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Restoration and Management of High-Use Urban Missouri Woodlands and Forests in St. Louis

St. Louis City's urban woodland and forested natural areas were modified, degraded, and/or overly-mature habitats requiring management intervention for ecological health, species diversity, and public safety. To accomplish long-term success in Forest Park's woodlands and forests, restorations and management strategies seeking to "treat the problem not the symptom" was implemented. The most important best management practices for Forest Park's woodlands and forests included forest stand improvement, prescribed burns, invasive and non-native species management, creation of public stewards, and plant material supplementation.

Keywords

urban forest restoration, urban natural area management, urban stand improvement, urban silviculture

INTRODUCTION

St. Louis City's urban woodland and forested natural areas were modified, degraded, and/or overly-mature habitats requiring management intervention for ecological health, species diversity, and public safety. To accomplish long-term success in Forest Park's woodlands and forests, restorations and management strategies seeking to "treat the problem not the symptom" was implemented. The most important best management practices for Forest Park's woodlands and forests included forest stand improvement, prescribed burns, invasive and non-native species management, creation of public stewards, and plant material supplementation.

CONTEXT

St. Louis City's urban woodlands and forests have faced many challenges, including disturbed soils from diverse human use, minimal management, removal of natural disturbances, little natural regeneration, fragmentation, and abundant invasive species. Furthermore, almost half of the City's woodlands and forests were transformed habitats in which turf grass with turf trees could convert into a "wild forest" in which human interference was originally limited (Forest Park Nature Reserve Management Plan 2007). Due to funding constraints, the primary focus for woodlands and forests in St. Louis City for the last hundred years was tree safety. Public perception of such areas was mixed, with many considering the forests unsafe due to their overgrown nature.

In 1993 the Missouri Department of Conservation supplied baseline forest analysis and grant funds to start the professional management of habitats in Forest Park. Forest Park Forever (FPF) assumed and progressed efforts in Forest Park through the staffing and establishment of the Nature Reserve in 2006. Since then, forest and woodland restoration underwent increased efforts and attention.

GOALS

- Reduce or focus resources spent on recurring short-term non-native and invasive species management.
- Improve and sustain long-term forest health and condition through the enhancement of native flora diversity. This includes the enhancement of plant supplementation and replacement success. Flora diversity is to support soil stabilization, competition against non-native species, wildlife, public experience, and habitat health and sustainability.
- Promote long-term habitat improvement through the inclusion of known and learned silviculture best management practices (BMP), such as the reintroduction of natural disturbances, modified for realistic urban expectations and public acceptance. Ensure public acceptance of BMP's through technique modification, creation of stewards, education, and communications.

APPROACH USED

Forest Stand Improvement (FSI)

Forest vegetation monitoring was used to determine need, record baseline state, monitor change over time, perform floristic quality assessment, and help prioritize sites. Stocking rates, trees per acre, and basal area were some of the methods used to guide FSI efforts. Serious efforts to reduce impact and build public support included manually removing material in sensitive sites and timing efforts during frozen ground periods to reduce soil compaction. To alleviate the public misperception of economic incentive, woody material was removed from the site quickly and none piled over a weekend. To enhance seeding success, leaf litter was manually removed or concentrated. Ground prep for seed was essential to the reintroduction of future fine fuels.



Image 1. Progression of Kennedy Forest site before and after restoration and thinning efforts. Prior to restoration efforts shade-tolerant, mesic trees were shading out the native oak and hickory saplings. Seeding, plug planting, and increased light have increased ground story flora diversity over time creating a complex structure.

Prescribed Burns (Rx burns)

Early Rx burns in savanna and prairie habitats allowed FPF to garner support for woodland and forest burns. An initial two-year effort to obtain letters of support and approval from impacted and supporting agencies was crucial to the establishment of a formal permitting process (Buback

2019). A contractor completed all burns due to the cost of liability insurance and training requirements required. To reduce air quality impacts, Rx burns were only allowed from October–April between 8 am – 4 pm. Increased burn prep enabled more precise burns, minimized potential hazards, decreased burn time, increased effectiveness, exemplified a commitment to safety and the process, and allowed repeated years of burning. Restoration projects were the ideal time to start prepping a site for future burns. Communicating to a broad sweep of agencies, organizations, representatives, etc. was completed well in advance to any ignition. It was integral to build a strong relationship with the Fire and Police Departments, and review sites, possible road closures, and emergency response resources with the departments well in advance. If possible, forest burn units were defined to include at least one hard access point. Lastly, it was important to communicate to the public thoughtfully and strategically, and to be prepared for media and visitor questions.



Image 2. Prescribed forest burn in Successional Forest, Forest Park, St. Louis, MO. Wells Drive and Interstate 64/40 visible on the left (south).

RESOURCES

A close partnership between FPF and the St. Louis City Parks Department, property owners of Forest Park, supports increased efforts and work-quality. Funding for personnel and equipment for prep work, monitoring, volunteer coordinating, and continued stewardship was provided by FPF (nonprofit conservancy). Contractors have been supported through various private foundation grants and Missouri Department of Conservation (MDC) agency grant funds. Many partners and affiliates assisted this process including MDC, St. Louis Health Department, St. Louis Fire Department, and the St. Louis 28th Ward Alderperson. Contractors were hired to supplement management implementation, including AmeriCorps of St. Louis and DJM Ecological Services.

KEY RESULTS

Forest Stand Improvement (FSI)

- Allowing light to reach the woodland and forest ground greatly increased the forest's ability to support plant diversity, diversified vegetation complexity, supported prescribed burns, and competed against many important invasive species that thrive in shaded conditions in St. Louis.
- Public acceptance of thinning efforts in an urban forested natural area was the greatest hurdle to FSI. Public acceptance was greatest during initial efforts when all baseline and site monitoring data readily was available; work was performed during the time of the year of lowest public-use interference; contractors used reduced impacts to the ground and flora to remain; fast flowering plants were seeded; and communication happened before, during, and after efforts.

Prescribed Burns

- Official permitting system was developed to ease and enable future burns throughout the city.
- Progressive and increased preparation techniques and public acceptance development allowed FPF to incorporate Rx burns into the Park's forests.
- Grasses
- Grass and sedge restoration were necessary to the development of safe fuels for effective Rx burns in the forests. Incorporation of Rx burn goals into restoration goals was the most cost and resource effective technique.

ADDITIONAL RESOURCES

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