FOREST DEVELOPMENT MANAGEMENT PHASES

George McFadden
Bureau of Land Management
February 26, 2008

BLM – ODF Joint Thinning Training – Silver Falls State Park

THIS IS NOT ROCKET SCIENCE

BLM – ODF Joint Thinning Training – Silver Falls State Park

NEWTON'S LAWS OF MOTION

- INERTIA
- ACCELERATION
- FORCE

THIS IS NOT ROCKET SCIENCE

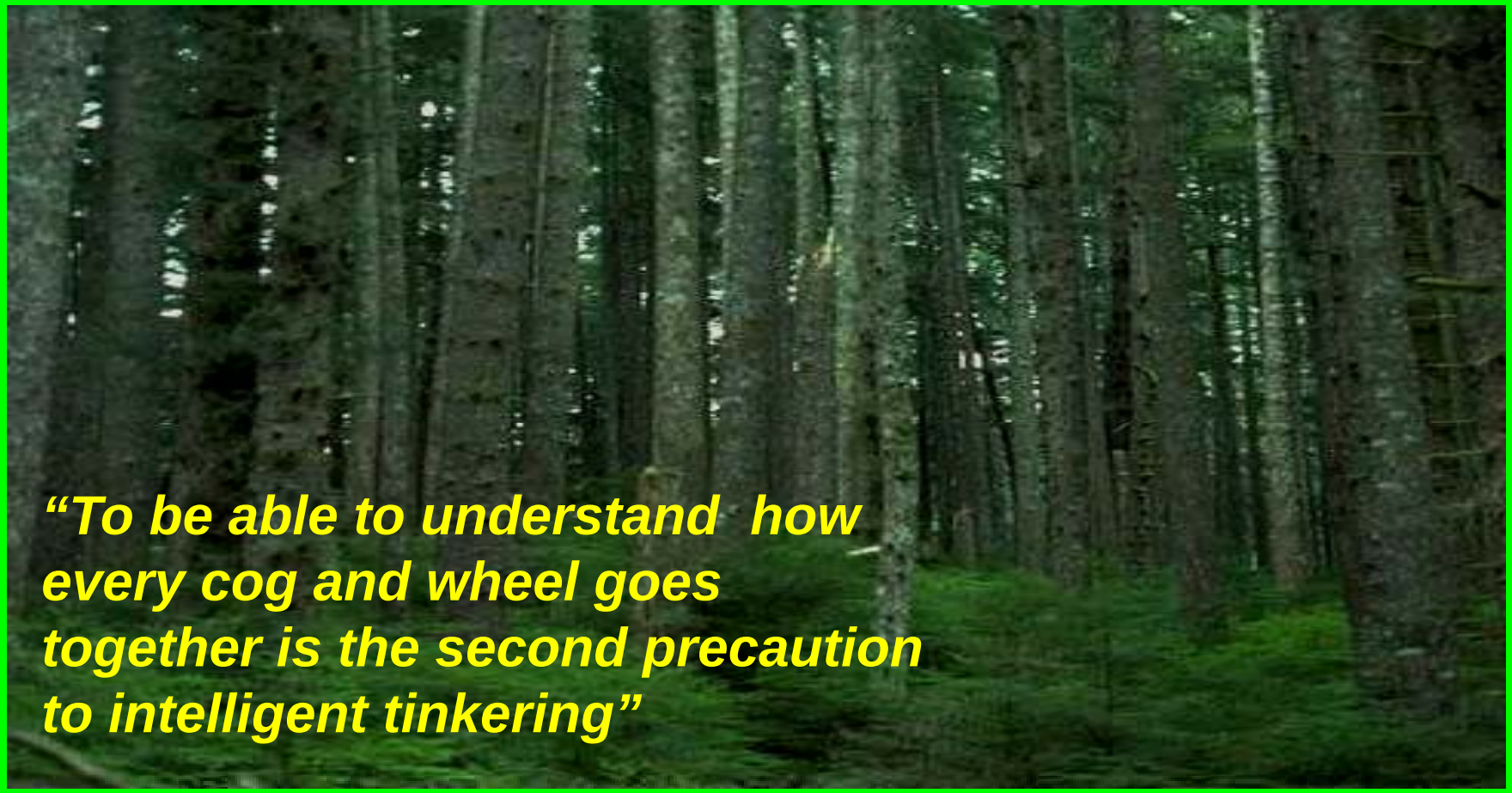
SYNERGISTIC RELATIONSHIPS

FOREST DEVELOPMENT

BLM – ODF Joint Thinning Training – Silver Falls State Park

FIRST RULE OF INTELLIGENT TINKERING

SECOND RULE OF INTELLIGENT TINKERING



STAND DEVELOPMENT MODELS

Generalized Stand Age*	Franklin et. al., 2002	Oliver and Larson, 1990	Spies and Franklin, 1996	Carey and Curtis, 1996	Wash. DNR SHC FEIS, 2004
	Disturbance and Legacy creation				
0	Cohort Establishment	Stand Initiation	Establishment Phase	Ecosystem Initiation	Ecosystem Initiation
20	Canopy Closure				
30		Stem Exclusion	Thinning Phase	Competitive Exclusion	Sapling Exclusion
40	Biomass Accumulation/ Competitive Exclusion				Pole Exclusion
50		Understory Re-Initiation		Understory Re-Initiation	Large Tree Exclusion
60					Understory Development
80	Maturation		Mature Phase		
110		Old-Growth		Botanically Diverse	Botanically Diverse
150	Vertical Diversification		Transition Phase (Early)	Niche Diversification	Niche Diversification
220				Old-Growth	Fully Functional
300	Horizontal Diversification		Transition Phase (Late)		
800	Pioneer Cohort Loss				
1200			Shifting-gap Phase		

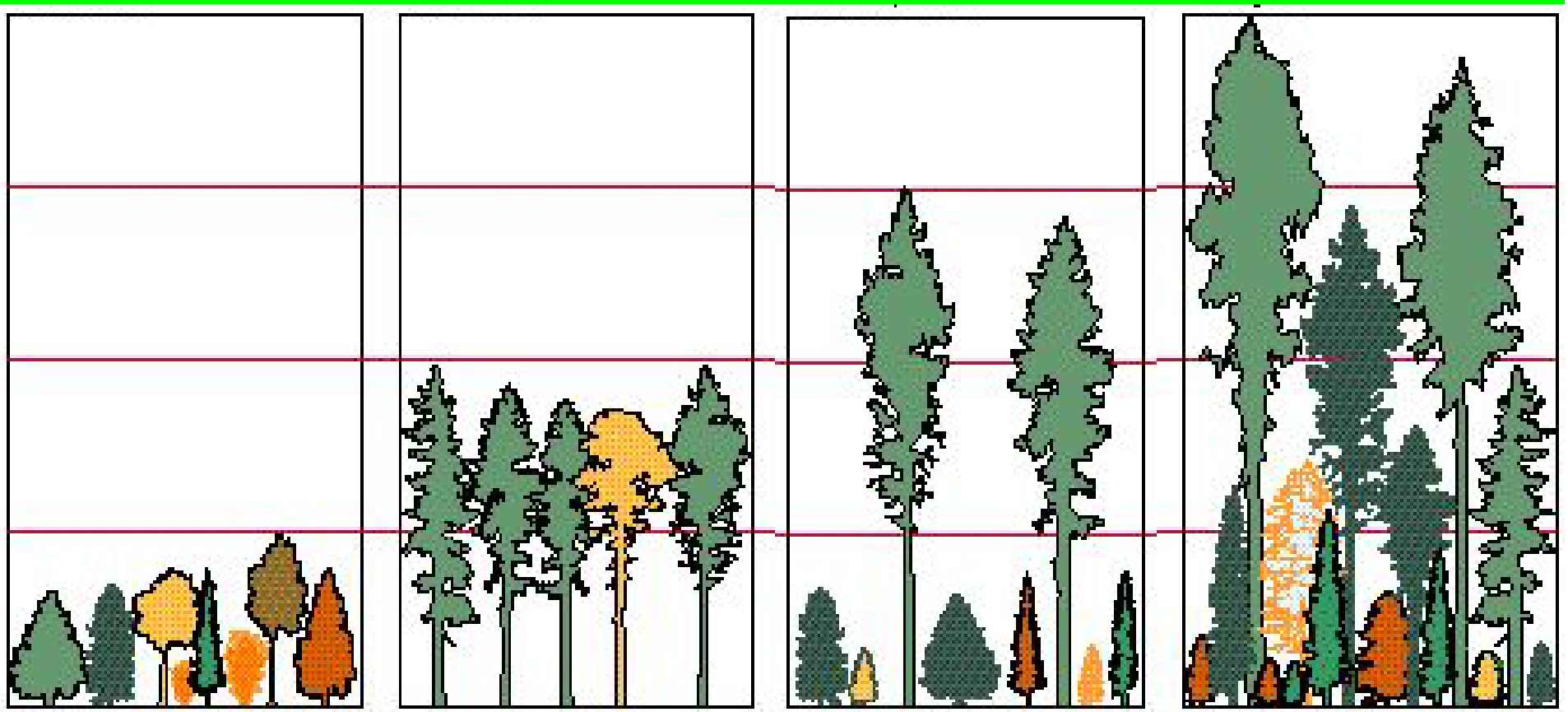
STAND DEVELOPMENT MODELS

Typical stand age[1] (years)	Oliver (1981) stand development stages	Franklin et al. (2002) structural stage	1994 RMP/EIS Seral stage	Structural stages (This RMP/EIS)
0		Disturbance and legacy creation		
20	Stand Initiation	Cohort establishment	Early seral	Stand Establishment
			Mid seral	
30	Stem Exclusion	Canopy Closure		Young
50		Biomass accumulation/ competitive exclusion	Late seral	
80	Understory Reinitiation	Maturation		Mature
150	Old Growth	Vertical diversification	Mature seral	Structurally Complex
300		Horizontal diversification		
800-1200		Pioneer cohort loss	Old-growth	

[1] Stand ages are provided as references. However, stands can achieve structural classes at different stand ages, depending on disturbance and site conditions

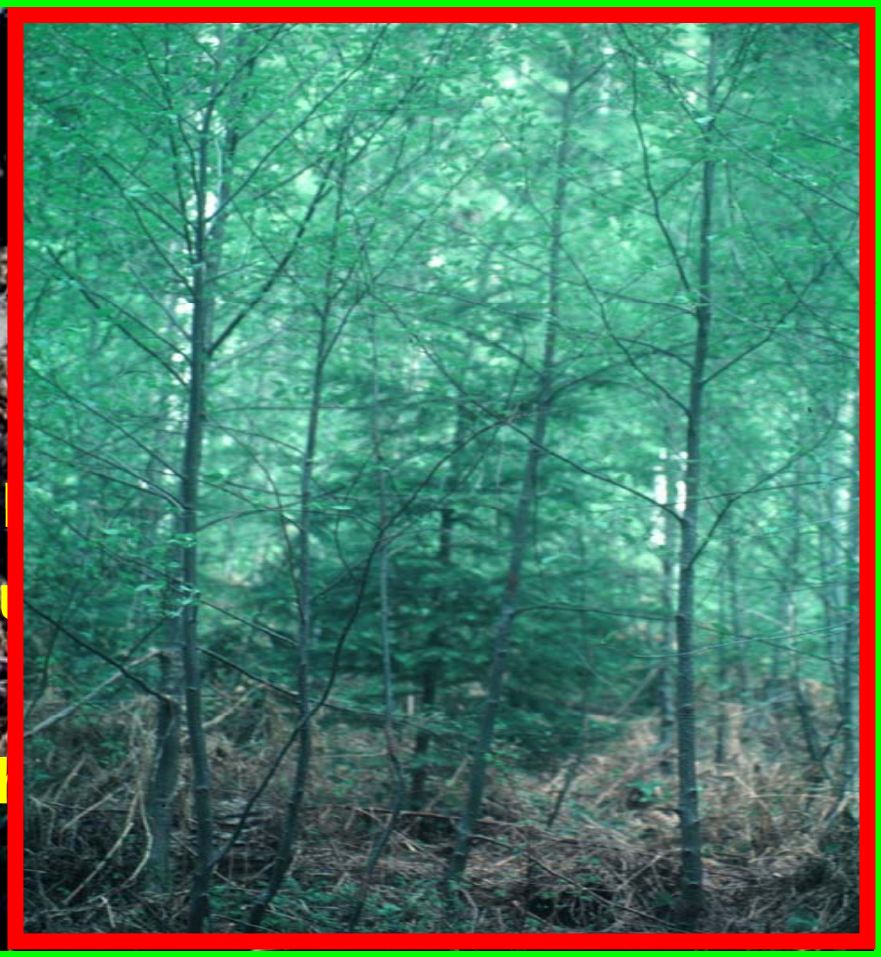
MANAGEMENT PHASES OF FOREST DEVELOPMENT

Stand Establishment | **Competition Mortality** | **Canopy Differentiation** | **Complex Structure**



CHARACTERISTICS OF ESTABLISHMENT PHASE

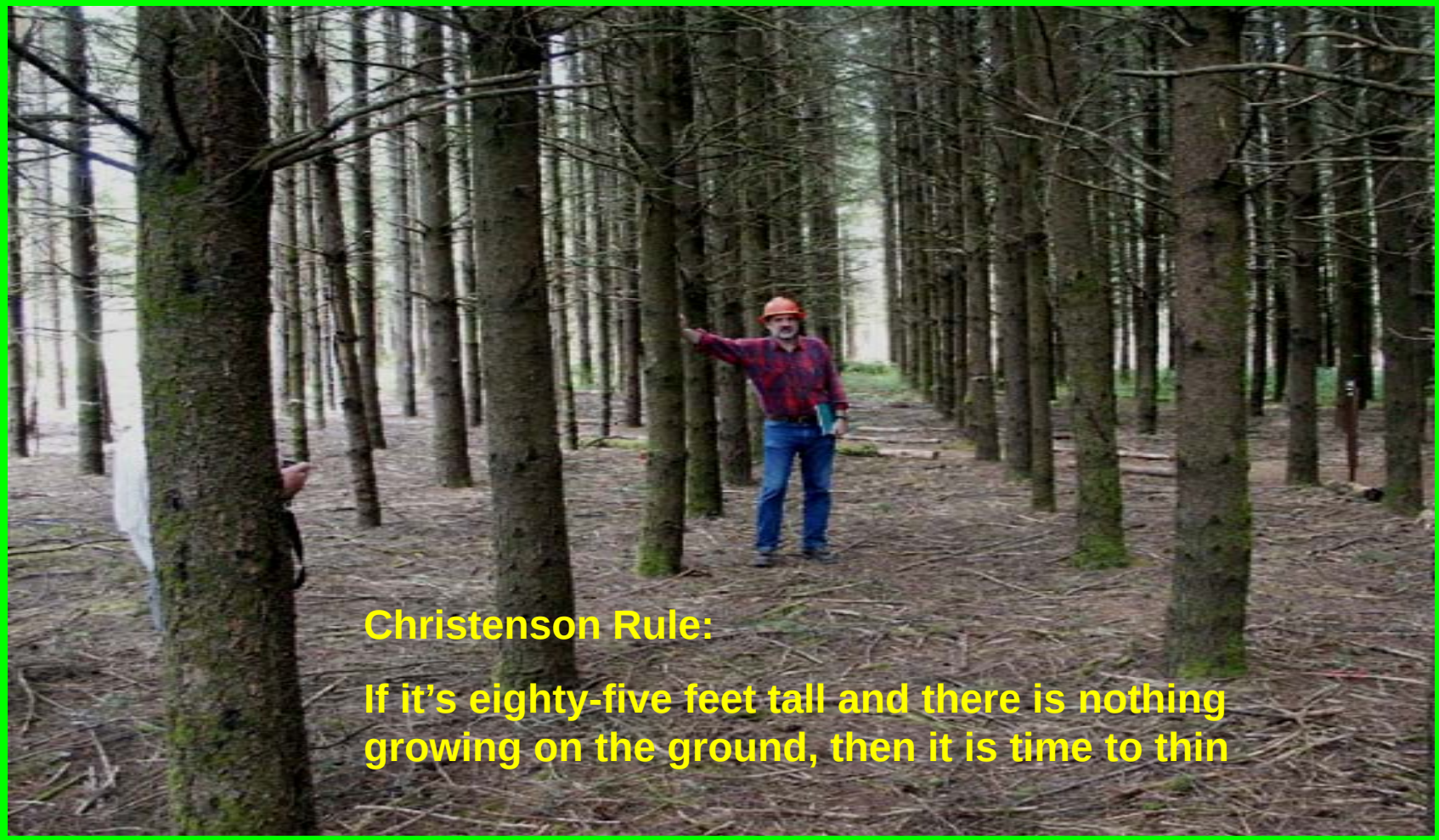
- High Degree of Species
- Little, if any, Vertical Stru
- Site Dominance Not Wel
- Large Amount of Sunligh



CHARACTERISTICS OF COMPETITION MORTALITY PHASE

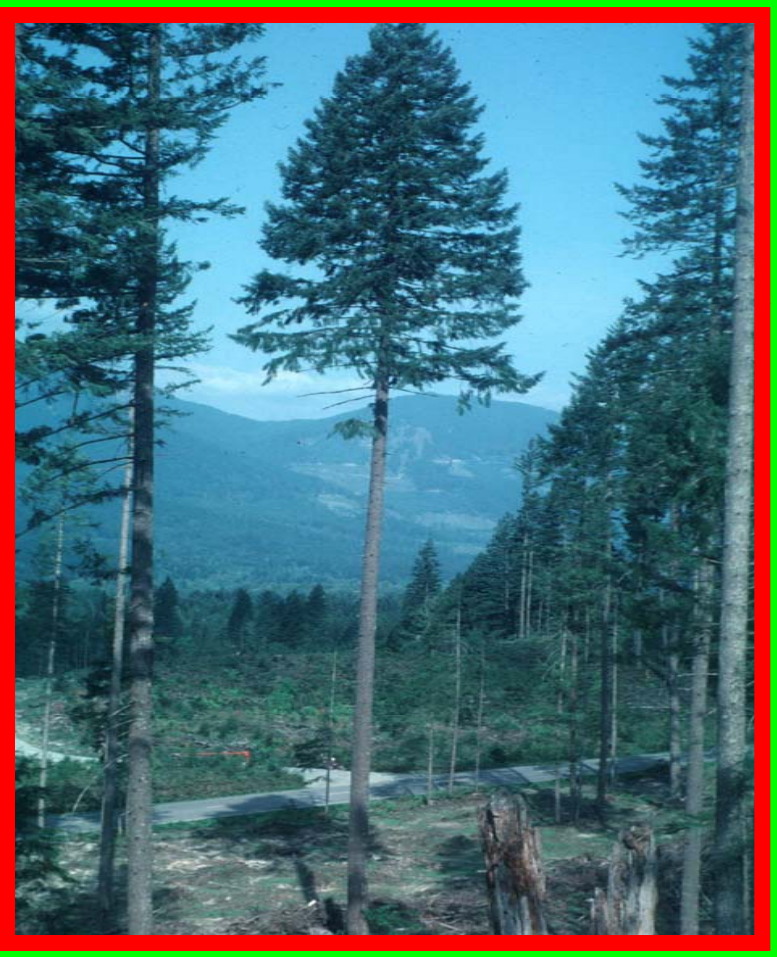
- Trees Dominate the Site
- Relatively Small Diameter Range
- Little Crown Differentiation
- Competition Induced Wave Mortality
- Little Species Diversity
- Little Sunlight Reaches Forest Floor
- Little, if any, Understory Vegetation

COMPETITION MORTALITY



CHARACTERISTICS OF CANOPY DIFFERENTIATION PHASE

- Lateral Crown Expansion
- Vertical Structure / Cano
- Diameter Range Increase
- Sunlight Enters Through
- Understory Species Dive
- Individual Tree or Disturl



CHARACTERISTICS OF COMPLEX STRUCTURE PHASE

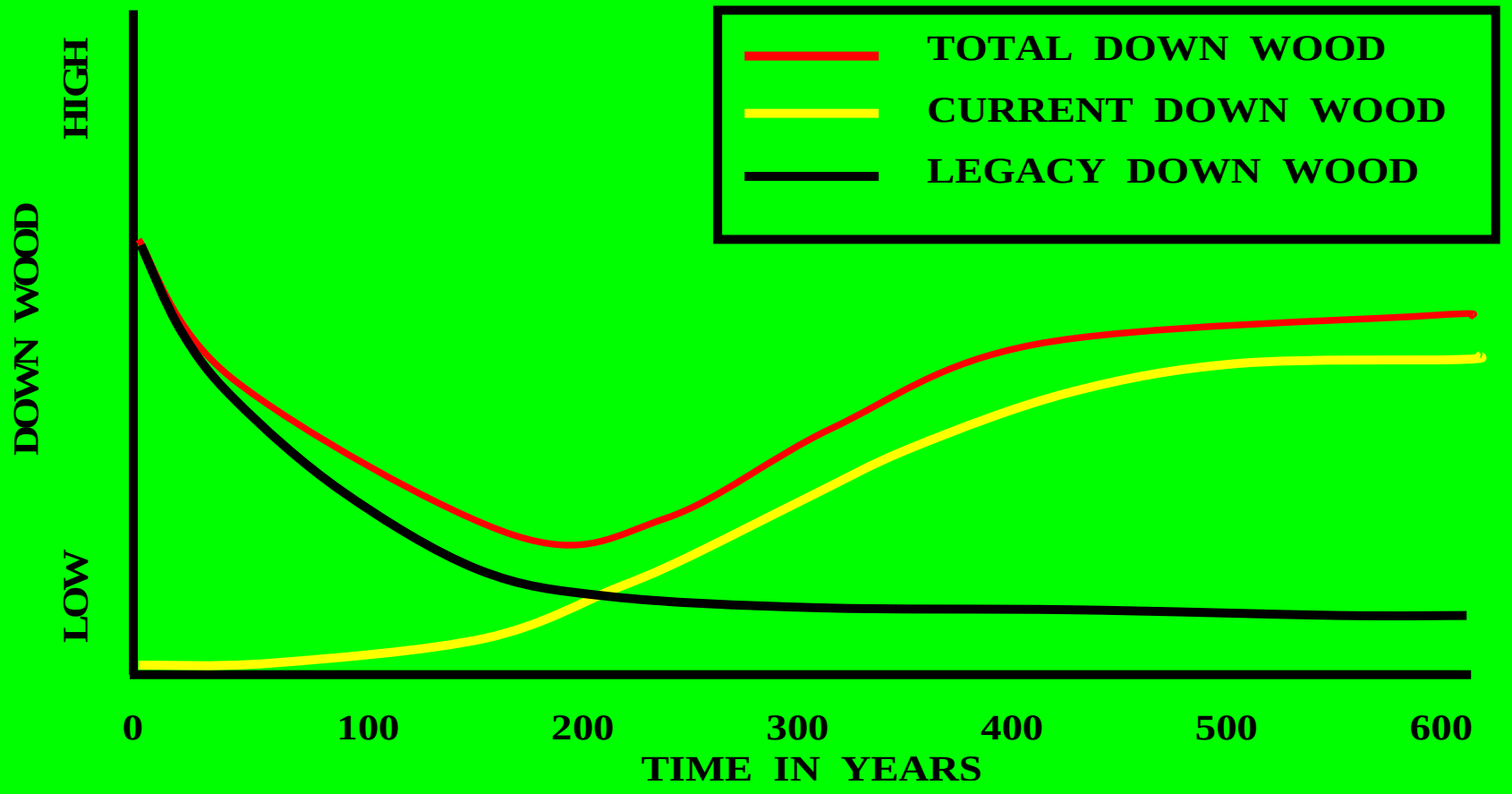
STAND DEVELOPMENT MODELS

Generalized Stand Age*	Franklin et. al., 2002	Oliver and Larson, 1990	Spies and Franklin, 1996	Carey and Curtis, 1996	Wash. DNR SHC FEIS, 2004
	Disturbance and Legacy creation				
0	Cohort Establishment			osystem Initiation	Ecosystem Initiation
20	Canopy Closure			mpetitive Exclusion	Sapling Exclusion
					Pole Exclusion
				derstory Re-Initiation	Large Tree Exclusion
					Understory Development
				tanically Diverse	Botanically Diverse
				iche Diversification	Niche Diversification
				Old-Growth	Fully Functional
800	Pioneer Cohort Loss				
1200		Shifting-gap Phase			

ROLE OF DECADENCE IN FOREST DEVELOPMENT

- Legacy Decadence
- Concurrent Decadence
- Trans-rotational Decadence

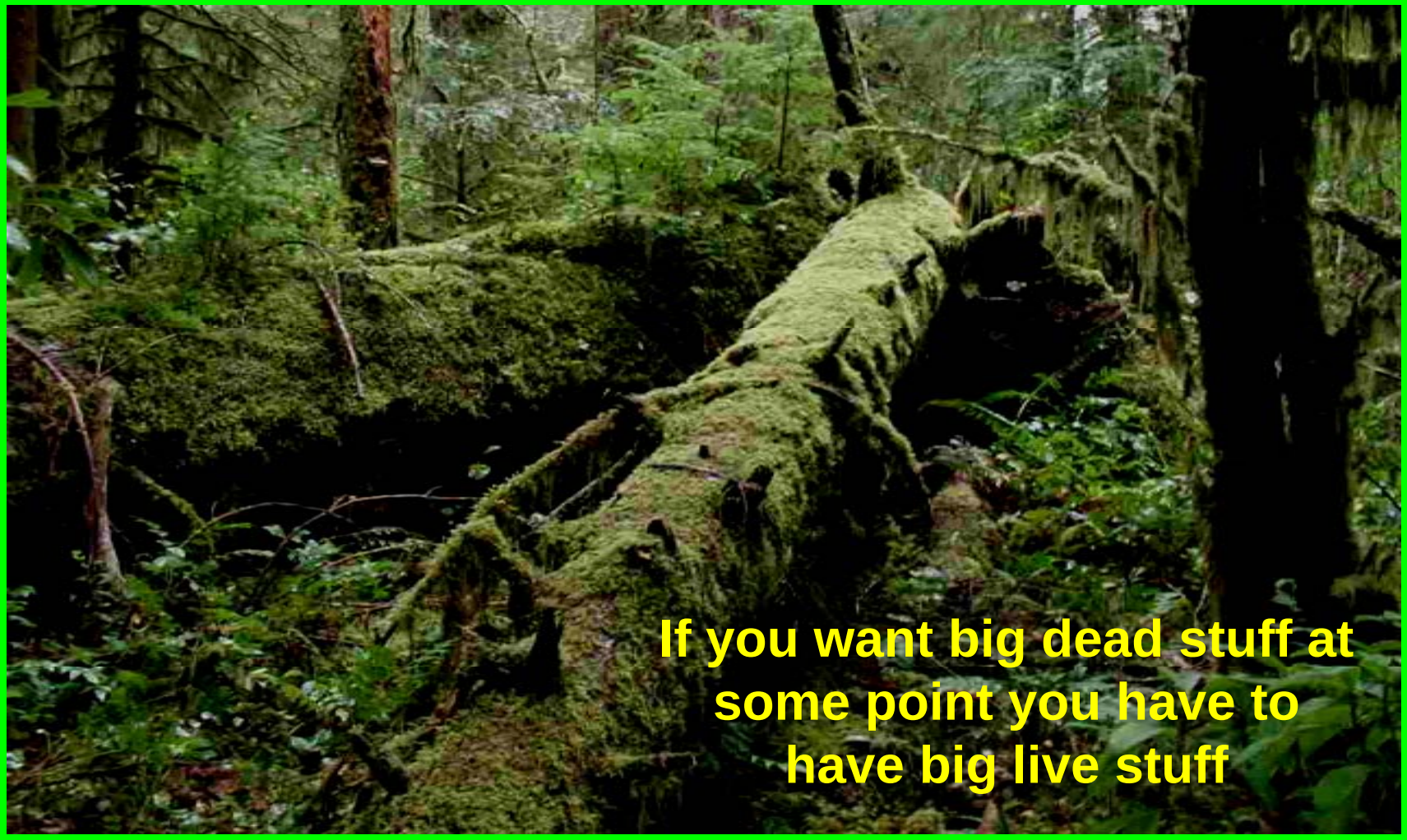
DOWN WOOD ACCUMULATION



BLM – ODF Joint Thinning Training – Silver Falls State Park

DOWN WOOD ACCUMULATION

ECOLOGICAL LAW



WHY DO WE THIN STANDS?

- Play with Neat Toys
- Establish Stand Dominance
- Recover Anticipated Mortality
- Maintain Growth Rate
- Taper Modification
- Accelerate Habitat Development
- Address Forest Health Issues
- Fuels Management
- Extend Rotation / Age Class Distribution

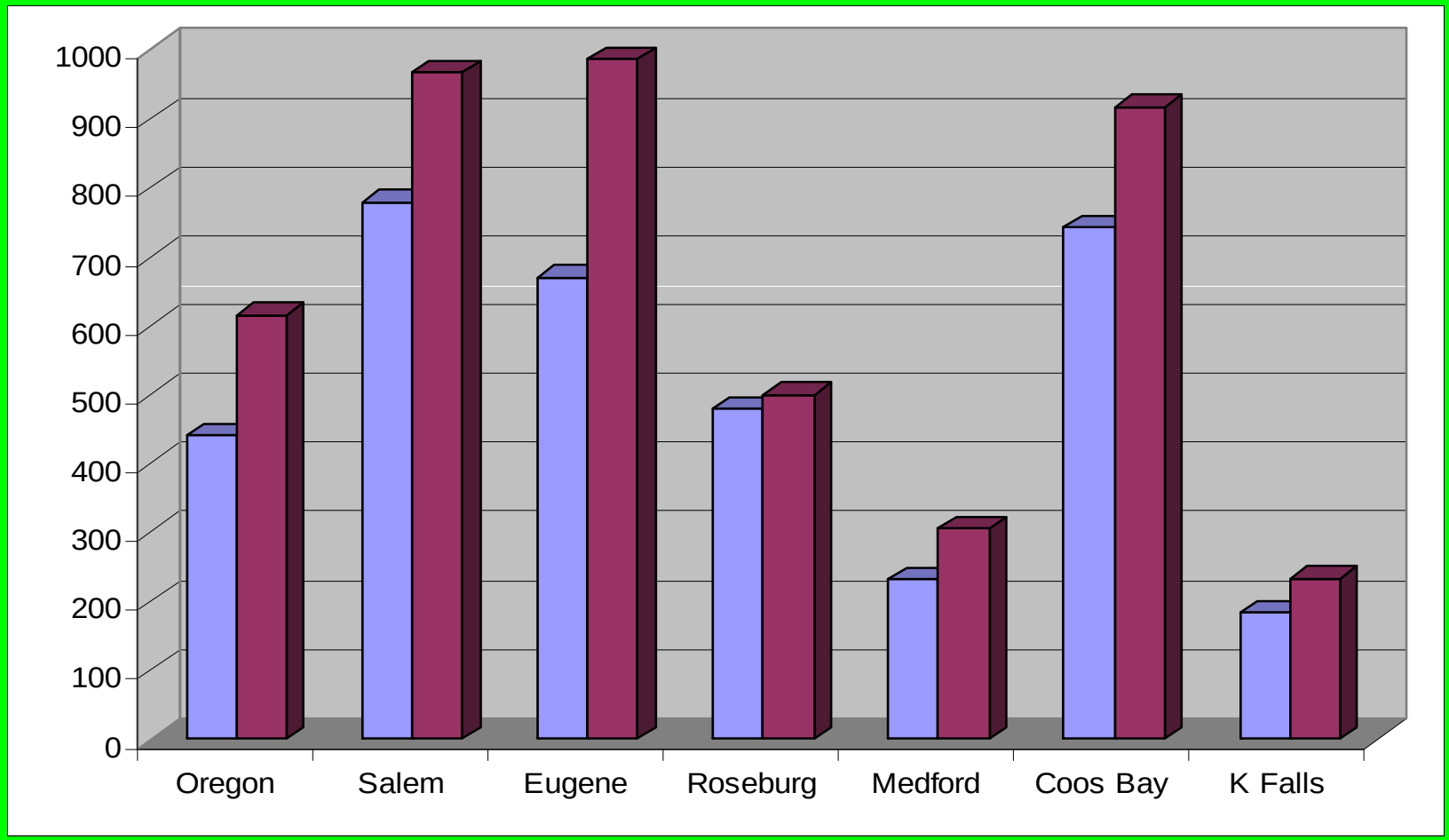
ESTABLISH STAND DOMINANCE

RECOVER ANTICIPATED MORTALITY

BLM – ODF Joint Thinning Training – Silver Falls State Park

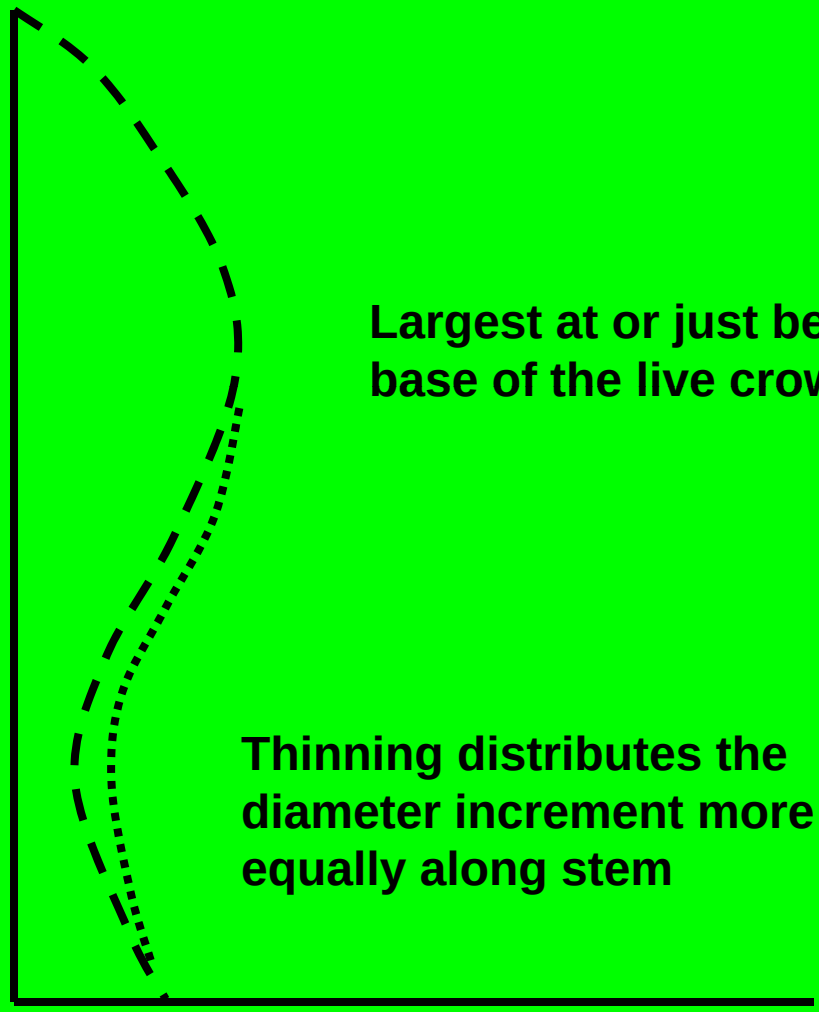
MAINTAIN GROWTH

WOPR GROWTH ESTIMATES



TAPER MODIFICATION

ANNUAL DIAMETER INCREMENT



Largest at or just below the base of the live crown

Thinning distributes the diameter increment more equally along stem

CANOPY DIFFERENTIATION

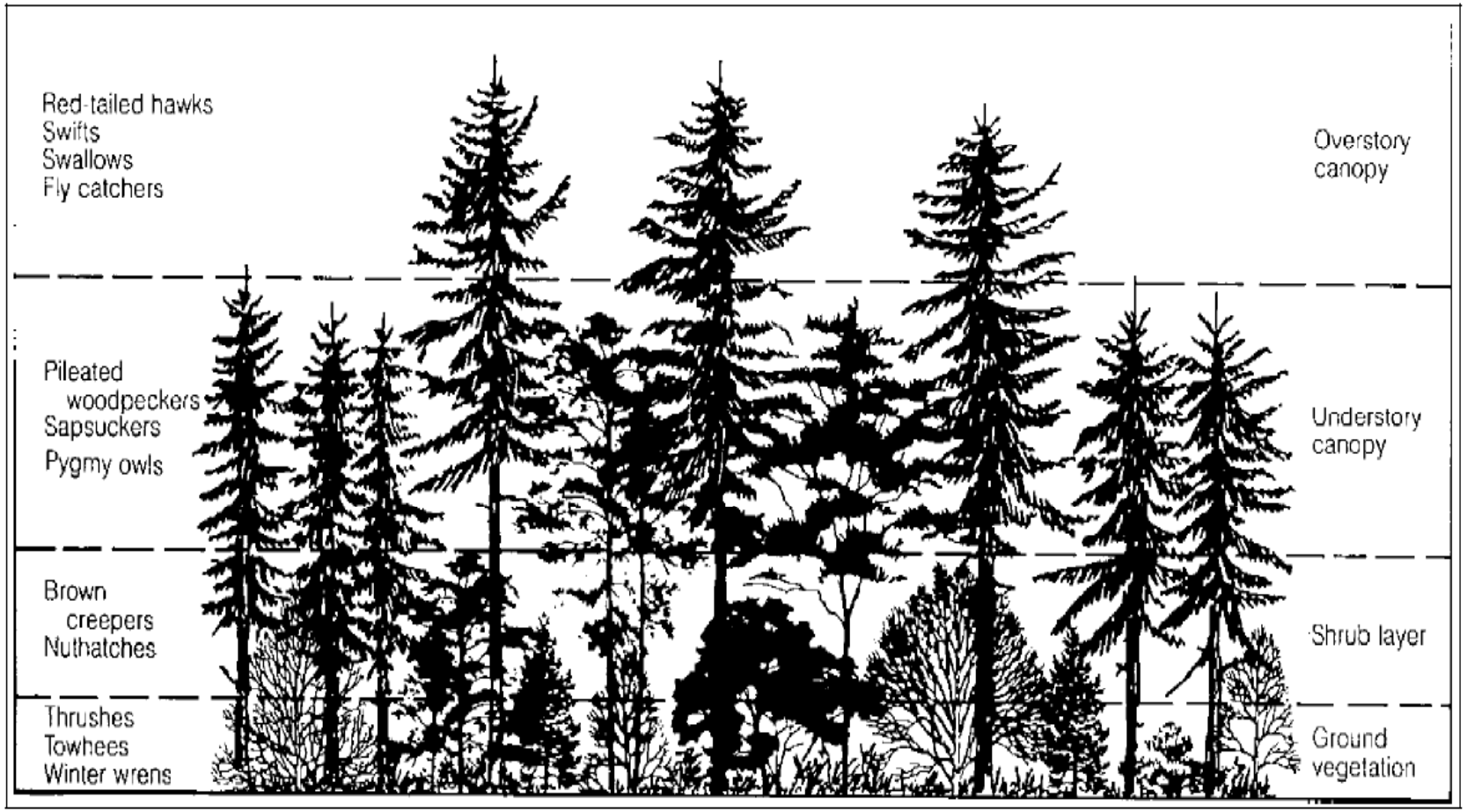
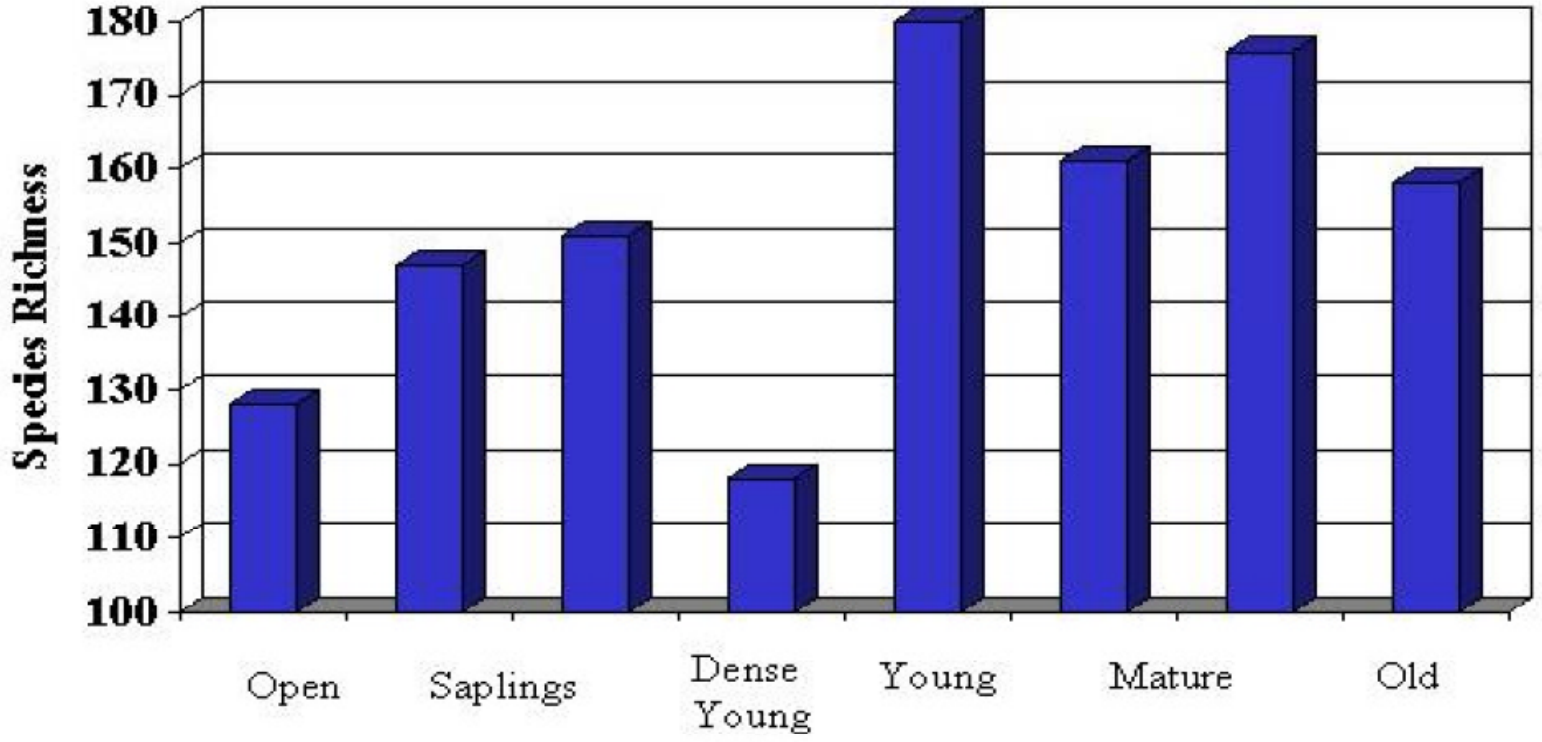


Figure 2. An example of the birds that utilize the vertical diversity in a mature Douglas-fir forest. *From Brown (1985)*

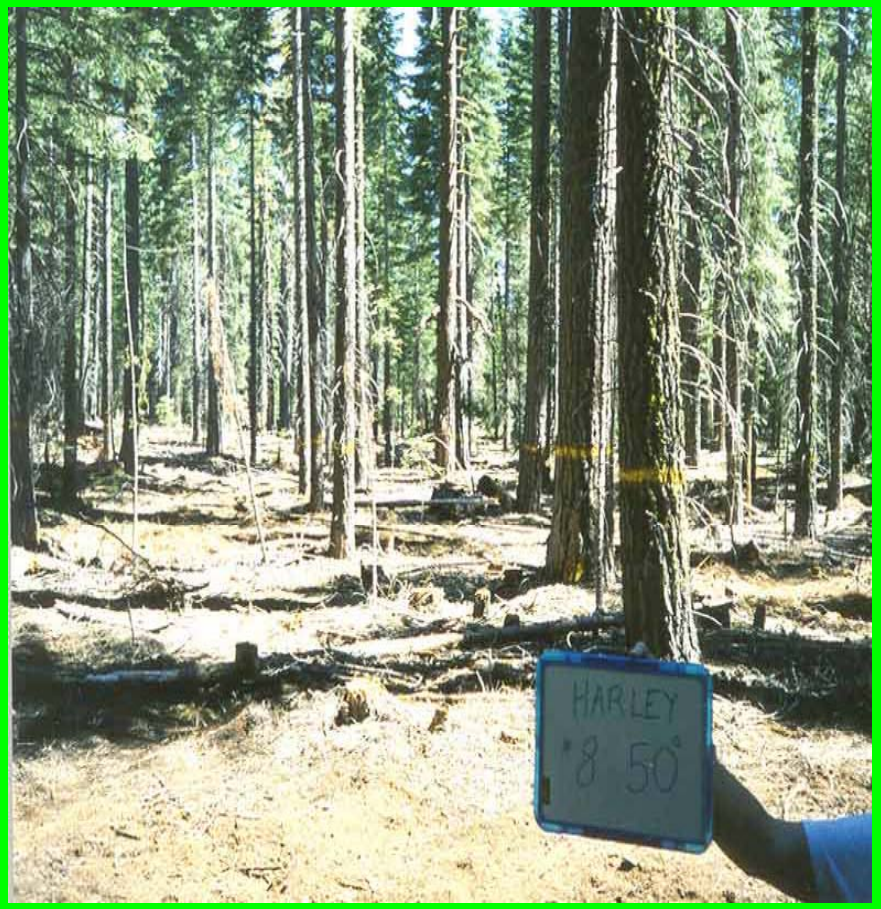
VERTEBRATE SPECIES RICHNESS BY FOREST DEVELOPMENT TYPE



FOREST HEALTH

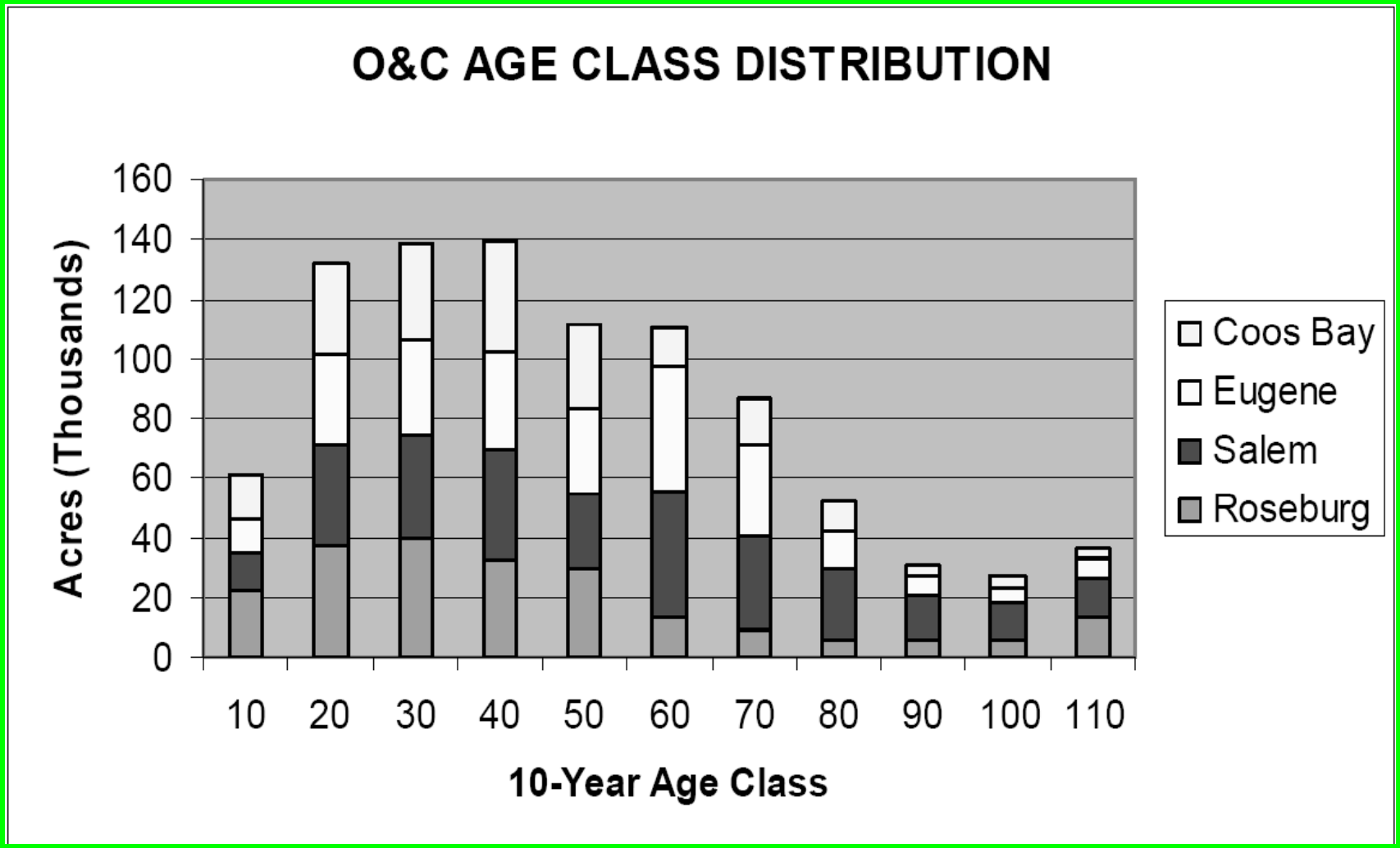
BLM – ODF Joint Thinning Training – Silver Falls State Park

FUELS MANAGEMENT

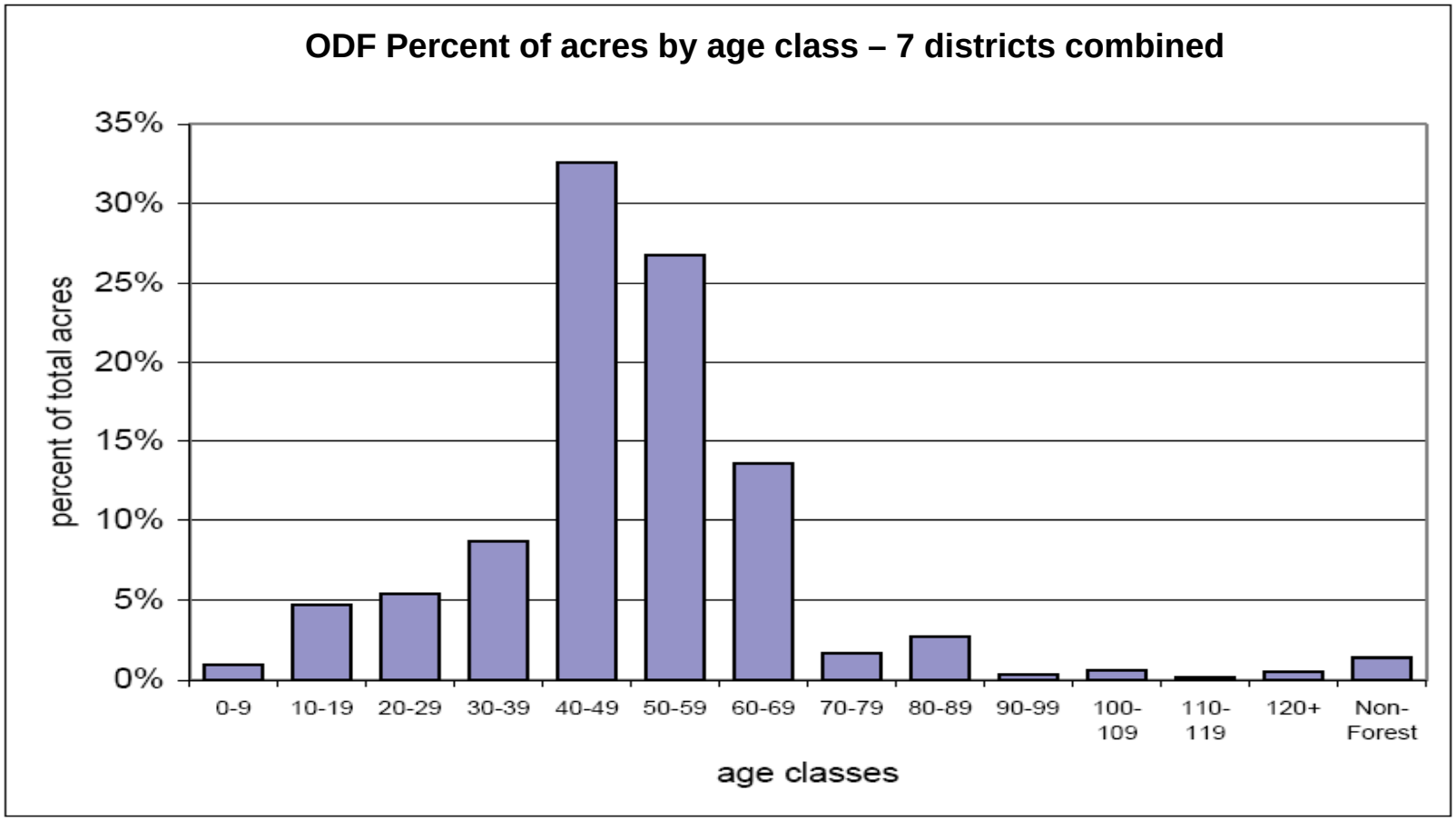


BLM – ODF Joint Thinning Training – Silver Falls State Park

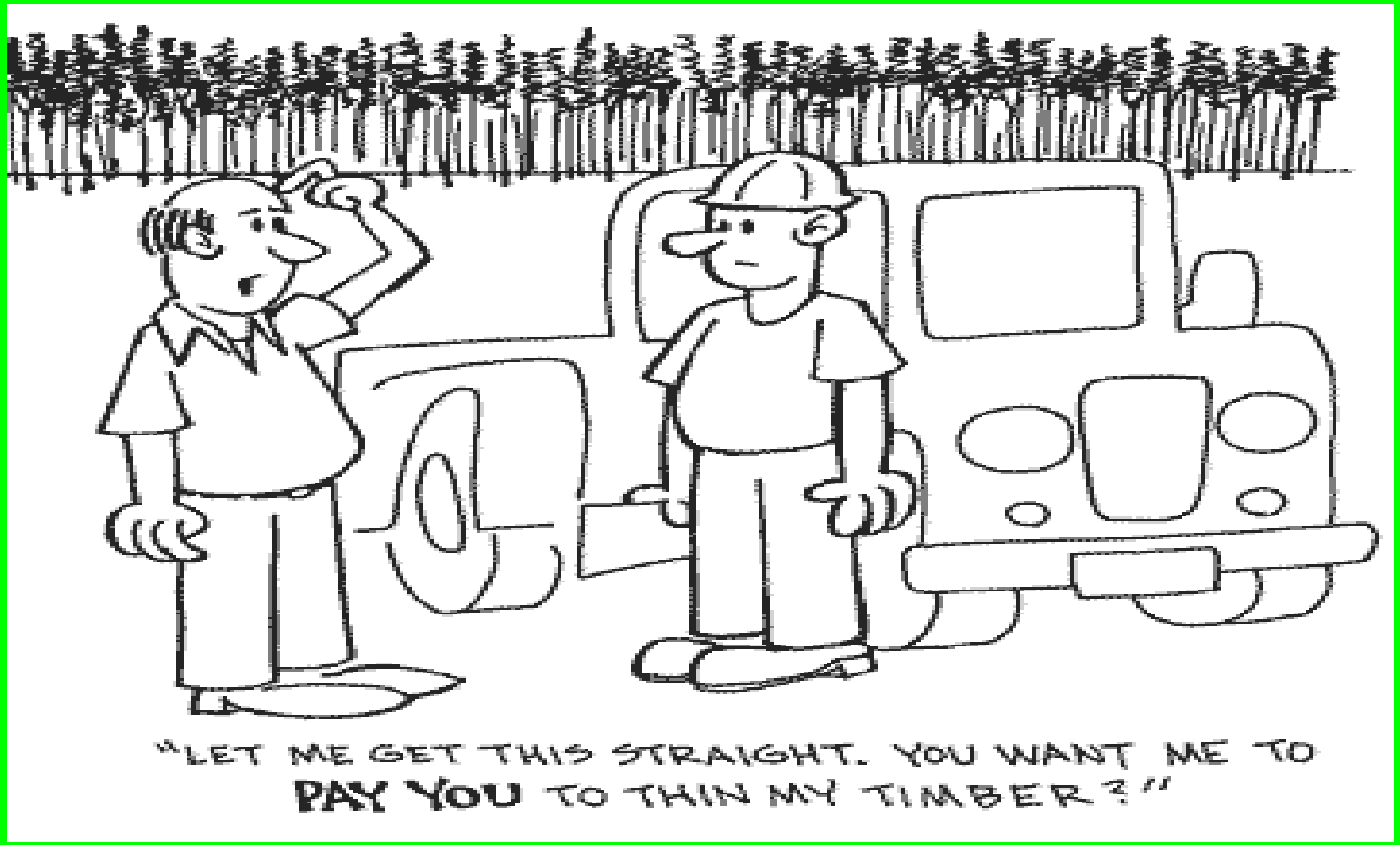
EXTEND ROTATION



EXTEND ROTATION



KEEP IT SIMPLE STUPID



QUESTIONS