IV. IDENTIFICATION OF SPECIFIC AREAS FOR TREATMENT

A. LANDSCAPE ANALYSIS

The objective of forest management in LSRs is to create, protect, and enhance characteristics of late-successional forest ecosystems. Attainment of some late-successional characteristics can be accomplished, and even accelerated, by focusing treatments both spatially and temporally. Landscape level functions and processes should be considered when developing a strategy for future management activities. The following section defines a landscape analysis process and describes the resulting design, based on the current condition and the objectives for LSRs and the Northern Coast Range AMA, as identified in the ROD. This design should serve as a basis for planning management activities. The main objectives for landscape analysis and design in this assessment area are to:

- Set federal lands in context of the surrounding landscape.
- Identify blocks in federal ownership where various treatments may be applied.
- Develop landscape level goals that provide focus and direction for fine scale treatments, helping to set watershed analysis areas in context of their role in the larger landscape.
- Prioritize landscape areas for treatment.
- Maintain and restore late-successional ecosystem processes critical to ecosystem function in this assessment area.
- Identify landscape scale, adaptive management learning opportunities and monitoring methods consistent with the standards and guidelines for the Northern Coast Range AMA.

This landscape design was based on the concept of securing the best late-successional habitat first, developing corridors connecting the best habitats together, and then working with more degraded habitats. "Securing the best habitat first" refers to the process of:

1) Identifying the least fragmented areas which are currently functioning as late-successional habitat or have the highest potential for developing late-successional characteristics in a relatively short timeframe.
2) Protecting those portions of the area which are already functioning as late-successional habitat from activities which damage or detract from late-successional characteristics.
3) Treating those portions of the area which have been degraded or are not yet functioning as late-successional habitat. Treatments include road closures, road obliteration, silvicultural treatments to accelerate development of late-successional characteristics, creation of snags, creation or addition of down logs, and treatments to restore aquatic habitats.
4) Monitoring to ensure that the habitat is developing as planned and evaluating it to determine if it is functioning as late-successional habitat.

1. Landscape Zones

The first step in landscape design was to identify the current and potential function of various areas at a relatively coarse scale. Functional areas were derived from a synthesis of physical and biological attributes, as well as disturbance processes. A dominant consideration was the past and current ability of portions of the landscape to produce contiguous late-successional habitat. Other areas provided landscape scale connectivity to and from adjacent LSRs. Three zones were delineated based on landscape function. These **Landscape Zones** are described below.

The **Core Landscape Zone**, located in the western portion of the assessment area (Map 13), is primarily managed by the Siuslaw National Forest, and contains large blocks of contiguous land which is in federal ownership. Disturbance regimes in this area have historically resulted in large patches within the assessment area. Most of the spotted owl sites with sufficient habitat to be considered viable in the immediate future are located within the Core Landscape Zone. As a result, the intended function of this Core Landscape Zone is to provide the genetic source for populations of late-successional species (especially those with large home ranges).

Blending aquatic and terrestrial priorities for restoration prov des a focus for restoration activities over the entire landscape, from stream channels to ridgetops. The two largest Key Watersheds (Map 12) in the analysis area, Upper Nestucca and Drift Cr ek (Siletz), are located in the Core Landscape Zone (Map 13). Both are high priorities (priority 1 and 2, respectively) for fish habitat restoration projects. Objectives, goals, and restoration treatments developed under the Aquatic Conservation Strategy (ROD B-11 through B-34) are usually compatible with those developed for LSRs.

The **Corridor Landscape Zone** (Map 13) is located to the north and to the south of the Core Landscape Zone. These areas are intended to provide a key connectivity function to the surrounding LSR network, as well as adjacent state and private lands. Currently, the majority of spotted owl sites within these areas do not contain adequate levels of suitable habitat and are considered to be marginally viable as described in Chapter III. Habitat restoration on federal lands will improve this condition. Because of the checkered federal ownership patterns within the Corridor Landscape Zone, this zone is intended to provide refugia areas along travel routes for late-successional forest species which are dispersing to and from the populations in the Core Landscape Zone to adjacent late-successional habitat outside of the Core Landscape Zone.

The southern Corridor Landscape Zone provides the closest federal land links from this landscape to LSR R0268. The northwestern and northeastern corridors are important connections with state lands and they provide the closest federal land links from this landscape to LSR R0271. A Habitat Conservation Plan is being developed for the Tillamook State Forest, where patches of late-seral habitat will be located throughout the State forest, rotating through different areas over long periods of time. These Corridor Landscape Zones may provide for continual passage of species across the entire landscape.

Three key watersheds are located within the Corridor Landscape Zone. The Little North Fork of the Wilson River Key Watershed lies in the northwest portion of the northern corridor, while the Middle Fork of the Trask River Key Watershed lies in the northeastern portion of the northern corridor. The southern corridor contains the North Fork of the Siletz River Key Watershed.

The **Buffer Landscape Zone** is that portion of the assessment area which does not directly link to areas outside of this area and is not likely to develop large, contiguous blocks of late-successional habitat. It is likely to be important for connectivity and dispersal of some organisms to and from isolated portions of LSR RO807 (Maps 2 and 13) and is intended to provide refugia for late-seral species in portions of the assessment area which are likely to continue to be dominated by early and mid-seral stands.

Portions of the Corridor Landscape Zone and the entire Buffer Landscape Zone are in fire disturbance regimes which historically produced variable patch sizes with more seral-stage variability than would have been found in the Core Landscape Zone. Intermediate disturbances in the northeastern and southern Corridor Landscape Zones, and the Buffer Landscape Zones were common, and the multi-layered characteristic of late-successional forests may have been established at a younger age in portions of these zones. As a result, this area will support a different species mix of organisms than the Core Landscape Zone. These areas have the potential to support isolated populations of threatened, endangered or sensitive plants and late-successional animal species that have small home ranges.

Based on the potential ecological functions of these different areas, goals for each zone were established for managers to consider when prescribing activities within the assessment area.

CORE Landscape Zone goals:

- Minimize fragmentation. Provide large, contiguous patches of late-successional habitat and maximize interior forest habitat.
- Increase connectivity and dispersal habitat within the large interior blocks and develop late-successional habitat in the mixed-seral areas adjacent to the large interior blocks.

CORRIDOR Landscape Zone goals:

- Improve, create, and maintain late-successional habitat connectivity and dispersal habitat across the assessment area, especially between Reserved Pair Areas.
- Increase late-successional habitat connectivity and dispersal habitat within the larger network of LSRs and with late-seral blocks on state and private lands outside of the assessment area.

BUFFER Landscape Zone goals:

- Maintain and increase late-successional habitat connectivity and dispersal habitat.
- Develop and maintain refugia for late-successional-dependent species.

Goals common to all Landscape Zones:

- Maintain and restore habitat to support well distributed populations of late-successional forest species.
- Conserve biodiversity, including special habitats.
- Protect from wildfire, especially along high use travel corridors and on the mixed ownership areas in the Corridor and Buffer Landscape Zones.
- Consider land exchanges and changes in land use allocations wherever it assists in attainment of the above goals.

2. Landscape Cells And Treatment Priorities

The current condition of the landscape was used to further divide the assessment area into **Landscape Cells**. The current vegetation seral-stage condition used to describe vegetation patterns in Chapter II, was used to determine the distribution of late-seral-stage forest across the landscape (Map 8). Patches of late-seral forest were considered to be contiguous if they were connected through forested corridors as narrow as riparian buffers. The initial landscape analysis was done for the entire assessment area, including all ownerships and all land-use allocations (AMA, LSR, and Congressionally Reserved or Administratively Withdrawn) on federal lands. The landscape was divided into three types of landscape cells: **Late-Seral Landscape Cells**, having at least 50 percent of the cell in late-seral-stage forest; **Mixed-Seral Landscape Cells**, with 20 to 35 percent late-seral-stage forest; and **Early-Seral Landscape Cells**, consisting of less than 10 percent late-seral-stage forest. (The proportion of late-seral habitat would be much higher if only federal lands were considered.) Landscape cells were then placed in context of the Landscape Zones (Map 14). Treatment priorities for landscape cells and zones apply only to federally managed lands.

The Landscape Zones and Cells Map (Map 14) was developed to portray the <u>concepts</u> of the landscape analysis and design. These cells and zones are <u>not</u> intended to be additional land-use allocations. At the scale of this assessment, the boundaries are conceptual. It is inappropriate to calculate acreages of certain treatment opportunities within these cells and zones. Watershed and project level analyses may define where and to what extent these landscape analysis and design concepts apply.

Using these Landscape Zones and Cells, priorities for management activities were based on the objectives of securing the best late-seral habitat first, developing corridors connecting the best habitat together, and working to improve the more degraded habitats:

- **Priority 1** was assigned to the large, contiguous blocks with a high proportion of late-seral-stage forest. These areas have the best potential for developing large blocks of interior, late-seral habitat. Priority 1 areas emphasize protection of existing late-seral habitat and conservative levels of enhancement treatments which have a high degree of certainty that such treatments will be successful and will accelerate the development of late-successional forest habitat.
- **Priority 2** areas have the highest potential for providing key connectivity within and beyond the assessment area. These areas have at least moderate levels of late-seral-stage

forest and are good areas to focus on developing late-successional habitat which expands the existing late-seral-stage forest in these cells and builds out from the blocks which were designated as Priority 1.

- **Priority 3** areas currently have very little late-seral-stage forest, but are critical to the development of a fully-functioning network of LSRs. These areas emphasize creating late-successional habitat and providing connectivity between large blocks of late-successional habitat. A considerable amount of effort will be required to restore these landscapes.
- **Priority 4** areas contain small patches of late-seral-stage forest which are not located in Core or Corridor Zones. Priority 4 areas emphasize maintaining and developing local connectivity and refugia.
- **Priority 5** areas have very little to no late-seral-stage forest and are not located in Core or Corridor Zones. Some of these lands contain small patches of late-seral-stage forest which are important to maintain and expand to the extent possible. Priority 5 areas emphasize maintaining late-seral refugia and the habitat diversity which they provide, while recognizing the limita ions of small parcels of federally managed land in a mid to early-seral-stage landscape.

These priorities apply to the specific Landscape Cells as follows:

Late-Seral Landscape Cells are only located in the Core Landscape Zone (Map 14) - These cells encompass the largest contiguous blocks of late-seral-stage forest, having at least 50 percent of the cell in late-seral-stage forest. They contain many of the spotted owl and marbled murrelet occupied sites. The minimum late-seral patch size is 2,000 acres. Existing late-successional species populations in these cells provide the foundation for recovery of these species in the assessment area. Management activities which "trade off" long term gains in late-successional stand composition and structure for short term negative impacts (habitat loss and disturbance) are generally **NOT** appropriate. **Treatment Priority =1**.

Management goals within the Late-Seral Landscape Cells include:

- Manage existing late-successional habitat to avoid activities which may damage or degrade late-successional characteristics.
- Emphasize road closures consistent with the Access and Travel Management (ATM) Plans /Transportation Management Objectives (TMOs).
- Identify Key Watersheds and anadromous fish "core areas" which need restoration and apply silvicultural treatments which have a high degree of certainty that such treatments will be successful and will accelerate the development of late-successional forest habitat.
- Treat the complete range of seral stages. Accelerate stands which lack late-successional habitat characteristics through successional pathways by prescribing treatments which set stands on the appropriate trajectories **with a limited number of entries**.
- Leave some untreated stands in each of the seral stages to develop on a slow trajectory toward late-successional habitat for the following reasons:
  - ⇒ to provide a continuous supply of snags,
  - ⇒ to provide dense hiding cover,
  - ⇒ to provide untreated stands for comparison with treated stands,
  - ⇒ and to provide dense young stands, often a missing component on this landscape.

Mixed-Seral Landscape Cells located in the Core and Corridor Landscape Zones (Map 14) - These cells have a wide variety of seral classes. The late-seral-stage forest in these Landscape Cells ranges between twenty and 35 percent and occurs in patches 100 to 1000 acres in size. A number of spotted owl and marbled murrelet occupied sites have been identified in these cells. **Treatment Priority = 2**.

There are three overall management goals for this Landscape Cell:

- "Grow out" from the adjacent large blocks of late-seral-stage forest in the Late-Seral Landscape Cells. Specific management goals in these areas are exactly the same as for the Late-Seral Landscape Cells.
- Create new and enlarge existing patches of late-seral-stage forest within this zone. Prescribe treatments which attain late-successional characteristics by following the sub-series environment successional pathways described in Chapter V. Treatments may be scheduled in multiple entries.
- Identify Key Watersheds and anadromous fish "core areas" which need restoration and apply silvicultural treatments which have a high degree of certainty that such treatments will be successful and will accelerate the development of late-successional habitat.

Early-Seral Landscape Cells located in the Core and Corridor Landscape Zones (Map 14) - They are currently dominated by early-seral-stage forest. Less than 10 percent of the landscape is in late-seral-stage forest. Several Key Watersheds and anadromous fish "core areas" are located in these cells. These areas are the highest priorities for restoration treatments. **Treatment Priority = 3.**

Specific management goals within these areas are:

- Identify Key Watersheds and anadromous fish "core areas" which need restoration and apply silvicultural treatments which have a high degree of certainty that such treatments will be successful and will accelerate the development of late-successional forest habitat.
- Maintain and enhance dispersal habitat for late-seral associated species.
- Protect and buffer existing small patches of late-successional habitat.
- Apply silvicultural treatments around T&E species locations to enlarge existing small, scattered patches of late-seral-stage forest. Silvicultural treatments need to have a high degree of certainty that they will be successful and that they will accelerate the development of late-successional forest habitat.
- Concentrate on reducing or eradicating exotic species.

Mixed-Seral Landscape Cells located in the Buffer Landscape Zone (Map 14) - These cells contain scattered small patches (100 acres or less) of late-seral-stage forest. **Treatment Priority = 4**.

Specific management goals are the same as the Early-Seral Landscape Cells located in the Core and Corridor Landscape Zones. In addition:

- Maintain diversity by managing special habitats for non-late-successional species (e.g., prescribed burning).
- Maintain natural processes.

Early-Seral Landscape Cells in the Buffer Landscape Zone (Map 14) - contain less than 10% late-successional habitat. An anadromous fish "core area" is located in the Trask River Watershed and may be a high priority for restoration treatments. **Treatment Priority = 5**.

Specific management goals are the same as the goals identified in the Mixed-Seral Landscape Cells in the Buffer Landscape Zone.

The remote and isolated BLM parcels which are within the assessment and outside of the AMA boundary, fit well with the priorities and goals identified for Mixed-Seral Landscape Cells in the Buffer Landscape Zone (applies to the LSR RO269 parcels, approximately 40 acres) and for Mixed-Seral Landscape Cells in the Corridor Landscape Zone (applies to the LSR RO807 parcels, approximately 260 acres).

B. APPLYING TREATMENT PRIORITIES

Treatment priorities identified in this chapter are recommended ways to achieve landscape level goals and objectives and are intended to assist managers in developing schedules for planning and implementation of watershed analysis (see watershed analysis schedule for this assessment area, Appendix G), leading up to project level planning and implementation schedules. As watershed analyses are completed, they will identify issues and priorities which will further define the location and timing of management activities. The general priorities are: first, securing the best potential late-successional habitat; second, developing corridors connecting the best habitats; and third, restoring degraded habitats. Existing habitat quality and needs for connectivity may modify the priorities for treatments within landscape cells. On National Forest lands within the Core Landscape Zone, the Hebo Ranger District has developed landscape priorities which blend treatment priorities in the Late-Seral and Mixed-Seral Landscape Cells (Appendix H).

Treatment priorities are often refined at the project level. At the level of individual stands, treatment priorities can be implemented by first securing and protecting individual stands with the highest quality late-successional habitat, next focusing on linkages between stands, and finally developing or expanding refugia in areas where late-successional habitat is lacking.

Treatment priorities also apply to non-silvicultural treatments which stabilize degraded sites, improve soil productivity, and enhance late-successional characteristics (i.e., road closures and obliterations).

Landscape Design Links to the Adaptive Management Area

Management activities can accelerate the development of many features of late-successional forests and healthy aquatic habitat (e.g. big trees and high quality snags and logs). In addition, one of the AMA objectives is to provide economic benefits to local communities, for which timber is an important resource. Although it may be possible to sustain late-successional species on an entire landscape by providing the highest quality conditions (e.g. high amounts of high quality snags and logs) on a smaller portion of the landscape, management activities may damage some species and processes (e.g. fungi, competitive stress, continuous input of woody debris) that are critical components of late-successional ecosystems. Therefore, it is advisable to implement alternative strategies to meet late-successional goals on landscape units large enough to evaluate their effects on a range of species and ecosystem processes.

The landscape analysis and design process included all LSR and AMA lands within the assessment area (Map 2), allowing us to assess ecological processes and functions across the entire assessment area. Although small scale adaptive management research can occur in many places, opportunities to test and refine landscape level assumptions regarding the development and maintenance late-successional habitat are limited because non-LSR lands within the AMA are relatively small and scattered or are predominantly alder or young managed stands. Portions of LSR RO807 were identified as lacking much of the structure associated with late-successional habitat and not likely to develop this structure for quite some time, making them likely candidates for testing and refining silvicultural treatments which will accelerate the development of late-successional forest habitat and have a high degree of certainty that they will be successful. Carefully designed, developed, and monitored landscape level studies would allow analysis of these treatments at the landscape scale.

A process using the adaptive management concepts at the landscape level is described below. Landscape level questions and the landscape cells which appear to be most appropriate for studying these questions are recommended. Within LSRs, the landscape or fine scale adaptive management strategies selected must meet Late-Successional Reserve standards and guidelines (ROD D-11) and should meet the goals and objectives identified in the landscape design process, as well as fine scale specific needs or issues (i.e., special habitats, T&E species populations, etc.). Landscape level studies within LSRs should be carefully designed and developed in conjunction with the research community and the general public. Study design and implementation should be reviewed by the REO Research and Monitoring Committee for compliance with the ROD.

The **Hebo Late-Seral** and the **Upper Nestucca Mixed-Seral Cells in the Core Zone** (Map 14) are recommended as cells in which it would be appropriate to apply treatments which meet LSR standards and guidelines while providing sustainable commodities over time. One of the most basic questions that needs to be addressed in this AMA is if there is a particular level of timber harvest that is compatible with providing late-successional habitat. A recent study (Tappeiner, et. al. 1997) identified that old-growth stands in the Oregon Coast Range generally developed at relatively low stocking levels (40 to 50 trees per acre). In this assessment area, trees can be grown at stocking levels which exceed these natural levels. Alternative

management options could be selected to provide appropriate levels of late-successional habitat (focusing on the structural and compositional components described in Chapter V), while producing some viable level of timber harvest.

The **Hebo Late-Seral Cell** is also recommended as the appropriate place to study the various approaches for achieving Late-Seral Landscape Cell objectives and goals, especially the goal of accelerating attainment of late-successional habitat characteristics and reducing fragmentation as quickly as possible. Many strategies which will achieve these goals and objectives have been proposed, but some may be more effective or efficient than others.

The Upper Nestucca Mixed-Seral Cell has the highest level of managed stands 80 to 110 years old within the assessment area and, because of an extensive commercial thinning program generally lacks the structure associated with old-growth stands. The Hebo Late-Seral Cell was selected because the older natural stands are predominately 80 years old; due to commercial thinning and previous planting of off-site stock, the forest lacks much of the structure associated with old-growth tands. Proposed Reserved Pair Areas (RPAs) have been delineated within these cells and provide an opportunity to compare the effects of more passive management activities within RPAs with more aggressive treatments outside of RPAs.

The role of red alder in coastal forest ecosystems is a major concern in the Northern Coast Range AMA. The **Lower Nestucca Mixed-Seral Cells in the Core Landscape Zone** were identified to examine the function and significance of red alder, particularly in the development of late-successional habitat. Only a small portion of these cells are designated as LSR. Treatments in the LSR within these cells could take a more conservative approach; al owing a der to remain on the site for a longer period of time, treating Riparian Reserves to re tore fish habitat, underplanting of conifers in small natural or created openings to initiate conifer establishment, etc. Acceleration through successional pathways by various means could be tested in these cells outside of the LSR and contrasted with treatments in the LSR.

It was not necessary to identify research opportunities in the Corridor Landscape Zone, as research on treatments which accelerate corridor function can be examined at the landscape scale in the Mixed-Seral and Early-Seral Cells not designated as LSR. Management actions in RPAs could be compared with active management in adjacent areas to test treatment effectiveness.

Many of the processes and issues in the Buffer Landscape Zone occur at scales finer than the landscape level (i.e., special habitats, fire patterns, dispersal to and from isolated patches of late-successional habitat, individual species population trends). Because of this, landscape level questions for individual cells were not identified.