness and (2) relative dominance. Data collected at all plots in a given month (*i*) of sample year (*j*) were pooled across the 17 plots. Using plant species lists generated during each monitoring event, changes in plant species composition across years were examined with a Fager binary similarity coefficient (F_{jk}). The purpose of the similarity coefficient is to transform the raw presence/absence data into a value that measures how similar the species lists are based upon the numbers of shared taxa. This approach also provided a more objective means of identifying change.

River habitat data collected in the field included general channel geometry, substrate type, bank conditions, in-stream habitat types, and USGS determined discharge data (ft³/sec). Sections of the river documented as supporting submerged aquatic vegetation were specifically targeted as part of the aquatic plant survey.

A total of 259 plant species were documented. The plant communities present within the floodplain of the brook and along the river are intact and comprised of a rich assemblage of native species. Invasive species, although present, comprise a small percentage of the overall plant community. The composition of plant communities in the riparian zone is stable and there is no evidence that marked changes in species composition are occurring as a consequence of landfill operation. An assessment of community similarity across years indicates that plant community species composition has remained more or less constant, with similarity coefficients that are moderate-high and range from 0.51 (51%) to 0.73 (73%).

With respect to the presence of submerged aquatic plant stands observed in the river, and other high levels of primary productivity, it is likely that elevated concentrations of limiting macronutrients including phosphorus are primarily responsible. For reasons related to local conditions (upstream sources), it is unlikely that the landfill is contributing to the excessive levels of phosphorus in the river and the establishment of aquatic plant beds in the river adjacent to the site.