

“Real world examples” of managing beech

“The western mountains of Maine”

Brought to you by the Seven Islands Land Company’s Rangeley Unit

Disclaimer:

- This presentation is biased.
- It pertains to conditions in western Maine that may not apply in your area.
- Silvicultural decisions are “stand” based and may vary tremendously even in the same watershed or planning unit. The possibilities and options are without limits so
- I’m going to move quickly.

Pingree Family Landowner Objectives

To protect land ownership rights, as well as land and timber values.

To protect aesthetic values.

To provide an after tax return that is comparable over the long-term with competitive uses of capital.

To manage the lands as a commercial forest, and to provide for multiple uses of the forest.

To increase utilization per acre and to develop new markets for forest products.

Beech Maintenance Policy

Purpose

Seven Islands recognizes the role that mast-producing plants play in providing critical food for numerous wildlife species in Maine's forests. It has been recognized that soft mast is associated with numerous understory trees, shrubs and more than 30 herbaceous plants. And that these plants are closely related to forest disturbance and are not presently considered a priority. Hard-mast producing trees, like American Beech (*Fagus grandifolia*), in Northern Maine are an issue of concern due to the beech bark disease, *Nectria coccinea*, which is transported by the beech scale insect, *Cryptococcus fagisuga*. Therefore Seven Islands recognizes the necessity to protect healthy mast producing beech in order to ensure its survival.

Background

Mast includes nuts, seeds, berries, and fruits. Nuts and seeds are referred to as "hard mast", fruits and berries as "soft mast". Mast provides critical food for many wildlife species. Our goal will be to maintain a variety and abundance of native mast-producing trees and plants in the landscape.

Numerous understory trees, shrubs, and more than 30 herbaceous plants produce soft mast. The majority of these species are associated with forest openings and scarification resulting from road and yard building and skid trails.

Biodiversity in the Forests of Maine. Guidelines for Land Management. UMCE Bulletin #7147

American beech (*Fagus grandifolia*) represents an important species of the Northern forest. The insect/pathogen complex (scale/nectria) has resulted in widespread mortality across the region. Beech is the most important hard mast north of the 45th parallel. Seven Islands' wildlife program recognizes the importance of retaining healthy, mast producing beech wherever and whenever possible.

The majority of beech is infected to some degree with beech bark disease. This disease is recognized most easily by the cankers on the bark. The disease weakens the tree, affects the tree's ability to produce mast, and can kill the tree. A minority of beech is resistant to the disease and is easily recognized by their smooth bark. In the long run, retaining beech for mast production in hardwood stands will depend on the retention and regeneration of disease-resistant beech.

Among the wildlife species relying on beechnuts as a primary source of their diet are: black bear, whitetail deer, squirrels, rodents, and ruffed grouse. Maintenance of mature nut-producing trees in hardwood stands will enhance the survival and reproduction of these species and will benefit species such as pine marten and fisher, which prey on rodents.

Research in Maine has demonstrated a strong relationship between the abundance of beechnut crops and cub production by black bears in interior forests. In much of northern Maine, bears do not have ready access to agricultural crops and beechnuts are the sole source of late Fall food.

Management Practices

Mature, full-crowned, trees are the best nut producers. Consequently beech mast management seeks to retain these trees as a viable component and retain adequate numbers of these trees in residual stands. Seven Islands ultimate goal is to have smooth bark beech trees account for up to 30% of the basal area in Northern hardwood stands where beech is present. Seven Islands will seek to retain smooth bark non-mast producing merchantable beech trees as a viable component of residual stands wherever and whenever Seven Islands can, especially trees showing evidence of extensive bear use.

In stands where there are too few smooth barked co-dominant and dominant mast producing beech trees, Seven Islands will retain some diseased, mast-producing trees to insure continuation of mast production. The goal in this situation should be to retain up to 10% of the basal area in diseased mast producing beech trees, especially trees showing evidence of extensive bear use.

Sizing up stands for commercial treatment when there is a beech component:

Intuition and the “art of” silviculture play a huge role

Nathan Kay: “We prescribe pattern recognition silviculture”

Forest health and vigor ?

Are there good quality mast producing beech in the stand ?

What other species am I working with ?

Stand structure potential ?

Regeneration potential ?

Pre-commercial treatment potential (ground application herbicide, pct etc...)

Three general types of beech prescriptions:

- 1: Do not harvest the beech.
2. Clearcut the beech (Bob Wilbur = “smoke it”)
3. Everything else/All the other beech prescriptions.

Category 1: The do not harvest the beech prescriptions group

Conducted where there are either lesser volumes of beech and/or good quality mast producing beech trees.

The basic premise is:



If I **DON'T** harvest the beech trees ... maybe my stand won't regenerate with beech root suckers and stump sprouts.



Marked to harvest where all of the beech was retained

Beech accounted for no more than 10 % of the residual BA in this particular stand. In other stands, it could be higher or lower.



Smooth bark and a healthy crown



Bear claw marks



More claw marks



Northern hardwood mixed species and multi-aged forest stands

Similar to “Dauerwald” except longer cutting cycles. Continuous regeneration “approach”, abandons the concept of age-class distribution , cutting cycle and rotation. Trees are retained to large sizes if they are still gaining in value. Individual tree removal based on financial maturity or patterns of decline. Regeneration does not drive the system. Loosely applied metrics. Mast and snag /legacy tree retention. Ideal for multi-cohort stand structures.

1999 Marked harvest. Notice the maple-birch saplings and the lack of beech regeneration/saplings because the beech trees were retained !



“Dramatic” video footage comparing
where the beech was cut vs. where
the beech was not cut



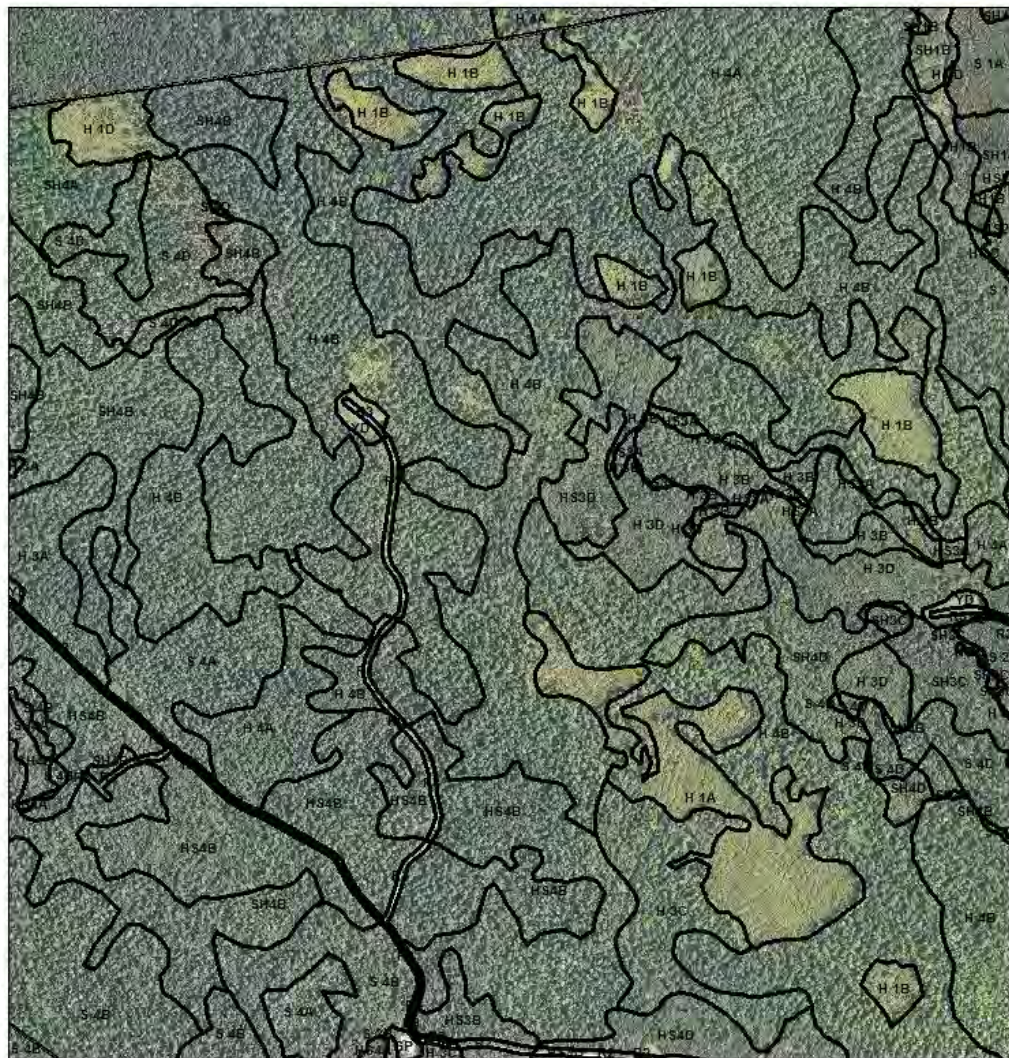
**Category 2: The Clearcut/patch cut/group
selection beech prescriptions group**

These are usually applied in two-aged to multi-aged beech situations where there is poor growing stock of other species and poor beech mast potential

These are usually “clean”, bare to the ground cuttings

Types:

- a. Clearcut it, no treatment
- b. Clearcut it, herbicide treatment for sugar maple release. Usually on lower slopes.
- c. Clearcut it, “enhanced” herbicide treatment for planted tree establishment. Typically on higher slopes.



Upton – 1999 – 16 patches totaling 50.6
acres ranging from 0.2 to 15 acres

Briggs site class 1.7 to 2.4 skerry-colonel-beckett
assoc. , mod. well drained to s.w. poorly drained,
very stony, 0 -30 % slope

Upton 1999 groups, patch cuts and clearcuts

These were clean cuttings with no residual stems except for a seed tree patch and a patch with a low density white pine residual.

Grapple skidder operators were encouraged to scarify as much as possible.

Planting/herbicide and even planting oak was discussed at that time

It was thought that the birches and maples would out compete the beech.

No follow up or tsi budget at that time.

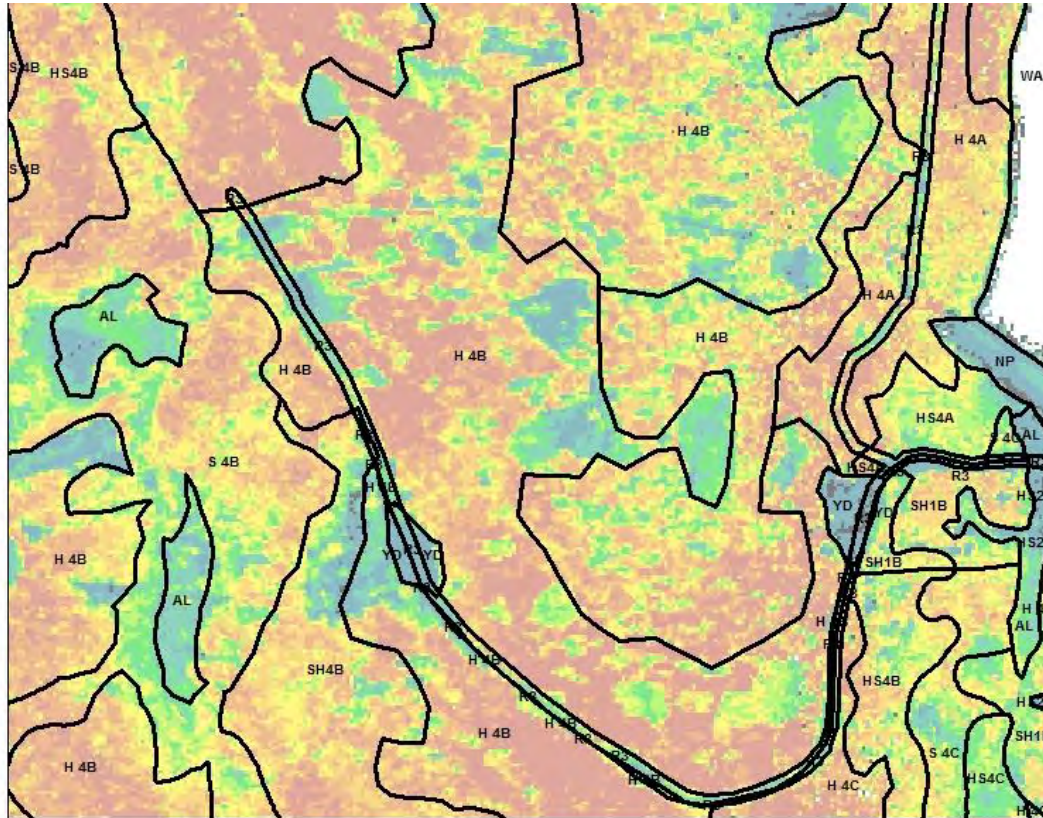
Walker Day Cruise 2016

Openings larger than 5 acres are comprised of 69 % beech, 16 % red maple, 8 % sugar maple, 3 % yellow birch, 2 % moose maple, 1 % poplar and 1 % other species.

Openings smaller than 5 acres are comprised of 61 % beech, 17 % red maple, 5 % sugar maple, 1 % yellow birch, and 16 % moose maple.

Less than favorable results, although clearcutting did produce twice the number of TPA $\frac{1}{2}$ dbh and up of sugar maple and yellow birch.

In hindsight, I would have done the same layout and prescription, but followed up with herbicide and planting and had prescribed a no beech harvest between groups/patches.



Dike road group selection harvest area 2001

About 15 groups ranging in size from 0.5 to about 1.5 acres.

Thinning/improvement harvest between groups

Briggs site class 1.8, tunbridge-plaisted
assoc. , well drained, very stony, 0 -15 %
slope

Results of 2013 Dike Road regeneration cruise

Percentage of Stems between 1/2 inch dbh and 4 1/2 inch dbh						
		<u>Groups</u>		<u>between groups</u>		
black cherry		4.67		5.33		
beech		30		44		
moose maple		22		42.67		
pin cherry		2.67		0		
poplar		0.67		2.67		
red maple		33.33		0		
sugar maple		4		5.33		
yellow birch		1.33		0		
non-comm.		1.33		0		
total		100		100		



beech

red maple

y. birch

black cherry











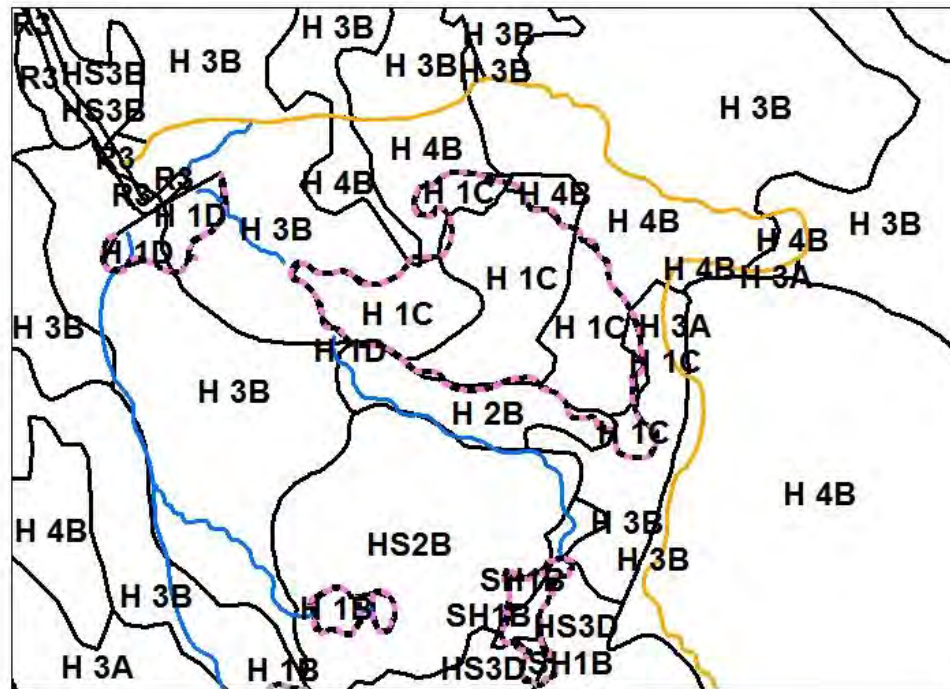
What did we learn from the Dike Road ?

Groups shifted species composition away from Beech unlike the improvement harvest between the groups.

Given that red maple is increasing value, the results are not “too bad”. Have we gone from “worse to bad” ?

Adding some black cherry into the equation was nice. Cherry sometimes regenerates on “drumlinoid” land forms where scarification has occurred.

I have yet to see a site in this unit that was originally **dominated** by **beech** and other tolerant hardwoods that has been converted to a pure sugar maple/yellow birch stand by using group selection - without the need for follow up “beech control” herbicide. G.S. works great in pure sugar maple stands.



Whitehurst Road – 12 acre clearcut - 2016

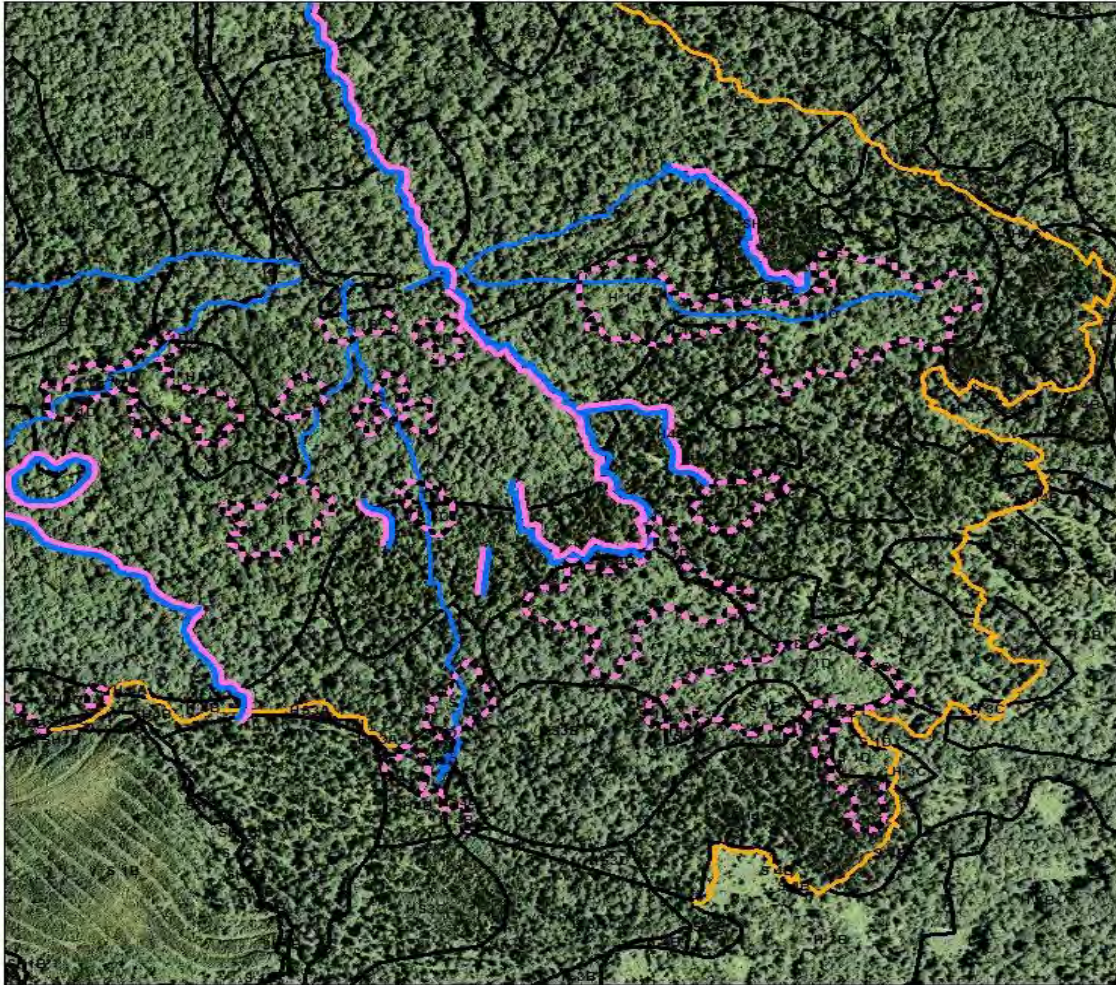
Briggs site class 1.4, colonel-skerry-pillsbury
 assoc. , mod. well drained to poorly drained,
 very stony, 0 -15 % slope

Whitehurst Road Plan

Clearcut 2016. No beech harvested in the adjacent non-clearcut areas.

Aerial herbicide – maple release – 2017

Sugar maple, **white ash**, yellow birch, spruce-fir, red maple, poplar and yes still beech are present or are expected to be present on this site. Northern hardwood management is the goal here.



Gilberts road 2017 harvest - about 16 clean patch cuts totaling 21 acres ranging in size from $\frac{1}{2}$ acre to 5 acres. No beech harvested elsewhere.

Briggs site class 1.4, beckett-skerry assoc. ,
well to mod. well drained, very stony, 0 -35 %
slope

The plan for Gilberts Road ?

2017 harvest

2019 ground application for patch cuts and either nothing or GA between groups/patches. Depending on beech regen, or height of regen.

2020 planted tree establishment – maybe Norway spruce.

This area is good example of how we are meeting both the Beech Maintenance Policy and the Landowner Objectives of increasing utilization per acre while providing for multiple uses of the forest.



**13 – acre black spruce planted area – road 3 –
Davistown**

Clearcut in 2009. Planted in 2010. Aerial Glyphosate with arsenol in 2013.

Briggs site class 2.5, marlow-peru-rawsonville
assoc. , mod. Well to well drained, very stony, 12 -
30 % slope, fine sandy loam



Notice the root suckering on the edge of the planted area !



Pole sized sugar maple and beech growing stock next to the same planted area



On the taller seedlings, the leader growth is 16 inches



Category 3: All the other beech prescriptions

**List of locally “banned” prescriptions:
“cut the bad beech, leave the good beech”
“diameter limits in even-aged stands”**

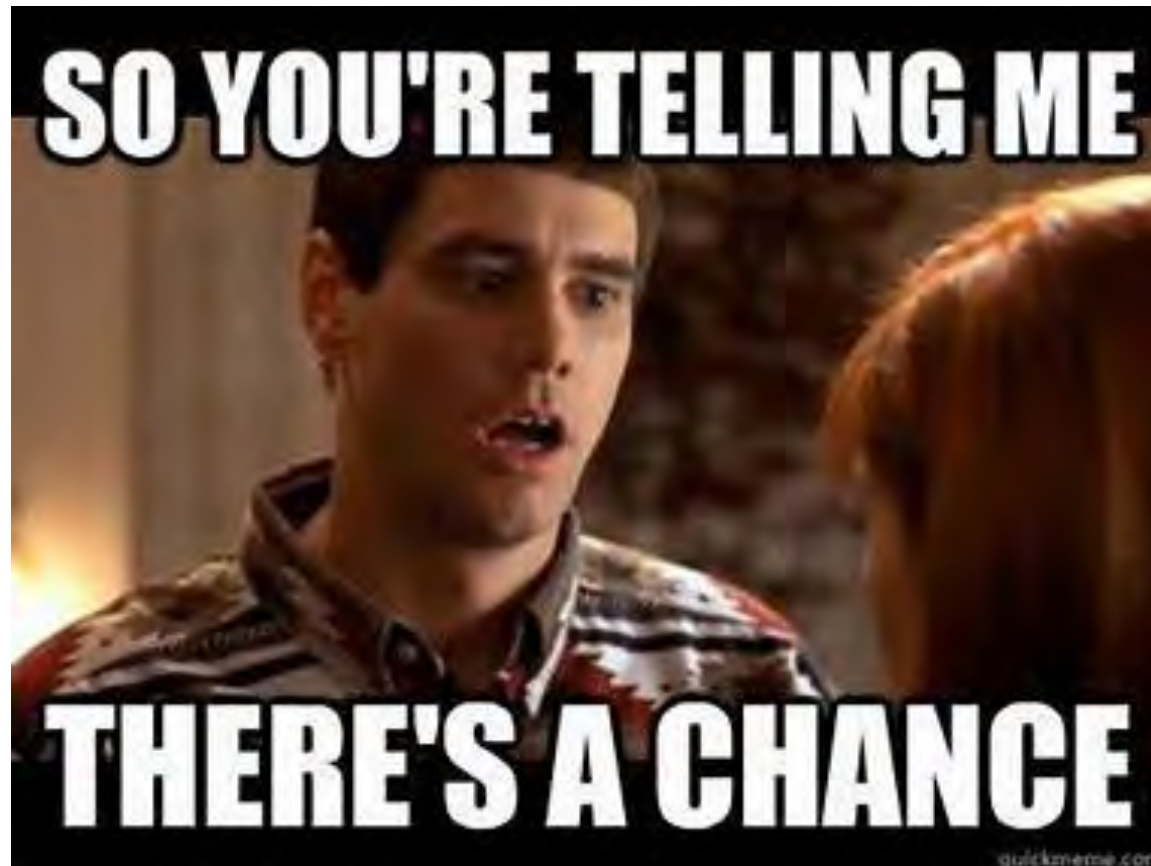


More than likely these will result in unsuccessfully regenerating the stand to “bad” beech.

Not so good for the maintenance of the beech mast nor is this quality silviculture.

Question: Is it possible to conduct a beech improvement harvest ?

Answer: Yes But you'll likely need some chemical follow up.





An acceptable amount of beech along with maple, birch, spruce-fir and moose maple regeneration ? You'll need to draw your own "line in the sand".

Two-aged root suckers !



A nice cluster of smooth barked beech with root suckers from a 2006 as well as a 1976 harvest.



A pole-sized mixed northern hardwood stand

Regenerated in 1976. Sugar maple, beech, birches growing stock along with pin cherry. Maybe some future mast producing beech ?



Pole sized residual stand ten years after harvest

Prolific beech regeneration will most likely warrant a ground application along with waiting until the poles reach small saw timber size before additional commercial treatment ?



Three-aged northern hardwood

A good choice for a ground application maple release where the seedlings/suckers/sprouts are mostly beech !

**Some post ground application pictures
from “Daddy’s Ridge”**



Dead
beech
saplings

Sugar maple
seedlings



Maple emerging under the dead beech saplings !

Sugar maple, white ash and yellow birch regeneration.
Notice the absence of beech regeneration in the
“wetter” non-treated riparian areas



Nice sugar maple regeneration and a lower level of acceptability mast beech



Excellent quality mast tree. Sugar
maple regeneration and dead beech
saplings



“Sugar maple decline” planned salvage harvest block – final removal about 9 acres. Previous understory glyphosate treatment. Excellent sugar maple and yellow birch regeneration.



- Be open to trying new treatments and monitor your results.



Prescribed burning ?

Pre-commercial thinning ?

Hack and squirt ?



Maybe plant some red and/or white oak where beech mast is in decline !

The moral of the story is:

**Harvesting beech regenerates beech whether
it is clear cut or partial cut.**

**Not harvesting beech is less likely to
regenerate beech.**

**Retain modest to good quality mast beech in
your partial harvests.**

**If you harvest beech and don't want beech
regeneration, you'll most likely have to use
herbicides to get rid of it.**

Ancient foresters at work

“How am I going to provide for the maintenance of the beech resource while meeting other landowner objectives ?”

