SHADED FUEL BREAKS

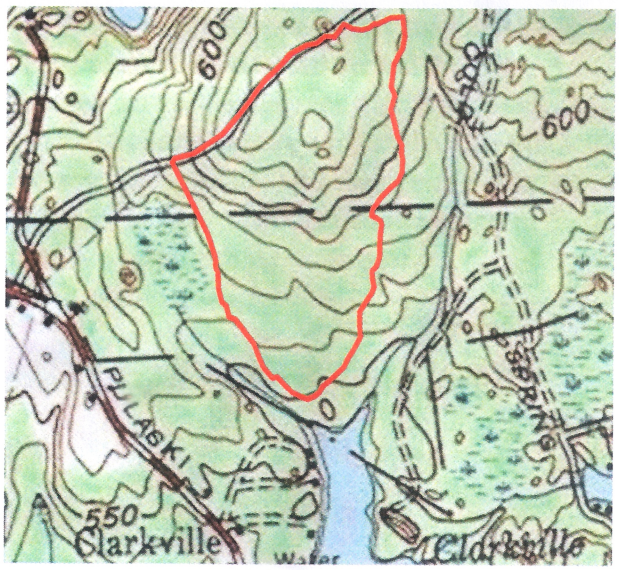
State Lands Fuel Reduction Treatment

ABSTRACT

A proactive approach that concerns the fuel loading on state lands primarily due to seasonal weather changes, invasive insects and decades long fire suppression.

Waterman, Allan (DEM, DFE)

Long-term goals consist of implementing fuel reduction treatments in Arcadia Management Area and other State Lands where they would be most beneficial to existing fire breaks and near-by communities. Goals will be adjusted due to time invested, personnel available and equipment availability. Monitoring effectiveness and maintenance upkeep will be key to a fuel breaks success. Most importantly are we getting the desired effect from the fuel reduction treatments.



Map 3 Shaded Fuel Break, Center Trail, GWMA

The above map will be the location of the fuel reduction treatment (shaded fuel break) and timber sale, south of Center trail in GWMA. Pulaski State Park is just west of the treatment for point of reference.

Pre-Treatment

Before operations begin the boundary of the designated fuel reduction treatment area will be marked with signage and flagging. Signage will be posted in treatment area where appropriate to inform public that it is an active cutting/operational zone. Any shrub or tree species deemed of importance will be flagged and or staked off by the State Lands Forester. All wetlands (streams, brooks, riparian areas) and blazed hiking trails will be marked with flagging, stating a no cut zone. A 100ft buffer zone will be established in these selected areas, to abide by wetlands rules and regulations.

Site Treatment

The goal of the shaded fuel break is to reduce fire behavior and intensity as it burns through the fuel break. The desired fire behavior is a low intensity surface fire producing head fire flame lengths no greater than 4ft. The desired treatment is to interrupt continuous horizontal and vertical fuel arrangement to prevent sustained mid-story and canopy fire. It is a defensible location that increases the probability of success for fire suppression activities.

Creation of these shaded fuel breaks will consist of trimming ladder fuels, felling of live and dead trees, and removal of dead downed branches and logs. All woody

vegetation up to 8inch (dbh) diameter breast height will be trimmed and or felled. If the shrub or tree species is favorable or endangered, it will be flagged to save. Any dead trees (snags) over 8inch dbh may be saved or felled depending upon safety and site-specific objectives. The trimming and felling operations will also consider not interfering with the remaining residual trees. All stumps of trimmed and felled trees will be flush cut to the ground for aesthetic value.

All residual trees greater than 8inch will be limbed up to and not to exceed 8ft unless it is beneficial for the fuel reduction treatment. All residual trees must have a minimum distance between canopies of 15ft based upon 0-20% slope. All proposed fuel reduction treatment sites in GWMA rest in this category.

Percent Slope	Distance Between Tree Canopies
0-20	15 ft
21-40	20 ft
41-60	30 ft
61+	45 ft

Table 1 Slope and Tree Canopy Specification

The woody debris will be piled and constructed in such a way as to not disturb, threaten, or scar the remaining residual trees when they are burned. The pile burning will take place most likely during the winter season when weather conditions are favorable. The pile burning will be in accordance with state law, local rules and regulations and agency burn permit. Piles left for wildlife purposes will be located at a minimum 30ft from road or shaded fuel break edge depending on estimated flame length.

Fuels Treatment

Understory Fuels: Winterberry, Sweet bush, Low and Highbush Blueberry, Autumn Olive, Sumac, Serviceberry, Barberry, Bayberry and Chokeberry

All woody vegetation in the understory over 1ft are to be removed in order to interrupt the horizontal continuity of fuels. This is to be done only within the selected boundary of the fuel reduction treatment. This will promote seasonal grasses to grow which will reduce fire spread and decrease fire behavior in the fuel break.

Mid-story and Canopy Fuels:

Favorable Hardwood species: White Oak, Northern Red Oak, Black Oak, Scarlet Oak, Chestnut oak, Sugar Maple, Red Maple, Paper Birch, American Beech, Black Gum and Hickory

Undesirable Hardwood species: Cankered Black Birch, Stressed and Dead Oak

Favorable Softwood species: Eastern Hemlock

Undesirable Softwood species: Eastern White Pine

All woody vegetation in the mid-story and canopy up to 8-inch will be removed. If shrub or tree species up to 8-inch is considered favorable and meets fuel break specifications it can be saved as a residual, such as limited canopy and or cavity trees retained for wildlife use.

Woody vegetation greater than 8-inch dbh may be removed if it is dead (snag), triggers a safety hazard, or specifications in the fuel reduction plan require more space between canopies for the given area. The minimum distance between canopies for mid-story and canopy trees is based on percent slope of the terrain. The specifications for minimum distance between canopies as to create a shaded fuel break is shown (Figure 2).

As mentioned previously, GWMA topography is considerably flat with rolling hills. Fuel reduction treatments in GWMA will be using the 15ft guidance between tree canopies. All remaining residual trees will be pruned to remove ladder fuels not more than 8ft from the forest floor.

Minimum shaded fuel break distance above and below road based on percent slope.

Percent Slope	Uphill Distance	Downhill Distance	Total Fuel Break Width
0-20 %	65 feet	65 feet	130 feet
21-40 %	55 feet	80 feet	135 feet
41-60 %	45 feet	95 feet	140 feet
61+ %	35 feet	110 feet	145 feet

Table 2 Shaded Fuel Break Width Verse Percent Slope

The recommended specifications for shaded fuel break width are determined by stand type, stand density (fuel load), and slope. Most treatment plans call for a minimum total width of 300 ft, although these fuel breaks are implemented on much different forests and slopes compared to the Northeast. The guidelines shown (Table 1) are modified to represent the characteristics of forests in the Northeast, in particular Rhode Island. These are general guidelines and width of fuel break can be altered to meet requirements of a strategic shaded fuel break treatment plan. Stand type, stand density and slope is not homogeneous throughout Rhode Island forests. Fire behavior and spread reacts differently as it burns through a hardwood stand as to a pitch pine/ scrub oak stand. Deciduous hardwood tree species are typically more fire resistant, compared to conifer tree species which are more flammable. Pitch pine, scrub oak stand types are fire dependent, relying on fire to regenerate. Stand type will be given most consideration when determining width of a shaded fuel break.

Wildland fire burns hotter and faster the steeper the slope. Radiant and convective heat pre-heats the fuel uphill of the main fire front. As shown in (Table 1) the minimum width increases downhill of a shaded fuel break as slope increases. Fortunately, Rhode Island's terrain is moderately flat with rolling hills being situated between the Atlantic Ocean and Appalachian Mountains.

All shaded fuel break treatment plans will also be constructed and maintained along established fire breaks (roads and trails system) in state management areas. This is also a consideration when determining minimum width of fuel break.

Retreatment

Shaded fuel breaks need continued maintenance of the removal of accumulated fuels for them to be effective. Minor maintenance of the removal of branches and residual trees from possible storm damage will be conducted annually. Regeneration of trees and shrubs that establish after treatment will differ among each shaded fuel break depending upon each site's productivity. Cutting of shrubs and trees that do establish will be performed every 3-5 years dependent on that specific site. Cuttings will be piled for future chipping and or burning determined by that site specific treatment plan. Herbicidal treatments may be performed to reduce or prevent fuel accumulation if the workload of maintaining the shaded fuel breaks becomes over-whelming for the forest fire program.