



Executive Summary

Fifteen park woodlands were studied in detail to document and map essential forest inventory attributes which form the basis of recommendations for woodland management and long-term monitoring. The study sites included a broad spectrum of ecosystems including: early successional plant communities on abandoned agricultural lands; locally and provincially significant wetlands, forests and woodlands; abandoned savanna ecosystems; and old landfill sites. Ecosystem characteristics varied considerably across the study sites with very few displaying characteristics of long-term natural forest/woodland cover. The majority displayed characteristics of intensive agriculture, resource extraction or other anthropogenic disturbance regimes. Gibbons Park, Windermere Fields and South Thames Terraced Forest are examples of river floodplain ecosystems which are disturbed on a periodic basis by flooding, erosion, and beaver activity. Common natural disturbance factors include Emerald Ash Borer (EAB) (*Agrilus planipennis*), Hickory Bark Beetle (*Scolytus quadrispinosus*), and the distinct lack of elm in its natural habitat suggests Dutch elm disease was a significant factor in the decline of that species. The most significant disturbance factor affecting all sites are variable degrees of buckthorn (*Rhamnus* spp.) infestation with stem densities ranging from 1000 up to 7000 stems per hectare (sph) in the understory canopy shading out and competing with all native vegetation. In the worst infestations, buckthorn is occupying up to 73% of the growing space and having a significant detrimental effect on biodiversity, wildlife habitat, and natural regeneration. In forests/woodlands where buckthorn is not yet established, patterns of colonization appear to be associated with disturbance during subdivision construction, trail development, and human activity. Similarly, bamboo, garlic mustard, periwinkle, and other invasive alien plants (IAP) appear to be colonizing the backyard interface and buffer zones where residents seem to use the woodlands as a dump site for garden waste.

Investigation using air photo interpretation of the University of Western Ontario (UWO) online library yielded some interesting findings; providing valuable insight into the length of time woodland/forests have occupied the site. It is anticipated that using this as an economical screening tool will help the City identify areas that have been under continuous long-term forest cover and are candidates for significant woodland designation. The most significant ecosystem restoration opportunities identified will be the control and eradication of buckthorn and other IAP, estimated at \$190,000.00 across 58 hectares; almost half of the 10 year work-plan budget. Controlling this IAP will help restore the natural ecosystem trajectory and allow the woodlands to transition to mature mixed forest characteristics that better emulate pre-settlement conditions. As IAP are removed from these woodlands, creation of open forest



conditions will benefit wildlife, species and structural diversity; and provide opportunities where under represented species can occupy canopy gaps. Direct seeding and enrichment planting are proposed where seed trees are no longer present and where management objectives identify the need for broadening the species composition and reintroducing a coniferous component to an otherwise deciduous dominated stand type. Coppicing is a recommended technique to conserve valuable genetic resources, reduce the availability of host trees for exotic pests, and introduce structural diversity into otherwise even-aged stands. Juvenile spacing is recommended where understorey pole/sapling regeneration is dense and under-represented species are being out competed by shade tolerant and pioneer species. It is a cost-effective methods of releasing shade intolerant trees where canopy gaps and openings are available.

Two of the study sites are designated significant woodland and after preliminary review, it appears that five additional woodlands meet the criteria and should be included in this designation. It is recommended that these seven sites be prioritized for woodland management funding, including: Forest Hill Woods, River Road Golf Course, Walnut Woods, Woodhull Ravine, Pond Mills ESA, South Thames Terraced Forest and Windermere Fields.

The new forest inventory mapping and attribute database provides the City with an ecosystem based platform that will allow the City to analyze forest resources, produce maps, and analyses to help support and guide decision-making as it relates to the use of these woodlands. This geodatabase will allow staff to easily identify as a desktop analysis: sensitive ecosystems, the presence of species at risk (SAR), constraints to development of trails, location and density of IAP, and location for species targeted for management such as EAB.

The findings of this study lay the foundation for the evaluation of new park woodlands prior to acquisition. Urban Forestry staff have a wealth of experience and knowledge in forest ecosystems, silviculture and ecosystem restoration; and it is essential they are consulted at the earliest stage possible to ensure that the diversity of values provided by new woodlands are optimized for the good of present and future generations.