

Railsiding Understory Thin

Non-commercial terrestrial habitat improvement

Sol Duc Valley, Olympic NF, Clallam County, WA

June, 2007

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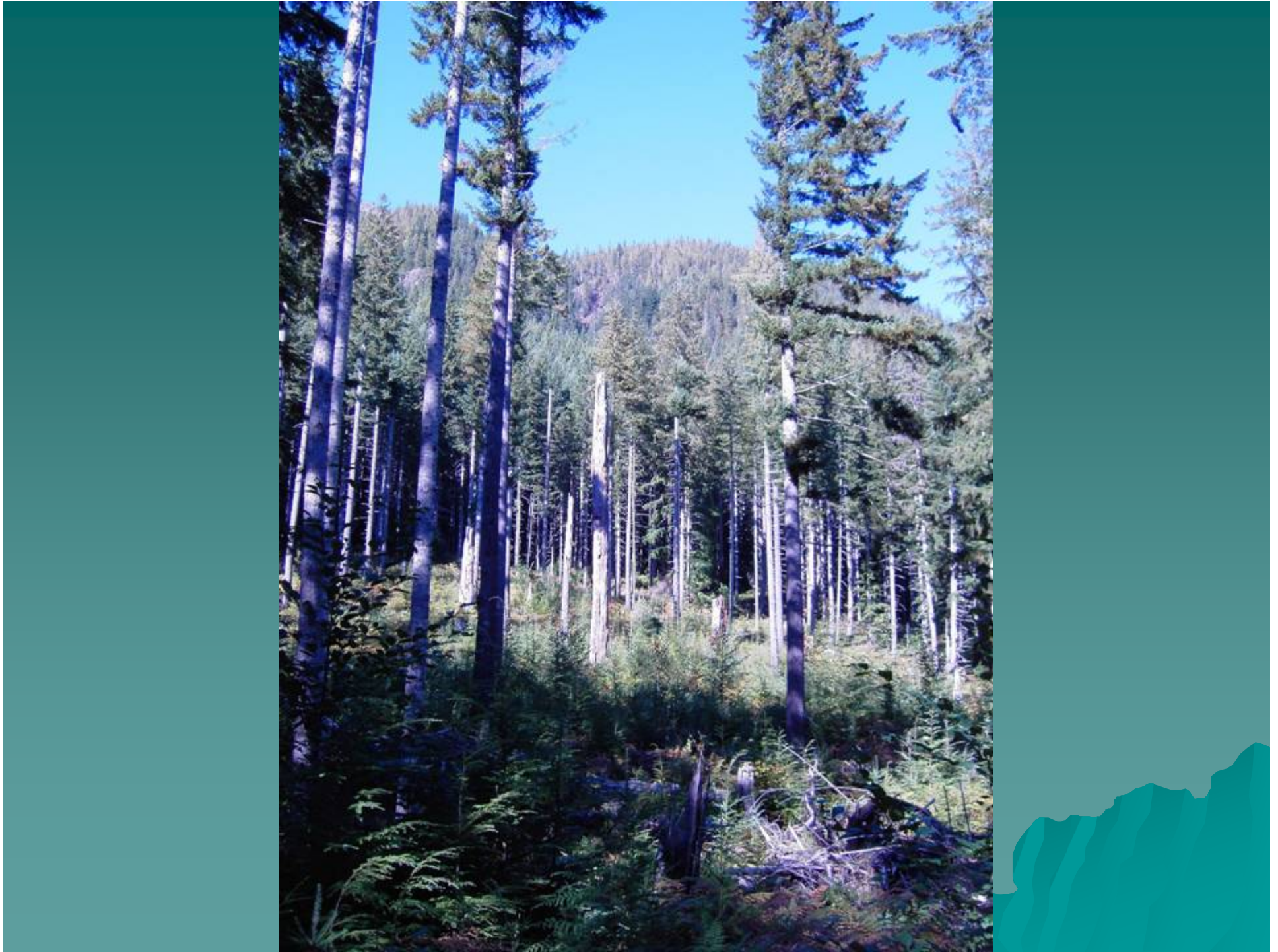












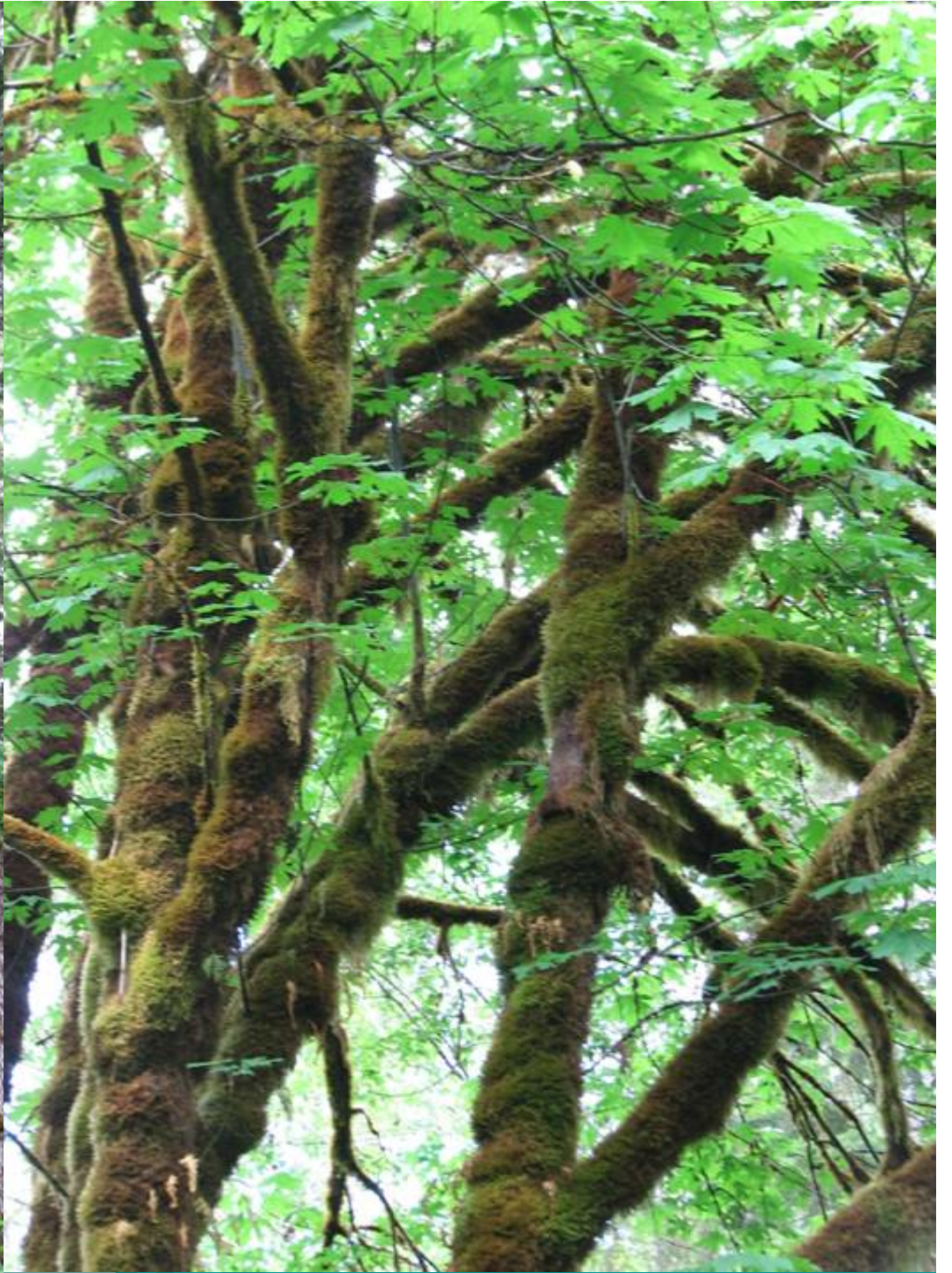






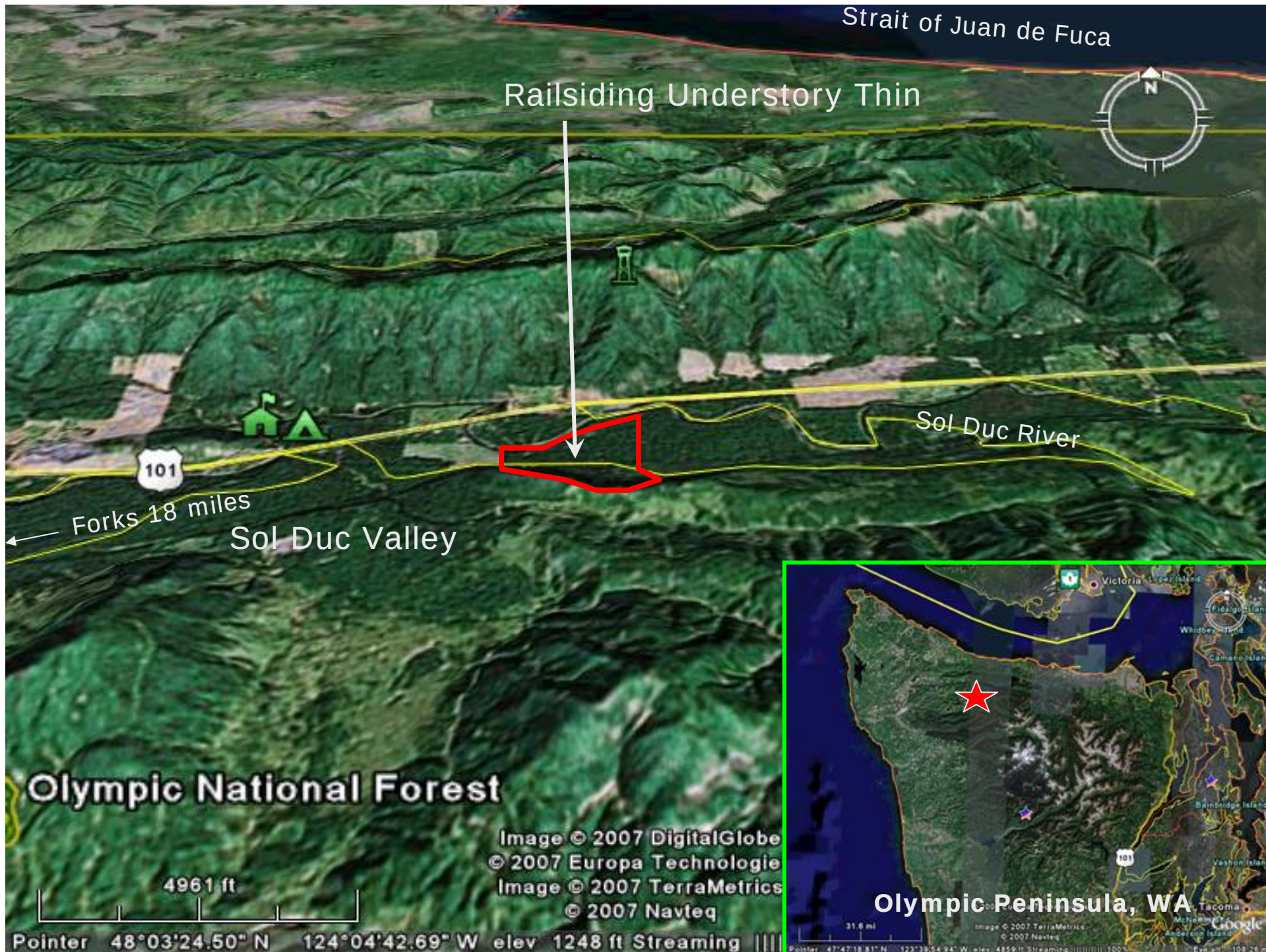




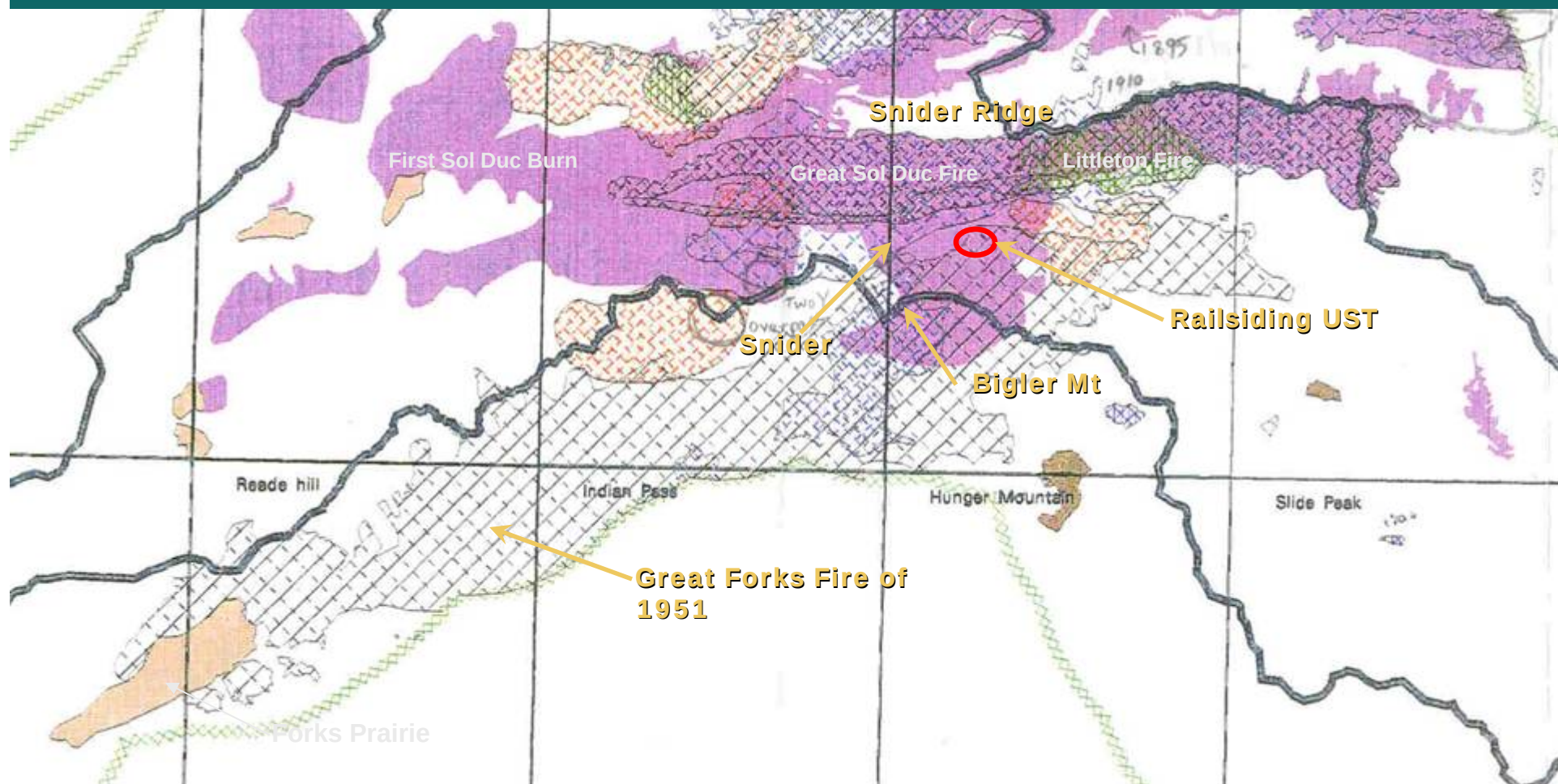








Sol Duc Area Fires, 1895 to Present



First Sol Duc Burn	ca. 1895	27,300 Acres
Great Sol Duc Fire	1907	8,800
Sol Duc Fire	1914	6,500
Planting Fire	1919	1,000
Littleton Fire	1920	2,800



1935 Osborn photo of the west end of Snider Ridge, Bigler, and Sol Duc Valley from Kloshe Nanitch Lookout



Railsiding
UST

First commercial thin, 1972-74

Second commercial thin, 1998



Objective: Develop terrestrial habitat in a twice-commercial-thinned stand of Douglas-fir and hemlock that had grown a dense “carpet” of hemlock saplings following its first commercial thinning in the 1970s.

Objective: Demonstrate management of hemlock “carpets”



Hemlock carpets?

Recalcitrant understories?

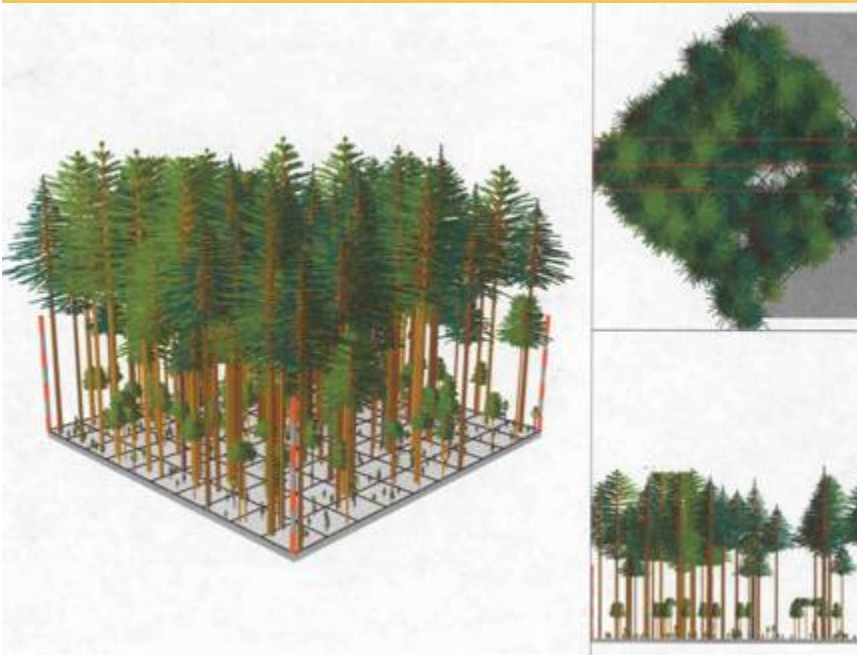
Objective: Allow retention of full crowns and encourage diameter growth of residual understory hemlock



Objective: Open the understory and reintroduce (or prevent exclusion of) herbs and shrubs to (or from) the forest floor by thinning the understory cohort of hemlock



Objective: Develop a stand exhibiting three distinct canopy layers—the overstory DF and WH, the understory hemlock and vine maple, and the ground layer of herbs and shrubs including red huckleberry, salal, fools huckleberry, sword fern, oxalis, etc.





Forest/Regional Goals:

- Implement the NW Forest Plan
- Develop late successional habitat in AMA and LSR — the Olympic is entirely AMA (20%) and LSR (80%)
- Add diversity to simplified second-growth forests — NWFP, Olympic AMA, D16

Pre-treatment Stand Conditions:

Overstory, post-commercial thinning (second CT 1998): Estimate 89% DF, 11% WH, 180 ft²/ac BA, 66 TPA, 22.5 in. QMD, $RD_{\text{Curtis}} = 38$, LCR 35-45%

Understory: Variably 5-20 thousand TPA, WH, 0-4" DBH, 4-18 feet tall that came in following the first commercial thin in the early to mid '70s.

Ground vegetation: Light to non-existent due to exclusion by the dense hemlock understory stand.



Intended post-treatment stand conditions:

A stand exhibiting three distinct canopy layers—the overstory DF and WH, approx. 150 feet tall, the understory hemlock (approx 170 TPA) and vine maple, approx 8-16 feet tall, and a ground layer of herbs and shrubs including red huckleberry, salal, fool's huckleberry, sword fern, oxalis, etc.

Prescription:

Thinning was specified to an average spacing of 16x16 feet, from below, cutting and spacing only from trees 6 inches DBH and under—in particular, thinners were not to space off overstory trees.

Hemlock was the priority cut-tree.

Cedar, spruce, and hardwoods were priority leave-trees.

Shrubs of any kind were not to be cut.

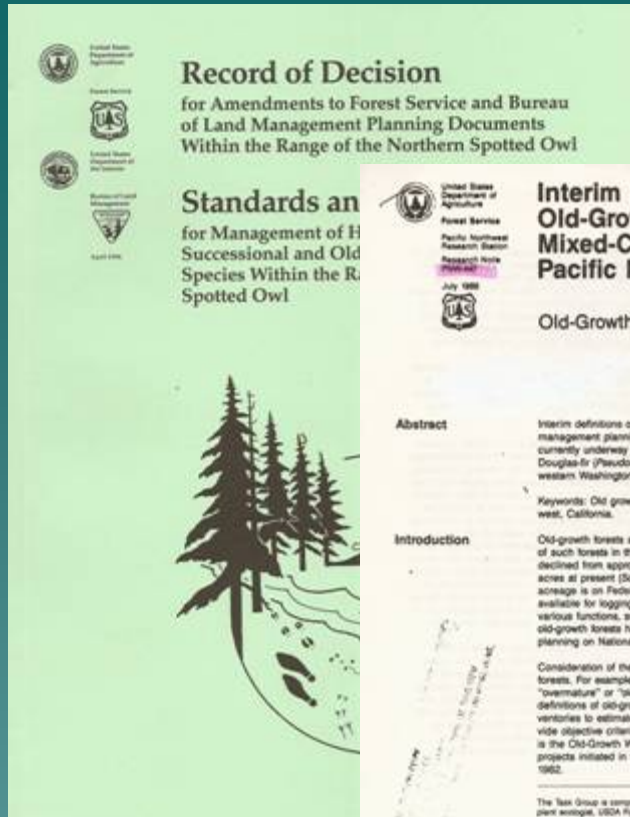
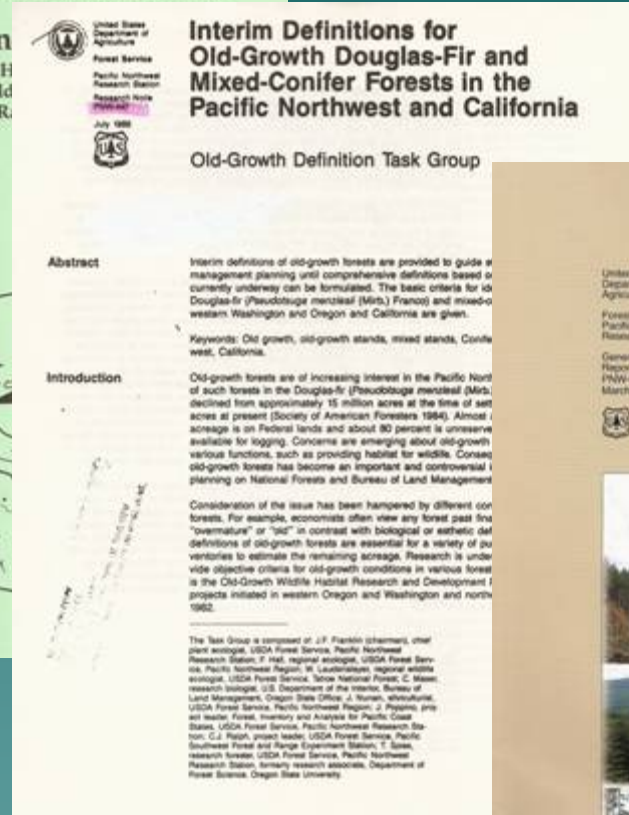
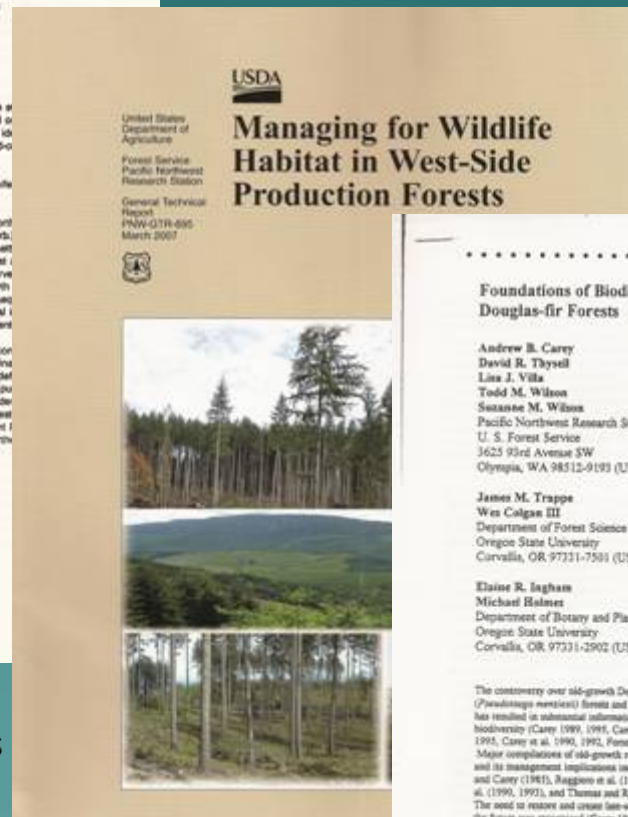
SILVICULTURAL PRESCRIPTION Silv Rx Book 1 Rx 8j	Riparian Reserve width: 398 ft.																
Rx Date: 5/21/96	CLIMATE: Precip., Temp., Snow, Growing season																
SALE NAME: Rail	Precip - Approx. 90 in./yr. mostly as rain. Intermittent snow Dec. -- Mar.																
Rail stands A and B, including HDS plots 1-4, and Sol Duc Riparian Reserve.	SOIL CLASSIFICATION: 14A Formed on glacial outwash plains. Well drained, variable, gravelly/very gravelly silt loam. Low erosion potential. Compaction a concern on this type.																
Stand A : 83 ac. AMA : 65 ac. Riparian Reserve : 18 ac.	FIELD DESCRIPTION: Depth: surface 24-60", sub 84 - 120" Duff Thickness: 2-3 inches.																
Stand B : 311 ac. AMA : 240 ac. HDS Plots 1,3,4 : 69 ac. HDS Plot 2 (control) : 23 ac. Remainder tmt. area : 148 ac. Riparian Reserve : 71 ac.*	FIRE HISTORY: According to Henderson, et al, this area has burned 4 and 5 times since 1300, and as recently as the 1930s. The Forks Fire of 1951 burned into the southern edge of this stand.																
* Based on horizontal distance measured on 4":1mi. map. NWFP ROD guidelines specify use of slope distances, so these measurements are a little high.	ANIMAL INFLUENCE: Deer & elk browse on red huck, Menziesia, and salmonberry.																
I. LOCATION: TRI Compartment: 5201 TRI Cell: 131, 137, 138, 140, 141, 144, 145, 282, and parts of 25, 108, and 143. Legal: Twp. 30N, Range 11W, SW 1/4 of Sec. 25, and S. 1/2 of Sec. 26. MAP: (see attached map) Scale 1:15840 Aerial Photo #1989 389-109	MANAGEMENT CONSTRAINTS: * E1-Timber Emph. (ONF LRMP, 1990). AMA-Adaptive Mgt. Area (ROD, NW Forest Plan, 1994) Riparian Reserve (ROD, NWFP, '94) Adjacent Ownership? DNR land to west, clearcut about 3 years ago. Merrill & Ring land to south of HDS plots 1 and 2 (see map, attached).																
II. EXISTING CONDITIONS Conditions are an estimate of an observed mean which can and will vary from one microsite to another.	Site Class 50 yr.: 3 (King, 1966) Site Index Sp. Est. Meas. 50 yr.: 110 DF X																
TOPOGRAPHY: Slope %: 0-20% Slope Shape: flat, benchy Position on Slope: valley bottom Elevation range: 840-920 feet Exposure: flat	VEGETATION: Stand A Overstory comp %: Stand A -- 89% DF, 11% WH Stand Information Table:																
STREAM CLASSIFICATION: Sol Duc River, anadromous fishery	<table><tr><th>Sp.</th><th>BA/Ac. (Sq.Ft)</th><th>QMD Trees/Ac (in.)</th><th>Vol./Ac (mbf)</th></tr><tr><td>DF</td><td>213.3</td><td>91.2</td><td>20.7 52.2</td></tr><tr><td>WH</td><td>26.7</td><td>14.1</td><td>18.6 4.4</td></tr><tr><td>Stand:</td><td>240.0</td><td>105.3</td><td>20.4 56.6</td></tr></table>	Sp.	BA/Ac. (Sq.Ft)	QMD Trees/Ac (in.)	Vol./Ac (mbf)	DF	213.3	91.2	20.7 52.2	WH	26.7	14.1	18.6 4.4	Stand:	240.0	105.3	20.4 56.6
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Tools/Resources

NW Forest Plan, Olympic AMA (D16):
Add diversity to simplified second-
growth forests

PNW 447, old-growth definitions: Large
trees; shade-tolerant associates; deep,
multilayered canopy; snags; CWD



Dr. Joan Hagar: Deciduous shrub
cover approaching 35% encourages
neotropical migrant birds to inhabit
conifer stands

Dr. Andrew Carey: Skips, gaps, CWD and
Ericaceous shrubs are important for spotted
owl prey species

Assumptions—basis: (and uncertainties)

- Once the understory hemlock has developed a woody stem, it can be thinned mechanically, the same as any plantation—experience.
- Two canopy layers, i.e., the overstory DF and WH, plus the residual understory hemlock and vine maple, would prevent a second pulse of hemlock regeneration from germinating under the thinned understory—experience and positive or wishful thinking.
- The thinned understory hemlock would be able to grow and develop without excessive wet-noodling—logic (wind should not be as great a factor in the understory and fervent prayer (the H/D ratio of a 2-inch, 16-foot tree is 96!))
- Herbs and shrubs would be able to persist and increase in biomass or be re-introduced in the thinned understory—experience with post-PCT and post-CT stands.



Railsiding Understory Thin

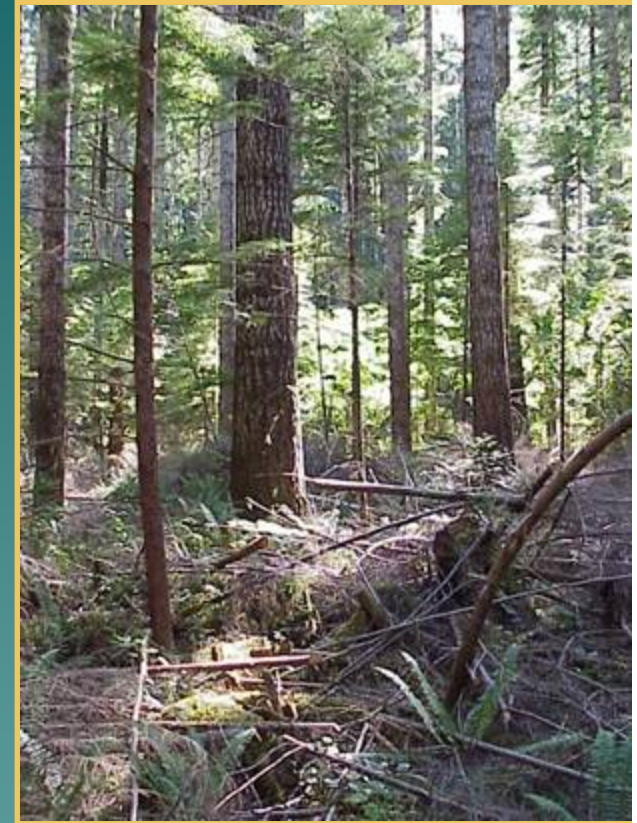
32 acres thinned November, 2001; 44 acres thinned March, 2004



Before Treatment,
October 5, 2001

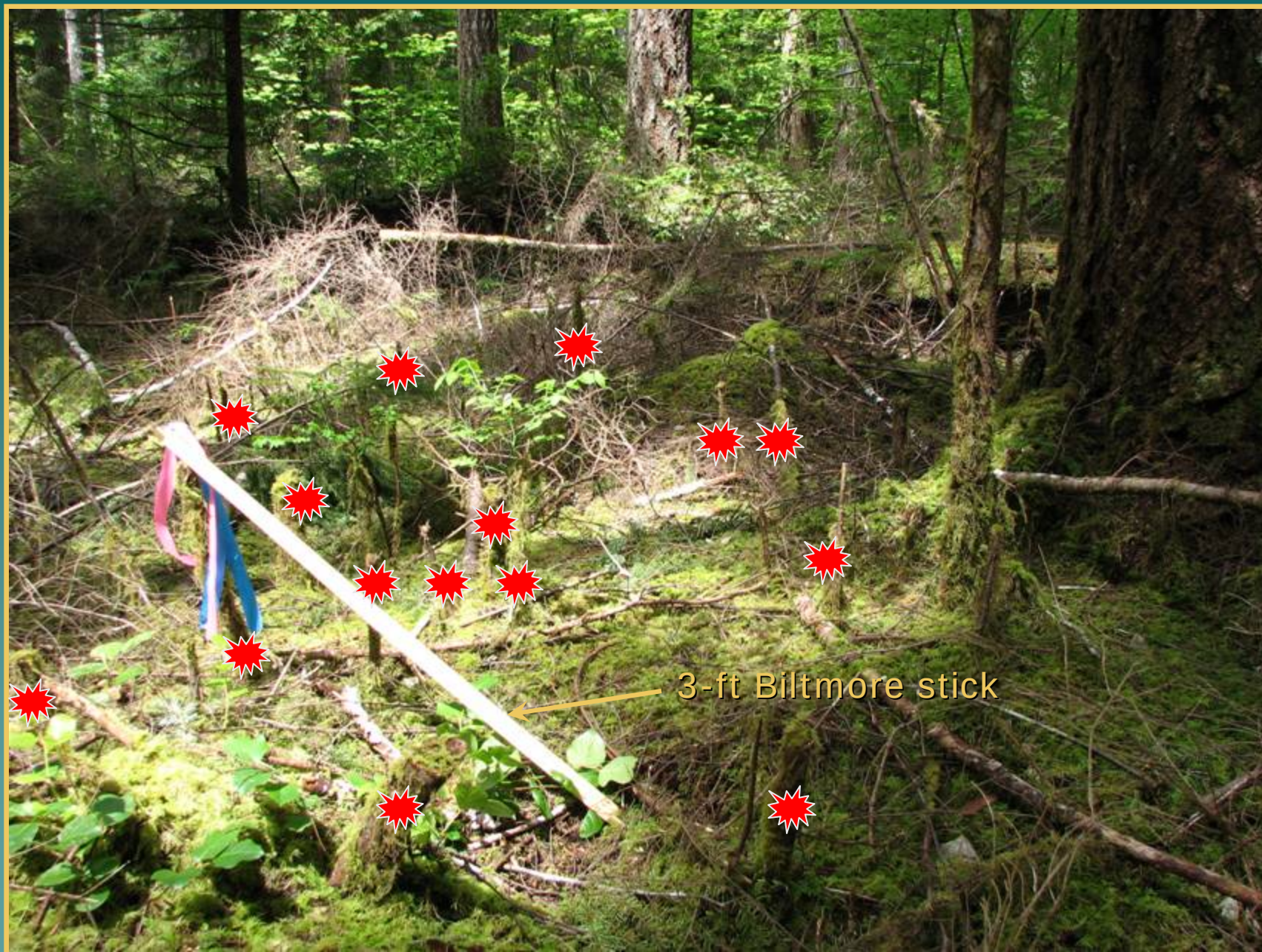


After Treatment,
December 3, 2001



After 2002 Growing
Season, September 23,
2002

A lot of stems were cut:



Potential problems:

- Prescription not understood:
 - All understory trees removed
 - Shrubs inadvertently cut
- Slash
- Wet noodling/blowdown



Results: (3 and 5 growing seasons on)

- Hemlock carpet eliminated
- Developing midstory WH & vine maple
- No new pulse of hemlock regen
- A few wet-noodled understory trees
- Much more ground vegetation



Results (continued):

- Improved diameter growth of understory trees

5-yr radial growth post-thin 0.35"

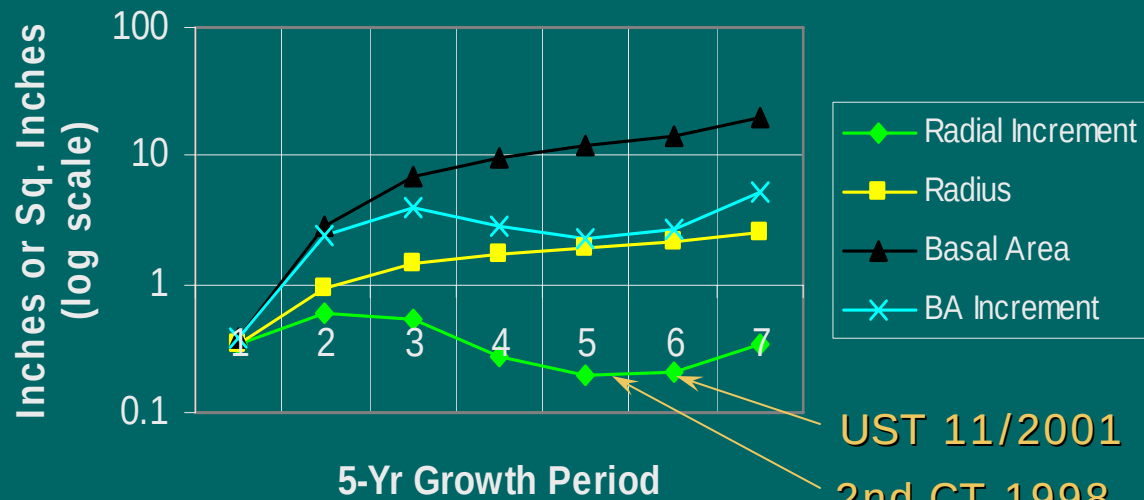
UST 11/01

5-yr radial growth pre-thin 0.22"

59% increase in
diameter growth

5 inch X 30 foot hemlock

Railsiding UST Hemlock



UST 11/2001
2nd CT 1998



Widely accepted, current?

Newly developed, novel?

Well...

Understory Thinning Accomplished to Date:

Sale	Unit	Acres	Watershed	Year Accomplished
Railsiding	PU-5 (S)	32	Sol Duc	F 2001
Railsiding	PU-5 (N)	44	Sol Duc	W-S 2004
Curmy	PU-2	46	Sol Duc	W-S 2004
Whatever Salvage (Kugel Kut PU4&5)	PU-2	26	Sol Duc	F 2004
Two Y	PU-2	72	Sol Duc	F 2004
Clark	SW-4	40	Sol Duc	F 2004
Scatter	PC-5	5	West Twin	F 2004
Kugel Kut	PU1,2,&3	34	Sol Duc	F 2006
Total Acres to Date		299		

KV Collections from Current Sales for Future Understory Thins:

Sale	Unit	Acres	Watershed	Approx Year Expected
Two Y	PU-3	36	Sol Duc	2010
Grindstone	C3B	196	NF Calawah	2012
Wild One	C1-1	104 (-2=102)	Sol Duc	2009
Wild One	C1A-1	33	Sol Duc	2009
Mower One	C1-2	125 (-25=100)	Sol Duc	2010
Mower One	C1-3C	48	Sol Duc	2010
Total Acres Planned		542 (-27=515)		

Planned KV Collections from Upcoming Sales for Future Understory Thins:

Sale	Unit	Acres	Watershed	Approx Year Expected
Flat Tire	C1-4	25	Sol Duc	2014
Flat Tire	C1-6	72	Sol Duc	2014
Flat Tire	C1-9	40	Sol Duc	2010
Flat Tire	C1-11	18	Sol Duc	2014
Flat Tire	Clark SW-5	17	NF Calawah	2010
Total Acres Planned		172		

Total KV Planned:

687 Acres

Proposed Understory Thinning Units for Appropriated Funding:

Sale	Unit	Acres	Watershed	Subwatershed	Priority	Thin Date
Kugel Kut Thin	PU-6	9	NF Calawah	Middle Mainstem	1	
Kugel Kut Thin	PU-7	11	NF Calawah	Middle Mainstem	1	
Whatever Salvage (Minoxidil Thin)	PU-1	34	NF Calawah	Middle Mainstem	1	
Curmy	PU-1	60	Sol Duc	Sol Duc Valley	1	
Curmy	PU-3	56	Sol Duc	Sol Duc Valley	1	
Curmy	PU-4	5.6	Sol Duc	Sol Duc Valley	1	
K Mark	PU-1	54	Sol Duc	Kugel Creek	1	
Not-Today-Ray	PU-1	34	NF Calawah	Middle Mainstem	1	
Hairline	PU-1	31	NF Calawah	Middle Mainstem	1	
Santo PC-3	PU-1	35	Sol Duc	Sol Duc Valley	1	
Santo PC-3	PU-2	28	Sol Duc	Sol Duc Valley	1	
Santo SO-136	PU-4	12	Sol Duc	Sol Duc Valley	1	
Total Priority 1		370				
Santo (SO-135)	PU-7	11	Sol Duc	Sol Duc Valley	2	
Heckel	PU-5	3	Sol Duc	Sol Duc Valley	2	
Curmy	PU-5	7	Sol Duc	Sol Duc Valley	2	
Fresca	PU-6	26	Sol Duc	Bockman Creek	2	
Fresca	PU-8	45	Sol Duc	Bockman Creek	2	
K Mark	PU-2	24	Sol Duc	Sol Duc Valley	2	
K Mark	PU-5	21	Sol Duc	Sol Duc Valley	2	
Total Priority 2		127				
Total Acres Proposed		507				

Questions?

This habitat
don't suck...



Answers \$1

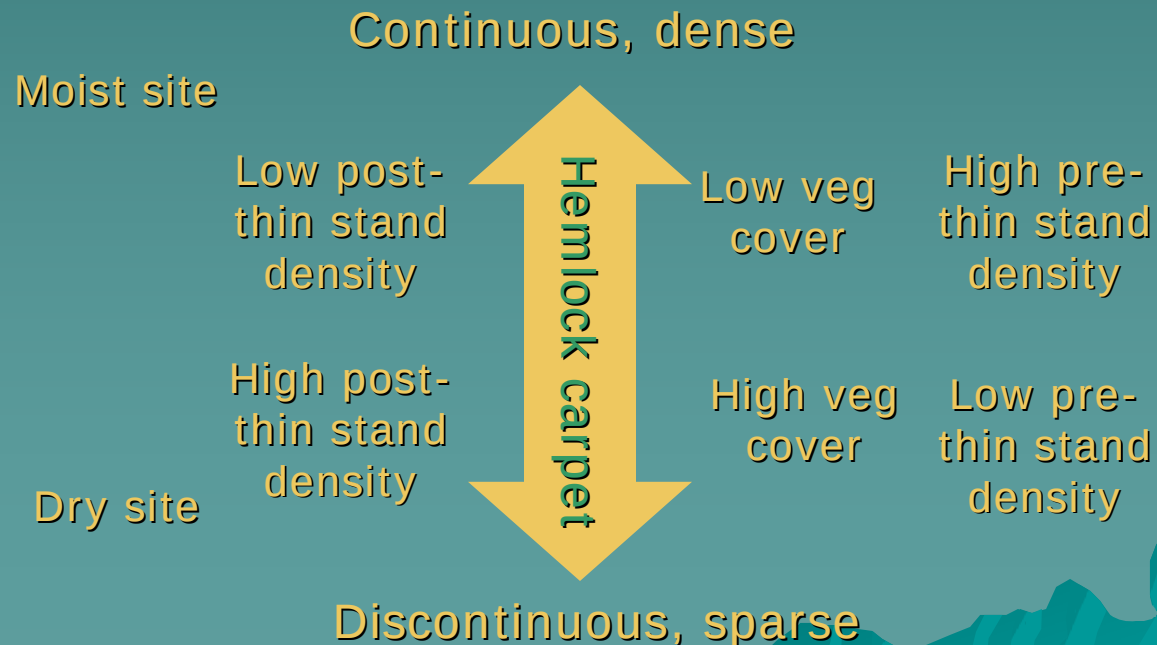
Answers requiring thought \$10

Truthful and/or correct answers \$100

(Questions and dumb looks are free)

Factors that may influence development of hemlock carpets in commercial thins:

- Site moisture regime/plant association
- Pre-thin ground vegetation cover, type and amount (reflecting stand density and history)
- Post-thin stand density, including losses due to blowdown
- Stand species composition, i.e., relative dominance of DF vs. WH – may affect height growth of hemlock carpet more than hemlock regeneration



Other disturbances can generate hemlock carpets:

- Post Christmas ice storm of 1996
- Douglas-fir dieback on Snider Ridge
- Low intensity fire along edge of Forks Burn, Bonidu Flat
- Understory reinitiation stage forest, found in relatively undisturbed old growth stands in Olympic National Park
- 1921 Blow (?) and other blowdown events

