

Baxter State Park/SFMA

Protocol: Management of the Frost Pond Forest

Goal:

Devise specific management procedures (harvest, regeneration, treatment) that provide for retention of the structural components of a mature to very mature softwood forest north of Frost Pond.

Background

We noticed this 150 acre forest a few years ago and have been considering its future carefully. This forest (structural numbers attached) exhibits many of the characteristics of the hemlock/red spruce types in parts of the BBNA. There is scattered evidence of past harvesting probably near the turn of the century – evidenced by a few large, old white pine stumps. There doesn't seem to be much evidence of recent harvest of red spruce or hemlock – these species now dominate the stand. Ages of red spruce are estimated to be from 160 to 220 years, although a chronograph by Seymour indicates a red spruce around 275 years. The hemlock is probably older. This area is unquestionably exceptional in its structure and different viewers have offered different outcomes for this parcel, including non-harvest. After several discussions with the SFMA Advisors (December 2001, May 2002 and May 2003) and others (Rob Bryan, Mitch Lansky), we decided:

- The area should be placed under active management and not set aside as a benchmark, representative or ecological reserve
- Management should strive to identify the structural and ecological features and components that define the late-successional nature of the stand and try and devise a management scheme(s) that retains these features.
- Opportunities for management for specialized “niche” products should be considered and pursued.
- Resource monitoring elements should be installed on this forest equal to or exceeding similar efforts installed on the SFMA

Based on our previous discussions, including the spring field tour of SFMA Advisors in 2002 and 2003, we have completed our forest management road construction in the area and installed a system of forwarding trails at a 500' spacing. We also cut and sold a small number (5) of large spruce for musical instrument tops or “tonewood” in the summer of 2002. These trees were located on or near the forwarding trails.

Management Approach

Many forest management schemes (including ours on the SFMA) claim that careful management of forest stands can, over time, allow many of the structural characteristics of older forests to develop. Is it possible to conduct active forest management in a mature to very mature softwood forest in such a way that the fundamental character of the older forest is maintained?

- Frost Pond has a significant stocking of large old hemlock and spruce with relatively good crowns. Can we maintain (including recruitment) this stocking over time?
- Frost Pond has a strong component of large dead woody debris – both standing and down. Can we maintain this component over time?
- Can we determine indicators of late successional status (“old”, “undisturbed”) and measure them over time to quantify our efforts at maintenance of these characteristics.
- Can harvest operations be conducted in such a way that disturbance from logging sufficiently mimics natural disturbance so that long-term natural forest cycles and development are not altered significantly?

With these questions in mind, we have developed an approach based on the following features:

Monitoring:

- Conduct a survey of lichens in the Frost Pond Forest,
- Survey should be replicable and results quantifiable with an accent on species which may indicate a low level of disturbance, late successional stage or both
- Conduct a presence/absence survey of avian species

- Install a system of continuous forest inventory plots (CFI) to measure stand structural characteristics, including line transects for coarse woody or dead and downed woody debris.
- Install a cover object array (COA) for upland salamanders

Harvesting and Management

- A narrow, permanent, numbered network of forwarder trails (12' width), spaced at 400 – 500'. This will provide access at the 2.5% density level.
- A very short operating cycle (every 2 years?) with a correspondingly low harvest level (150 ac. X .25 = 37.5 x 2 years = 75 cords per harvest.
- Harvest would be targeted toward recent or very imminent mortality only. Entire area would be covered – marked trees mapped with gps.
- To improve operational productivity, harvester provided with mapped tree location for harvest (including gps) – navigation by numbered forwarder roads. Harvest would require pre-bunching to forwarder roads with small skidder.
- Approximately 5% of target harvest retained in stand for structural needs.
- Harvest sites revisited at 10 years for stand composition treatments (spacing).
- Begin pruning program on red spruce < 8" dbh.
- Strive to develop long-term niche markets for large, high quality spruce logs.

Results

CFI plots were installed in the fall of 2001; the remaining components of the forest monitoring protocol were completed in the spring and summer of 2003. During the installation of the CFI plots and in various visits to the FPF, large standing dead spruce were noticed. Casual observation seemed to indicate that the number of standing dead spruce was increasing noticeably. In the spring of 2003, spruce over 20" dbh (alive and 1-2 years dead but standing) were tallied and marked in the stand. . The location of each red spruce >20" was determined and recorded with a gps unit. During this inventory the presence of the spruce bark beetle was confirmed (explaining the increasing presence of large standing dead spruce) and indicators of existing infestation in trees with live crowns was determined. In addition, each tree was assigned two ratings indicating crown health (1 = good to excellent, 2= fair, 3 = mortality imminent and 4= standing dead) and bole quality (1=very good, 4 = poor to cull). Of 466 >20" dbh, 117 (25%) were rated as dead or dying. The majority of these trees were marked and harvested in the late summer of 2003. A small number (<6) of these trees were left as standing snags. During the inventory process, a number of trees (<10) that were <20" dbh but were dead or dying from bark beetle infestation were also left to provide additional standing dead snags.

The total 2003 harvest of bark beetle infested spruce was approximately 130 cds., or about 3 years worth of harvesting under the original plan. Additional harvesting will likely be necessary in 2004 to capture mortality in trees infested in 2003. The end point of the infestation is unknown at this time, but as mortality in the mature red spruce tapers off, the stand structure and growth estimates should be re-evaluated and a new harvest schedule developed to accommodate the volume killed by the bark beetle.

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October 2003