

Red Alder Management: Silviculture to Marketing

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Hardwood Silviculture Cooperative (HSC)

- The HSC is a research and education program focused on the silviculture of red alder and mixes of red alder and Douglas-fir in the PNW.
- Began in 1988, the HSC is a combination of industry and both federal and state agency members, each with their own reasons for pursuing red alder management.
- Members provide direction and funds. They provide the land for research sites and the field crews for planting, thinning, and conducting growth measurements.
- The goal of the HSC is to improve the understanding, management, and production of red alder.



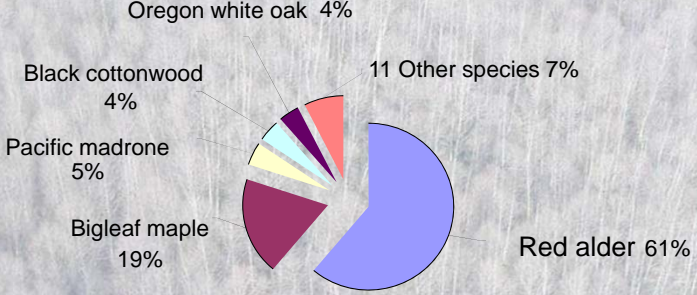
Red Alder Management: Silviculture to Marketing

- Hardwoods and red alder: An Overview
- Why (or why not) manage for red alder?
- Gains from Management
- Management scenarios
 - Existing stands of natural origin
 - Mixed & pure
 - Plantations
 - Site Selection, planting, thinning
- Marketing red alder
 - Inventory, appraisal & marketing
- Comments/questions



Hardwoods and red alder: An Overview

In the PNW, hardwoods comprise ~12% of the growing stock



Species	Percentage
Red alder	61%
Bigleaf maple	19%
Other species	11%
Pacific madrone	5%
Black cottonwood	4%
Oregon white oak	4%

Why (or why not) manage for red alder?

- Hardwoods are important on non-industrial private forests (NIPF) or family forestlands
 - Significant proportion of the forest
 - NIPF owns a large share of the hardwood resource
 - NIPF are not "eradicating" hardwoods

Why (or why not) manage for red alder?

Alder Sawtimber Inventory by Owner



Why (or why not) manage for red alder?

- What are your goals?
 - Because its there (managing incidental hardwoods)
 - Aesthetics
 - Ecological restoration
 - Intensive plantation management
 - ????
- Predominant conifer objective
 - Increase value of your forest just by understanding and utilizing value of incidental hardwoods
- Hardwood objective
 - Intensive hardwood management short-rotation, high-value timber

Why (or why not) manage for red alder?

- **Reasons TO manage red alder**
- **Reasons NOT TO manage red alder**
- **Management Gains**



Reasons to manage red alder

- Biologic
- Economic



Reasons to manage red alder-Biologic

- Tree Diseases
 - Swiss Needle cast & Laminated Root Rot



Reasons to manage red alder-Biologic

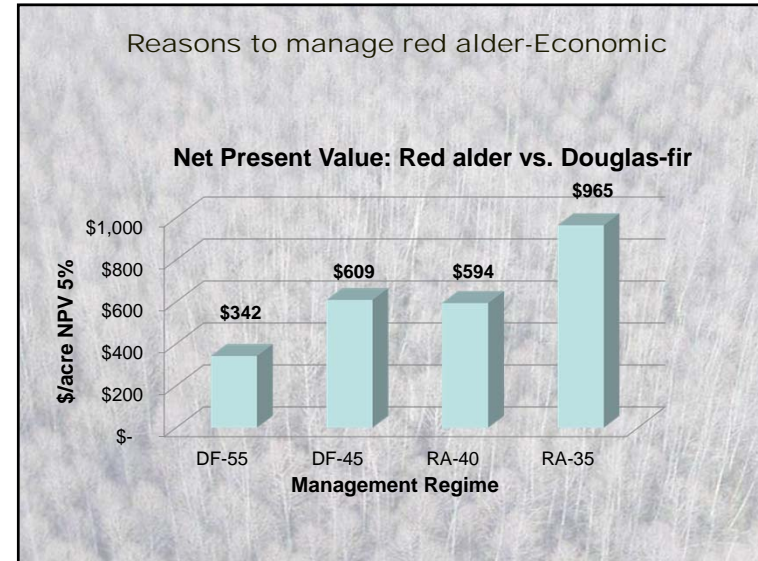
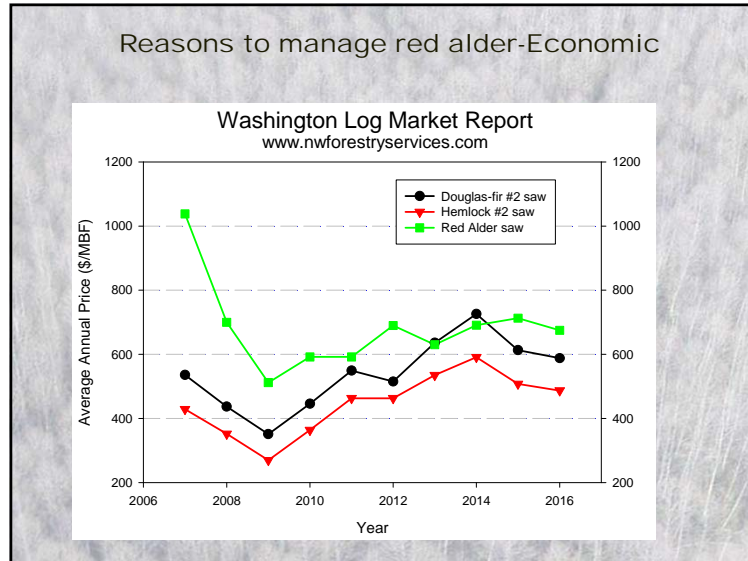
- Diversity



Reasons to manage red alder-Biologic

- Ecological importance/functions





Reasons not to manage red alder

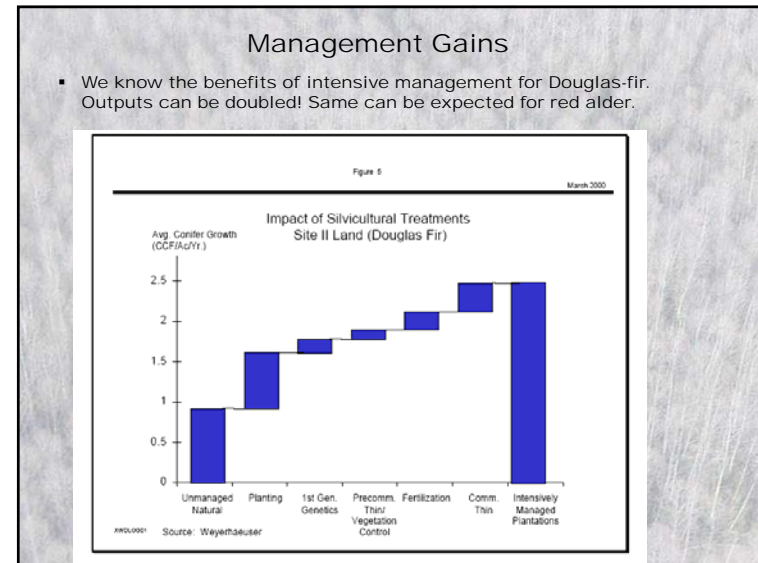
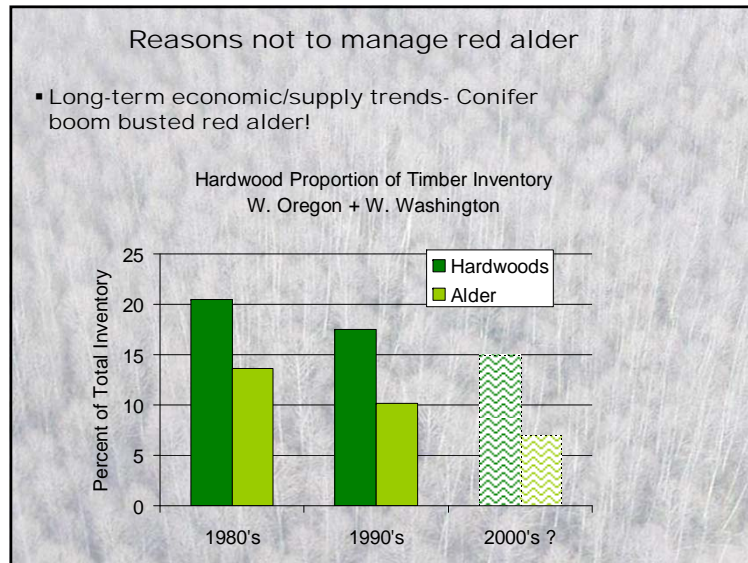
- It's a weed

Stand Management
Converting Western Oregon Red Alder Stands to Productive Conifer Forests

OREGON STATE UNIVERSITY EXTENSION SERVICE

Reasons not to manage red alder

- Perceived lack of knowledge



Management Gains

Yield expectations for managed red alder compared to natural stands

Management regime	Rotation length	Yield 30-foot average log length 5-inch plus	Percentage "high-value" sawlogs 8-inch plus
Intensive plantation management (speculative projections from 9-15 year old plantations)	25-30 years	13-17 mbf/acre	60-80%
Thinning existing alder patches (estimates from case studies)	30-40 years	10-15 mbf/acre	50-80%
Natural, unmanaged (based on empirical yields)	30-40 years	8-12 mbf/acre	10-30%

Managing existing stands of natural origin

Mixed species

- Alder and conifers tend to grow in patchy mixtures with one species predominating
- It is relatively simple to apply appropriate techniques for one predominant species in a patch

Managing existing stands of natural origin

Mixed species

- Options for more intermixing with shade tolerant trees under alder or with delayed alder establishment



Managing existing stands of natural origin

Mixed species

- Leave alder when it appears to be the "best" tree



Managing existing stands of natural origin

Mixed species

- Leave alder when it appears to be the "best" tree



Managing existing stands of natural origin

Mixed species

- Management of mixtures with alder can be difficult
- Requires a careful balance in order to achieve the expected benefits from all species



Managing existing stands of natural origin

Pure Stands

- Density Management is key!
 - Extreme initial densities
 - Rapid juvenile growth rate
 - Use tree vigor and stand conditions, not age

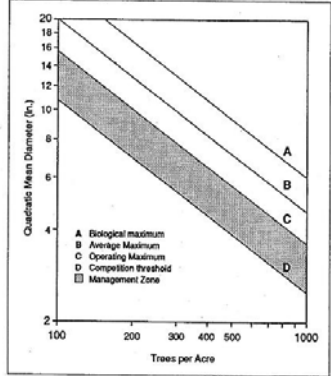


Managing existing stands of natural origin

Pure Stands

Density Management Guide

- Defines relationship between growing space and tree size
- Very useful tool for making decisions regarding stand density (i.e. thinning)




Density Management Diagram for red alder

Managing existing stands of natural origin

Pure Stands

- Pre-commercial thinning
 - Before crown recession exceeds 40-50%
 - Approximately 30ft height
 - Reduce to 250-400tpa
 - Avoid opening excessively to keep brush down and reduce sun scald




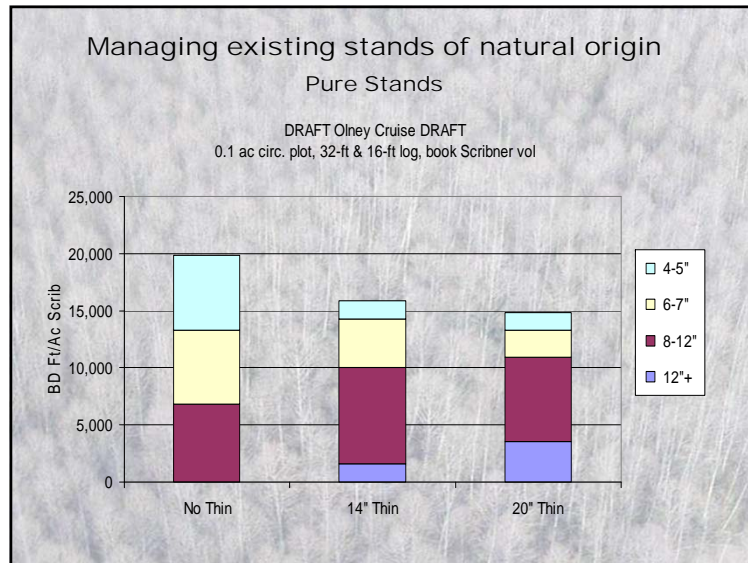
Managing existing stands of natural origin

Pure Stands

Olney Site

- Average site index 100ft at 50 years.
- Stand establishment 1967 after logging
- Thinning occurred at age 14
- Density 710 to 1269 tpa
- DBH 4 to 5in
- Height about 50ft
- Logged at age 35

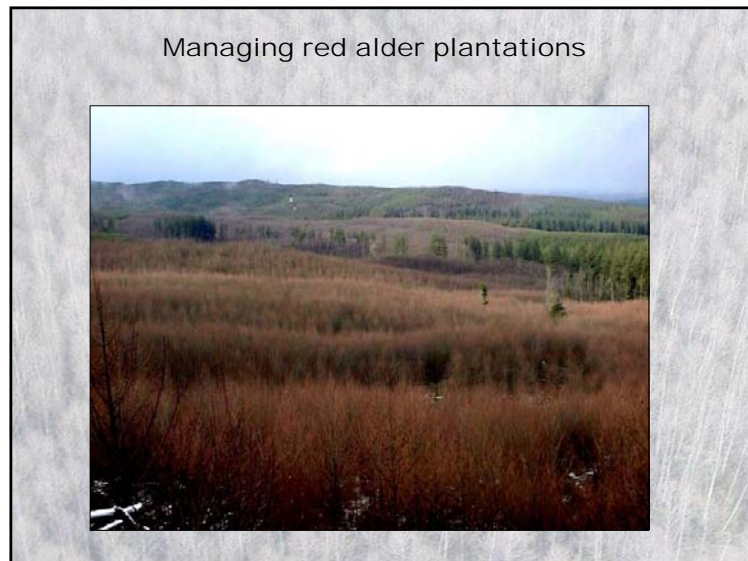




Managing existing stands of natural origin

Pure Stands

- PCTing resulted in less total volume than unthinned stands (narrow=20.3%, wide=25.4%)
- However, thinning resulted in more revenue from sawlogs and a greater total value (from 4.9% to 17.3%)
- So, given these stand conditions, market prices, and assumptions, PCTing natural red alder stands could make financial sense



Managing red alder plantations

Keys to successful management

- Selecting suitable sites
- Site prep and veg management
- Regeneration
- Thinning
- Planning for harvest

Managing red alder plantations

Selecting suitable sites

- Red alder occupies sites with a range of physical properties but best growth achieved on the more limited well-drained upland or alluvium sites.
- Good drainage but not swamps
- Avoid heavy frost pockets
- Avoid summer drought and heat stress



Managing red alder plantations

Selecting suitable sites

- With nearby trees
- Site index curves have been developed for natural stands of red alder using a base age of 50 years.

Red Alder Site Index: Max. by Age and Height - ages 5-20 years from seed
 Find 41 in the table using age, height of dominant trees in left column, age in top row

height	age	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
14	5	5															
14	6	6															
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Calculated from equations of Harrington and Curtis 1956, converted to Slippy map by Vancouver and Washington 1991

Managing red alder plantations

Selecting suitable sites

- Without nearby trees or bare ground
- The most common way of determining site index (base age of 50 years) uses the soil-site method developed by Harrington (1986).

Site evaluations for red alder

Site name or number: _____

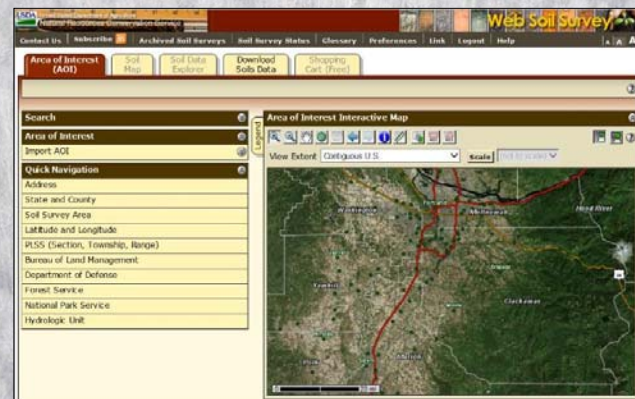
Location: _____

		Soil-site factors		
		1	2	3
Geographic and topographic position	Soil moisture and aeration during the growing season	Soil fertility and physical condition		
Soil-site property	Score for this site	Soil-site property	Score for this site	Soil-site property
Elevation	Internal drainage	Parent material and age		
Physiographic position	Texture	pH		
Aspect and slope	Soil depth	Organic matter		
Precipitation	Rock and gravel content	Bulk density		
Special hazards	Depth to water table			
Total for factor 1 =	Total for factor 2 =	Total for factor 3 =		
Total for all factors = _____				
Site = _____ m.				

Managing red alder plantations

Selecting suitable sites

- Soils data can be most readily found at the NRCS website



Managing red alder plantations

Site prep

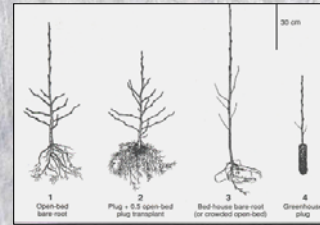
- Pre-planting vegetation control measures are required!
- There are no operational chemical treatments for release
- Manual brush cutting is expensive
- Site preparation is very important
- The quicker red alder 'occupies the site' the better



Managing red alder plantations

Seedlings

- Seed zones are similar to Douglas-fir
- What is a quality seedling?
 - Healthy branches or buds along the entire length of stem



Managing red alder plantations

Seedlings

- Be sure to order in advance
- From where?

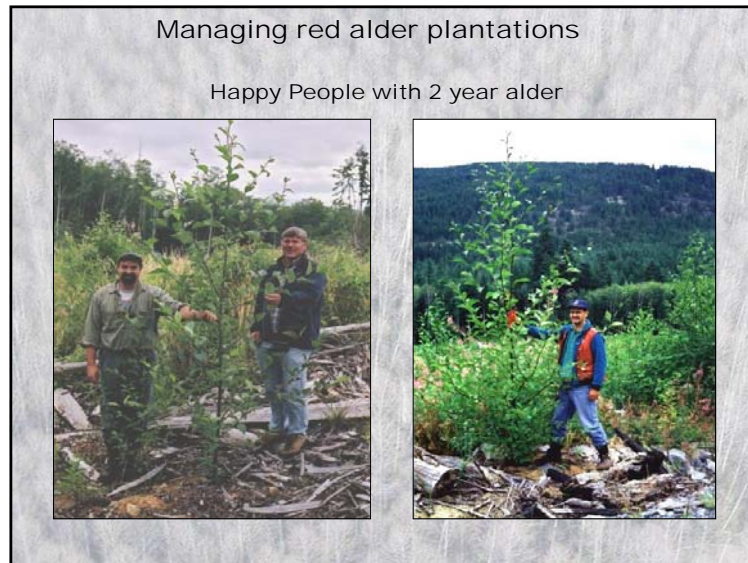


Managing red alder plantations

Outplanting

- Red alder must be planted in spring, mid-March through mid-April after the risk of frost is over but before summer drought stress
- Stock very easily damaged, handle gently
- Red alder seedlings are susceptible to heat stress so deep planting and minimal scalping is recommended
- Finding a crew familiar with red alder is very important

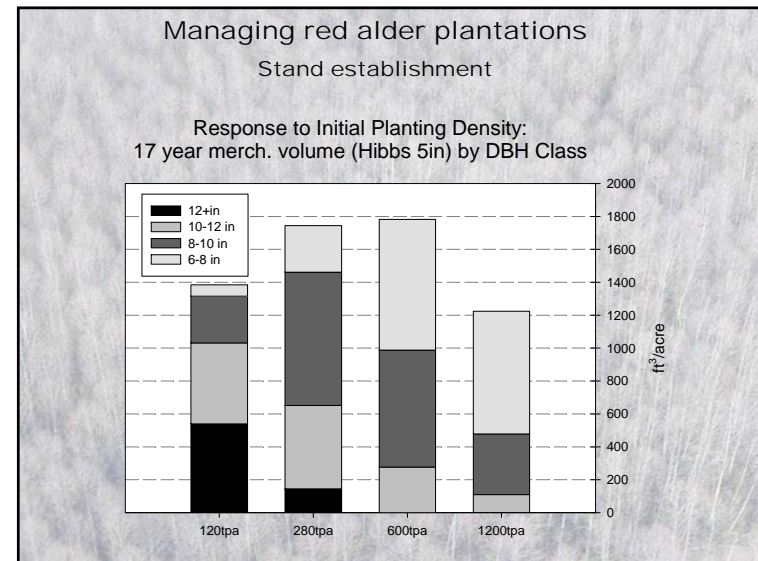


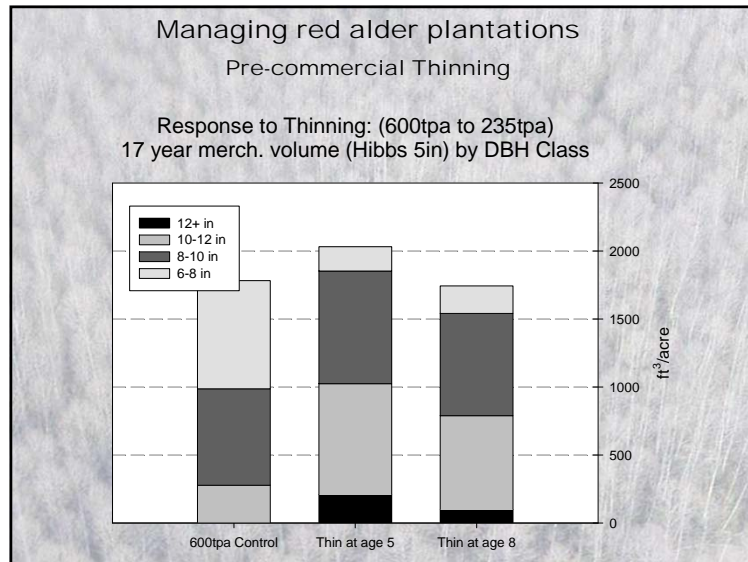
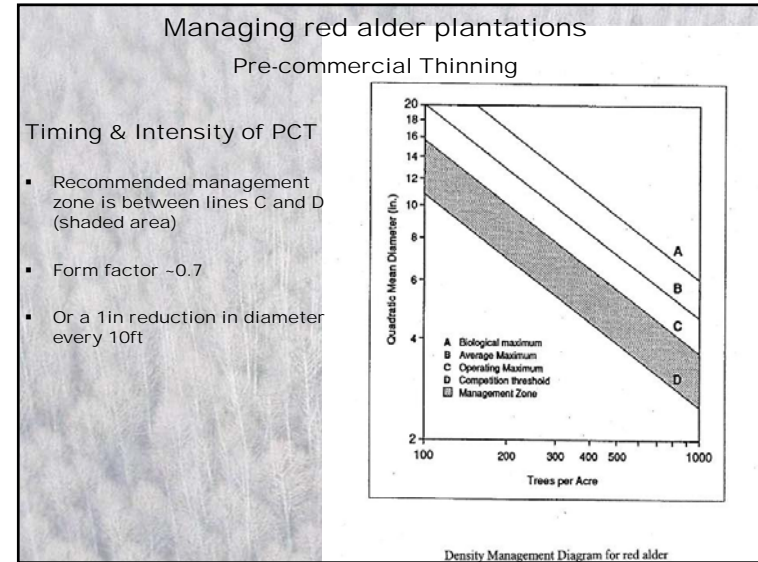


Managing red alder plantations

Stand establishment

- Initial and continued dominance of red alder is needed for good establishment and growth
- Getting red alder to quickly occupy the site (and thus, to optimize its rapid, early growth) is crucial
- Young red alder likes company!
 - Stem form
 - Natural Pruning
 - Growth rates
- Therefore, planting fairly dense ~600tpa (8.5 X 8.5ft) tries to balance tree survival, growth rates and stem quality with cost (seedlings and stand tending)





- ### Managing red alder plantations
- #### Pre-commercial Thinning
- Sooner than you think!
 - Reduce to ~ 200 tpa: depending on economics, piece size, etc.
 - Try to keep spacing uniform
 - Avoid opening excessively
 - On an "average" site and "average" density (~ 600 tpa):
 - Age= 5-8 years
 - DBH=4-5in
 - Height= 25-35ft
 - HLC= 8-12ft
 - Tries to balance tree vigor, response potential, individual growth rates, stand yield, stem quality

Managing red alder plantations

Commercial Thinning

- No existing data
- Two possible scenarios
 - Plant wider and wait longer
 - PCT then CT



Managing red alder plantations

Pruning

- Best to try to prune when DOS is less than 4 inches
- Always keep at least 50-60% live crown
- Often difficult to do both
- Timing does not make much difference in the incidence of rot
- Healing rates are similar for live branch pruning and dead branch pruning



Managing red alder plantations

Inventory, Appraisal & Marketing

- Know what you have
- Get good advice from Extension forester or log buyer
- Assess stand volume by log diameter (small end)
- Use log length and diameter specifications of prospective buyers



Managing red alder plantations

Harvesting

- Find the right logger, with references!
- Buck and sort logs to match markets
- Avoid staining and degrade - deliver logs within 1 month
- Harvest costs still are often higher
 - 40-50% of gross log value (\$160-200/mbf)
- Planning for access and timing is key
- Experienced hardwood operators demonstrate better returns with more attention to planning, harvesting, and marketing



Red Alder Management: Silviculture to Marketing

Summary

- Don't be afraid of red alder!
- Much of the red alder resource is on NIPF, which is advantageous to small landowners
- Conifer objective
 - Increase value of your forest just by understanding and utilizing the value of incidental hardwoods
 - Established red alder patches can be an opportunity: easy to evaluate and manage
- Hardwood objective
 - Intensive hardwood management, short-rotation, high-value timber
 - These plantations can perform well, but only under certain conditions

Questions?

