

## OUTCOME BASED FORESTRY AGREEMENT #2012-2

This agreement by and between the Bureau of Parks and Lands (hereinafter "BPL") and the Department of Conservation, Maine Forest Service (hereafter "MFS") is entered into pursuant to Title 12 M.R.S., §8003, sub-§3.Q. and §8869, subs-§3-A and 7, and in accordance with MFS Forest Policy and Management Division procedures.

Whereas, the Maine Legislature has defined outcome based forestry as "a science-based, voluntary process to achieve agreed-upon economic, environmental and social outcomes in the State's forests, as an alternative to prescriptive regulation, demonstrating measurable progress towards achieving statewide sustainability goals and allowing landowners to use creativity and flexibility to achieve objectives, while providing for the conservation of public trust resources and the public values of forests;

Whereas, in its 1999 State of the Forest report, MFS stated that the state has "reached the limits of what a command and control regulatory framework has to offer [with respect to regulation of forest practices]. Command and control regulation has many limitations and may result in unintended consequences, such as forest fragmentation and premature harvesting to recover equity in a forest investment. The Maine Forest Service believes that the state should begin to focus more on outcome-based forestry regulation, on the premise that this approach will do more to promote, stimulate and reward excellent forest management yet still provide a baseline of regulatory protection for critical public resources;"

Whereas, the Maine Legislature has endorsed outcome based forestry and directed MFS to pursue experimental agreements consistent with legislative direction; and,

Whereas, outcome based forestry is intended to be a long term approach to ensuring the sustainable management of Maine's forests; now therefore,

BPL and the MFS agree as follows:

1. **Authority:** Pursuant to Title 12 M.R.S. Chapters 801 and 805, subchapter 3-A, MFS has regulatory authority over the activities described herein.
2. **Partner to this agreement:** BPL is a land manager involved in forest management on Public Reserved Lands in the state of Maine. BPL's primary office is located in Augusta, Maine.
3. **Location:** BPL Lands Division manages approximately 0.6 million acres in the state of Maine.
4. **Application of this agreement; forest management plan:** This agreement applies to management activities on selected lands managed by BPL in Maine. The BPL Forest Management Plan for these selected areas (see Appendix 2) has outlined targets for opening size, residual stand objectives, and harvest levels by silvicultural

prescription. The selected areas include, but may not be limited to, lands in BPL's Round Pond, Donnell Pond, and Richardson Units.

5. **Interpretation of this agreement:** In the context of this agreement, the use of terms including, but not limited to, "maximize," "minimize," and "optimize," and other similar terms are understood to mean that the landowner will take reasonable measures to achieve the specific outcomes identified.
6. **Panel of technical experts:** As required by 12 M.R.S. §8869, sub-§ 3-A; the Governor of Maine has established a panel of technical experts (hereinafter "panel") to work with the Director of the Maine Forest Service to implement, monitor and assess tests of outcome-based forestry experiments. The makeup of the panel may change from time to time at the discretion of the Governor of Maine. Present membership on the panel is:
  - A. Gary Donovan, Certified Wildlife Biologist;
  - B. Maxwell L. McCormack, Jr., Research Professor Emeritus of Forest Resources, University of Maine;
  - C. William A. Patterson IV, The Nature Conservancy;
  - D. Peter Triandafillou VP Woodlands, Huber Resources; and,
  - E. Robert G. Wagner, Director, University of Maine, School of Forest Resources, and Henry W. Saunders Distinguished Professor in Forestry.
7. **Desired outcomes of Outcome Based Forestry:**
  - A. Compliance with the state's forest sustainability goals and outcomes for soil productivity; water quality; wetlands and riparian zones; timber supply and quality; aesthetic impacts of timber harvesting; biological diversity; public accountability; economic and social considerations; and forest health (Appendix 1).
  - B. Continued certification to the standards of a recognized certification system, for example, American Tree Farm System, Forest Stewardship Council (FSC) and/or Sustainable Forestry Initiative (SFI), will be prima facie evidence that BPL has achieved compliance with the state's sustainability goals and outcomes. Certification is a continuous process that involves regular surveillance audits and periodic recertification audits; therefore, any departures from the standards will be discovered and rectified in a timely manner. BPL is currently enrolled in both SFI and FSC and uses the former for benchmarking compliance with the State's Sustainability Standards.
  - C. Enhance deer wintering areas by accelerating the progression of young softwoods into winter cover status, increasing the availability of hardwood browse

in close proximity to winter cover, and providing additional edge habitat. (Note: Both 7.C and 7.D are more fully described in Appendix 2.)

- D. Ensure successful establishment of forest regeneration of high value species, especially yellow birch, sugar maple, and white pine, and increase growth rates and/or timber quality on site specific areas, using a variety of forest management techniques that may include but are not limited to varying intensity of timber harvest, vegetation management, matching species to site, tree improvement techniques, pre-commercial and commercial thinning, etc.
  - E. Conduct harvests with consideration for visual aesthetics.
8. **Exemptions from certain requirements of 12 M.R.S. §8869 and MFS Chapter 20 Rule, Forest Regeneration and Clearcutting Standards:** Provided that BPL satisfies the conditions set forth in Section 7 of this agreement, BPL is exempt from the following requirements of law and rule on the selected areas shown in the attached document:
- A. 12 M.R.S. §8869, sub-§2-A and Chapter 20 Rule Section 5.B. (clearcut separation zones).
  - B. 12 M.R.S. §8869, sub-§3 and Chapter 20 Rule Section 5.C. (forest management plans for individual clearcuts larger than 20 acres).
  - C. 12 M.R.S. §8883-B, sub-§1 and Chapter 20 Rule, Section 3.A.3. (prior notification, submission of harvest plans to MFS for individual clearcuts larger than 75 acres).
  - D. Chapter 20 Rule, Section 5.C.3.b. (certification of establishment of clearcuts).
  - E. Chapter 20 Rule, Sections 4.C. and 5.C.3.a. (certification of regeneration of clearcuts). Notwithstanding such exemption, BPL must regenerate all clearcuts within five years of completing any timber harvest that creates a clearcut, except for instances where wide-spaced pine management results in an overstory with less than 30 square feet of basal area, and maintain internal documentation available for inspection by MFS and the panel.
9. **Modifications to certain requirements of 12 M.R.S. §8869 and MFS Chapter 20 Rule, Forest Regeneration and Clearcutting Standards:** BPL may operate subject to the following modifications of law and rule:
- A. Chapter 20 Rule, Section 3.A.3. BPL must file one harvest notification per township harvested per two years. BPL is not required to file harvest notification amendments with MFS. However, BPL is required to internally maintain adequate documentation of harvest activities by township to permit harvest inspections by MFS and to facilitate work of the panel.

10. **BPL commitments:** BPL agrees to and commits to the following as good faith demonstrations of its commitment to practice forestry in a manner that provides at least the equivalent forest and environmental protection as provided by existing rules and any applicable local regulations:
- A. BPL shall maintain its current Forest Stewardship Council and/or Sustainable Forestry Initiative certifications (FSC: BV-FM/COC-017429; SFI: BV-SFIS-US004629-1).
    - 1. BPL shall act promptly to satisfactorily address any Corrective Action Request or Nonconformance associated with its FSC and/or SFI certifications.
    - 2. A member of the panel or a mutually agreeable designee shall be permitted to participate in the forest management certification audit field visits, and to provide input to the third party lead auditor on behalf of the panel.
    - 3. BPL shall invite one member of the panel or a mutually agreeable designee to attend meetings of and provide input to BPL's Silvicultural Advisory Committee.
  - B. BPL shall document and periodically provide results of its efforts to improve measurably the quantity and/or quality of its timber resource on those areas included in this application. In addition to documentation of compliance with applicable certification standards, BPL shall periodically provide evidence of attainment of the desired outcomes described in Section 7 of this agreement through the use of metrics outlined in Section C. below.
  - C. BPL shall report to MFS its harvest management and silvicultural metrics for the selected areas included in this application including, but not limited to:
    - 1. Estimates of harvest acreage for the entire projects summarized for the coming five year period by silvicultural prescription; overstory removal, commercial thinning, shelterwood, clearcut, etc.
    - 2. More specific annual harvesting plan which shows the planned acreage for harvest for the upcoming year (mapped and numerical count) by prescription, and with clearcuts exceeding 60 acres individually identified.
    - 3. Annual harvest summary, provided within 60 days of year end, showing the areas harvested over the previous year by prescription (actual versus plan.) Information will be made available for sites visited by the panel. BPL will continue to provide information on acres harvested by harvest type, by township as required on the "Confidential Report of Timber Harvest." BPL will report on how its management activities are influencing white pine growth and the progression of thinned softwood (fir-dominated) stands into conforming deer winter cover.

4. Regeneration targets and success for natural stands. Where available, information will be provided by site at the time the panel conducts field verifications.
  - D. A Maine Licensed Forester within the Bureau shall review and approve BPL's Forest Management Plan.
  - E. Harvests will be laid out with consideration of visual aesthetics in areas of moderate and higher visual sensitivity. BPL's forest management staff will be proficient in managing for visual aesthetics.
  - F. BPL will accommodate other reasonable requests for information made by MFS and the panel as mutually agreed upon.
11. **Reimbursement:** Panel members will be reimbursed for reasonable expenses incurred in the course of their work; specifically, mileage for travel in personal vehicles at the state rate; lodging costs, and per diem at the federal rate. Reimbursement will be made by MFS; BPL shall reimburse MFS by journal for documented expenditures.
  12. **Duration of this agreement:** This agreement takes effect on 11 May 2012 and terminates on 10 May 2017. It is renewable by mutual agreement between the MFS and BPL.
  13. **Amendments:** This agreement may be amended at any time by mutual, written consent of BPL and MFS, with the concurrence of the panel.
  14. **Termination of this agreement:** This agreement may be terminated by either party with 90 days notice. As soon as notice is either given by the landowner or received from the state by the landowner, the landowner is obliged to comply with all regulations then in effect for all harvests started after delivery or receipt of such notice.
  15. **Official Record:** This agreement shall not be effective nor become part of the official record unless and until it is signed by the Director of the Maine Forest Service.

IN WITNESS WHEREOF, the parties hereto have executed this Outcome Based Forestry Agreement consisting of 20 pages.

Department of Conservation, Bureau of Parks and Lands

By: *Willard Harris* Date: 5-11-12

Willard Harris  
Director, Bureau of Parks and Lands

Department of Conservation, Maine Forest Service

By: *Douglas Denico* Date: 5-11-12

Douglas Denico  
Director, Maine Forest Service

## Appendix 1. State of Maine Criteria, Goals, and Outcomes of Forest Sustainability.

### 1. Criterion 1: Soil productivity

- a. Goal: Maintain site productivity.
- b. Outcome: Site productivity will be maintained or improved, and the area in roads and yards will be minimized.

### 2. Criterion 2: Water quality, wetlands and riparian zones

- a. Goal: Maintain or improve the chemical, physical, and biological integrity of aquatic systems in forested areas and riparian forests.
- b. Outcomes: Forest management in shoreland areas protects water quality and aquatic and riparian forest biodiversity.

### 3. Criterion 3: Timber supply and quality

- a. Goal: Improve the quantity and quality of future timber supply when appropriate.
- b. Outcome: The management strategy and harvest levels for the lands will increase the quality and quantity of the forest resource as appropriate in the medium and long term (20 - 50 years).

### 4. Criterion 4: Aesthetic impacts of timber harvesting

- a. Goal: Minimize adverse visual impacts of timber harvesting.
- b. Outcomes:
  1. The landowner will minimize visual impacts of harvests, roads, landings and other management activities.
  2. The landowner's planning staff are trained in and apply principles of visual quality management.
  3. The landowner identifies areas with high and moderate visual sensitivity, and takes appropriate measures to avoid significant visual impacts whenever necessary.

### 5. Criterion 5: Biological diversity

- a. Goal: Maintain biological diversity with healthy populations of native flora and fauna, forest communities and ecosystems.

b. Outcomes:

1. Management addresses the habitat needs of the full range of species present.
2. Maintain or manage for acreage in the late successional (LS) condition through management and protection.
3. Maintain a reasonable component of standing dead trees, live cull trees, and down logs across the landscape (not necessarily on every acre).
4. High Conservation Value Forests are properly identified and values are protected on the ownership.
5. Rare, threatened and endangered species habitats are properly identified, and the land is managed to protect the habitats and occurrences of rare, threatened and endangered species.
6. Important plant communities are properly identified, and the land is managed to protect important plant communities.
7. Deer wintering areas are properly identified and managed to maintain or improve their value as winter cover for deer.

6. Criterion 6: Public accountability

- a. Goal: Demonstrate sustainable forestry and build public confidence that forest management is protecting public values for the long-term.

b. Outcomes:

1. The landowner will maintain independent 3<sup>rd</sup> party certification with a nationally recognized sustainable forestry management certification system without major, unresolved non-conformances on managed lands.
2. A Licensed Forester within the Bureau will review and approve the landowner's Forest Management Plan.
3. The landowner will employ Licensed Foresters who are actively involved in the management, planning and supervision of operations on the land.
4. All timber harvesting contractors will employ at least one person possessing Certified Logging Professional or Qualified Logging Professional certifications or the equivalent.

7. Criterion 7: Economic considerations

- a. Goal: Optimize benefits to the local and regional economy while also achieving the goals specified for the other criteria, to the extent allowed by market conditions.
- b. Outcome: The landowner's management activities support as vibrant and diverse a forest products industry as is practicable, including loggers, truckers, and production facilities.

8. Criterion 8: Social considerations

- a. Goal: The landowner supports the communities surrounding their lands and operations, and except where special circumstances dictate otherwise, the landowner continues to provide historic and traditional recreational opportunities that do not conflict with the landowner's objectives or values.
- b. Outcome: The landowner provides opportunities for appropriate historic and traditional recreational uses that do not conflict with the landowner's values or objectives.

9. Criterion 9: Forest Health

- a. Goal: The forest is healthy and vigorous with no serious insect infestations or disease outbreaks.
- b. Outcome: The landowner does what is prudent and practicable to monitor for and prevent and control insects, disease, and fire, consistent with good practice in the industry and assists the MFS in forest health monitoring programs on the ownership.

## Appendix 2.

### Summary: North Region - Hardwood Seed-Tree Harvest, Round Pond

--Desired outcome: Replacing beech-dominated regeneration with a mix of yellow birch, sugar maple, beech and spruce.

--Method: Seed-tree harvests in blocks of 20 to 50+ acres, leaving 10-25 square feet basal area of good quality yellow birch and sugar maple, and spruce if windfirm.

--Benefit of OBF: Under FPA, clearcuts larger than 20 acres require considerable added administrative work. Furthermore, it is a bit unclear whether the above method meets any of the acceptable reasons for larger clearcuts shown in the FPA rules, Ch 20, sec 5,C,1,b,(8), which might also require the Bureau to obtain a variance. Operating under OBF would relieve the Bureau of this additional office/fieldwork required under the general FPA rules, while permitting a practice that should increase future timber values while providing near-term browse and edge for wildlife.

--The seed-tree practice will be accompanied by an initial commercial thinning in young mixedwood - aspen/birch above spruce/fir. This will accelerate the development of quality winter shelter for deer, adjacent to an important zoned deer wintering area, while increasing growth on valuable timber species. This practice, per se, does not require the provisions of OBF, but is an integral part of the two-pronged strategy to provide value to both wildlife and timber.

### Summary: East and West Regions - Low Density Pine Management

--Desired outcome: Maintaining/accelerating growth rates on high quality white pine, especially on the first sawlog where the bulk of a tree's timber value is usually found.

--Method: Thinning (East) and partial overstory removal (West) of blocks of 20 to 50 acres, leaving 15-30 square feet basal area of the better quality white pine. In the East, this harvest will be followed by pruning to 17 feet, to allow production of very high value clear lumber. In the West, the pines are somewhat older and are naturally pruned. In the East, this thinning will allow lowbush blueberries to capture the ground layer, providing abundant food for wildlife and berry-picking opportunities for recreational users, as the stand lies within a short distance of Route 182.

--Benefit of OBF: Much the same as with the hardwood seed-tree harvest, above, except that the low density pine management clearly falls outside the acceptable reasons in FPA for larger clearcuts. The Bureau will be able to carry out this cutting edge pine management for maximizing high-value lumber production without the administrative burden necessary under the general FPA provisions.

--In the West, this pine management will be part of the second entry into 1,700 acres of spruce-pine stands thinned 1996-2002. Another 500 acres considered too small in 1996 for commercial thinning can now be treated, and about 90 acres of this stand lie within

the Mosquito Brook deer wintering area. Thinning these acres will retain longer live crown ratios on residual trees, thus enhancing their potential as primary winter cover.

### Outcome based forestry - Bureau of Parks and Lands

Note: All operation dates are tentative, depending on job layout and contract development.

**NORTH REGION: ROUND POND, Mixedwood Semi-commercial Thinning, Hardwood Seed-Tree Harvest, Alder/Aspen Patchcuts for Early Successional Habitat**

#### Summary of Concept:

This is a two-pronged strategy aimed at improving deer habitat on an important wintering-area township while managing for high value timber products. The tract has considerable acreage in younger stands with good fir and spruce content but overtopped by aspen and white birch. It also holds a smaller but significant area in northern hardwoods of modest quality, relatively near to those younger stands, and also close to zoned deer wintering area with good cover. The proposal seeks to accelerate the young stands' development into core winter cover while the current cover is still useful, by removing the taller hardwoods. At the same time, the harvest in hardwoods will provide abundant browse nearby to cover areas, and should increase the stocking of valuable species in the new stand, especially yellow birch.

#### **WILDLIFE (More details are found under Wildlife/Timber)**

##### **Semi-commercial thinning in sapling/pole stands:**

This would be done mainly in mixedwood stands, some possible in softwood stands. General tree-selection objectives;

--Release overtopped softwoods

--Remove most hardwoods, retaining good quality sugar maple and yellow birch

--Retain cedar and spruce, also any pine (and hemlock, if any are encountered.)

--Fir is the most abundant species on most of these acres, and though it (and aspen) will be the major species harvested, fir will still be the leading species after treatment. It is a good shelter species though short-lived and susceptible to spruce budworm. This and subsequent entries can move composition toward longer-lived species like spruce and cedar while utilizing the fir before it becomes overmature.

#### **Outcome:**

Maintain or increase softwood component in these stands. Most lie within the HMA area and some have nearly achieved primary cover character. This will promote earlier progression of these stands into suitable winter shelter for deer, thus providing

increased acreage of shelter, and will also enhance habitat for marten by adding both horizontal and vertical softwood structure to the treated stands.

### Early Successional Habitat Component

--Create small openings in hardwood dominated stands and in alder runs.

#### Outcome:

This will quickly become suitable woodcock singing grounds and brood habitat, and will develop into hare habitat, and thus benefitting lynx, at 12-15 years post-treatment. It will also create edge and produce food for deer.

### Edge and Browse - Yellow Birch and Sugar Maple Seed Tree Harvest:

These heavy harvests, designed to foster regeneration of valuable hardwood timber species, would be located in relatively close proximity to primary and secondary deer cover. The harvests would create extensive edge habitat and establish abundant browse on acres convenient to deer yarding areas.

## WILDLIFE/TIMBER

### Semi-commercial thinning in (mostly) sapling stands:

The former landowner conducted moderate to heavy diameter limit harvests west of the Allagash during the mid-late 1960s. These harvests created a number of small to medium clearcuts where stands had been mostly large softwoods, and these younger stands are mainly small pole timber at present. Removing most aspen and birch along with the scattered older fir bypassed in the 1960s would leave the residual fir and spruce with more growing room, promoting conforming winter cover at an earlier date than would otherwise be the case. The proposed treatments, in addition to making the stands more valuable for future harvests, will also restore the forest on this area to what had been there prior to the 1960s harvests.

These stands typically hold 10-40 sq.ft. basal area in older stems (usually spruce, fir and RM), with over 100 sq.ft. in trees established or released by the 1960s harvests. The younger stratum is mainly aspen over fir, with some white birch and spruces. Aspen is mostly 6-12" dbh, with most stems of other species 4-7". The stands are 10+ years older than those east of the river, and the trees may be large enough to allow a roundwood harvest, though having a biomass component might yield a total harvest double the roundwood-only estimate of 7-10 cords per acre.

There are nearly 600 acres potentially suitable for this treatment, although logistics and variable stocking of young softwoods may cut this to perhaps 300 acres. Many of these stands lie in close proximity to the hardwood stands for which a seed tree harvest is proposed. The combination of treatments would produce edge and browse located near to stands which are presently cover or will soon attain that character.

There are also 2,200 acres of somewhat similar stands east of the Allagash. These are about 10 years younger and lack the scattered overstory, as they are the result of stands clearcut in the 1970s and treated (with modest success) with herbicides in 1981. Although outside of this specific proposal, in part because extensive roadwork will be required for access, these areas offer additional opportunity to enhance deer winter cover in the near future.

### Seed-tree Harvest in Hardwood Stands:

About 350 acres of potentially suitable hardwood stands are found outside of zoned AWW visual areas on the lands between Schedule Brook and the Blanchet Road. These stands are heavy to poor quality beech both in the overstory and regeneration strata, but have sufficient stocking and distribution of yellow birch and sugar maple on most acres to make a seed tree harvest a viable option. These are also among the more windfirm of Maine's tree species. Yellow birch in particular is adapted to widespread distribution of seed, often due to the small seed being blown across the surface of snow.

Parameters of these stands (weighted averages):

Basal area: 110 sq.ft., 100 in trees 5"+

Average diameter: 11.6" (for trees 5"+)

Composition: BE 44%, SM 31%, RM 10%, S/F 9%, YB 5%, CE 1%.

The seed-tree harvest would make clearcuts of 20-30 acres, selecting as residual trees those which appear healthy and vigorous, of mid to large size - 12" to 24"+. Approximately 8-15 such trees per acre (probably 10-30 sq.ft. per acre basal area), reasonably well distributed, would suffice to reseed the openings. Given YB basal area in these stands, it would likely make up 1/3 to 1/2 of the leave trees, with the remainder SM, and possibly some spruce or smooth-barked beech where they are located near the edge of a patch. All beech regeneration would be felled or crushed, with sugar maple, yellow birch and softwoods retained where economically practical for machine and operator. These retained saplings would be as "gravy", not especially necessary but useful in giving some acres a heads start. However, they will almost certainly be too few to have the harvest meet the standards for an overstory removal. The plan would include a protocol for monitoring of subsequent regeneration of these clearcuts, both the species and stocking of seedlings and a qualitative record of browsing by moose and deer.

The goal would be to retain a scattered overstory of larger trees which would modify somewhat the environmental conditions of the openings, in favor of yellow birch and sugar maple rather than more aspen and/or paper birch. This overstory would also retain some late successional character where trees are left near the clearcut edges. The regeneration forming the new stand would have high stocking of the more valuable hardwood species and provide abundant edge plus a major supply of preferred browse. Having this edge/browse relatively close to winter cover would make it quite valuable for

deer health. Should beech dominate the post-harvest regeneration, the Bureau will consider the use of herbicide, the chemical and application rate chosen so as to target beech while retaining most/all of the more desirable hardwood species and all softwoods. This would be done by skidder-mounted sprayer, as the acreage is too modest to warrant setting up an aerial project.

For the hardwood stands on this part of the Unit, the seed-tree harvests would probably be done over a 2-3 year period. There may be opportunity to conduct similar harvests east of the river, in proximity to the much larger young mixedwood stands suitable for the semi-commercial thinning. Entry into these east side hardwoods, if they are good candidates, would take place 3-5 years from now. This delay is due to the need to re-establish access, but would extend the browse availability for several additional years. According to 1999 inventory points, some areas within H2A, H2B, and H3B types may be suitable. H2C and H3C points averaged less than 20 sq.ft. BA in SM+YB, with about 2/3 the 5"+ stocking in AS/PB+spruce-fir, and thus do not appear viable prospects for this treatment. Some parameters for A and B density hardwood stands, weighted by number of inventory points:

Basal area: 133 sq.ft., 104 in trees 5"+

Average diameter: 10.0" for TH species 5"+

Composition (5"+): SM 37%, AS/PB 20%, RM 18%, BE 9 % S/F 9%, YB 6%, WP 1%.

The 2-4" composition: SM 32%, BE 19%, AS/S-F/OH each 13%, YB 5%, RM/PB each 3%.

#### **Measuring Outcomes:**

Semi-commercial thinning: Harvest areas should be visited semi-annually to track their progression to secondary and/or primary deer cover, with evidence of deer use also recorded. Permanent growth plots could be established along with some controls in areas not thinned. These latter could be in areas where proximity to the Waterway make extensive harvests less practical.

Early successional habitat: At the same time the semi-commercial harvests are monitored, these hardwood/alder patchcuts could be visited to check on resprouting. Spring visits to check for potential woodcock use would also be useful.

Hardwood seed-tree harvests: An initial visit at harvest plus two years could evaluate several of the clearcuts for regeneration species and stocking. However, the success of yellow birch and sugar maple regeneration will not be fully apparent before year five or later, as trees grow up through the inevitable rubus. Results from elsewhere give confidence that desirable regeneration will be present in sufficient numbers to produce a high value stand dominated with yellow birch and sugar maple, with some healthier-appearing beech also retained to ensure mast production.

## DRAFT PROPOSAL - LOW-DENSITY PINE MANAGEMENT

### Summary of Concept:

Dr. Robert Seymour of the University of Maine has established a six-acre research plot to evaluate low density management of white pine for high quality sawtimber production. His idea is that if white pine crop trees were managed under much wider spacing than is conventional wisdom, they should develop into large sawtimber trees much more quickly with greater economic return. This assumes these trees would be pruned to a height that would result in at least the first sawlog providing clear lumber for optimum value. It also assumes control of competing vegetation so trees are free to grow.

### WEST REGION: Richardson Cut-to Length Stands

#### Initial Thinning

During the period 1996-2002, the Bureau conducted low thinnings on 1,700 acres of spruce-dominated poletimber on this township, utilizing a small, 4-tired processor. These stands had originated mainly from the hurricanes of 1938 and 1944, thus the overstory trees are about 70 years old, give or take a few years. Average pre-treatment basal area for these stands was 200-220 sq.ft., with perhaps 30% of that in stems smaller than 5" dbh. Thinning from below reduced the basal area to about 120-125 sq.ft., nearly all 5"+, while raising the average stem diameter from an average of 6.0" to about 7.5". The operation produced over 24,000 cords, only 135 of which were hardwood, another 150 or so pine, the rest spruce and fir. Average volume harvested was 14 cords per acre. Since then the basal area has climbed only a bit more than 5 sq.ft., due to significant mortality, much of which occurred with the severe storm of July 5, 1999. This event caused major windthrow throughout western Maine, in both recently cut and uncut stands.

Although establishment of regeneration was not an objective for these thinnings, it has occurred on nearly all treated acres, and consists of spruce and fir with a significant pine component in many places. The presence of this desirable regeneration plus a significant overstory component of white pine form the basis for this portion of the proposal.

Only those pine with blister rust or unavoidably on forwarder trails were cut, with the bulk of harvested pine coming from salvage of July, 1999 blowdowns. Two untreated 0.02-acre control plots and 15 thinned plots 0.05 acre were established in February 1997 and three more thinned plots added in October 1998. Pine made up 10-12% of the pre-treatment stand basal area. Due to its being retained, its basal area as of October 1998 was 22.6 sq.ft., about 18% of the stands' total. By the most recent remeasure in June 2010, pine BA was 31.3 sq.ft., and was now 24% of the stand.

#### Divisions in the pine population

By Plot: Using the thinned growth plots as surrogates for the 1,700 treated acres, one

can divide the area into three populations. The first, "high pine", covering perhaps 40% of this area, currently holds over 30 sq.ft. in pine, with the average being over 50 and some areas with 70 or more. The second, "medium pine" with 20% of thinned acres, has pine basal area at 20-30 sq.ft., while "low pine", with about 40% of the thinnings area, has very little pine - plots average 5 sq.ft. basal area. This proposal looks only at the first two, as the third holds insufficient pine.

By Tree: The 29 surviving pines on thinned growth plots can be looked at as two distinct groups. The first is all the pines as large or larger than the average spruce, 8.6" dbh, and the second being the smaller pines, 5.6" to 7.5" as of June 2010. The 22 larger pines have all, with the exception of one sick 14" tree, added at least 1.4" (average 2.22") in dbh during the eleven years ending in June 2010. None of the seven smaller trees have grown more than 1.3" during that time (average is 0.64") and only one has grown even 0.10". In managing both the high and medium pine areas, the smaller pines will generally not be retained, as they have shown very low potential for response.

High pine: The larger pine (8.6" dbh and larger) on these plots average 42 per acre and 15.0" dbh, for 52 sq.ft. basal area. These plots also hold 85 sq.ft. basal area of spruce. Harvesting all of the spruce that can be taken without causing machine damage to any pines would produce about 20 cords per acre, perhaps 2/3 sawlogs. The residual pines would be nearly at the standard basal area for low-density management, but below the recommended stems per acre. Due to their age and the low number, they would be unlikely to close crowns, but could be expected to continue or accelerate diameter growth. Most of these pines have two clear or nearly clear logs due to natural pruning in past decades, so much of the growth would be on top grade sawlogs.

Assuming the growth plots are somewhat representative of the total 1,700 acres of thinnings, the high pine stands would cover some 680 acres. That is probably more than the actual acreage with over 30 sq.ft. in pine, and logistics plus regeneration status probably would limit this proposal to treating less than half the high pine acres, perhaps 150 acres total in patches of 5 to 25 acres. Probably few of these patch harvests would qualify as clearcuts under FPA, and it is extremely unlikely any would produce clearcuts in excess of 20 acres. Precise location of patches to be treated will require considerable on-ground surveillance. Not all high pine areas would be treated, as in some places the spruce-under-pine mixture should continue to be managed.

Medium pine: The large pine on these plots average only 20 per acre and 14.2" dbh, making 22 sq.ft. basal area. Spruce basal area is 122 sq.ft., and harvesting all of it that is feasible would produce 25-30 cords per acre, with sawlog proportion a bit lower than on the high pine areas because the spruce here is about ½" smaller in average diameter. The residual pines would be far fewer than the recommended number for low-density management, and would be more like the scattered (and very fast-growing) residual pines studied by Dr. Seymour in 2009-10. Regeneration in these areas would be very close to fully released, and height growth should quickly accelerate. White pine weevil incidence is fairly low in the general area, so this degree of release should not allow too much deformity from this insect.

Using the same plot-proportion rationale as for the high pine areas would give an estimated 340 acres in the medium pine stands, and this is probably less likely to be an overestimate than is the calculation for high pine acres. The same caution about regeneration status is in play, given similar total basal areas (about 140 sq.ft.) for both high and medium pine plots. Perhaps 200 acres of this type could feasibly be treated, in patches of similar size (5-50 acres, also requiring fieldwork to determine locations) as for high pine stands. Between the high basal area and the heavy harvest, it is unlikely that there would be sufficient tall regeneration for these treatments to qualify as overstory removals. Thus these harvests would be FPA clearcuts if larger than 5 acres, and would normally trigger the additional qualifications and reporting if larger than 20 acres. Though the entire harvest regime, including the low thinning of additional spruce stands, is included in the Richardson portion of this proposal, it is the work in these medium pine stands that justifies its inclusion in the Objective-Based Forestry process.

Low pine: Growth plots in these areas held only 5 sq.ft. basal area of pine. While any well-formed and sizable pines on these acres will be retained, harvesting will be aimed at favoring the best spruce and nurturing desirable regeneration. These acres are not considered to be part of the OBF proposal.

### Low Thinning of Spruce

This portion of the Richardson proposal is included not because it requires the flexibility of OBF related to FPA, but that it provides a companion harvest to the pine management which should increase interest among potential contractors, and because it includes a distinct wildlife objective. Including it as part of OBF may also reduce the paperwork needed for harvesting within a zoned deeryard.

When the spruce poletimber stands were being examined in preparation for the low thinnings conducted during 1996-2002, an area of more than 500 acres lying south of Mosquito Brook was considered to have stems too small on average for a commercial harvest, even with the small processor. Most of these acres have since grown to where a thinning is economically and practically feasible. The thinning would have two objectives. The first would be to produce the same financial and silvicultural results and opportunities as did the earlier thinnings. The second would be to improve the condition and future potential of the Mosquito Brook deer wintering area.

The subject area includes about 90 acres zoned P-FW, a deer wintering area along Mosquito Brook. Although winter use of this area by deer is light at present, the cover is currently suitable. However, the very dense stocking is causing crown length to be reduced, which will shorten the period for which these stands will remain effective cover. The low thinning will open up the stand somewhat, but will allow for lengthening and thickening of crowns, as well as establishing/releasing regeneration and providing a short period of browse availability.

### Possible timetable

Harvesting with cut-to-length technology can be done at almost any season. Given the fieldwork necessary for full implementation, a start-up would be unlikely to happen

before the summer of 2012 and may not occur until later, perhaps beginning in 2013. Once under way, the two projects - pine management and low thinning - would probably take at least four years. In this instance it will probably be longer, as those stands thinned 1996-2002 but not part of the two OBF projects are also ready for their next entry. It makes both economic and silvicultural sense to include these harvests with those included in the proposal. The attached map displaying past and proposed harvest areas shows the logistical benefit of rolling them into one contract if possible.

### Summary of Objectives

#### Low-density pine management:

--To produce rapid growth of high value knot-free sawtimber by releasing overstory pines from competition by other trees.

--To release and nurture desirable regeneration, especially of pine but with spruce also important, such that the stand becomes two-storied, with high quality trees in both height classes.

--To increase the edge area in these stands by creating low-density overstories in proximity to those with much higher stocking.

#### Low thinning of spruce poletimber

--To duplicate the success of the 1996-2002 thinnings on the acres holding trees deemed too small at that time, concentrating growth on the best and most vigorous spruce and pine, while increasing the proportion of those species (especially pine, outside the DWA) within the stand.

--To allow vigorous spruce to increase their live crown ratio, width, and density, so that they remain as core winter cover for deer for many decades, while also establishing the next generation of spruce and fir, and providing for a period of increased browse.

### Measurement of Outcomes

--Remeasures of the 18 existing growth plots should continue at intervals of two or three years. Additional plots may need to be established, both in the low-density pine management acres and in the first-entry low thinnings. In the latter these should mostly be within the DWA, assuming that the residual stand there is similar to that outside the zoned P-FW. In the low-density area, existing plots should be augmented as necessary to have at least five each in the high pine and medium pine areas.

--Monitoring of deer use within the Mosquito Brook deeryard should be done on a continuing basis, though it need not be done too frequently (perhaps biannually) until that use becomes significant. Once that occurs, monitoring should include comparisons of treated and untreated acres within and proximate to the P-FW.

### EAST REGION: Tunk-Donnell Mixedwood/Pine Stands

In 2007 and 2008, a commercial harvest on Compartments 50 and 51 of the Donnell Pond Unit was completed. One mixedwood area of about 50 acres was well stocked with white pine trees of varying diameters, the highest quality pines being 6-10" dbh and about 40 years old. A light thinning removed most hardwoods and some softwoods around potential pine crop trees. The site is well suited for pine. A quick survey of the stand in 2011 indicated a basal area of 130 sq.ft. per acre, with 80 sq.ft. of white pine, the remainder being some red pine, aspen, and other hardwoods. This proposal would call for a reduction of total basal area to a residual average of 20-35 square feet per acre of exclusively white pine depending on the average stem diameter. Under the Maine Forest Practices Act, a residual basal area of less than 30 would be considered a clear-cut and trigger other requirements such as justifications and separation zones. With the proposed residual basal area so close to the threshold, a considerable amount of post-harvest cruising would be needed to determine whether the stand was above or below 30 sq.ft. Including the harvest in the Objective-Based Forestry proposal makes such intensive inventory unneeded, while allowing the proper spacing and stocking throughout the stands.

The proposal is to thin up to 50 acres of the former Stands #1 and 8 in Compartment 351 (Map attached) of the Donnell Pond Unit to a low density stocking of 80-100 white pine trees per acre. Given an average diameter of 6-10" for the best quality pines, this would translate to the 20-35 sq.ft. basal area shown above. All residual trees would be identified prior to harvest as final crop trees and marked to retain. A whole tree harvesting operation would then remove all other stems two inches diameter at breast height and up, excepting that a few of the largest pine (18" or so) with decent form could be left for legacy purposes. The crop trees would then be pruned to a height of 17' or 1/3 maximum of total tree height, whichever is less, to ensure a good live crown ratio. A basal herbicide application would then follow to remove other stems that may compete with final crop trees. The objective in the understory would be to encourage wild blueberry growth, which is already present in large amounts. This would deter hardwood competition for water and nutrients while providing a pleasing appearance and a readily accessible location for berry picking.

#### Desired Outcome:

Timber production is the primary emphasis of this project. The desired outcome will be the production of clear pine sawlogs in shortened rotations. Enhanced wild blueberry production under the forest stand will provide some additional benefits for wildlife such as black bear and turkeys. The area would also provide opportunities for the public to pick blueberries for consumption.

#### Project Timeline: (tentative)

Warm season 2012 - Proposal evaluation and approval (if approved)

Winter 2012-2013 - Lay out harvest operation

Winter 2013 - Conduct harvest on frozen/snow cover conditions to protect blueberries

Outcome based forestry agreement #2012-2  
11 May 2012

Spring/Summer 2013 - Contract pruning up to 5,000 crop trees

Fall 2013 - Contract basal herbicide application to control woody competition

Summer/Fall 2015- Monitor growth and survival of crop trees (start a five year rotation of monitoring)

Attachments: Maps of proposed areas