Fire and silviculture tools for securing oak regeneration on the WMNF

Successes and lessons learned

WMNF- Established in 1918

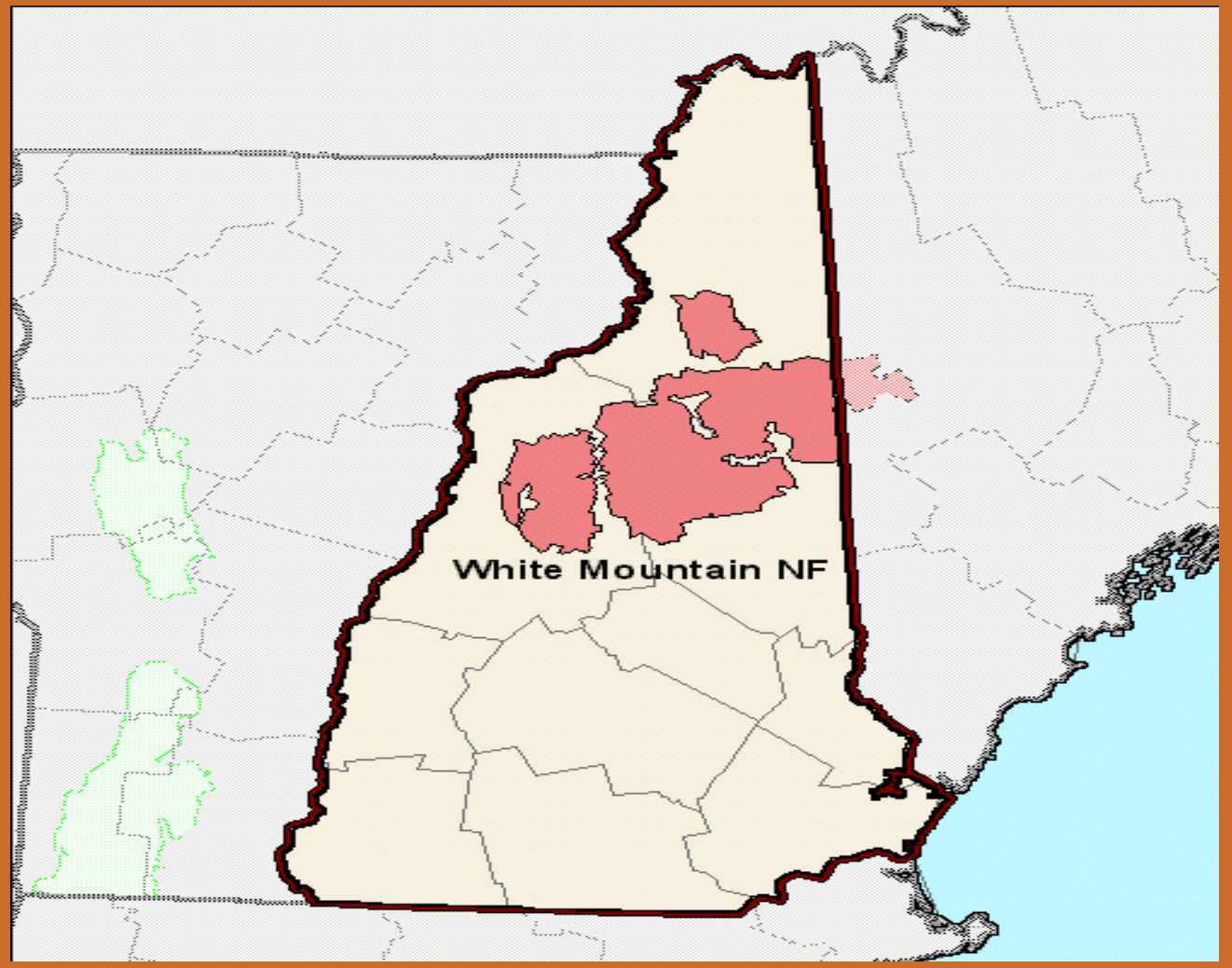
Approx 800,000 acres in NH and ME

One of the most popular forests in the country with upwards of 6 million visitors annually.

Approx 40% of the forest is managed for timber.

Harvesting occurs on approximately 0.5% of the entire Forest at any given time, with about 29 million board feet of timber harvested annually.

Veneer hardwood is WMNF's main product.



Oak is small but important component of the WMNF

Estimated 8-9 thousand acres of oak dominated forest. There is much more where oak is a strong competitor but not dominant.

Past fires are usually evident in our oak stands-natural and human caused

Presently there is very little established oak regen. The vast majority is mature/over mature or seedling class.

You can see oaks left as seed trees in past harvests but most of the understory is beech and maple.

Some of the oaks appear to be on site as a result of past agriculture and others are on or below rocky hilltops with natural oak-pine stands.

Since 2004 the WMNF has used silviculture and rx fire to promote oak-pine regen.

Generally marking 30-70 BA leaving an oak and pine seed source under a shelterwood system.

Harvest occurs before the burn so timber defect will not need to be re-estimated.

Summer/fall harvest is preferred for scarification but not always possible.

The burns are considered to be preparatory for the next rotation in 20 years or so.

We analyze for multiple burn rotations in our Environmental Assessments.

These burns are part of large vegetation management projects that can cover thousands of acres. There are a lot of moving parts to keep track of.

Our general findings:

Oaks in northern new England respond to fire the same way they do anywhere else.

A moderate to high intensity fire will achieve better results. Late spring early summer are our target dates.

We don’t wait for bumper crops or worry about burning acorns as believe setting the stage (light, competitor reduction) is more important. Seed sources are still there and more acorns will drop or be cached by wildlife. We want to promote the existing seedling class.

If we wait for advance regeneration 4.5’ high and 0.75” at root collar we will never burn anything. Smaller oaks than that resprout and compete.

Consider forming a rx fire council to help promote burning to the public.

Timber, Wildlife, and Fire are involved in the process

Use separate funding to separate time dependent actions (Knutsen-Vandenburg funds vs. fuels funds) for prep and implementation.

Tie activities also to hazardous fuels- stress the multiple benefits fire can achieve.

Decide what stands you want to promote oak regen in and burn then monitor for success. If you don't get it burn again.

Consider that fire will achieve multiple objectives at once when considering costs. Larger units are more cost effective than smaller if you can meet your fire behavior objectives

Our general findings:

We do not wait for oak regen to establish itself before burning. It will very rarely make it to that competitive level in the understory.

Seedling oaks can be top killed and regrow. These oaks will dominate in the understory for about 5 years before beech/birch/maple catches back up.

We monitor the stand and when the oaks begin to be overtopped, make a decision to burn again or apply some other type of TSI.

Secondary benefits

Tremendous flush of growth in herbaceous layer. Great browse and does not seem to affect oak regen significantly.

Forest and opening birds, hawks and other wildlife are tied to these areas.

Moderate to high intensity fire can kill midstory trees and further increase light.

Lessons Learned

White pine is susceptible to damage from fire and may slowly degrade until timber value is negligible.

The crowns may look fine but bole is damaged.

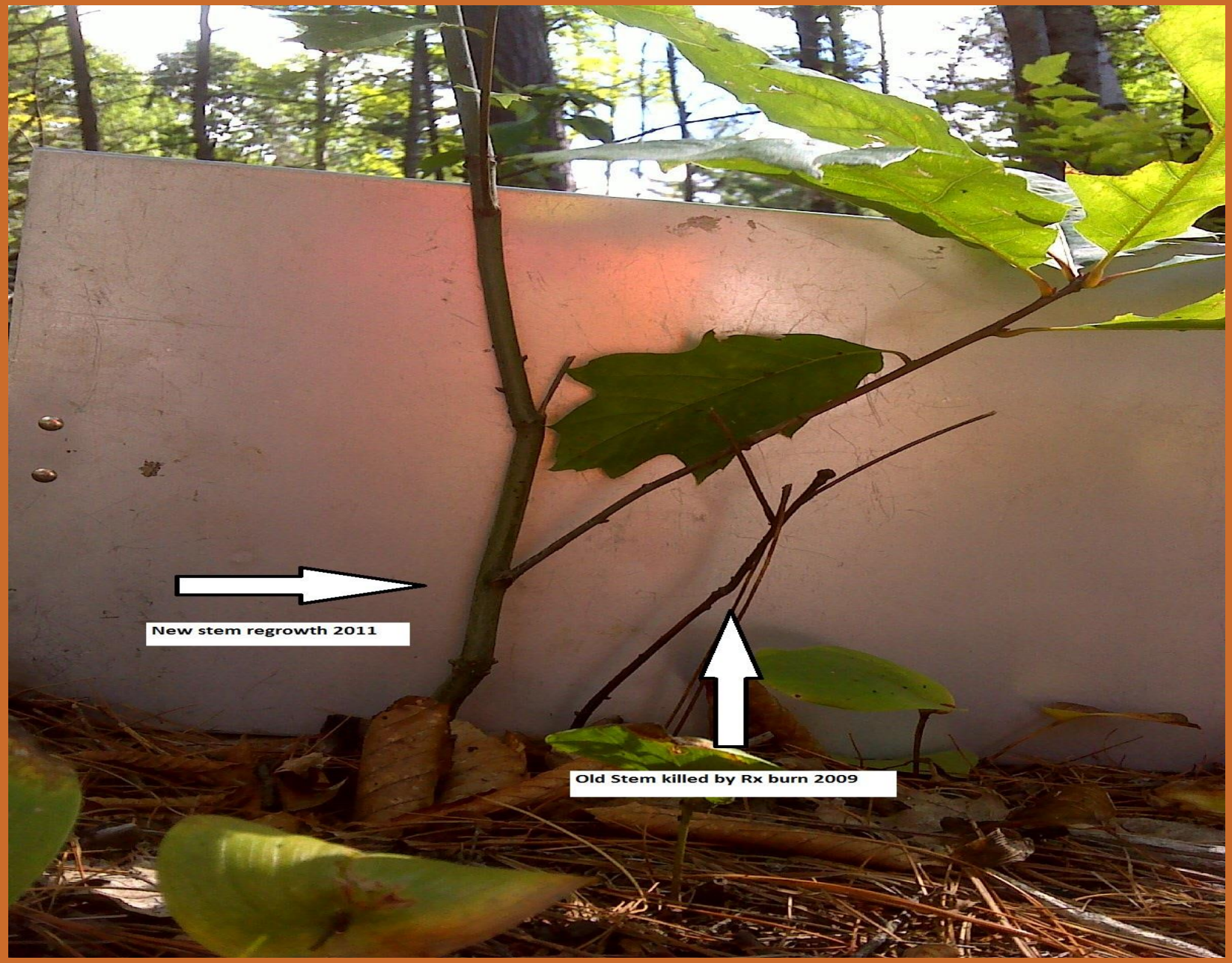
Important to harvest pines 2-3 years post burn if you want the value.

Pine on right 7 years post burn.

Example-

Fire behavior Right Angle Unit 05-21-2009 Erin Lane photo

Right Angle Monitoring Plot Before and After. J. Neely photo



Right Angle red oak stem die back and regrowth example 07-2011. This die back allows oak to develop a large root system and is important for successful competition. J. Neely photo

Red flagging indicates 3-4’ red oak stems competing successfully in understory layer 2011. J. Neely photo

Red oak stems have increased to 6-9’ by 2014 and are released to further improve growth. J. Neely photo