

# Inventory, Silvicultural Prescription and Harvest Operational Plan

## Fenton-Ruby Park and Wildlife Preserve

### Park Management Unit 08

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At the WCC's request, NRC inventoried the 33-acre Management Unit (MU) 08 in May of 2014 for the purpose of assessing the feasibility of a commercial timber harvest. MU 08 was established as a distinct planning unit in "Inventory Results and Ten-Year Forestry and Wildlife Habitat Management Plan", a 2001 product of Connwood Foresters, Inc. Among the factors examined in this current assessment were certain key indicators that, taken together, paint a picture of this forest stand's condition – tree age and density; relative size; species composition; wood volumes; evidence of severe damage, declining vigor or unexpected mortality; the frequency of high-risk trees; etc. The physical features of the MU, the park as a whole and the general area contribute to an assessment of harvest logistics - guidance for how, where and when logging activities may be permitted to ensure a safe, effective operation.

#### Forest Conditions

MU 08 is composed of a 100+ year-old mixed hardwood-white pine stand that is overcrowded and has a relatively closed canopy that blocks most sunlight from reaching ground level. The upper forest canopy is dominated by black oak, red oak and white pine trees, some of whom are impressively large; other tree species in the canopy include white oak, scarlet oak, hickory, white ash, black birch and red maple. Understory development is poor and very few of the trees between 5 inches and 11 inches in diameter are considered worthy of continued growth. The moderate shrub layer is mostly occupied by witchhazel and high-bush blueberry. Hazelnut, maple-leaved viburnum and hawthorn are seen only occasionally. Notably, there are very few invasive plants present.

Many of the larger black oaks are obviously in decline, showing crown dieback, advanced stem decay and substantial evidence of native bark beetles that feed on weakened trees. Several severe wind and snow storms in 2011-2012 also took their toll here in broken and uprooted trees. These conditions are common in aging forests with no history of scientific forest management and are not inherently bad. However what may be perfectly fine for privately-owned woodland may not be appropriate in a public park setting. As these ageing trees compete for room and resources in increasingly dense conditions, their individual growth rates slow, increasing stress and raising the forest's susceptibility to damaging insects or disease. Although some level of tree decline and mortality is normal and beneficial in a forest ecosystem, the conditions observed in MU 08 suggest that more widespread decline and mortality is possible.

A list of MU 08's current silvicultural details is provided in Appendix A.

## Silvicultural Prescription

Given the conditions observed and the information collected, a silvicultural treatment aimed at preparing for the natural establishment of the next forest is recommended. A shelterwood harvest could be employed to capture some of the potential revenue from those trees most at risk from further decline or mortality while reserving the superior trees of all species to serve as a seed source and shelter for the young trees we hope to establish. Classified as a forest regeneration method, shelterwood harvests are intended to facilitate the establishment of a new age class of forest trees to one day occupy the main forest canopy. Based on the relatively high tree density and the high percentage of trees with low potential, this operation could result in a harvest of as much as 60% of the trees and 40% of the current sawlog volume. Trees retained for continued growth will be considered for their seed-bearing capacity. Post-harvest spacing of canopy trees will be highly irregular and intended to facilitate understory development. With careful selection of trees for harvest, the post-treatment canopy can have a more balanced mix of all species with some bias in favor of the longer-lived white and red oaks over the traditionally shorter-lived black and scarlet oaks. The increased sunlight penetration and available soil moisture and nutrients will lead to rapid understory development, which may begin with several years of non-woody plants and berry thickets (depending on canopy gap size), eventually giving way to forest tree seedlings.

The apparently inevitable spread of emerald ash borer in Connecticut suggests that the white ash trees in Fenton-Ruby Park are threatened. Ash of substantial size and value are likely to be among those trees that would be designated for this harvest.

The inventory indicates that the recommended harvest will yield at least 70,000 board-feet of hardwood sawtimber (and fuelwood) with a projected gross market value of approximately \$15,000.

## Wildlife Habitat

Since Fenton-Ruby Park is designated a wildlife preserve, wildlife habitat must be considered when conducting certain maintenance or management activities. In general, wildlife management improvements may be achieved by preserving certain conditions/features or by changing others. In this case the prescribed harvest will create significant canopy openings which will facilitate understory development and improve cover for wildlife feeding, nesting and brood-rearing. Recently felled tree tops provide immediate food from leaves, buds, nuts, acorns and fine twigs. Coarse woody debris, as it slowly decays, feeds a host of invertebrates, fungi and other wood decay organisms. Woody debris also provides temporary cover for ground-dwelling woodland birds, small mammals and amphibians, as well as physically sheltering newly germinated tree seedlings. In addition to the expected changes in forest structure that a shelterwood harvest will create, habitat values will also be preserved by protecting wetlands, retaining the best examples of all tree species (for biodiversity and long-term seed/food production), as well as certain snags (standing dead trees) and significant den trees.

## Harvest Operations

This southeast corner of Fenton-Ruby Park & Wildlife Preserve is easy to access with substantial frontage along both Burma and Amidon Roads. From Burma Road (where the main log landing would be situated) to Moose Meadow to Route 74 is the preferred route for logging traffic.

There are no marked walking trails within MU 08. However, pedestrians and equestrians use those portions of Burma and Amidon Roads that form its north and east borders. Also, there are park trailheads and a parking area on Burma Road, which will serve as the main haul road.

The log landing is where the harvested wood products meet the log trucks that will transport them to market. Because of the need for level ground, room enough to turn a large truck around, and a reasonable distance from wetlands, log landing locations are nearly always somewhat restricted. In this case there is really only one good landing site, on the unmaintained section of Burma Road near its junction with the Dupilka property driveway. Use of this site will likely mean that logging equipment will be routinely operating on the eastern, unimproved section of Burma Road. Utilizing a log forwarder (vs. a skidder) to bring wood to the landing will prevent the accumulation of waste wood in the landing (which could be considerable in this case). In order to avoid wetlands the forwarder will need to operate on eastern portions of Burma Road. A log skidder may be utilized to “pre-bunch” logs within the MU for later transport (by the forwarder) to the log landing.

All trees designated for harvest should be marked by a certified forester. The two main wood products will be sawlogs and fuelwood. Typically only logs, the straightest sections of tree tops and the stems of small cull trees are harvested and removed from the forest as wood products.

Tree tops are never pulled out of the forest in one piece and are more likely to be chopped up and left to decay where they fall. Woody debris in a forest is beneficial; helping retain soil moisture, providing organic nutrients to an important component of the forest food web, building soil and providing shelter for young trees to become established, as well as providing food and cover for a host of forest birds, small mammals, amphibians and invertebrates. In this stand there will be a substantial amount of woody debris, some of it quite large, that will remain after a harvest is complete. Some are likely to consider the result aesthetically displeasing, suggesting that an effort to inform and educate the public in advance be part of the WCC’s considerations.

There are two seasonally wet swales which bisect MU 08. By designing two harvest nodes with separate forwarder entrances onto Burma Road, these wetlands can be completely avoided. No wetland regulated activities are anticipated, however the WCC must submit harvest plans to the Willington Inland Wetlands Commission for review and, if necessary, official approval.

If it is helpful, NRC can lead one or more guided site walks of the MU to explain the harvest rationale, design and logistics.

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## Appendix A

List of silvicultural details derived from 2014 inventory.

ID	stand 1
Average dbh (in)	10.92
Basal area (sq.ft/ac)	130.0
Trees per unit area (stems/ac)	165.5
AGS basal area (sq.ft/ac)	50.0
UGS basal area (sq.ft/ac)	80.0
AGS relative density (%)	37
UGS relative density (%)	62
Net board-foot volume (bd.ft/ac)	7932.54
Net cord volume (cords/ac)	32.02
Canopy closure (% closure)	94.9
Size class	small sawtimber
Conifers (% ba)	4.4
Plots sm saw (% plots)	71
Plots lg saw (% plots)	29
Quad Mean dbh (in)	12.00
Relative density (%)	99
Site index spp.	QUVE
Big trees (stems/ac)	19.4
Forest type	oak northern hardwoods
Evergreen (% ba)	4.4