

# SITE PREPARATION TREATMENT TYPES AND APPLICATIONS

Region (I-K) II

# Requirements for Successful Scarification.

- ▣ Based on species requirements and site conditions both of target species and the species being managed for.

Canadian research shows very little need for site preparation on Fireweed dominated sites.

- ▣ Harvest considerations such as time of harvest, equipment used and amount of logging debris removed or retained impact seedling establishment .

Successful tree planting is part micro-site selection as well as Site Preparation

- ▣ Effects on soil moisture regime on the target species after clear-cutting.

Clearcut harvests remove a larger portion of the evaporation transpiration water loss from a site. -- Hubbard brook and other experimental site show increase in ground water levels after harvest and dry late season conditions.

Has been observed in the Anchor Point area by NRCS soil survey mapping. (change soil water horizon levels of saturation)

# Cost Consideration

- ▣ Cost Effectiveness

Investment in the type of treatments and planting need to reflect both the recovery of the landowner investments and or the public benefits.

Government \$\$ assistance allows for back log reforestation treatments to occur at a more intensive intensity.

- ▣ Lowest cost

Lowest real installation cost is for hand scalping 15 to 20 cents per tree based on size of clearing 10 to 20% cost of the planting, marginally effective- Opinion – set selection is a better choice

# Cost continued

- ▣ Highest is mechanical site prep with chemical treatment at \$450 per ac.
- ▣ Add Tree protectors at an additional 50 cents to \$1+ per tree and the cost of tree planting approaches \$900+ per acre.
- ▣ Which is more than land clearing cost for agricultural land (if you include harvest income.... Delta Junction land clearing study)

# Operational Consideration with applications

- ▣ No site preparation – Preferred method In Kodiak area immediately or 1 year post harvest Interior 1-2 years post harvest
  - ▣ + cost is minimal
  - ▣ + no delay in planting while waiting for implementation
  - ▣ + delay in planting, decreases effectiveness
- ▣ Mowing - Site dependent, mowing can be for grass, shrubs and other tree species
  - Kenai- BIA – hand mowing. Very labor intensive and costly, Mowing is effective when applied below the growing point on Blue Joint Grass, Second years growth is reduced if timed accordingly but is impacted by soil moisture, sunlight and previous mowing or grazing
  - Kodiak – mowing of grass produces decreased regrowth on dry sites, Mowing produces increased growth of grasses on wet sites, discharge slopes, and cooler slopes. (moisture dependent)

# Mowing of Shrubs

- ▣ Set back on alders but limited on Salmonberry
- ▣ Regrowth on salmonberry is within the year and followed by a flush the following season
- ▣ Mowing or maceration can remove existing regeneration.

# Maceration – Kenai, Kodiak. MatSu.

- ▣ Cost is high \$200 to \$300 per acre based on ground debris, slope and stumps
- ▣ Kodiak – treatments produced more grass than was present before treatment, when treatment went into the organic layer (rhizomes) Olsen
- ▣ Kenai- treatment had good results some areas produce good results other produced a great kill (Herbicides may have been used)

# Scarification Kenai, Kodiak, Mat-Su

- ▣ + Removes vegetation,
- ▣ + Warms soil
- ▣ + easy planting contract compliance
- ▣ - Nutrient stripping if done deep
- ▣ - Erosion and Sedimentation can be an issue
- ▣ + - based on site conditions and equipment used.
- ▣ Species dependent. +++ Birch vs + - Spruce
- ▣ - Excellent result in Mat-Su and interior for Birch regeneration for natural regeneration. 50%+ bare ground needed for natural seeding? (Collins)

# For Direct Seeding/Scarification

- ▣ Moose range had positive results in Mat-Su  
.....Collins
- ▣ NNAI – had poor result with project with  
winter scarification 50% with direct seeding  
Result was a sea of Blue Joint Grass. .... NRCS  
WHIP... Haines
- ▣ Anchor Point Direct seeding NRCS WHIP Poor
  - ▣ Seed quality may have been an issue
- ▣ Afognak Island Results with Spruce???????????

# Excavator

- ▣ Bucket w/ & w/o thumb.... ANC .. Nesheim
  - Costly, production per acre was low, moving on slopes difficult , Removing organic mat resulted in very large opening due to Salmon Berry root system
  - Patch treatments, Leisnoi... Olsen fast since it was Afforestation, erosion and sedimentation on steep slopes.. good success, but expensive, small equipment
  - Afognak application also resulted in erosion but on a larger scale. (due to the volcanic ash component in the soil)
  - Mounted vertical axis macerator head – did not work on Salmon Berry or grasses, Clogged lawn mower issue worked well on alder and woody material
  - Mounted horizontal axis will be tried in 2015.

# Dozer/crawler, flat, V and Brush blade,

- ▣ V-Blading, NNAI Rick Charton. Had good to moderate results. Low spots ponded water and some frost jacking. High spots had drought issue. Mid slope were good to moderate. Edges of v-blade had good natural regeneration. Excessive depth resulted in horsetail flush with poor survival on those sites. Survival was good enough for compliance. May produce more micro sites - Nutrient vs Rhizomes
- ▣ Flat Blade Similar to V-blade but with need for backing up more often, slower need angle blade. Collins and Charton
- ▣ Brush Rake Similar to Flat Blade.. less soil removal, but similar grass regrowth. Salamatof Native Association – site prep ... Jimmy Segura (mentions roller crusher)
- ▣ (Creation of Brush Piles = Hare warrens, bunny condos)

# Trencher and Scalpers

- ▣ Efficient over most flat ground with minimum slash. (not much known on the use in south central but is used now in Tok?)

# Chemical

- ▣ Landowners acceptance is low, low threshold for risk
- ▣ Effect on Salmon is well known and often misunderstood
- ▣ Not applicable to most public lands
- ▣ Spot Spraying - use in SE AK to control shrub growth. Very intensive. Cost was \$1.00 per site. Timing resulted in less than 50% effectiveness

# Effects on Vegetation

## -on Calamagrostis

- Has seen up to a 3 years residual effect on Afognak
- Good effects on Salmonberry, young growth
- Effects on salmonberry yields in a release of Blue Joint grass if you mow the salmon berry and let the grass grow and get shrub re-sprout followed up by a later spray... very expensive greater than \$400 per acre
- Timing is critical

# Non ground/vegetation Site Treatments

- ▣ Herbivory
- ▣ Do nothing....Interior AK.... Do nothing and wait the “critters out” very good in areas with no to little grass competition.
- ▣ Reforestation natural stocking is often limited by Moose populations. (Swanson River Burn occurred during an epic low moose population period.)
- ▣ Its not just Hares.
  - Hares, Moose, Voles, Deer are most common, but includes are also birds and other small mammals.

# Human Issues

- ▣ Access Control
- ▣ Snowmobiles - leader clipping especially for Pines. (Ninilchik .Kenai Peninsula)
- ▣ Wildlife management changes.

Greater than 50% loss of lodgepole pine leaders in Seldovia plantings occurred after a three years of increase black bear harvests, that resulted in a higher moose population.

# Summary

- ▣ - site preparation falls into three major areas
  - Post Commercial Harvest- low shrub and grass
  - Post Salvage Harvest –early shrub and grass growth
  - Afforestation – advanced shrub and grass growth
- Time follows cost.
  - The more time that passes the mostly costly the site preparation.

# Summary

- ▣ Site preparation techniques are needed in almost all 2-year post harvest planting
  - Exception maybe in burn areas
  - Site Treatments are expensive
  - Essential Highly Productive Lands Where a Fully Stocked Regulated Forest is Desired.

# Summary

- ▣ Single Entry Treatments Highly Desired
- ▣ Mixed Impacts on Herbivory
  - Costly to use Site Prep to Reduce Herbivory

Treatments that have multi-year effects beneficial  
For follow up treatments