LATE-SUCCESSIONAL RESERVE ASSESSMENT

for Oregon's

Northern Coast Range

Adaptive Management Area

APPENDICES

APPENDIX A

Seral-Stage Classification

and

Mapping Standards

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Seral Stage Definitions Used in This Assessment

Definitions used in this assessment were roughly similar to those identified in Forest Ecosystem Management: An Ecological, Economic, and Social Assessment (FEMAT 1993). However, the FEMAT definitions were adapted to fit this assessment area and specific seral-stage characteristics that this LSRA Team emphasized. All timelines are artificial, in that they may represent the "typical" timelines for conifer stands in this assessment area in each environment. However, the type of disturbance, availability of seed sources, and a wide variety of environmental factors can substantially change these timelines. The definitions also identify the dominant size class of typical stands in each seral stage as an aid in evaluating stand structure.

Seral Stages - The series of relatively transitory plant communities which develop during ecological succession from bare ground following a disturbance such as fire, through climax, when plant succession culminates and the plant community becomes relatively stable:

- **Pioneer** - This seral stage generally covers the period from **0 to 10 years** following a disturbance, depending on site conditions and stand history. This is the period from disturbance to establishment of a conifer or hardwood stand. Herbs, shrubs, and grasses generally dominate the site. Conifer or hardwood trees are generally less than five inches in diameter at breast height (dbh, measured at four and one half above ground level).

- **Very Early-Seral Stage** - This seral stage generally covers the period from **11 to 24 years** following a disturbance, depending on site conditions and stand history. It covers the period from stand establishment to crown closure. At the end of this period, conifers or conifer/hardwood mixes typically dominate the site. Dominant size class of stands is typically **five to ten inches dbh**. Trees have long crowns with live limbs all the way to the ground. These stands serve as good hiding cover for many mammals, reptiles, and amphibians. In managed plantations, tree limbs begin to overlap, shading out the understory shrubs, herbs, and grasses.

- **Early-Seral Stage** - This seral stage generally covers the period from **25 to 49 years** following a disturbance, depending on site conditions and stand history. This is the period in a stand's life from crown closure to self-pruning. Stands maintain full crown closure, however, the live canopy begins to move up. Dominant size class of these stands typically ranges from **five to eighteen inches dbh**. Tree boles have many dead limbs which have been shaded out, making it easier for larger mammals to move along the ground and birds to fly through the understory. In managed plantations, trees often grow so close together that thinning of the stand may be necessary to maintain wind firmness. The understory is often very sparse, with few or no tree seedlings or saplings, shrubs, herbs, and grasses.

- **Mid-Seral Stage** - This seral stage generally covers the period from **50 to 79 years** following a disturbance, depending on site conditions and stand history. This is the period in a stand's life from self-pruning to maturation. Stands still maintain full crown closure, usually resulting in a high, single-canopy layer throughout the stand. Dominant size class of these stands typically ranges from **ten to eighteen inches dbh**. There is little stand diversity (little to no understory yet). In natural and unthinned stands, tree mortality begins to increase. These stands provide some hiding and thermal cover.

- **Late-Seral Stage** - This condition generally begins at approximately **80 years**, depending on site conditions and stand history. This seral stage includes two stand conditions:

  ⇒ **Mature** - This condition generally covers the period from **80 to 149 years**, depending on site conditions and stand history. This is the stage in a stand's life when height growth and crown expansion of the dominant trees begins to slow. Trees begin to form large, heavy limbs. Insects, disease, and windthrow begin to kill or damage individual trees, creating openings in the overstory canopy. Shade tolerant seedlings may become established in the understory. Snags and large down logs begin to accumulate. Much of the compositional and structural features of late-successional forests are just beginning to develop - large accumulations of coarse woody debris, trees with large limbs and thick bark, numerous trees with deformities such as broken or forked tops, multiple canopy layers with an abundance of shade tolerant species in the understory, large diameter trees, etc. The dominant size class of these stands typically ranges from **nineteen to 32 inches dbh**.

  ⇒ **Old Growth** - Stands in this condition are generally **150 years old and older**, depending on site conditions and stand history. At this stage in a stand's life it begins the transition into a more stable plant community with moderate to high canopy closure; a mullet-layered, mullet-species canopy dominated by large overstory trees; a high incidence of large trees with thick bark, some with broken tops and other indications of old and decaying wood (decadence) and deformities; numerous large snags; and heavy accumulations of wood, including large logs on the ground (FEMAT 1993). Size class is extremely variable in these stands, but trees **larger than 32 inches** dbh are common, with a component of trees larger than 48 inches dbh.

- **(Any Seral Stage) Mix** - The word "mix" following any seral stage implies that the designated stand's overstory canopy is comprised of 50 to 80 percent hardwoods, usually red alder in this assessment area. **Pure Hardwood** - Designates stand's in which 80 percent or more of the overstory canopy is comprised of hardwoods.

Late-Successional Habitat - This term generally refers to stands which have the structural and compositional characteristics believed to be important habitat elements for species dependent on older forest stands. Such features include large trees with deformities or broken tops, large logs on the forest floor and in stream channels, multi-layered canopies, gaps, shade tolerant tree species in the understory, etc. These features may be found in stands in the old-growth condition of the late-seral stage. However, the term "late-successional" refers to the structure of the habitat **without regard for age**.

Development of Seral-Stage Map Coverages

The mid 1900s seral-stage coverage for this assessment area was developed from a series of county-wide vegetation coverages that were originally digitized by Pacific Meridian Resources (PMR). The original county maps which PMR worked from, were developed in the mid 1900s and published at that time. These maps were assembled from existing maps provided by the individual landowners. Unmapped areas were filled by field observation before World War II and from aerial photographs after World War II (starting in 1946). Data included primary and secondary tree species, mean size class and or dbh, and percent density. These items were used to designate seral stages as shown on the following page (Table B.1.). Each county used different size classes, so seral stages were assigned to each county coverage, then the maps were jointed together. In some cases data was vague or missing.

The current seral-stage coverage for this assessment area was developed by combining polygon vegetation datasets from the BLM's Salem District, the Siuslaw National Forest, the Tillamook State Forest and, for areas not covered by these three datasets, from the Coastal Landscape Analysis and Monitoring Study (CLAMS). All vegetation datasets were developed from aerial photograph interpreted data, except the CLAMS dataset which was based on remotely sensed satellite imagery. State, BLM, and Forest Service datasets have been supplemented with stand examination and other field survey data where such surveys have been completed. Items which were used in this classification included: primary and secondary species, mean size class, stand age, and type of stand (managed or natural). These items were used to designate seral stages as shown in Table B.2.

Note: The datasets for both the mid 1900s and the current seral-stage mapping do not provide enough information to distinguish between stands which are in a mature condition and those which are old growth. Therefore, all late-successional habitat is lumped together as "late-seral-stage" forest in Maps 7, 8, and 9, and in Table 4 which was derived from these datasets. Local BLM and Forest Service biologists estimate that old-growth stands occupy less than one percent of all lands (four percent of the federal lands) in this assessment area.

Table A.1. Cross-walk to mid-1900s seral stages (Map 7).

Seral Stages	Lincoln County	Polk County	Tillamook County	Yamhill County
Untyped	Primary and secondary species left blank			
Very Early (11 - 24 years)	Conifer/conifer stands less than 5" dbh	Conifer/conifer stands less than 6" dbh	Conifer/conifer stands less than 5" dbh	Conifer/conifer stands less than 6" dbh
Very Early Mix (11 - 24 years)	Conifer/hardwood stands less than 5" dbh	Conifer/hardwood stands less than 6" dbh	Conifer/hardwood stands less than 5" dbh	Conifer/hardwood stands less than 6" dbh
Early (25 - 49 years)	Conifer/conifer stands 5" to 11" dbh	None	Conifer/conifer stands 5" to 11" dbh	Conifer/conifer stands which did not have a size class, but had an individual dbh between 5" & 10"
Early Mix (25 - 49 years)	Conifer/hardwood stands 5" to 11" dbh	None	Conifer/hardwood stands 5" to 11" dbh	Conifer/hardwood stands which did not have a size class, but had an individual dbh between 5" & 10"
Mid (50 - 79 years)	Conifer/conifer stands 11" to 21" dbh	None	Conifer/conifer stands 11" to 21" dbh	Conifer/conifer stands 11" to 21" dbh
Mid Mix (50 - 79 years)	Conifer/hardwood stands 11" to 21" dbh	None	Conifer/hardwood stands 11" to 21" dbh	Conifer/hardwood stands 11" to 21" dbh
Late (80 + years)	Conifer/conifer stands larger than 21" dbh	Conifer/conifer stands larger than 16" dbh	Conifer/conifer stands larger than 21" dbh	Conifer/conifer stands larger than 20" dbh
Late Mix (80 + years)	Conifer/hardwood mixed stands larger than 21" dbh	Conifer/hardwood mixed stands larger than 16" dbh	Conifer/hardwood stands larger than 21" dbh	Conifer/hardwood stands larger than 20" dbh
Pure Hardwood (any age)	Hardwood/conifer and hardwood/ hardwood stands larger than 5" dbh	Hardwood/conifer and hardwood/ hardwood stands larger than 6" dbh	Hardwood/conifer and hardwood/ hardwood stands larger than 5" dbh	Hardwood/conifer and hardwood/ hardwood stands larger than 6" dbh

Table A.2. Cross-walk to current seral stages (Maps 8 and 9, and Table 4).

Seral Stages	Siuslaw National Forest	Salem District, BLM	Tillamook State Forest	CLAMS
Pioneer (0 - 10 years)	Plantations 10 years old or less			
Very Early (11 - 24 years)	Conifer plantations 11 to 24 years old **OR** natural conifer stands 5" to 10" dbh	Conifer plantations 11 to 24 years old	Conifer plantations 11 to 24 years old	Conifer stands less than 10" dbh (small size class)
Very Early Mix (11 - 24 years)	Conifer/hardwood mixed stands 11 to 24 years old **OR** natural conifer/ hardwood stands 5" to 10" dbh	Conifer/hardwood mixed stands 11 to 24 years old	Conifer/hardwood mixed stands 11 to 24 years old	Conifer/hardwood mixed stands less than 10" dbh (small size class)
Early (25 - 49 years)	Conifer plantations 25 to 49 years old			
Early Mix (25 - 49 years)	Conifer/hardwood mixed stands 25 to 49 years old			
Mid (50 - 79 years)	Conifer plantations 50 + years old **OR** natural conifer stands 10" to 18" dbh **OR** natural conifer stands 51 to 80 years old	Conifer stands 50 to 79 years old	Conifer stands 50 to 79 years old	Conifer stands 11" to 20" dbh (medium size class)
Mid Mix (50 - 79 years)	Conifer/hardwood mixed plantations 50 + years old **OR** natural conifer/ hardwood mixed stands 10" to 18" dbh **OR** natural conifer/hardwood mixed stands 51 to 80 years old	Conifer/hardwood mixed stands 50 to 79 years old	Conifer/hardwood mixed stands 50 to 79 years old	Conifer/hardwood mixed stands 11" to 20" dbh (medium size class)
Late (80 + years)	Natural conifer stands greater than 18" dbh	Conifer stands greater than 80 years old	Conifer stands greater than 80 years old	Conifer mixed stands larger than 21" dbh (large & very large size classes)
Late Mix (80 + years)	Natural conifer/ hardwood mixed stands greater than 18" dbh	Conifer/hardwood mixed stands greater than 80 years old	Conifer/hardwood mixed stands greater than 80 years old	Conifer/hardwood mixed stands larger than 21" dbh (large & very large size classes)
Pure Hardwood (any age)	Hardwood stands at any age			Broadleaf Categories