

FINAL

HABITAT CONSERVATION PLAN

for the

NORTHERN SPOTTED OWL

MILLICOMA TREE FARM
COOS AND DOUGLAS COUNTIES, OREGON

WEYERHAEUSER
COMPANY

NORTH BEND,
OREGON



February 1995

 Weyerhaeuser

**HABITAT CONSERVATION PLAN FOR THE
NORTHERN SPOTTED OWL
ON THE
MILLICOMA TREE FARM
COOS AND DOUGLAS COUNTIES, OREGON**

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1.0

SUMMARY

1.0 SUMMARY

Weyerhaeuser has prepared this Habitat Conservation Plan (HCP) for the Millicoma Tree Farm to compliment federal and state efforts to recover the spotted owl in Oregon. It is based on the recommendations of the federal Spotted Owl Recovery Team (Recovery Team) that viable breeding populations be maintained in federal reserves, and that private lands in the vicinity of the Millicoma Tree Farm provide linkage between federal reserves through the maintenance of landscapes conducive to the dispersal of juvenile owls. Weyerhaeuser's tree farm encompasses 209,000 acres of private industrial timberland in Coos and Douglas Counties, Oregon. The tree farm lies between two proposed federal Late-Successional Reserves (LSRs) and the Elliott State Forest, all of which are likely to support populations of breeding owls into the future.

The tree farm will be managed to provide a dispersal landscape that will facilitate the movement of young owls between the federal and state populations and thus improve the overall prospects of recovery of the species in the region by avoiding fragmentation of the local/regional population. As noted in the Final Draft Recovery Plan for the Northern Spotted Owl (U.S. Fish and Wildlife Service 1992a) and the Northwest Forest Plan (U.S. Forest Service and Bureau of Land Management 1994), dispersal is important to the survival of the species because if owls in managed reserves become isolated, the potential for local extinction increases. The HCP will contribute to the recovery of the species by managing the tree farm in a way that links core breeding populations on federal and state lands into one effective population of larger size and greater resilience. At the same time, the HCP will allow Weyerhaeuser to continue its harvesting, reforestation, and mill operations that depend on the tree farm, and continue sales of logs to other mills in the area, while providing relief from the incidental take prohibitions of the federal Endangered Species Act of 1973 (ESA), as amended.

Recent surveys by Weyerhaeuser and other landowners have identified the presence of up to 35 resident spotted owl pairs and singles on the Millicoma Tree Farm, and additional owls on adjacent

private, state, and federal lands. Most of the owls on the tree farm are not considered to be potentially reproductive in the long term because of the limited amount and fragmented nature of the mature forest habitat on the ownership. The tree farm currently contains approximately 16,275 acres of suitable nesting-roosting-foraging (NRF) habitat for spotted owls (8 percent of the total tree farm). Most of the NRF habitat is in small, isolated patches of several hundred acres or less. Based on techniques developed by the U. S. Forest Service and the Recovery Team (U.S. Forest Service 1992), it is estimated that the habitat on the tree farm is capable of supporting a maximum of seven pairs of spotted owls over the long term (Appendix B). A total of 10 pairs are known to have reproduced on the tree farm at least once since 1990; the maximum number to reproduce in any one year has been six pairs. The remaining owls on the tree farm are not likely to persist over the long term due to the general shortage of habitat.

The ESA prohibits the taking of federally-listed species, and the U.S. Fish and Wildlife Service (USFWS) has advised that the harvest of NRF habitat used by resident spotted owls to the point at which the owls are injured through significant impairment of reproduction, nesting, or foraging could constitute take. Incidental take is only allowed if approved in advance by the USFWS under the authority granted the agency in Section 10 of the ESA. When implementing the take restrictions under the ESA, the USFWS considers any action that may harm a given owl. Weyerhaeuser therefore has decided to apply for an Incidental Take Permit which would authorize any incidental take of spotted owls which might result from the harvest of NRF habitat on the Millicoma Tree Farm, though many of the owls might not persist in the long term even if no further harvest occurred.

The HCP includes a number of measures to avoid the direct death or injury of spotted owls, and minimize and mitigate the effects of the habitat loss. These measures include:

- Development of a dispersal landscape that will, by 13 February 2015, meet the following criteria:

Section 1.0 Summary

- At least 40 percent of the tree farm will be in forested stands capable of providing roosting and foraging habitat for dispersing juvenile owls.
 - A minimum of 80 percent of the tree farm will be in dispersal habitat and gaps less than 0.5 mile;
 - A minimum of 90 percent of the tree farm will be in dispersal habitat and gaps less than 1 mile; and
 - A minimum of 99 percent of the tree farm will be in dispersal habitat and gaps less than 3 miles.
-
- Retention of 1,592 acres of existing NRF and other forest habitat in two strategically-located blocks for at least 20 years to enhance the dispersal landscape.
 - Retention of 371 acres of existing NRF and other forest habitat adjacent to four known spotted owl sites on or near federal lands near the tree farm for at least 20 years to supplement and enhance those sites.
 - Protection of at least 70 acres of NRF habitat around all occupied sites, where occupancy is determined through surveys according to USFWS protocol.
 - Prohibition of timber harvest and road construction within 0.25 mile of known active spotted owl nests during the active breeding season of 1 March through 30 September.
 - Continued monitoring and banding of spotted owls on the tree farm in conjunction with state and federal survey and banding programs, and avoidance of the harvest of active spotted owl nests.

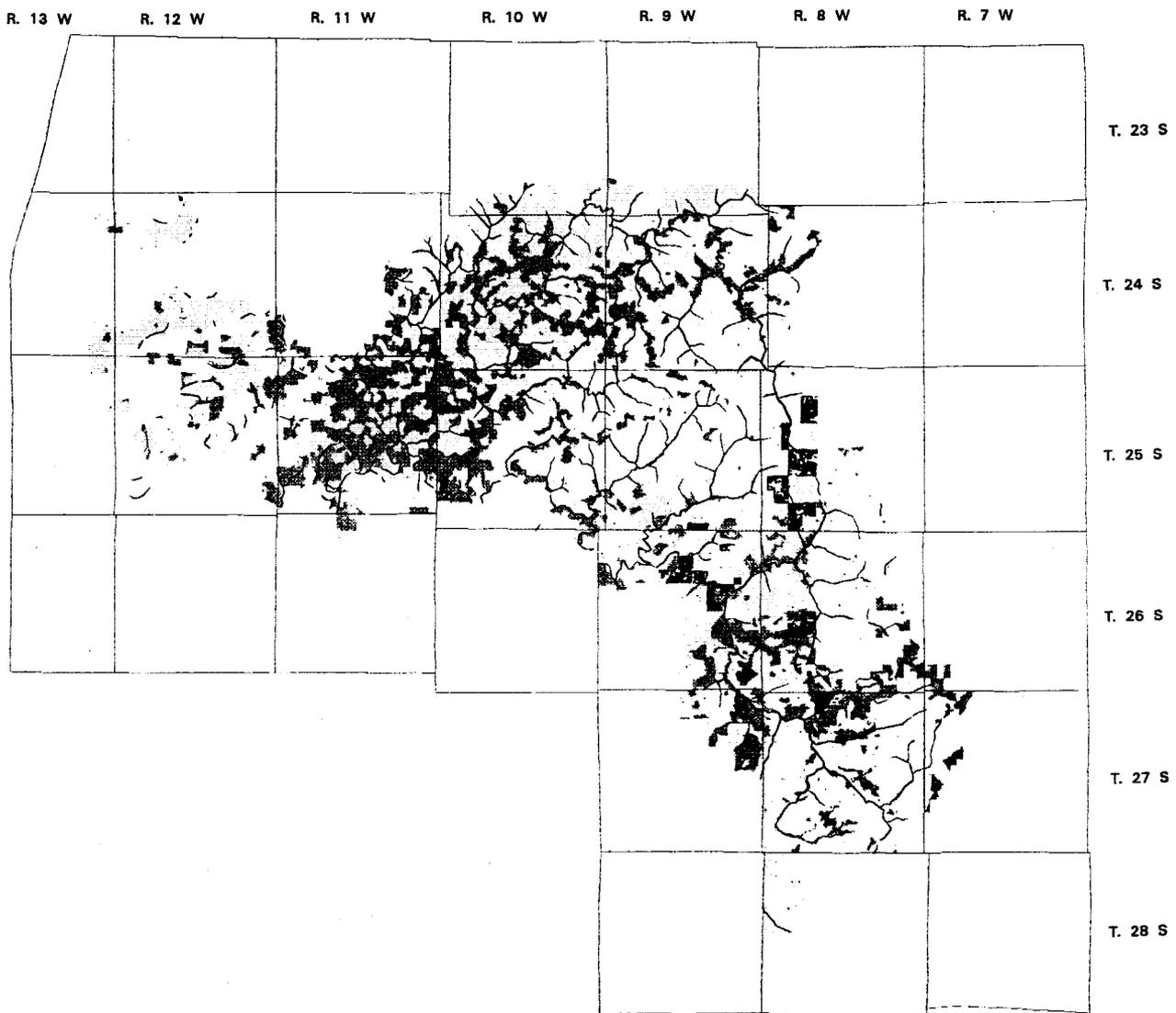
The HCP was prepared according to the requirements of Section 10 of the ESA. It is being submitted to the USFWS in support of Weyerhaeuser's application for an Incidental Take Permit under which any incidental take resulting from harvest of existing spotted owl NRF habitat would be authorized. The HCP will run for 50 years (until 13 February 2045), with potential extensions up to a total term of 80 years if certain conditions exist (see Section 2.4). The dispersal landscape, once achieved, will be maintained for the full term of the HCP. Stands of retained NRF habitat will remain until at least 13 February 2015. The dispersal landscape will be developed through careful planning and scheduling of harvest activities and use of such silvicultural methods as thinning, fertilization, and pruning to accelerate the growth of appropriate conditions.

The net effect of the HCP and Incidental Take Permit will be to improve the dispersal landscape condition of the tree farm and maintain it at the elevated condition until at least 13 February 2045, while the capability of the tree farm to support reproductive spotted owls will be reduced from the current level of up to 10. The existing spotted owls on the tree farm may be displaced into NRF habitat on adjacent state and federal lands or may perish at rates quicker than would be expected without the HCP. Few of the existing activity centers would be expected to remain occupied under any circumstances due to the current condition of the habitat. The benefits of this HCP are illustrated in Figures 1-1 through 1-3.

The HCP provides for future adjustments to the mitigation measures or amendments to account for unforeseen circumstances, changes in land ownership, monitoring and reporting on the implementation of the measures, and future research. A number of alternatives to the HCP have been identified by Weyerhaeuser and USFWS, and are discussed in this document.

In addition to the northern spotted owl, the Millicoma Tree Farm is known to be occupied by the marbled murrelet and northern bald eagle, both federally-listed species. Measures will be taken by Weyerhaeuser to avoid the risk of incidental take of either species. Potential murrelet habitat

Section 1.0 Summary



LEGEND

- Weyerhaeuser habitat
- Reserve habitat
- Weyerhaeuser non-habitat
- BLM habitat
- BLM non-habitat

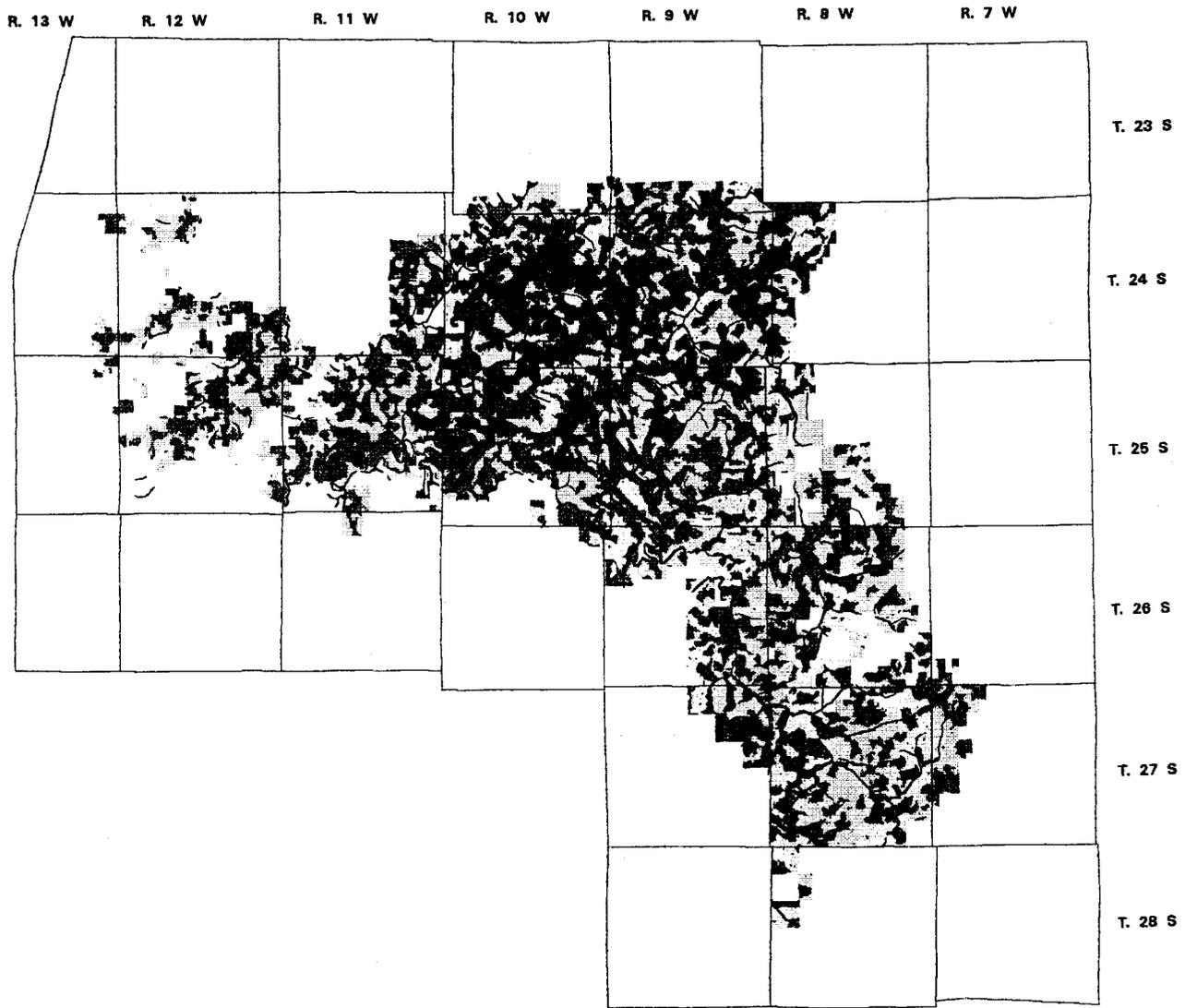


UTM zone-10

Forest inventory as of: May 31, 1994

Figure 1-1. Spotted owl dispersal habitat on the Millicoma Tree Farm in 1994.

Section 1.0 Summary



LEGEND

- Weyerhaeuser habitat
- Reserve habitat
- ▨ Weyerhaeuser non-habitat
- BLM habitat
- BLM non-habitat



UTM zone-10

Forest inventory as of: May 31, 1994

Figure 1-2. Potential distribution of spotted owl dispersal habitat on the Millicoma Tree Farm in 2045 under the HCP.

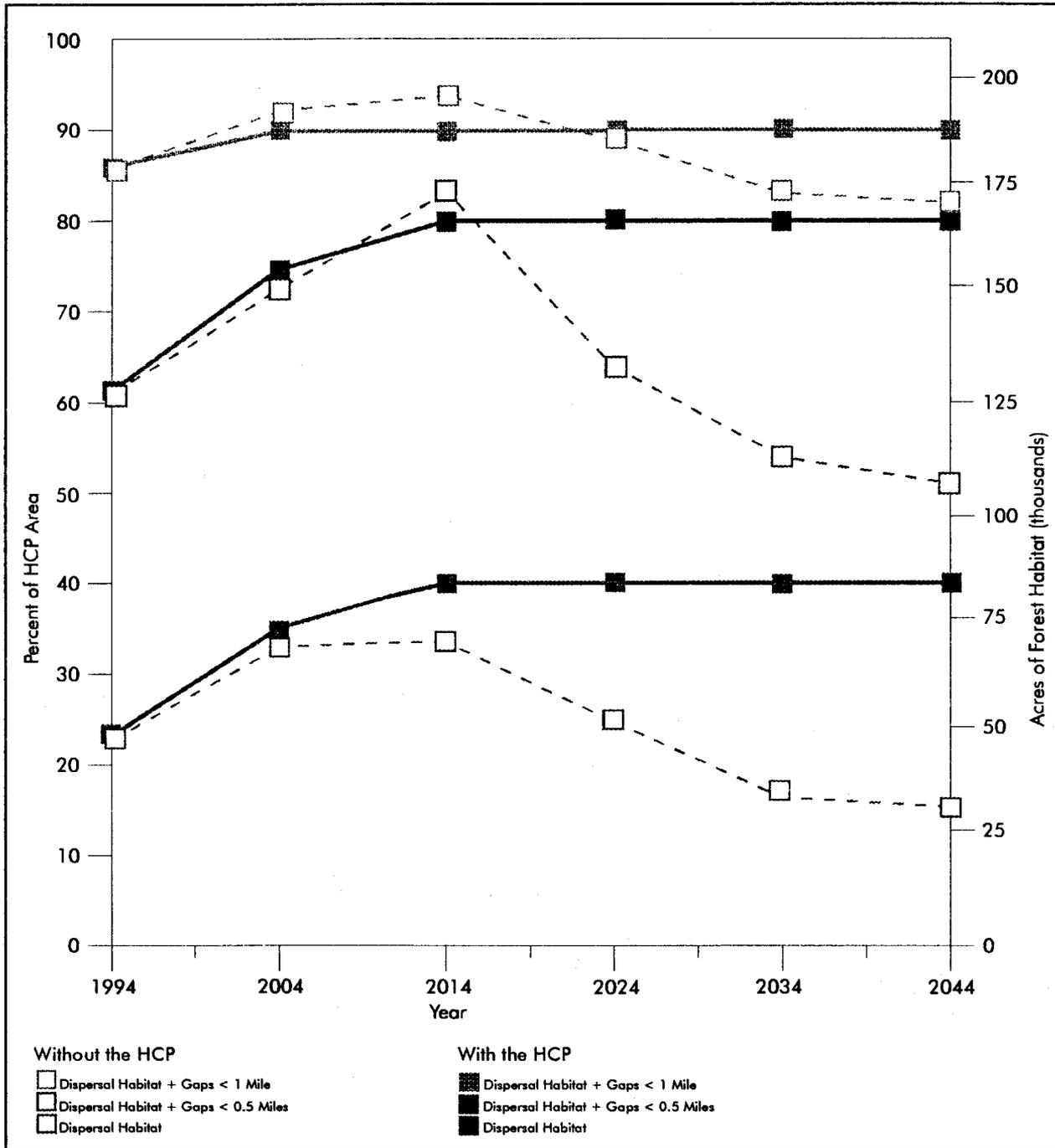
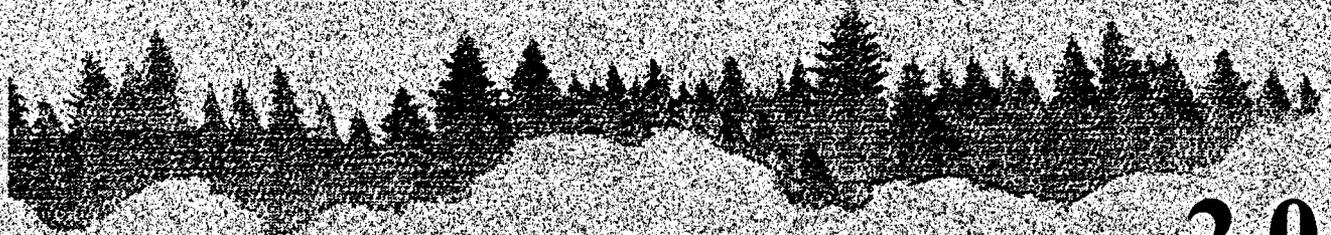


Figure 1-3. Projected trends in dispersal habitat on the Millicoma Tree Farm with and without the HCP.

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will be surveyed for the presence of murrelets prior to harvest or habitat alteration, and occupied habitat will be managed to avoid the take of murrelets. Active bald eagle nesting areas on the tree farm will continue to be managed according to measures implemented by Weyerhaeuser when the nests were originally discovered. Any future nests will be protected in a similar manner.



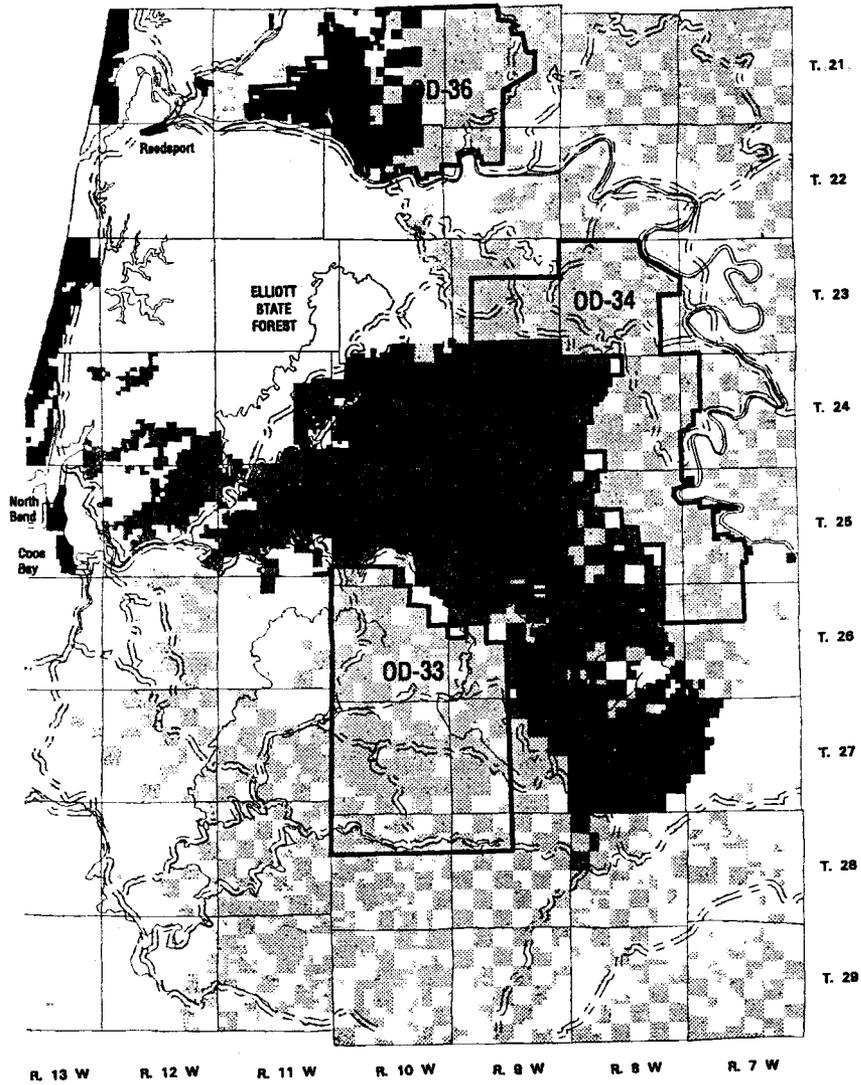
2.0

INTRODUCTION

2.0 INTRODUCTION

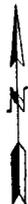
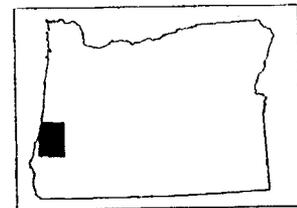
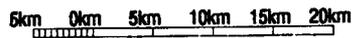
2.1 Overview

Weyerhaeuser Company (Weyerhaeuser) owns approximately 209,000 acres of commercial timberland in Coos and Douglas Counties, Oregon known as the Millicoma Tree Farm (Figure 2-1). The tree farm has been managed for commercial timber production since 1913, and approximately 95 percent of the forest has been harvested at least once and converted to forest plantations. The entire tree farm lies within the geographic range of the northern spotted owl (*Strix occidentalis caurina*), a species listed as threatened under the Federal Endangered Species Act of 1973, as amended (ESA). Recent surveys of the tree farm and adjoining public lands have identified the presence of several resident spotted owls on and near Weyerhaeuser lands. Most of these owls reside within the remaining 5 percent of mature and old-growth coniferous forest on the tree farm, which also is the area where Weyerhaeuser plans to conduct most of its timber harvest over the next 10 years. The U.S. Fish and Wildlife Service (USFWS), which administers the federal ESA for terrestrial wildlife species, considers that the harvest of forest habitat occupied by spotted owls could result in the *take* of owls, an act that is prohibited under USFWS regulations. The USFWS can authorize the take of a listed species if a number of conditions are met. Among those conditions are that the take must be incidental to an otherwise legal activity (i.e., commercial timber harvest) and the effects of the take on the listed species must be minimized and mitigated to the maximum extent practicable. Weyerhaeuser has applied to the USFWS for a permit to allow the incidental take of spotted owls on the Millicoma Tree Farm, and has prepared this Habitat Conservation Plan (HCP) to minimize and mitigate the effects of the take. The basis for this HCP is the future management of the Millicoma Tree Farm in a manner that is consistent with and contributes to the conservation and recovery of the northern spotted owl in the southern Oregon Coast Range province. While an applicant for an incidental take permit is not required to contribute to species recovery (see Section 10 of the ESA), the Millicoma Tree Farm is uniquely situated to



LEGEND

- | | |
|-----------------------------|---|
| ■ Weyerhaeuser lands | □ Other lands |
| ▨ BLM lands | ■ Towns |
| □ State of Oregon lands | ▨ Proposed Designated Conservation Area |
| ■ U.S. Forest Service lands | ▨ Roads |



UTM zone-10

Figure 2-1. Vicinity Map.

assist and enhance survival of the regional owl population. The tree farm lies between two federal reserve areas, where recovery efforts will be concentrated, and adjacent to the Elliott State Forest, which also may be managed to contribute to recovery. Weyerhaeuser will manage the tree farm under the terms and conditions of this HCP for 50 years, with the possibility of another 30 years if the conditions listed in Section 2.4 exist, unless the Incidental Take Permit is terminated earlier. If the permit is terminated earlier, the USFWS may require Weyerhaeuser to continue operating all or part of the tree farm under some or all provisions of this HCP to the extent necessary to mitigate any incidental take which did occur while the permit was in effect.

2.2 Biological Basis for the HCP

The spotted owl recovery strategy originally developed by the Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl (ISC) called for the creation of a series of habitat reserves on federal lands across the full geographic range of the species (Thomas et al. 1990). This same approach was adopted by the federal Spotted Owl Recovery Team (Recovery Team) (U.S. Fish and Wildlife Service 1992a) and expanded to address a broader range of fish and wildlife species in the Northwest Forest Plan (U.S. Forest Service and Bureau of Land Management 1994), which is currently being implemented. Each Late-Successional Reserve (LSR) created under the Northwest Forest Plan will be dedicated to the growth and maintenance of late-successional forest capable of meeting all life requirements of the northern spotted owl (among other species). Spotted owls within the LSRs are meant to form the basis for the recovery of the species. Owl populations within the LSRs will vary in size, depending on the size and shape of the reserve and the amount of suitable habitat within it. The objective of the ISC was to maintain a minimum population of 20 reproductively-capable pairs within each reserve, because populations of this size are expected to have a reasonable chance of short-term internal stability. Several LSRs will be too small to support 20 reproductive pairs because of the fragmented nature of the federal land ownership, but they represent the best available habitat on federal lands.

To allow for normal population processes to continue across the full range of the spotted owl and increase the chances for the species to persist over the long term, the Final Draft Recovery Plan for the Northern Spotted Owl (Recovery Plan; U.S. Fish and Wildlife Service 1992a) provides for the individual reserve populations to be linked into a larger meta-population. Populations of wild animals are subject to a number of mortality factors such as predation, disease, lack of food, and habitat loss, all of which can reduce the overall population size. In a stable population, mortality is offset by recruitment through reproduction and immigration. However, below some theoretical population size there exists a significant risk that natural variations in reproduction and mortality will result in periods where reproduction does not fully compensate for mortality, and the population can crash. Under such circumstances, recruitment through immigration becomes important to maintaining the local population. The ISC estimated that spotted owl populations of 20 or more reproductive pairs have a reasonable expectation of persisting at least 100 years in the face of anticipated mortality factors (Thomas et al. 1990: Appendix O). Populations of fewer than 20 potentially-reproductive pairs are at an increased risk of local extinction, and immigration becomes an even more significant element in maintaining the species across the range. Theoretical population models suggest that immigration of only a few individuals per generation may be adequate to prevent deleterious genetic effects from inbreeding. However, immigration of a larger number of individuals may be needed to counteract the random death of individuals due to predation, starvation, habitat loss, and catastrophic weather events.

The primary means of immigration among spotted owls is the dispersal of juveniles. In the first autumn of their lives, young owls leave the territories of their parents in search of a territory and mate of their own. If they are fortunate enough to find both, they tend to keep them for life. Adult owls are known to occasionally change mates and territories, but the frequency of change and the distances involved are relatively small compared to the dispersal movements of juveniles. The recolonization of vacant habitat and the movement of genetic material from one part of the population to another are accomplished primarily by the dispersal movements of the juveniles. Dispersal distances of nearly 100 miles have been reported (Gutierrez et al. 1985), although two-thirds of all

dispersal distances analyzed by the ISC were 12 miles or less (Thomas et al. 1990: Appendix P). The ISC therefore recommended that habitat reserves of 20 or more potentially-reproductive pairs be spaced no more than 12 miles apart. Reserves with smaller populations should be no more than 7 miles apart. The ISC also recommended that the federal lands between the reserves be managed to provide a landscape conducive to the dispersal of spotted owls between reserves.

The relationship between the size and the spacing of LSRs is somewhat variable. A large LSR (one capable of supporting a large population of reproductive spotted owls) is innately more stable and less dependent on immigration from adjacent LSRs. The spacing between large LSRs can therefore be greater without significantly reducing the long-term viability of the local owl populations. Conversely, small LSRs are more susceptible to local extinction and more dependent on immigration to remain viable. As the population within the LSR decreases in size, immigration becomes more important and the management of a dispersal landscape between the LSRs becomes essential. The ISC recommended that the maximum distance between reserves of 20 or more spotted owl pairs should be 12 miles, and the maximum spacing between reserves with fewer than 20 pairs should be 7 miles (Thomas et al. 1990: page 29). This recommendation was carried through to the federal Final Draft Recovery Plan.

The ISC and the federal Recovery Team divided the geographic range of the spotted owl into physiographic provinces based on distinct differences in geomorphology and vegetation (Thomas et al. 1990; U.S. Fish and Wildlife Service 1992a). The Millicoma Tree Farm lies in the southern portion of the Oregon Coast Range province, directly between two federal LSRs and in the vicinity of a third (Figure 2-1). The LSRs are very similar in size, shape, and location to Designated Conservation Areas (DCAs) OD-33, OD-34, and OD-36 in the Final Draft Recovery Plan (U.S. Fish and Wildlife Service 1992a: page 133). The DCA numbers are more widely known than the LSR numbers, and will be used to identify the reserves throughout the remainder of this document. Weyerhaeuser lands abut two of the DCAs, but do not fall within any.

The Final Draft Recovery Plan identified a number of threats to the spotted owl population in the Oregon Coast Range province, and made four general recommendations for the management of non-federal lands to contribute to the conservation of the species. The first recommendation was for the contribution of non-federal lands within DCAs to the maintenance of late-successional habitat for nesting, roosting, and foraging. The Millicoma Tree Farm does not lie within either of the DCAs (now LSRs), and is not affected by this recommendation. The second recommendation is for the maintenance of spotted owl pair clusters on non-federal lands in the northern portion of the province, where federal lands are limited. The Millicoma Tree Farm lies outside this area of concern. The third recommendation pertains only to state lands in the province, and does not include Weyerhaeuser or other private landowners. The fourth recommendation is for the maintenance of habitat conditions conducive to the dispersal of juvenile spotted owls between the DCAs. This is the basis for the Millicoma HCP.

The tree farm includes most of the non-federal land between DCAs OD-33 and OD-34, and is therefore critical to the dispersal of juvenile owls among the two reserves. The average distance between the reserves is approximately 12 miles, which meets the ISC standard for reserves of 20 or more pairs, but the current and future projected capabilities of the DCAs are all below 20 pairs (Table 2-1). In addition, dispersal habitat conditions are less than optimal on roughly 50 percent of the Bureau of Land Management (BLM) lands surrounding the reserves (U.S. Fish and Wildlife Service 1992a: page 132), placing even greater importance on the dispersal landscape within the Millicoma Tree Farm. In the short term, the situation is particularly acute because the owl populations in the reserves are depressed due to the limited amount and fragmented nature of the habitat within the reserves. The amount and distribution of federal habitat in the reserves are expected to improve over the next 40 to 80 years as previously harvested or disturbed forest stands develop roosting, foraging, and some nesting conditions. In the meantime, the effective population sizes in the reserves are expected to fall to 12 pairs (OD-33) and to 10 pairs (OD-34). This suggests that not only is the dispersal landscape on the Millicoma Tree Farm important to overall recovery of the spotted owl in the southern Oregon Coast Range, it is particularly important

Table 2-1. Current and future projected capability of Designated Conservation Areas in the vicinity of the Millicoma Tree Farm (U.S. Fish and Wildlife Service 1992a: page 133).

DCA Number	Total Area (acres)	Total NRF Habitat (acres)	Known Activity Centers	Current Projected Pairs	Future Projected Pairs
33	55,800	28,200	24	12	17
34	48,500	21,600	25	10	15
36	43,000	28,900	13	13	15

Section 2.0 Introduction

during the next 50 to 80 years while the federal reserve populations are depressed and more vulnerable to local extirpation.

Under the HCP, the Millicoma Tree Farm will be managed to develop a landscape conducive to the dispersal of juvenile spotted owls in the shortest time practicable. The desired landscape condition will be achieved by 13 February 2015, and maintained until at least 13 February 2045. This initial 50 years will be important to the maintenance of local owl populations due to depressed habitat conditions on adjacent federal lands. After 13 February 2045, standard forest management as practiced by Weyerhaeuser will tend to maintain the dispersal landscape at the 13 February 2015 level. The dispersal landscape will be created by adjusting the size and spacing of forest stands and the relative distribution of different forest age classes. Once the appropriate conditions are created through the measures described in the HCP, standard forest practices will tend to maintain them. Deviations from the optimum landscape condition would occur only if there were a significant change in forest technology or timber markets that caused Weyerhaeuser to substantially change its management practices. If the USFWS determines in accordance with Section 2.4 of this HCP that the term should extend beyond 50 years, then the HCP and all commitments herein to maintain the dispersal landscape can be continued for additional 10-year increments, up to a total HCP term of 80 years.

This HCP is a long-term agreement designed to improve the likelihood of survival and recovery of the spotted owl over a large portion of southwest Oregon. The recovery and protection of the regional spotted owl population will be enhanced by this agreement because reproductive populations in federal reserves will be interconnected. Habitat provided by Weyerhaeuser will allow juvenile owls to disperse with a reasonable chance of success. Without the dispersal habitat provided for in this HCP, dispersing juvenile owls will have less chance of survival because they will be more vulnerable to predation and/or starvation while searching for their own home range. As an alternative to the dispersal landscape, Weyerhaeuser could have proposed to manage the tree farm for reproductive spotted owls to increase the effective sizes of federal populations. Such

an approach could increase the stability of the federal populations and decrease the potential for local extirpation, but the opportunity for the tree farm to contribute a significant number of reproductive pairs was considered remote because of current habitat conditions and the fact that it is not practicable for private landowners to grow new owl habitat without financial subsidies which are not currently available or anticipated.

Weyerhaeuser will use advanced forestry techniques to provide this dispersal habitat. The company will guarantee that 40 percent of its 209,000-acre tree farm will meet dispersal habitat standards within 20 years, and will sustain them for at least the initial 50-year term of the agreement. Further, virtually all, or 99 percent of the tree farm, will have no gaps greater than 3 miles in distance between stands meeting specified dispersal habitat conditions. These dispersal habitat standards will greatly increase survival rates for juvenile owls moving through the tree farm. Weyerhaeuser also will leave over 1,900 acres of existing mature forest to augment public land habitat needs until 13 February 2045, or until the dispersal habitat requirements are met in the younger forest, whichever is later. The timber on this land is currently worth in excess of \$40 million.

2.3 Purpose and Need for the HCP

Weyerhaeuser has prepared this HCP to support its application for an Incidental Take Permit for the northern spotted owl on the Millicoma Tree Farm. The tree farm currently contributes to the habitat used by 35 known spotted owl pairs and resident singles with activity centers on Weyerhaeuser lands. An additional 44 sites occur on adjacent lands within 1.5 miles of the tree farm, and the owls occupying them could use Weyerhaeuser lands to meet some of their life requirements. The USFWS has stated that harvest of suitable spotted owl nesting-roosting-foraging (NRF) habitat in close proximity to known owls could result in a high risk of incidental take under certain circumstances. Taking of a listed species is prohibited by USFWS regulations

adopted under the ESA unless an Incidental Take Permit is issued in advance. However, avoidance of incidental take could require Weyerhaeuser to delay harvesting some of its older timber and increase the harvest of younger timber which otherwise could remain available as dispersal habitat. This could eventually interfere with the movement of spotted owls between breeding populations on federal reserves adjacent to the tree farm. To avoid this result, Weyerhaeuser is seeking an Incidental Take Permit which will allow harvest of suitable habitat that currently is supporting owls. In exchange, Weyerhaeuser will grow and maintain dispersal habitat over a broader area. This HCP describes the measures Weyerhaeuser will take to minimize and mitigate the effects of the incidental take to the maximum extent practicable. Under the Permit, any incidental taking of spotted owls resulting from the otherwise legal activities of commercial timber production and harvesting, along with other incidental uses allowed on commercial forest lands under the Oregon land use laws such as of rock quarries and electronic communication facilities, would be allowed in accordance with the HCP.

2.4 Term

The Permit and this HCP shall remain in force and effect for 50 years (until 13 February 2045) unless sooner terminated in accordance with Section 6.9 of this HCP below. The USFWS may extend the term of the Permit and the HCP on the existing terms or other mutually agreeable terms three times for up to 10 years per extension, provided:

- 1) Weyerhaeuser and USFWS have met approximately 5 years before any scheduled Permit expiration to discuss the need for any extension of the Permit and HCP. If Weyerhaeuser decides not to seek an extension, but USFWS decides such an extension meets the criteria of this Section of the HCP, USFWS must notify Weyerhaeuser of its decision and any extension at least 4 years before the previously scheduled expiration date. Neither the HCP nor the Permit may be

extended by USFWS beyond 13 February 2075 without the consent of Weyerhaeuser.

- 2) The USFWS finds that:
 - a) The owl remains threatened or endangered or, absent the benefits of the HCP, would likely become threatened or endangered in the portion of its range in which the HCP area is located;
 - b) Nearby public lands are still being managed as nesting, roosting, and foraging habitat for owls;
 - c) Such extension is necessary to provide opportunities for juvenile and other single owls to disperse to and from those nearby public lands so as to: i) maintain genetic diversity in the regional owl populations; and ii) repopulate any nesting, roosting, and foraging habitat on those nearby public lands which are not occupied by owls at that time, and
 - d) ESA restrictions concerning take of owls remain in place for other private owners of comparable commercial timberland in the area. Further, continuing the mitigation requirements during the proposed extension would be no more demanding than the requirements with respect to spotted owls then applicable to private owners of nearby comparable commercial timberlands.

Any dispute between Weyerhaeuser and the USFWS concerning the need for or duration of any proposed extension of the Permit and HCP will be resolved in accordance with the procedures set forth in Section 9 the Implementation Agreement.

2.5 Organization of the HCP

This HCP has been written to meet all pertinent requirements of Section 10(a)(1)(B) of the ESA. It is organized into 11 chapters plus appendices. Chapter 1 is a summary of the entire HCP. Chapter 2 provides background on the need and regulatory basis for preparing the HCP and Chapter 3 identifies objectives of the HCP. Chapter 4 is a description of the environmental setting and plants and animals in the HCP area, including the northern spotted owl. Chapter 5 describes the specific habitat conservation measures to be implemented for spotted owls on the Millicoma Tree Farm. Monitoring of the HCP is discussed in Chapter 6, while costs and funding are discussed in Chapter 7. Chapter 8 presents alternatives to the proposed incidental take. The effects of the HCP on plants and animals is discussed in Chapter 9. Chapter 10 lists references and Chapter 11 is a glossary of terms used in this HCP. The scientific basis for conservation measures in this HCP is presented in Appendix A of this document, and a spotted owl landscape capability analysis of the tree farm is presented in Appendix B. A complete listing of the lands covered by the HCP and the Incidental Take Permit is included in Appendix C.



3.0

OBJECTIVES OF THE HCP

3.0 OBJECTIVES OF THE HCP

3.1 Biological Objectives

3.1.1 Dispersal Landscape

The primary biological objective of this HCP is to manage the Millicoma Tree Farm in a manner that makes it conducive to the dispersal of juvenile spotted owls. The tree farm is uniquely located between the Elliott State Forest and two blocks of federal land administered by the BLM (Figure 2-1). The Millicoma HCP can contribute to the survival and recovery of the northern spotted owl by linking the three small population areas into what can effectively become one larger interacting population.

The Northwest Forest Plan (U.S. Forest Service and Bureau of Land Management 1994) calls for the management of federal lands on either side of the tree farm as LSRs capable of supporting populations of spotted owls, as recommended by the federal Recovery Team (U.S. Fish and Wildlife Service 1992a). The Recovery Team also recommended that state lands within the Elliott State Forest be managed in a similar manner to support some resident owls, and that private land between all three parcels be managed to facilitate the effective dispersal of juvenile owls. While the future management of the Elliott State Forest is uncertain, it is likely to support at least a small population of owls. Dispersal of juvenile owls between the public reserves is considered important to the long-term maintenance of the individual populations and the survival of the species as a whole (Thomas et al. 1990). In the absence of dispersal between the reserves, populations could become isolated, and the potential for local extinctions would increase (Murphy and Noon 1992). The Millicoma HCP will provide a landscape of managed forest conducive to the dispersal of juvenile spotted owls and occasional movement of adult owls between the federal reserves to the northeast and southwest. Connectivity with the Elliott State Forest also will be provided.

3.1.2 Mature Forest Habitat

A secondary biological objective of this HCP is to maintain selected stands of mature forest habitat within the dispersal landscape. Spotted owl dispersal, in general, appears to be random and not amenable to management within narrow corridors of suitable habitat (Appendix A). Dispersal across the Millicoma Tree Farm, however, is likely to be greater in two general areas that lie directly between the breeding populations on public lands. While dispersing owls may make use of all portions of the tree farm, the owls most likely to contribute significantly to the maintenance of viable populations will be those dispersing more directly from one reserve area to the other or from one reserve area to the tree farm and back again to the same reserve. Selected stands of mature forest will be retained directly between the reserves to increase the potential for successful dispersal. The habitat will be retained until overall conditions for dispersal across the tree farm reach target conditions. These stands will provide patches of suitable roosting and foraging habitat for dispersing owls.

3.1.3 Resident Owl Habitat

Federal LSRs directly abut the Millicoma Tree Farm on the northeast and southwest, while the Elliott State Forest lies directly to the north (Figure 2-1). The spotted owl populations in the federal reserves are currently below target levels because habitat has been reduced by past timber harvest. Until the habitat on federal lands recovers, mature forest habitat on the tree farm immediately adjacent to the federal lands can make a significant contribution to the maintenance of reproductive populations. This HCP will contribute to the maintenance of existing suitable habitat around selected federal activity centers.

3.1.4 Protection of Occupied Activity Centers and Active Nests

Many of the activity centers on the Millicoma Tree Farm might continue to support resident spotted owls for some time, provided there are sufficient amounts of suitable foraging habitat surrounding the activity centers. The HCP will allow for the protection of a minimum of 70 acres of suitable habitat around each occupied activity center as a buffer against actively displacing resident owls during harvest. A number of existing activity centers lie within 0.25 mile of established mainline haul roads on the tree farm. Activity on these established mainline roads will be limited during the spotted owl nesting season where a practicable alternative exists. This HCP also will restrict harvest and road construction within 0.25 mile of any known active spotted owl nest between 1 March and 30 September to protect nesting adults and their young.

3.2 Economic Objectives

3.2.1 Short-term Timber Supply

The short-term economic objective of this HCP is to sustain the supply of merchantable timber to Weyerhaeuser's metric mill in Coos Bay, Oregon. Weyerhaeuser acquired this mill in 1989 and converted it into a quality precision metric mill that cuts products with high value. The mill is supported primarily by the harvest of merchantable timber on company-owned timberlands. The mill directly or indirectly supports a staff of approximately 500 people, including those who work at shipping facilities, on company and contract logging and trucking crews, and in a transportation network to ship the finished product to the market. The mill and all support functions depend on the supply of logs from the Millicoma Tree Farm.

Weyerhaeuser's current efforts to protect spotted owl site centers on the Millicoma Tree Farm already have resulted in a 20 percent reduction in harvest and have necessitated the purchase of

logs of others from a limited supply to support the Coos Bay mill. The tree farm also produces logs which cannot be used by the Coos Bay mill because of size, quality, or species. These logs are processed by five other mills. Any future reduction in harvest levels will impact these other mills as well. With the withdrawal of federal timber from the Coos Bay market, and the greatly reduced harvest from the Elliott State Forest, continued restrictions on harvest of Weyerhaeuser timber to protect the spotted owl could necessitate reductions in production or closure of the mill. This reduction also would hurt the five other mills Weyerhaeuser supplies. Any opportunity to increase harvest levels will have a beneficial effect on increasing timber supply in the immediate areas, both for Weyerhaeuser and other nearby mills. It is Weyerhaeuser's intention to keep the mill, woods crews, and contractors fully employed as long as operations can be conducted efficiently.

3.2.2 Long-term Predictability

The long-term objective of this HCP is to provide a predictable and sustainable supply of timber from the Millicoma Tree Farm in order to justify continued financial investment in both the timberlands and local milling facilities. Timber production is a long-term business venture, as investments do not produce significant returns for 40 or 50 years. Any uncertainty in the ability to recover these investments in the future can influence initial investment decisions either to buy more land or to continue to invest in growing future timber crops on the lands Weyerhaeuser currently manages. This HCP is intended to help resolve the unpredictability resulting from the listing of the spotted owl.



4.0

CURRENT CONDITION OF THE HCP AREA

4.0 CURRENT CONDITION OF THE HCP AREA

4.1 Environmental Setting

4.1.1 Location

The Millicoma Tree Farm is located east of U.S. Highway 101 in Coos and Douglas Counties, Oregon (Figure 2-1). It extends from Coos Bay east approximately 25 miles to the crest of the Oregon Coast Range and approximately 20 miles from north to south. The HCP area encompasses Weyerhaeuser timberlands in 23 townships within the tree farm (Figure 2-1). A number of small parcels on the perimeter of the tree farm are excluded from the HCP area because they do not contain spotted owl habitat and they are not situated to contribute to the long-term management of owls prescribed in this HCP.

4.1.2 Geology and Soils

The tree farm falls within the southern Oregon Coast Range physiographic province (Franklin and Dyrness 1984). The area is characterized by steep mountainous slopes with ridges that often are extremely sharp. Elevations in the area range from 100 to 3,200 feet.

The Tye formation, largely composed of rhythmically-bedded tuffaceous and micaceous sandstone, occurs throughout the southern Oregon Coast Range province. Scattered igneous intrusions, consisting mostly of gabbro, date from the Oligocene and cap many of the most prominent peaks. During the Miocene, localized depositions of both sedimentary and volcanic rocks occurred, which are exposed near Coos Bay (Franklin and Dyrness 1984).

There are seven major soil associations present on the tree farm; five derived from sedimentary rocks, one from volcanic rock, and one from alluvium. Soil associations consist of groupings of soil series occurring in the same geographic area that usually have similar parent materials. Eocene sandstone and siltstone are the parent materials for the Cooston, Noah, Remote, Millicoma, and Yaokum Associations, while Eocene basalt is the parent material for the Keever Association. Older sandstone alluviums are the parent materials for the Bessee Association (Duncan and Steinbrenner 1972). There are 22 soil series occurring on the tree farm. Callahan, Nabb, and Jolson are the three most common, comprising approximately 50 percent of the area.

Nearly 89 percent of the tree farm has moderate to good soil fertility (Douglas-fir Site Class III or better). Hazard from windthrow, based on a combination of soils and topography, is low on 58 percent, moderate on 36 percent, and high on 6 percent of the area. High susceptibility areas occur on steep slopes with shallow, stony soils (Duncan and Steinbrenner 1972).

4.1.3 Climate

The Millicoma Tree Farm is characterized by a wet, mild maritime climate, with annual rainfall averaging 60 to 120 inches. Most precipitation falls in the winter; summers are relatively dry. Precipitation is higher on the western portion of the tree farm due to orographic effects of the coastal mountains (Franklin and Dyrness 1984). Fog drip also accounts for a significant portion of the precipitation in coastal areas.

4.1.4 Surface Hydrology

Most surface waters from the tree farm flow into tributaries of the Coos River, including the South Fork Coos River, West Fork Millicoma River, East Fork Millicoma River, and Williams River (Figure 4-1).

Section 4.0 Current Condition of the HCP Area

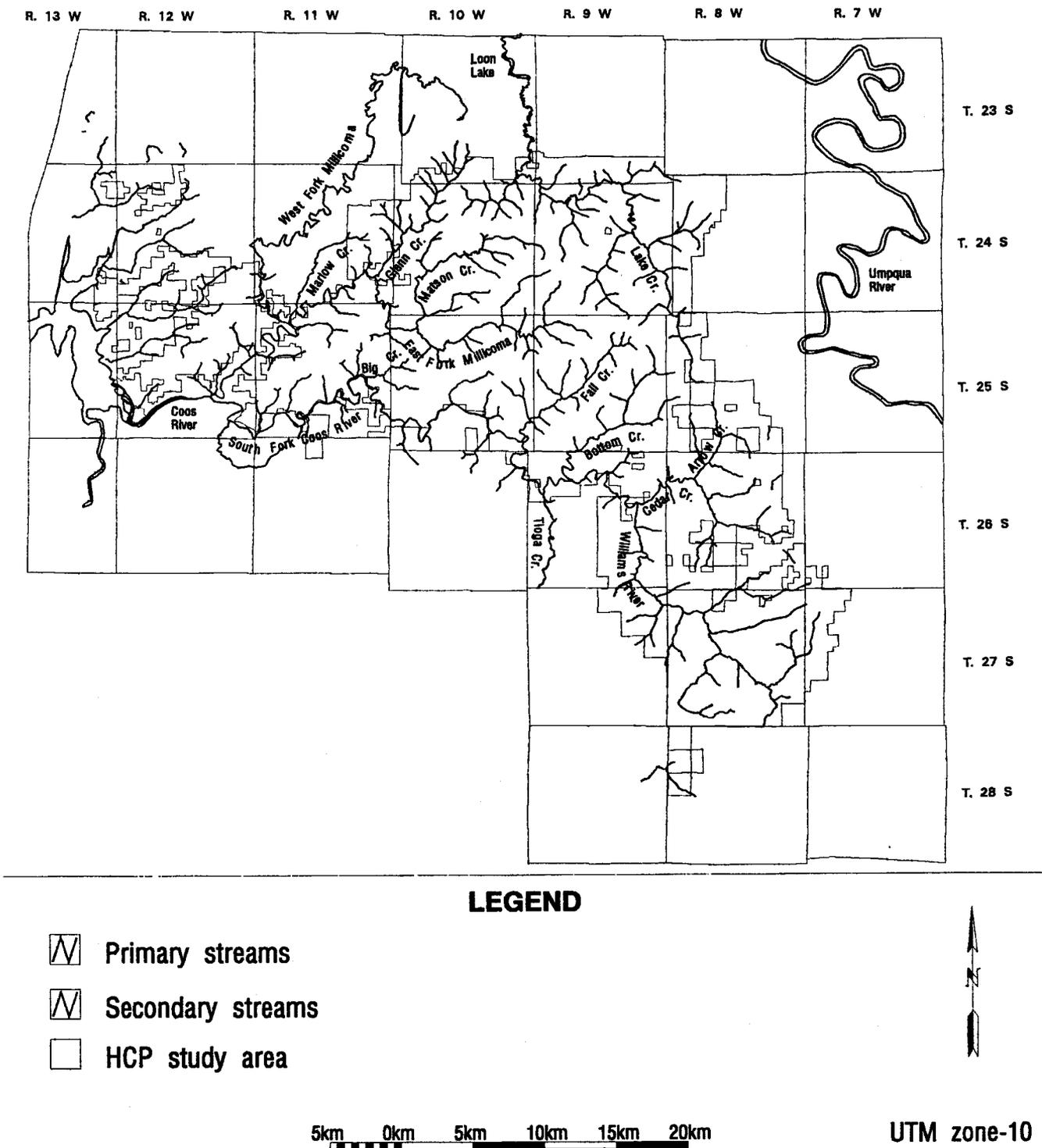


Figure 4-1. Map of rivers draining the Millicoma Tree Farm.

Eastern and northern portions of the tree farm drain northward and eastward via Lake Creek and Hubbard Creek into the Umpqua River.

4.1.5 Land Ownership and Land Use

The Millicoma Tree Farm is a mostly contiguous block, bordered to the south, east, and northeast by a checkerboard of private land and federal lands administered by the BLM (Figure 2-1). State lands administered by the Oregon Department of Forestry (Elliott State Forest) are located to the northwest of the tree farm, while a contiguous block of private timberlands is located to the south. Lands to the west are mainly private and include the communities of North Bend and Coos Bay, while lands to the southwest and northeast are comprised of rural residences and small farms, particularly along streams and rivers (Slater, pers. comm., 14 December 1993). Federal lands in the area are managed by the BLM for multiple uses, but timber harvest traditionally has been the most significant use affecting wildlife habitat. Future management of BLM lands surrounding the Millicoma Tree Farm will be guided by the Northwest Forest Plan (U.S. Forest Service and Bureau of Land Management 1994). Much of the BLM ownership to the northeast, east, and south of the tree farm will be managed as reserves to benefit the spotted owl and other late-successional forest species. The state of Oregon currently is preparing a management plan for the Elliott State Forest, which could include some management for spotted owls and other late-successional wildlife.

The Millicoma Tree Farm is managed for commercial timber production in a manner consistent with sustainable forestry and the protection of public resources such as air quality, water quality, fish, and wildlife. Individual forest stands are planted and grown for the purpose of commercial timber harvest at intervals determined by local growing conditions. A number of silvicultural techniques are employed to increase the production of commercially-valuable wood fiber, such as intensive planting, thinning, and fertilization. Harvest is typically done by clearcutting. A system of permanent and temporary roads is maintained to access the forest for management and harvest.

Road surfaces and drainage systems are maintained to ensure access and minimize impacts to water quality, and the majority of the tree farm is gated and patrolled to control traffic on the roads. A number of ancillary facilities are maintained on the tree farm to support forestry activities, including gravel pits, log sort yards, and radio repeater stations. Weyerhaeuser also issues a limited number of leases for non-company facilities such as radio and telephone relay stations and electrical transmission lines. Management of the tree farm occurs in compliance with Oregon forest practices rules which cover most activities related to forestry and timber harvest.

4.2 Vegetation

4.2.1 Plant Communities

The majority of the Millicoma Tree Farm lies within the *Tsuga heterophylla* Zone, which may occur between sea level and approximately 3,000 feet in elevation (Franklin and Dyrness 1984). Dominant tree species within this zone include western hemlock (*Tsuga heterophylla*), Douglas-fir (*Pseudotsuga menziesii*), and western redcedar (*Thuja plicata*). The western-most portion of the tree farm lies within the *Picea sitchensis* Zone. This zone, usually found below approximately 500 feet in elevation, also may occur up to nearly 2,000 feet when mountain masses are located immediately adjacent to the ocean. This zone could be considered a variant of the *Tsuga heterophylla* Zone, distinguished by the occurrence of Sitka spruce (*Picea sitchensis*), proximity to the ocean, and frequent summer fogs. Dominant trees within the *Picea sitchensis* Zone include Sitka spruce, western hemlock, and western redcedar. Natural stands in these forest zones, if undisturbed, eventually develop "old-growth" characteristics which include dominant trees greater than 3 feet in diameter and 200 feet in height, multiple age and size classes of trees ranging from large dominants to seedlings, large standing dead trees (snags), and heavy accumulations of logs on the forest floor (Franklin et al. 1981). Stands such as these may attain ages of several hundred years, subject only to catastrophic disturbances such as fire or wind.

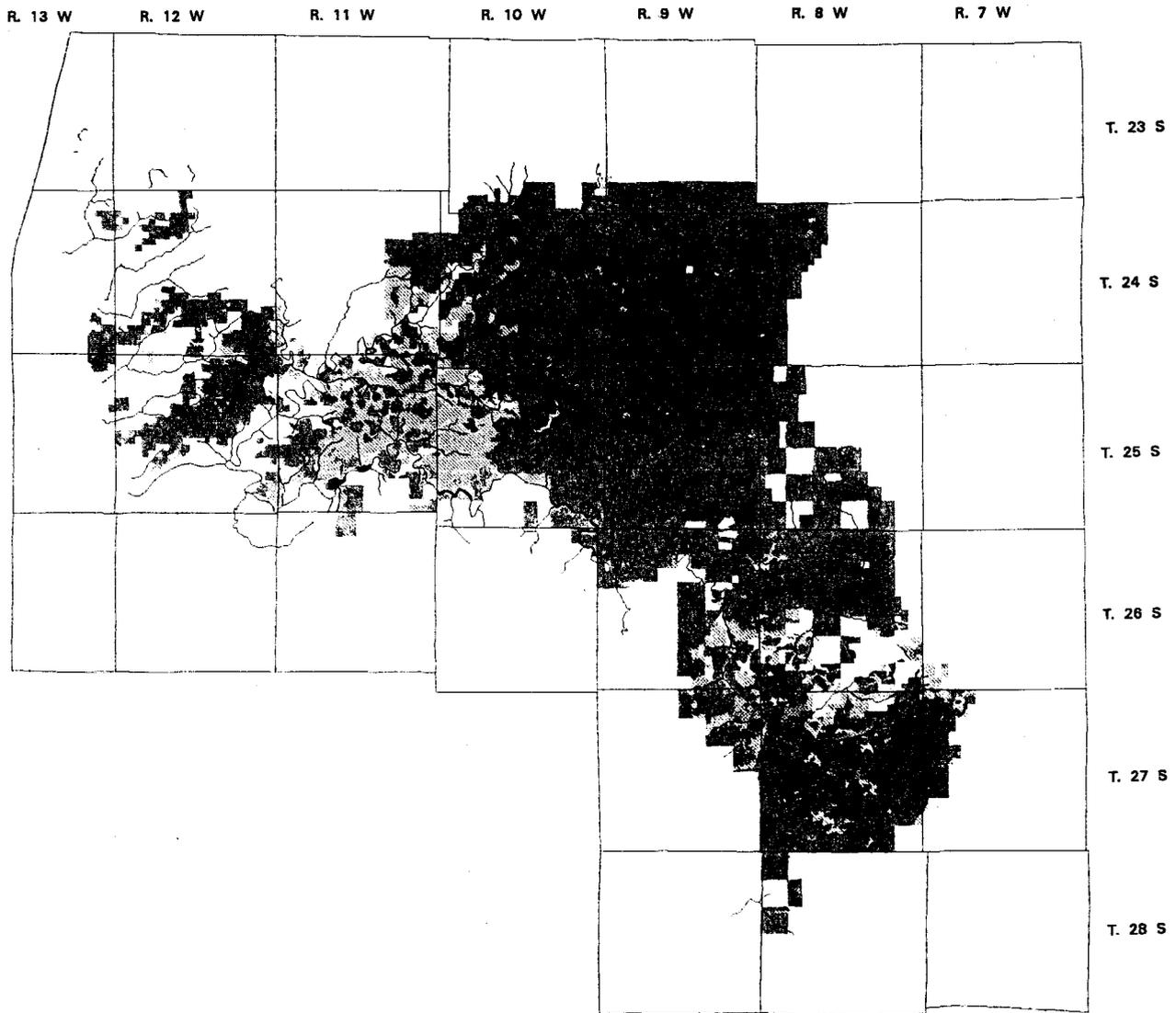
The Millicoma Tree Farm is currently a mosaic of forest stands of varying ages (Figure 4-2; Table 4-1). Areas in the western portion of the tree farm are characterized by mature second-growth timber with residual old-growth trees in the overstory and a significant percentage of mature hardwoods. Areas in the southeast portion of the tree farm are characterized by small fragmented stands of mature timber in a matrix of recently harvested areas and young stands. Northeast and north-central portions of the tree farm contain a matrix of early-successional and immature stands. Less than 1.5 percent of the tree farm (2,727 acres) is occupied by old-growth coniferous forest that has never been harvested. Most of the old-growth is in small, dispersed stands.

4.2.2 Plant Species of Special Interest

The Millicoma Tree Farm supports no federally-listed plant species. Four endangered species and one threatened species can be found within the state of Oregon, but none are listed by the Oregon Natural Heritage Program (ONHP) as occurring within Coos or Douglas Counties.

The USFWS provided a list of plant species of concern that included seven candidates for federal listing likely to occur within the area of the Millicoma Tree Farm (U.S. Fish and Wildlife Service 1993). The list included the western lily (*Lilium occidentale*), the wayside aster (*Aster vialis*), Oregon bensoniella (*Bensoniella oregana*), tall bugbane (*Cimicifuga elata*), salt-marsh bird's-beak (*Cordylanthus maritimus ssp. palustris*), shaggy horkelia (*Horkelia congesta ssp. congesta*), and slender meadowfoam (*Limnanthes gracilis ssp. gracilis*) (Table 4-2). In further consultation, the crinite mariposa-lily (*Calochortus coxii*) and Umpqua mariposa-lily (*Calochortus umpquaeni*) were added to the species provided on the original USFWS consultation list (Vrilakas, pers. comm., 8 December 1993).

Section 4.0 Current Condition of the HCP Area



LEGEND

- Early-successional forest
- Non-forested land
- Mid-successional forest
- Streams
- Mature forest
- Old-growth forest



5km 0km 5km 10km 15km 20km

UTM zone-10

Forest inventory as of: May 31, 1994

Figure 4-2. Forest cover types on the Millicoma Tree Farm in 1994.

Section 4.0 Current Condition of the HCP Area

Table 4-1. Forest cover types on the Millicoma Tree Farm in 1994.

Cover Type	Area (acres)
Early-successional Forest (0-39 years old)	171,517
Mid-successional Forest (40-79 years old)	25,147
Mature Forest (80-199 years old)	8,727
Old-growth Forest (200+ years old)	2,727
Non-forest Land	<u>882</u>
Total	209,000

Section 4.0 Current Condition of the HCP Area

Table 4-2. Plant species with special federal status that may be present on or near the Millicoma Tree Farm.

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS ¹	OCCURRENCE POTENTIAL	HABITAT
Western lily	<i>Lilium occidentale</i>	PE	remote	Occurs in poorly drained, highly organic soils at the edges of bogs near the ocean.
Wayside aster	<i>Aster vialis</i>	C2	remote	Edges of woodlands, woodland openings, and shaded roadsides.
Oregon bensoniella	<i>Bensoniella oregana</i>	C2	low	Damp, well-drained soils at the edges of bogs, meadows, and springs above 3,500 feet elevation.
Crinite mariposa-lily	<i>Calochortus coxii</i>	C2	possible	Serpentine soils, on shady, north-facing slopes, often near ridgelines.
Umpqua mariposa-lily	<i>Calochortus umpquaeni</i>	C2	unlikely	Forest and meadow habitats.
Tall bugbane	<i>Cimicifuga elata</i>	C2	possible	Moist, shady coniferous or mixed deciduous-coniferous forests at low elevations.
Salt-marsh bird's-beak	<i>Cordylanthus maritimus ssp. palustris</i>	C2	unlikely	Immediately above the high tide line within salt marshes.
Shaggy horkelia	<i>Horkelia congesta ssp. congesta</i>	C2	possible	Dry open places.
Slender meadowfoam	<i>Limnanthes gracilis ssp. gracilis</i>	C2	possible	Natural habitat is flat, alluvial plains. Prefers areas of slowly receding spring flood waters.
Clustered lady's-slipper	<i>Cypripedium fasciculatum</i>	C2	possible	Moist to dry, rocky coniferous forest.

¹ PE - Proposed Endangered
C2 - Federal Candidate

The ONHP maintains a database system containing information on the occurrences of rare, threatened, and endangered plants and plant communities within the state of Oregon. A search of this database for the Millicoma Tree Farm produced documented occurrences of five of the plant species on the USFWS consultation list (Oregon Natural Heritage Program 1993b). Rare plant survey results also were requested from both the Coos Bay and Roseburg BLM Districts because this information had not yet been incorporated into the ONHP database (Vrilakas, pers. comm., 8 December 1993). The Roseburg District did not conduct rare plant surveys within the area of the Millicoma Tree Farm in 1993 (Holmes, pers. comm., 17 December 1993) and did not note the occurrence of any rare plants within the vicinity of the tree farm (USDI Bureau of Land Management 1993a). Data received from the Coos Bay District indicated three occurrences of rare plants within the vicinity of the Millicoma Tree Farm (USDI Bureau of Land Management 1993b). Two of the three plants noted are on the USFWS consultation list.

Western lily (*Lilium occidentale*)

The western lily, which is proposed for federal listing as endangered within the state of Oregon (U.S. Federal Register 1992), is known to exist within Coos County (Oregon Natural Heritage Program 1993a). This species typically occurs at the edge of bogs near the ocean and is known to inhabit poorly drained, highly organic soils of *Sphagnum* origin. Common associates of this species includes sundew (*Drosera* spp.), Pacific rhododendron (*Rhododendron macrophyllum*), evergreen huckleberry (*Vaccinium ovatum*), Labrador-tea (*Ledum groenlandicum*), and red alder (*Alnus rubra*) (Meinke 1982). As a result of the ONHP database search, one occurrence of western lily was noted within a bog along Highway 101. The occurrence of this species within the same approximate location also was noted within the 1993 rare plant survey information obtained from the BLM Coos Bay District Office (USDI Bureau of Land Management 1993b). The location of these occurrences (Township 24 South, Range 13 West) is approximately 3 miles from the western-most portion of the Millicoma Tree Farm (Oregon Natural Heritage Program 1993b). The potential for occurrence of this species on the Millicoma Tree Farm is remote, as this species

usually is restricted to areas within 2 miles of the ocean (Meinke, pers. comm., 9 December 1993) (Table 4-2).

Wayside aster (*Aster vialis*)

The wayside aster is known to occur in Douglas County (Oregon Natural Heritage Program 1993a). The habitat of this species, which is a federal candidate for listing within the state of Oregon (U.S. Federal Register 1993), includes the edges of woodlands, woodland openings, and shaded roadsides (Oregon Natural Heritage Program 1993c). Eastman (1990) identifies open woodlands of the upper Willamette Valley as the primary habitat of this species. Meinke (1982) states associates of this species include Douglas-fir (*Pseudotsuga menziesii*), golden chinquapin (*Castanopsis chrysophylla*), and Pacific madrone (*Arbutus menziesii*). One occurrence of wayside aster was noted approximately 4 miles south of the southern-most portion of Weyerhaeuser ownership in Township 28 South, Range 8 West (Oregon Natural Heritage Program 1993b). Within the forested environment, this species inhabits clearings created through openings in the tree canopy (Meinke, pers. comm., 9 December 1993). Due to intensive forest management on the Millicoma Tree Farm, the occurrence potential for this species is remote (Table 4-2).

Oregon bensoniella (*Bensoniella oregana*)

Bensoniella is known to occur within both Coos and Douglas Counties (Oregon Natural Heritage Program 1993a). Eastman (1990) identifies moist streamsides and wet meadows in Pre-Cretaceous metasedimentary rock at elevations above 4,000 feet as the preferred habitat of this species. Meinke (1982) states damp, well-drained soils at the edges of bogs, meadows, and springs within mixed coniferous zones from above 3,500 to 5,000 feet as the preferred habitats for this species. Common associates of bensoniella include currants (*Ribes* spp.), louseworts (*Pedicularis* spp.), and sedges (*Carex* spp.) (Meinke 1982). No occurrences of this species were noted as a result of the ONHP database search (Oregon Natural Heritage Program 1993b). Based upon low elevations throughout the Millicoma Tree Farm (maximum elevation of 3,200 feet), the occurrence potential for this species is low (Table 4-2).

Crinite mariposa-lily (*Calochortus coxii*)

Crinite mariposa-lily, a federal candidate for listing (U.S. Federal Register 1993), is known to occur within Douglas County (Oregon Natural Heritage Program 1993a). This species occurs on serpentine soils and on shady, north-facing slopes, often near ridgelines. Common associate species include incense-cedar (*Calocedrus decurrens*), Idaho fescue (*Festuca idahoensis*), Jeffrey pine (*Pinus jeffreyi*), Tolmie's mariposa-lily (*Calochortus tolmiei*), Bolander's onion (*Allium bolanderi* spp. *mirabile*), western azalea (*Rhododendron occidentale*), Hooker's silene (*Silene hookeri*), ponderosa pine (*Pinus ponderosa*), Douglas-fir, and Pacific madrone (Oregon Natural Heritage Program 1993c). As a result of the ONHP database search, no occurrences of this species were noted within the area of the tree farm (Oregon Natural Heritage Program 1993b). It is possible this species could occur on the Millicoma Tree Farm (Table 4-2).

Umpqua mariposa-lily (*Calochortus umpquaeni*)

Umpqua mariposa-lily, a federal candidate for listing (U.S. Federal Register 1993), occurs within forest and meadow habitats. This species has been found to occur in a variety of habitats including forests dominated by incense-cedar, Pacific madrone, and Douglas-fir and areas of limited shrubs, and has been found to be associated with moss, (*Phacelia capitata*), rosy plectritis (*Plectritis congesta*), podfern (*Aspidotis densa*), California danthonia (*Danthonia californica*), and Idaho fescue (Oregon Natural Heritage Program 1993c). This species is known to occur within Douglas County (Oregon Natural Heritage Program 1993a). No occurrences of this species have been noted in the area of the Millicoma Tree Farm (Oregon Natural Heritage Program 1993b). This species generally is known to occur only east of Interstate 5 (Meinke, pers. comm., 9 December 1993) and is not expected to be present on the tree farm (Table 4-2).

Tall bugbane (*Cimicifuga elata*)

Tall bugbane, a federal candidate for listing (U.S. Federal Register 1993), is known to exist within Douglas County (Oregon Natural Heritage Program 1993a). This species occurs at the margins of, or within moist, shady coniferous or mixed deciduous-coniferous woodlands at lower elevations.

On the Willamette National Forest, this species appears to be limited to wetter, steep (60 to 80 percent), north-facing slopes. This species has been observed within areas where the herbaceous layer is dominated by sword fern (*Polystichum munitum*). Other species indicative of potential sites include California maidenhair fern (*Adiantum jordanii*) and wild sarsaparilla (*Aralia nudicaulis*) (Oregon Natural Heritage Program 1993c). No occurrences of this species were noted as a result of the ONHP database search (Oregon Natural Heritage Program 1993b). Since the Millicoma Tree Farm is dominated by low elevation coniferous forests with herbaceous layers often being dominated by sword fern, this species could potentially occur on the tree farm (Table 4-2).

Salt-marsh bird's beak (*Cordylanthus maritimus ssp. palustris*)

According to the ONHP (1993a), salt-marsh bird's-beak exists within Coos County. This species, which is a federal candidate for listing (U.S. Federal Register 1993), grows just above the high tide line within salt marshes (Eastman 1990). Meinke (1982) found associates of this species to include pickleweed (*Salicornia virginica*), black knotweed (*Polygonum paronychia*), and American searocket (*Cakile edentula*). Other associates include California marsh-rosemary (*Limonium californicum*), seashore saltgrass (*Distichlis spicata*), California hairgrass (*Deschampsia californica*), and fleshy jaumea (*Jaumea carnosa*) (Oregon Natural Heritage Program 1993c). Eight separate occurrences of this species were noted as a result of the database search. Each occurrence was located adjacent to Coos Bay and west of Highway 101 (Oregon Natural Heritage Program 1993b). The occurrence of this species within the same approximate location also was noted in the 1993 rare plant survey information obtained from the BLM Coos Bay District Office (USDI Bureau of Land Management 1993b). The occurrence potential for this species on the Millicoma Tree Farm is limited to those portions of the tree farm located directly adjacent to saltwater. This species potentially could occur within these areas; however, the salinity of the water east of Highway 101 may be insufficient to support this species (Rittenhouse, pers. comm., 13 December 1993) (Table 4-2).

Shaggy horkelia (*Horkelia congesta* ssp. *congesta*)

Shaggy horkelia, known to exist within Douglas County (Oregon Natural Heritage Program 1993a), occurs primarily in open grassland habitats within the Willamette and Umpqua Valleys (Vrilakas, pers. comm., 8 December 1993 and Meinke, pers. comm., 9 December 1993). Abrams (1944) lists dry open places as the preferred habitat of this species. This species is a federal candidate for listing within the state of Oregon (U.S. Federal Register 1993). A plant monograph provided by the ONHP (1993c) states this species typically occurs from the lower Willamette Valley to the Umpqua River Valley and recommends the low hills of the Umpqua be taken as the type locality. The ONHP database search identified one occurrence of shaggy horkelia approximately 5 miles south of the tree farm (Township 29 South, Range 8 West) (Oregon Natural Heritage Program 1993b). It is possible this species could occur on the Millicoma Tree Farm; however, the available habitat information tends to suggest this species prefers grassy areas rather than managed coniferous forests (Table 4-2).

Slender meadowfoam (*Limnanthes gracilis* ssp. *gracilis*)

Slender meadowfoam, known to occur within Douglas County (Oregon Natural Heritage Program 1993a), occurs in areas which are moist to wet in early spring, often on serpentine soils (Meinke 1982; Eastman 1990). This species has been reported within the elevation range of 1,500 to 5,600 feet. Common associates are presumed to be primarily herbaceous plants (Meinke 1982). Habitat information obtained from the ONHP (1993c) stated this species occasionally is found in ditches or disturbed areas, but the natural habitat is flat, alluvial plains, usually in open valley bottoms of ponderosa pine and Garry oak (*Quercus garryana*). Other common associates include California danthonia, annual hairgrass (*Deschampsia danthoides*), pine bluegrass (*Poa scabrella*), small-leaved bentgrass (*Agrostis microphylla*), and common buckbrush (*Ceanothus cuneatus*) (Oregon Natural Heritage Program 1993c). This species prefers areas of slowly receding spring flood waters (Meinke, pers. comm., 9 December 1993). The ONHP database search identified two occurrences of slender meadowfoam approximately 5 miles south of the tree farm (Township 29

South, Range 8 West) (Oregon Natural Heritage Program 1993b). Slender meadowfoam could occur on the Millicoma Tree Farm (Table 4-2).

In addition to the above-listed species, the ONHP database search also noted the occurrence of russet cotton-grass (*Eriophorum chamissonis*), whorled marsh pennywort (*Hydrocotyle verticillata*), and bog clubmoss (*Lycopodium inundatum*) within the area of the Millicoma Tree Farm (Oregon Natural Heritage Program 1993b). None of these species are federally listed (U.S. Federal Register 1993).

Clustered lady's slipper (*Cypripedium fasciculatum*)

In addition to the western lily and salt-marsh bird's-beak, information received from the BLM Coos Bay District also noted the possible occurrence of clustered lady's slipper (*Cypripedium fasciculatum*) directly south of the Millicoma Tree Farm (Bureau of Land Management 1993b). This species is a federal Candidate 2 (U.S. Federal Register 1993) and is known to occur in Douglas County (Oregon Natural Heritage Program 1993a). Based upon the information received, an occurrence of this species was not directly noted. Rather, the data form received was a record of a subsequent visit in which an attempt to find this species was unsuccessful. In addition, the data form noted the locational information for the previous sighting of this plant may be erroneous. The clustered lady's slipper occurs within moist to rather dry and rocky coniferous forests (Hitchcock et al. 1990). Consequently, this species could occur on the Millicoma Tree Farm.

4.3 The Northern Spotted Owl

4.3.1 Regional Spotted Owl Status

The U.S. Forest Service Scientific Advisory Team summarized the number of northern spotted owls detected in surveys from 1987 through 1992 to be 3,605 pairs and approximately 1,000 territorial

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singles in Washington, Oregon, and California (Thomas et al. 1993). The actual number of owls is expected to be greater because portions of the species range have not been surveyed (U.S. Forest Service and Bureau of Land Management 1994).

The federal Recovery Team divided the range of the spotted owl into 11 physiographic provinces based on geographic patterns in the distribution of natural vegetation (Figure 4-3). These divisions are modifications of the provinces described by Franklin and Dryness (1984). The Millicoma Tree Farm lies within the Oregon Coast Range province, which includes the coastal mountains of western Oregon from the Columbia River south to the Middle Fork of the Coquille River. As of 1992, 303 pairs and 77 territorial singles were known to exist in the Coast Range province, primarily on public lands (U.S. Fish and Wildlife Service 1992a). Roughly half of the known owls (47%) were found south of State Highway 38 in the southern one-quarter of the province that includes the Millicoma Tree Farm. The higher density of owls in the southern portion of the province was attributed to the greater amount of federal land with suitable spotted owl habitat south of Highway 38 (U.S. Fish and Wildlife Service 1992a).

The Recovery Team analyzed trends in populations and habitats within each province, and identified a number of threats to the survival and recovery of the owl population. The Recovery Team considered the most severe threats in the Coast Range province to be low and declining populations; little nesting, roosting, and foraging habitat; poor distribution of the remaining owls and habitat; isolation of the province from other populations of spotted owls, and high levels of predators. Most of these threats were considered to be more severe in the northern portion of the province than in the area of the Millicoma Tree farm (U.S. Fish and Wildlife Service 1992a).

The Recovery Team recommended three DCAs on federal lands in the vicinity of the Millicoma Tree Farm (Figure 2-1). These same areas were later adopted as LSRs in the Northwest Forest Plan (U.S. Forest Service and Bureau of Land Management 1994), with only minor modifications in size and shape. They have been assigned LSR identification numbers in the Northwest Forest

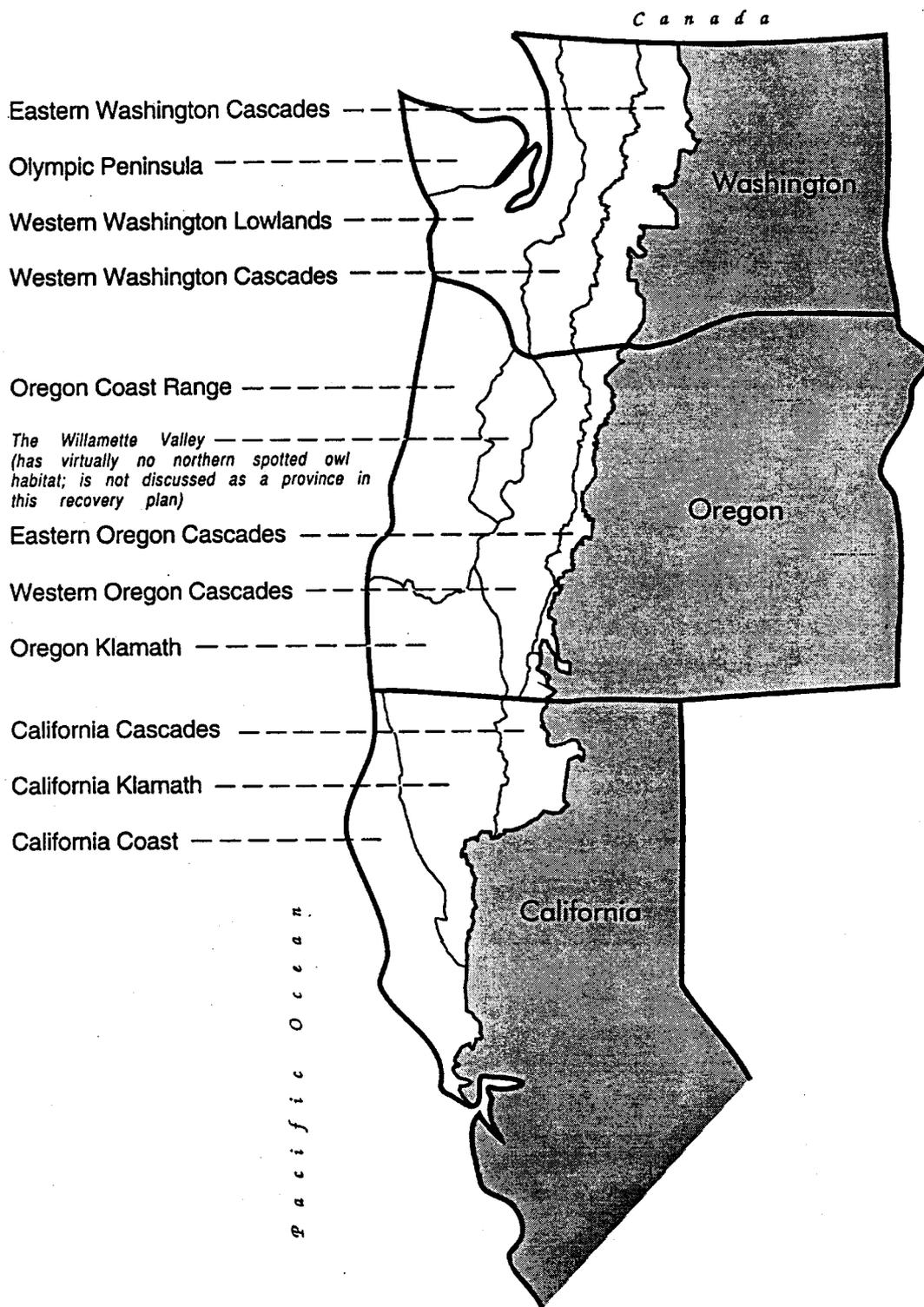


Figure 4-3. Provinces within the range of the northern spotted owl in the United States (from U.S. Fish and Wildlife Service 1992a).

Plan, but they are referenced in this HCP by the DCA numbers used in the Final Draft Recovery Plan because these numbers are more widely used.

The projected future capacity of the three DCAs ranges from 15 to 17 pairs of potentially-reproductive spotted owls (Table 2-1), compared to the Recovery Plan target of 20 pairs per reserve. The DCA populations of 20 or more reproductively-capable pairs are assumed to have a reasonable expectation of persisting 100 years, given known rates of mortality and immigration (Thomas et al. 1990: Appendix O). All three DCAs are therefore below optimum in size. The maximum recommended distance between DCAs of fewer than 20 pairs is 7 miles (Thomas et al. 1990), to allow for adequate dispersal of juvenile owls from one DCA to the other. The two DCAs lying on either side of the Millicoma Tree Farm are separated by approximately 12 miles, suggesting that dispersal could become a limiting factor in the future maintenance of owls in the DCAs.

After laying the groundwork for recovery on federal lands, the Recovery Team recommended a number of management actions for non-federal lands. The recommendations for non-federal lands in the Coast Range province are:

1. Provide nesting, roosting, and foraging habitat on non-federal lands contained within federal DCAs;
2. Provide nesting, roosting, and foraging habitat to support individual supplemental spotted owl pair areas and clusters on non-federal lands, particularly in the northern portion of the province;
3. Provide dispersal habitat to assure successful dispersal of owls between DCAs and from the Coast Range province to adjacent provinces; and

4. Develop a habitat management plan for the state lands in the province.

Recommendation 1 does not pertain to the Millicoma Tree Farm because it is addressed specifically at non-federal lands within DCAs. Due to the history of land settlement in the Pacific Northwest, many forest areas are checkerboards of alternating federal and non-federal ownership. The Oregon Coast Range is typical of this condition, where square-mile parcels of U.S. Forest Service (USFS) or BLM land alternate with private or state forest lands (Figure 2-1). Most of the DCAs identified by the Recovery Team in the Coast Range province encompass checkerboard ownership, and the team considered it important to manage the non-federal lands in a manner consistent with the federal objectives for the DCA. All three DCAs in the vicinity of the tree farm are heavily checkerboarded, but none of the lands within the DCAs belong to Weyerhaeuser because of the company's past efforts to consolidate its ownership through trade and acquisition.

Recommendation 2 was intended primarily for the northern portion of the Coast Range province, where federal lands are limited and the Recovery Team felt local populations could not be maintained without the contribution of non-federal lands. It is less of a concern in the portion of the range south of State Highway 38 because of the greater relative amount of federal lands present there, but it is still pertinent because none of the DCAs meet the target of supporting 20 reproductive pairs.

Recommendation 3 is the role for which private lands in the southern portion of the province are best suited. The size and spacing of the DCAs leaves them at increased risk of local extinction unless adequate dispersal occurs. Dispersal habitat will be provided on some federal lands between the DCAs, but in areas where no federal lands are present, private and state lands provide the only opportunity. Due to Weyerhaeuser's program of land consolidation in the Coos Bay area, few federal lands exist between DCA 33 and DCA 34. Dispersal habitat will exist between these two DCAs only if provided by Weyerhaeuser.

Recommendation 4 is directed at state lands in the province. The Elliott Forest, which lies directly north of the Millicoma Tree Farm, is one such state-owned parcel. Management plans being developed for the Elliott may include provisions for resident owls and/or dispersal habitat.

4.3.2 Spotted Owl Status Within the HCP Area

The BLM and the state of Oregon have conducted surveys for spotted owls in the vicinity of the Millicoma Tree Farm since the early 1980's. Weyerhaeuser initiated spotted owl surveys on the tree farm in 1990, and expanded them in 1991, 1992, 1993, and 1994 to cover additional areas of potential habitat. The combined information from all surveys to date indicates there may be up to 79 spotted owl pairs and territorial singles (un-paired adults showing consistent use of particular areas) on or within 1.5 miles of the Millicoma Tree Farm (Table 4-3). The actual number of resident owls probably is less, because owls are occasionally detected in multiple locations and reported as different birds.

Of the 79 known and suspected spotted owl activity centers within 1.5 miles of the tree farm, 35 are actually on Weyerhaeuser lands and the remaining 44 are on private, state, and federal lands outside the tree farm. The 35 activity centers on the tree farm include ten pairs that have demonstrated successful reproduction at least once since 1990, 20 pairs that are not known to have successfully reproduced since 1990, and five territorial singles (Table 4-3). Some of the 35 activity centers are well within the tree farm where the only available habitat is owned by Weyerhaeuser. Other activity centers are along the perimeter of the tree farm, where the available habitat is owned by a combination of Weyerhaeuser, other private owners, the state of Oregon, and the BLM. It is likely that owls at all 35 activity centers make use of mature forest habitat on the tree farm.

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Table 4-3. Summary of known spotted owl sites on and near the Millicoma Tree Farm as of 1994.

I. Resident Spotted Owl Sites on the Tree Farm		
A. Pair Sites With Successful Reproduction Observed Since 1990		10
B. Pair Sites with No Successful Reproduction Observed Since 1990		20
C. Resident Single Sites		5
	Subtotal	35
II. Resident Spotted Owl Sites Within 1.5 Miles of the Tree Farm		
A. Sites With at Least 1,906 Acres of NRF Habitat Protocol in Federal LSR ¹		7
B. Sites Receiving No Substantial Contribution of NRF Habitat from Weyerhaeuser Lands ¹		23
C. Sites Receiving Substantial Contribution of NRF Habitat From Weyerhaeuser Lands		
1. Pair Sites with Successful Reproduction Observed Since 1990		9
2. Pair Sites With No Successful Reproduction Observed Since 1990		5
	Subtotal	44
	TOTAL	79

¹ Sites that would not be negatively affected by harvest activities on the tree farm.

The 44 activity centers outside the tree farm fall into a number of categories (Table 4-3). Seven of the activity centers are within federal LSRs and have at least 1,906 acres of suitable NRF habitat that will be protected. Owls in these activity centers are likely to remain reproductively viable regardless of habitat alteration on the tree farm. Another 23 activity centers are situated such that there is little or no NRF habitat on the tree farm that is within 1.5 miles of the activity center. Habitat on the tree farm probably does not contribute substantially to the support of spotted owls at these 23 activity centers, and the harvest of habitat on the tree farm probably would not result in the risk of take of these owls. The amount of NRF habitat on the tree farm and within 1.5 miles of the 23 activity centers ranges from 0 to 62 acres, and it is all in small isolated patches in locations unlikely to be used by the resident owls. Owls at the remaining 14 non-Weyerhaeuser activity centers probably do make substantial use of mature forest habitat on the tree farm, and could be affected by the harvest of the habitat. Of these 14, nine are known to have successfully reproduced since 1990.

Two separate analyses of the tree farm suggest the number of owls that successfully can reproduce on the tree farm in any one year is between six and eight pairs. The first analysis, conducted according to methods employed by the USFS and federal Spotted Owl Recovery Team in their assessments of federal LSRs (U.S. Forest Service 1992) indicate the long-term landscape capability of the Millicoma Tree Farm is seven pairs of spotted owls (Appendix B). Recent records of reproduction obtained from surveys of the tree farm from 1990 through 1994 provide a second estimate of landscape capability. Reproductive data show a total of ten pairs that reproduced at least once during that period, with the maximum number of pairs reproducing in any one year being six. Seven is probably the maximum number of pairs that could reproduce in any one year on the tree farm.

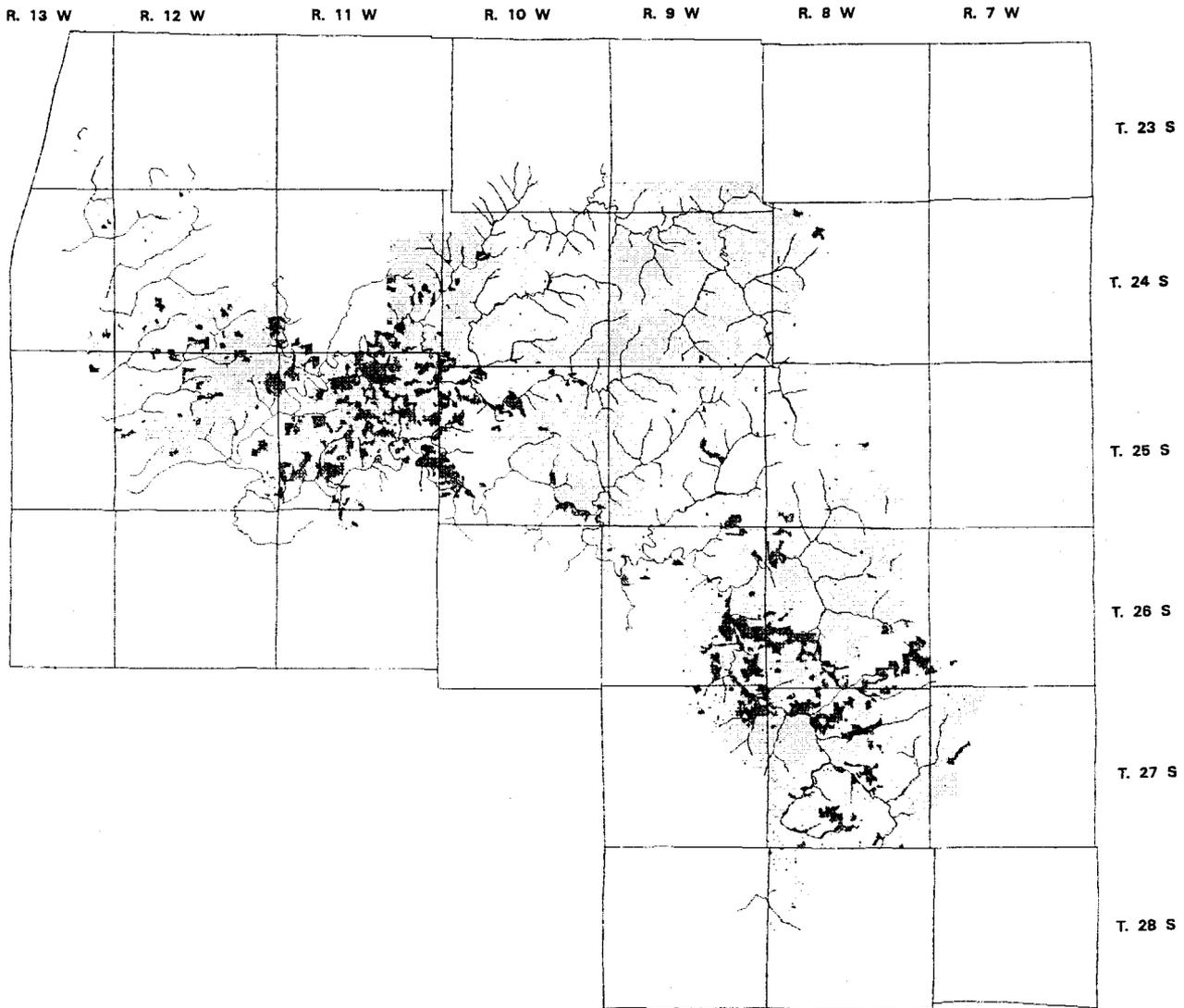
4.3.3 Suitable Spotted Owl Habitat Within the HCP Area

The Millicoma Tree Farm contains an estimated 16,275 acres of potential NRF habitat for spotted owls (Figure 4-4). Optimal NRF habitat for spotted owls is generally considered to be biologically mature or old-growth forest that exhibits the following characteristics (Thomas et al. 1990):

- moderate to high canopy closure;
- a multilayered, multi-species canopy dominated by large overstory trees;
- a high incidence of large trees with various deformities such as cavities, broken tops, and dwarf mistletoe infections;
- numerous large snags;
- large accumulations of fallen trees and woody debris on the ground; and
- sufficient open space below the canopy for owls to fly.

This definition generally describes classic "old-growth" NRF habitat, but a limited amount of old-growth exists on the Millicoma Tree Farm. As noted in Table 4-1, the tree farm supports 8,727 acres of mature forest and 2,727 acres of old-growth forest. Portions of both forest types have the NRF habitat structural characteristics described above, for a total of approximately 3,630 acres of "old-growth" NRF habitat. However, spotted owls have been observed in numerous areas that do not meet the old-growth NRF definition. For purposes of this HCP, NRF habitat on the tree farm was expanded to include younger and less diverse habitat of the type that has been found to support owls in western Oregon, and could potentially support owls on the tree farm. Potential NRF habitat on the Millicoma Tree Farm is defined as forest stands with:

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LEGEND

-  Potential Nesting, Roosting, Foraging habitat
-  Non-habitat
-  Streams



5km 0km 5km 10km 15km 20km

UTM zone-10

Forest inventory as of: May 31, 1994

Figure 4-4. Potential nesting-roosting-foraging habitat for spotted owls on the Millicoma Tree Farm in 1994.

- 20 or more coniferous trees per acre with a dbh of 20 inches or greater, or five or more coniferous trees per acre with a dbh of 31 inches or more;
- 15 or more coniferous trees per acre in excess of 60 years old;
- 30 percent or more of the total stand basal area in coniferous trees; and
- fewer than 100 square feet of basal area per acre in trees less than 60 feet tall.

This definition is consistent with the locations of nesting, roosting, and foraging owls reported during recent surveys of the tree farm. Optimal NRF habitat is relatively scarce on the tree farm due to wildfire and timber harvest. Sub-optimal habitat makes up a large percentage of the habitat currently being used by owls. The distribution of NRF habitat on the tree farm is generally fragmented (Figure 4-4). Efforts to disperse harvest units and meet other environmental criteria over the past several decades have left the remaining mature habitat in isolated stands of a few acres to several hundred acres in size.

4.4 Other Fish and Wildlife Species of Concern within the HCP Area

An estimated 638 species of vertebrates (460 terrestrial, 178 freshwater, and selected marine fish species) inhabit western Oregon and Washington (Brown 1985). The USFWS, under the authority of the ESA, has identified species considered threatened or endangered due to low population numbers or other significant threats to their survival (U.S. Fish and Wildlife Service 1990a), as well as candidate species under consideration for formal listing proposals (U.S. Fish and Wildlife Service 1991). The USFWS has identified 19 listed or candidate species that could be present on the tree farm (Table 4-4). The species list includes the northern spotted owl, which is the focus of this HCP. Distribution maps for federally-listed marine fish species discussed in this section will

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Table 4-4. Animal species with special federal status that may be present on or near the Millicoma Tree Farm.

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS ¹	STATE STATUS ¹	OCCURRENCE	HABITAT
INVERTEBRATES					
Burnell's false water penny beetle	<i>Acneus burnellii</i>	C2	none	unknown	streams, lakes
FISH					
Umpqua Oregon chub	<i>Oregonichthys kalawatseti</i>	C2	SV	unknown	streams
Coho salmon	<i>Oncorhynchus kisutch</i>	FR	SC	present	rivers, streams
Steelhead	<i>Oncorhynchus mykiss</i>	FR	none	present	rivers, streams
Cutthroat trout (North and South Umpqua River)	<i>Oncorhynchus clarki</i>	FR	none	possible	streams
REPTILES AND AMPHIBIANS					
Del Norte salamander	<i>Plethodon elongatus</i>	C2	SV	unlikely	forest floor, talus
Northern red-legged frog	<i>Rana aurora aurora</i>	C2	SU	present	ponds, streams, marshes
Foothill yellow legged frog	<i>Rana boylei</i>	C2	SV	probable	streams
Northwestern pond turtle	<i>Clemmys marmorata marmorata</i>	C2	SC	present	marshes, ponds, sloughs
BIRDS					
Northern bald eagle	<i>Haliaeetus leucocephalus</i>	LT	LT	present	mature forest
Peregrine falcon	<i>Falco peregrinus</i>	LE	LE	possible	streams and forest
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	LT	LT	absent	sandy spits, estuaries
Marbled murrelet	<i>Brachyramphus marmoratus</i>	LT	SC	present	old-growth forest
Northern spotted owl	<i>Strix occidentalis caurina</i>	LT	LT	present	mature forest
MAMMALS					
Pacific western big-eared bat	<i>Plecotus townsendii townsendii</i>	C2	SC	possible	caves, riparian areas
White-footed vole	<i>Arborimus albipes</i>	C2	SU	possible	riparian areas
Pacific fisher	<i>Martes pennanti</i>	C2	SC	possible	remote forest
California wolverine	<i>Gulo gulo luteus</i>	C2	LT	unlikely	high mountains
Columbia white-tailed deer	<i>Odocoileus virginianus leucurus</i>	LE	LE	unlikely	forest

1 Status Codes: C2 - Federal Candidate
 SV - State Vulnerable
 LT - Listed as Threatened
 FR - Under Federal Review for Listing

SC - State Critical
 SU - State Status Undermined
 LE - Listed as Endangered

be provided in the Environmental Assessment for this HCP to be prepared under the direction of the USFWS.

Burnell's false water penny beetle (*Acneus burnellii*)

This species is a federal candidate for listing (Category 2) and has been documented as occurring in the vicinity of the Millicoma Tree Farm. This beetle is in the family *Psephenidae* of aquatic beetles. *Acneus* is restricted to California and Oregon and is considered rare. They usually occur on rocky or gravel bottoms along wave-swept shores and in streams where water is shallow and swift. Adults are small, oval, and flat. They often are found clinging to logs and stones. Eggs are deposited on the undersides of stones and hatch into distinctive larvae often called "water pennies" due to their shape and color. The entire life cycle of the species takes about 2 years (Pennak 1978).

Umpqua chub (*Oregonichthys kalawatseti*)

The State of Oregon lists the Umpqua chub as a vulnerable species or a species that can be protected by additional monitoring and protective measures. The species is also a federal candidate for federal listing (Table 4-4). Little information is available on the Umpqua chub. The Oregon Department of Fish and Wildlife (ODFW) has indicated it has not been found in waters within the Millicoma Tree Farm (Bender, pers. comm., 15 December 1993).

Coho salmon (*Oncorhynchus kisutch*)

Coho salmon occur from Monterey Bay, California to Point Hope, Alaska (Wydoski and Whitney 1979). Adults and juveniles are found in most rivers and small streams throughout Coos Bay and the Oregon coast. Coho salmon are found in Larson and Palouse Creeks and the mainstem Coos River, Marlow Creek and the mainstem Millicoma River (Oregon Department of Fish and Wildlife

1991). This species also occurs on the Elliott State Forest to the northwest of the tree farm (Oregon Department of Forestry 1993). The ODFW lists the status of coho salmon populations south of Bandon, Oregon as critical. The species is not currently listed under the federal ESA, however, the National Marine Fisheries Service (NMFS) is currently reviewing the status of coho salmon throughout Oregon, Washington and California to determine whether specific populations qualify for listing as threatened or endangered (Table 4-4). Salmon are anadromous, spawning in fresh water but spending much of their life in the ocean. Coho salmon typically spend 18 months in the marine environment before returning to their natal streams to spawn. Spawning occurs from September through December in small rivers and streams with areas of gravel and small cobble and velocities from 1 to 1.5 feet/second (Laufle et al. 1986; Reeves et al. 1989). Juvenile coho salmon usually spend 1 year in freshwater before migrating to the marine environment. While in freshwater, juvenile coho typically are associated with backwater areas, pools, beaver ponds, and side channels (Reeves et al. 1989).

Steelhead (*Oncorhynchus mykiss*)

Steelhead historically ranged from southern-most California to central Alaska (Scott and Crossman 1973) and are found in most rivers along the Oregon coast. Both summer and winter run races of steelhead occur in Oregon, although only winter run steelhead are found in the Coos River and its tributaries (Pauley et al. 1986). Currently, the NMFS is reviewing the status of coastal stocks of steelhead in Oregon, Washington, and California. The ODFW has not listed any steelhead populations as threatened or endangered (Table 4-4). Adult steelhead typically weigh from 5.5 to 12 pounds and usually spend 2 or 3 years at sea. They may, however, spend up to 4 years at sea and attain weights of more than 25 pounds. Winter steelhead enter streams during winter and early spring, spawning from March through May (Wydoski and Whitney 1979). Preferred spawning areas are well oxygenated, with small to medium gravel and velocities ranging from 2 to 4.8 feet/second (Pauley et al. 1986; Stolz and Schnell 1991). These areas are most often associated with tailouts of pools and riffles. Unlike chinook, coho, and chum salmon, steelhead do not die after spawning and may survive to spawn again. Juvenile steelhead typically spend 2 to 3 years in

freshwater before migrating to sea. While in freshwater, juvenile steelhead are found in a variety of stream habitats, but are most often found in association with submerged cover such as woody debris, boulders, and aquatic vegetation (Pauley et al. 1986).

Cutthroat trout (*Oncorhynchus clarki*)

Coastal cutthroat trout (*O. clarki clarki*) are found from the Eel River in northern California to Seward, southeast Alaska (Scott and Crossman 1973). Cutthroat trout exhibit two basic life history types; anadromous (sea-run) fish and resident fish (those fish that spend their entire lives in freshwater). Sea-run cutthroat trout range in length from 10 to 18 inches, while resident fish are considerably smaller. Resident cutthroat trout are likely found in all fish-bearing streams within the Millicoma Tree Farm, however, sea-run cutthroat are not found in streams on the tree farm. The ODFW lists coastal cutthroat trout from the Columbia River basin as critical, or a species for which listing as threatened or endangered may be appropriate. In addition, the Umpqua River sea-run populations have been petitioned for listing under the ESA. The NMFS issued a proposed rule to list all life history forms of Umpqua cutthroat as endangered (U.S. Federal Register 1994) (Table 4-4). However, it is the anadromous component of the Umpqua River cutthroat trout population that is in danger of extinction (U.S. Federal Register 1994). The American Fisheries Society (AFS) considers Oregon coastal cutthroat as a stock of special concern. An anadromous migration barrier occurs near the confluence of Soup and Lake Creeks, off-site and downstream of the tree farm. Therefore, only resident fish are found on the tree farm. South Umpqua River sea-run cutthroat do not have access to water courses on the tree farm.

Cutthroat trout are found in a broad range of habitats, from large rivers and lakes to beaver ponds and small high-gradient mountain streams. Optimal cutthroat trout habitat is characterized by clear, cold, water and a silt-free rocky substrate. A 1:1 pool-riffle ratio with areas of slow, deep water; well-vegetated stream banks; abundant instream cover; and relatively stable flow and temperature regimes are also important habitat components (Raleigh and Duff 1981). Cutthroat trout typically spawn in low-gradient areas of streams from February to June, depending on elevation (Trotter

1989). Resident cutthroat trout generally mature at age three (Trotter 1989). Sea-run cutthroat trout in Oregon typically migrate to sea in the late spring or early summer after 2 to 3 years of freshwater residence (Benke 1992). After a relatively short residence in saltwater (2 to 5 months), sea-run cutthroat return to their natal streams, spawning in late winter or early spring.

Del Norte salamander (*Plethodon elongatus*)

The Del Norte salamander is a candidate for federal listing (Category 2). This is an uncommon species located primarily in southwest Oregon. The Del Norte salamander requires moist rock rubble areas, such as talus slopes, or logs and other down material in mixed coniferous forests or in mixed conifer-hardwood or hardwood forests. Breeding season is typically April to November, and clutch size averages 10 to 16 offspring (Brown 1985).

Northern red-legged frog (*Rana aurora aurora*)

The northern red-legged frog is a designated federal candidate species (Category 2) and is designated as a sensitive species by the state of Oregon. Preferred habitat includes lowland and foothill ponds, streams, rivers, and marshes in moist forests with vegetative cover at the water's edge. During the breeding season, a slow moving, backwater pond area of the stream with little or no flow is necessary. During the non-breeding season the species uses dense, shrubby, low vegetation adjacent to water, although they may inhabit moist forested areas if dense vegetation is present.

Foothill yellow-legged frog (*Rana boylei*)

The foothill yellow-legged frog is a federal candidate species and is listed as a vulnerable species in the state of Oregon. This species ranges from western Oregon south to southern California. It is confined to the vicinity of permanent streams and is most common in and near streams with rocky, gravelly, or sandy bottoms. Breeding occurs in calm sections of streams from early April to early June for about a two-week period. Adult frogs are known to feed on both aquatic and

terrestrial invertebrates. Once considered abundant in southwestern Oregon, there is evidence that populations of this species are greatly reduced (Leonard et al. 1993).

Northwestern pond turtle (*Clemmys marmorata marmorata*)

The northwestern pond turtle is designated as a federal candidate species (Category 2) and has been documented in the vicinity of the Millicoma Tree Farm (U.S. Fish and Wildlife Service 1993). This species is found in California, Nevada, Oregon, and Washington, where its status is listed as declining (U.S. Fish and Wildlife Service 1991). Northwestern pond turtles inhabit marshes, ponds, sloughs, and small lakes. They require abundant aquatic vegetation, protected shallows for juveniles, and logs, banks, or floating vegetation for basking adults (Rodrick and Milner 1991). Northwestern pond turtles are opportunistic feeders on aquatic vegetation and small animals. This species has been documented as likely to occur along the Millicoma River from the confluence with the South Fork of the Coos River to the town of Allegany. A small population also is likely along the South Fork of the Coos River from approximately the confluence with the Millicoma River to the Dellwood gate, and along Tenmile Creek to the west of the HCP area (Oregon Natural Heritage Program 1993b).

Northern bald eagle (*Haliaeetus leucocephalus*)

The northern bald eagle is designated as a federally threatened species in the state of Oregon and as a threatened species by the ODFW. Preferred nesting habitat consists of mature or old-growth trees in proximity to available food sources (rivers or lakes with abundant populations of fish or waterfowl). Eagles typically select the largest, most dominant trees in conifer stands, usually Douglas-fir, for nesting (Anthony et al. 1982). Nest sites usually are within 0.25 mile of open water. Preferred roosting habitat consists of stands of mature conifers with large branches that usually are in wind-protected valleys and may be up to 10 miles from available food sources (open water in rivers or lakes or ungulate winter range). Northern bald eagle nesting activity has been documented south of the Millicoma Tree Farm near the South Fork of the Coos River and on the

Millicoma Tree Farm near Mettman Ridge and Palouse Creek (Oregon Natural Heritage Program 1993b; Oregon Department of Forestry 1993). Active bald eagle nesting areas on the tree farm are protected from harvest, and stands of mature forest are retained around the nests to facilitate their long-term use. All management activities within 1 mile of known nests are reviewed and approved by the ODFW through ODF administration of the Oregon Forest Practices Act for the protection of resource sites. All known bald eagle nests on the tree farm are monitored annually in conjunction with the Oregon Eagle Foundation and the Cooperative Wildlife Research Unit at Oregon State University. No disruptive activities are conducted by Weyerhaeuser within 0.25 mile of active nests during the nesting season. Management of the nest stands will not change under the HCP.

Peregrine falcon (*Falco peregrinus*)

The peregrine falcon is listed as an endangered species under the ESA. Current peregrine falcon population levels in the 48 contiguous states are lower than historically recorded levels. This population decline is correlated with the widespread use of chlorinated hydrocarbon pesticides (e.g., DDT and derivatives). Disturbance and loss of nesting habitat have contributed to the reduction in peregrine falcon numbers (Peregrine Falcon Recovery Team 1982).

Peregrine falcons historically have occurred in a variety of coastal and inland areas throughout Oregon (Henny and Nelson 1981; Peregrine Falcon Recovery Team 1982). The Pacific Coast Recovery Plan for the Peregrine Falcon lists southwestern Oregon as a management unit for peregrine falcon recovery. The peregrine falcon is a cliff-nesting species that primarily preys on birds. Prey species include waterfowl, shorebirds, doves, pigeons, and larger passerines. Preferred nest sites are sheer cliffs 150 feet or more in height with a small cave or overhung ledge. Acceptable surrounding habitat appears to include a broad range of cover types with the exception of desert (Peregrine Falcon Recovery Team 1982).

Nesting peregrines forage over a large area, which frequently includes bodies of water, marshes, shorelines, wooded areas adjacent to water, and grasslands. The presence of diverse and abundant avian prey, and the ease of prey capture, probably dictate the peregrine's choice of foraging habitat. Less is known of the winter habitat of peregrines in the Pacific Northwest. Some winter population movement may occur in the northern part of the range, including Oregon, although some adults remain near the nest site. Inland wetlands also appear to attract wintering peregrines. Peregrine falcons often migrate to areas where waterfowl and other prey species concentrate. There are documented occurrences of the peregrine falcon in the vicinity of the tree farm (Oregon Natural Heritage Program 1993b).

Western snowy plover (*Charadrius alexandrinus nivosus*)

The western snowy plover is a federally listed threatened species. The breeding range of the Pacific coast population of the western snowy plover extends from southern Washington State to southern Baja California. In Oregon, there are six locations identified as breeding sites for the western snowy plover. The species breeds primarily on open, unvegetated sandy spits, dune-backed beaches, and areas adjacent to river mouths and estuaries. They require flat, open sandy, or saline areas with limited driftwood and vegetation. The breeding season extends from mid-March through mid-September, and the birds return to the same site annually. Snowy plovers feed in the wet sand of intertidal zones, dry sand above high tide lines, and along the edge of salt marshes. Loss of habitat due to encroachment of European beach grass (*Ammophila arenaria*), human disturbance at nesting sites, and nest predation by animals are considered the primary causes of decline of this species. Western snowy plover occurrences have been documented to the north of the tree farm near the mouth of Tenmile Creek (Oregon Natural Heritage Program 1993b).

Marbled murrelet (*Brachyramphus marmoratus*)

The marbled murrelet is listed federally as a threatened species, and by the state of Oregon as critical. The murrelet is a robin-sized seabird that is found throughout coastal regions of the north

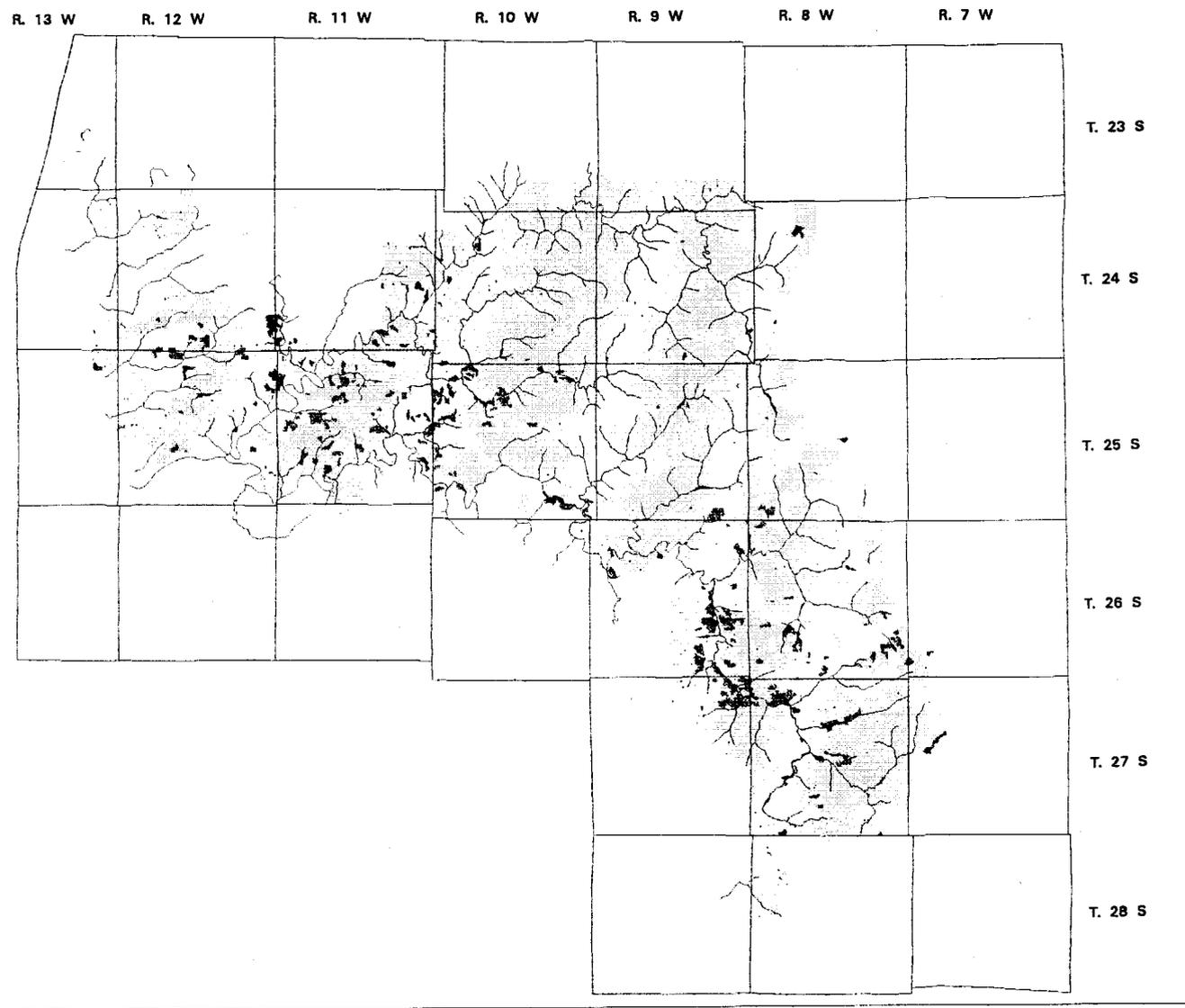
Pacific Ocean. This species nests from southeast Alaska to central California in large mature or old-growth coniferous forests within 53 miles of the ocean. The marbled murrelet is a member of the family *Alcidae*, and the only member of this family that nests in trees. Suitable habitat is considered to be old-growth forests and mature forests with an old-growth component (large conifer trees greater than or equal to 32 inches in dbh; Interagency Interim Guidelines Committee 1991). Trees must contain large branches or other structures to provide platforms. The minimum stand size for successful reproduction is unknown, as there is limited knowledge about the murrelet's nesting biology. The Millicoma Tree Farm currently supports an estimated 6,707 acres of potential nesting habitat for marbled murrelets (all forest stands greater than 100 years old with one or more conifer trees per acre greater than or equal to 32 inches in dbh (Figure 4-5).

Murrelet nests consist of bare depressions or depressions in moss, lichens, or duff on lateral branches of mature or old-growth trees (Marshall 1988). There is only one egg per clutch, and both parents attend to the young by making flights between the ocean and the nest at dusk and dawn. During the day, the nestling is left alone while the parents forage at sea. The initial fledgling flight of the young murrelet takes place at dusk and is a direct flight to the ocean.

It is believed that adults do not breed until after the second year. Although not colonial nesters, they may nest in small aggregations where suitable habitat is abundant (Marshall 1988). Throughout the non-breeding season, marbled murrelets are found on the ocean usually within 1 mile of shore where they feed on small fish and invertebrates. Occurrences along the coast are often adjacent to stands of mature or old-growth coniferous forests. They also are found at inland salt waters and occasionally freshwater coastal lakes, usually within 15 miles of the ocean (Carter and Sealy 1986). Murrelets have been recorded as far as 38 miles inland in Oregon.

Marbled murrelets have been documented recently on the tree farm and in the vicinity in the Remmy Creek area north of the tree farm, around Daniels Creek on the western edge of the tree

Section 4.0 Current Condition of the HCP Area



LEGEND

-  Potential Marbled Murrelet habitat
-  Non-habitat
-  Streams



UTM zone-10

Forest inventory as of: May 31, 1994

Figure 4-5. Potential marbled murrelet habitat on the Millicoma Tree Farm.

farm, on the Elliott State Forest to the northwest, and on BLM land to the south (Oregon Natural Heritage Program 1993b). Weyerhaeuser takes steps to avoid the incidental take of murrelets on the tree farm, as described in subsection 9.2.

Pacific western big-eared bat (*Plecotus townsendii townsendii*)

Feeding habitat of the Pacific western big-eared bat consists of meadows and early-successional conifer-hardwood and mixed conifer forests, as well as in grass-forb on dry hillsides. It feeds in a range of plant communities, including temperate and high temperate coniferous forests, in riparian and wetland areas, and in conifer and mixed conifer forests. Breeding and resting habitat consists primarily of caves. Mating occurs from September to February, with birthing from May to July. In western Oregon and Washington, the species is known to hibernate (Brown 1985).

White-footed vole (*Arborimus albipes*)

The white-footed vole is designated as a federal candidate species (Category 2) and as a status undetermined species by the state of Oregon. Preferred habitat consists of riparian zones along small streams within forests of the Oregon Coast Range, particularly where there is abundant dead and down woody material and alder-dominated riparian forest.

Pacific fisher (*Martes pennanti*)

The Pacific fisher, of the family *Mustelidae*, is found across Canada and in forested regions of the western and northeastern United States. This species is designated federally as a candidate species (Category 2). The range of the Pacific fisher includes most forested areas of northern California, Oregon, and Washington, but it is considered rare throughout its range.

The Pacific fisher feeds on porcupines, squirrels, wood rats, hares, mice, and grouse. Individual home ranges are large (up to 10 square miles in Canada), and large undisturbed tracts of mature coniferous forest may be needed to maintain viable populations of fisher (Rodrick and Milner 1991).

Because of the fisher's reluctance to use or cross large forest openings, it is believed they are rare in highly fragmented forest habitats.

California wolverine (*Gulo gulo luteus*)

The California wolverine, of the family *Mustelidae*, is found in California, Oregon, and Washington and is designated as a federal candidate species (Category 2). Its status trend is listed as unknown (U.S. Fish and Wildlife Service 1991). The USFWS distinguishes the California wolverine from the North American wolverine (*Gulo gulo luscus*), which is found in Colorado, Idaho, Minnesota, Montana, North Dakota, Nevada, Utah, and Wyoming.

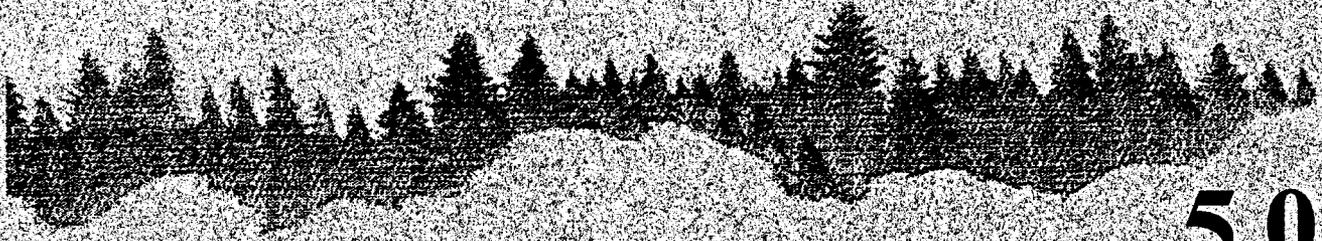
Larrison (1976) lists the habitat of the wolverine as coniferous forest, especially in mountainous areas. Stevens and Lofts (1988) list the habitat of *Gulo gulo* in British Columbia as coniferous-dominated habitats, alpine tundra, and fresh water emergent wetland habitats. Brown (1985) lists the primary habitat for wolverines to be conifer forests of subalpine forest parks and forested wetlands, with large sawtimber, old-growth, grass, and shrub habitats used as secondary habitats. Wolverines prey upon carrion, small mammals, birds, bird eggs, insects, and insect larvae in summer (Stevens and Lofts 1988). In winter, they are capable of preying on large mammals in deep snow. The breeding period for wolverines is April to September, with the young born in early spring in dens located in protected areas, such as thickets or rock crevices (Whitaker 1980).

Columbia white-tailed deer (*Odocoileus virginianus leucurus*)

The Columbia white-tailed deer is a federally designated endangered species and has been documented as occurring in the vicinity of the tree farm. This species typically is found along the lower Columbia River and in the Umpqua Valley of southwest Oregon. Primary habitat includes riparian areas and sloughs in grassy and shrubby communities as well as early-successional forests. Columbia white-tailed deer feed primarily in wet meadows and along grass-shrub edges, but also use other edge types (shrub-forest, grass-forest). Ranges are generally 95 to 270 acres, and typically one to three offspring are produced each year (Brown 1985). This species has been

Section 4.0 Current Condition of the HCP Area

sighted southwest of the tree farm near Hawkins Lake. The last documented observation was in 1980 (Oregon Natural Heritage Program 1993b).



5.0

HABITAT CONSERVATION MEASURES TO BE IMPLEMENTED UNDER THE HCP

5.0 HABITAT CONSERVATION MEASURES TO BE IMPLEMENTED UNDER THE HCP

The Millicoma HCP consists of five elements designed to minimize and mitigate the effects of the incidental take of spotted owls. These elements include:

- The maintenance of a landscape conducive to the dispersal of juvenile spotted owls;
- Retention of existing NRF and other forest habitat around four spotted owl activity centers on Weyerhaeuser lands to augment the dispersal landscape for at least 20 years;
- Retention of existing NRF and other forest habitat around four known spotted owl activity centers on or near federal lands to supplement and enhance those sites for at least 20 years;
- Protection of occupied spotted owl site centers; and
- Seasonal protection of active nests.

Each of these elements is discussed separately below.

5.1 The Maintenance of a Landscape Conducive to the Dispersal of Juvenile Spotted Owls

Weyerhaeuser will manage the Millicoma Tree Farm as a dispersal landscape for spotted owls. Forest stands planted after 1994 will be managed to develop roosting and foraging opportunities for dispersing owls. Stands planted prior to 1994 also will be managed to

provide varying amounts of dispersal habitat and meet overall landscape goals for dispersal. The dispersal habitat value of individual stands planted prior to 1994 may be less than stands planted after that date, depending on their ages and management histories. The size and spacing of dispersal stands will be managed so that by 13 February 2015:

- a minimum of 40 percent of the forested area on the tree farm will be in a stand condition suitable for roosting and foraging by dispersing owls;
- a minimum of 80 percent of the tree farm will be in dispersal habitat and gaps less than 0.5 mile;
- a minimum of 90 percent of the tree farm will be in dispersal habitat and gaps less than 1 mile; and
- a minimum of 99 percent of the tree farm will be in dispersal habitat and gaps less than 3 miles.

Once achieved, this condition will be maintained within the managed tree farm until at least 2045. If the USFWS finds it necessary to continue the HCP in order to assure continued survival of the spotted owl in the wild, the dispersal landscape condition will be maintained for additional 10-year periods, until 13 February 2075.

As described in detail in Chapter 2.0 of this HCP, the Millicoma Tree Farm is located strategically between the Elliott State Forest and two blocks of federal land managed as LSRs by the BLM (Figure 2-1). Both federal blocks will be managed in the future to support resident populations of spotted owls (U.S. Forest Service and Bureau of Land Management 1994). The Elliott State Forest is likely to support at least a small population of resident owls, based on the most recent management plan for the forest (Oregon Department of Forestry 1993). The maintenance of a

viable population in the southern Oregon Coast Range province overall would be enhanced by the successful movement of dispersing owls among the reserve populations (U.S. Fish and Wildlife Service 1992a). Dispersing owls provide a flow of genetic material from one sub-population to another and reduce the potential for genetically-related extinctions. These individuals also increase the effective population size of each area and reduce the potential for local extinction due to environmental catastrophe or random demographic shifts (Murphy and Noon 1992). The Millicoma Tree Farm is therefore important to the effective dispersal of spotted owls between managed population clusters on adjacent public lands, particularly those in federal LSRs.

The current understanding of juvenile owl dispersal is based on field studies conducted in Washington (Allen and Brewer 1985), Oregon (Miller 1989), and California (Gutierrez et al. 1985) and reviews of dispersal presented by Thomas et al. (1990) and Beak Consultants Incorporated (1993). The general model of dispersal that emerges from this work is discussed in Appendix A and summarized as follows:

- Dispersal is primarily a phenomenon that occurs among juveniles (i.e., between the time a young owl reaches physical maturation and the time it establishes a territory and reproduces for the first time). Adult spotted owls occasionally change territories and/or mates after their first year of reproduction, but this is less common than juvenile dispersal and serves a different purpose in the population.
- The onset of dispersal occurs rather suddenly in September or October of the first year, and appears to coincide with the time when adults stop feeding their young.
- Dispersal is initially rapid; owls move an average of 1 to 5 miles per day.
- The direction of movement during dispersal appears to be random and not correlated with the amount or proportion of mature or late-successional forest on the landscape.

Section 5.0 *Habitat Conservation Measures to be Implemented Under the HCP*

- Dispersing owls appear to cross extensive areas of unsuitable habitat (i.e., young forest, agricultural land or water) in the course of dispersal, although the survival of individuals may be less in landscapes dominated by such habitats due to the increased risks of predation and/or starvation. For planning purposes, gaps greater than 0.5 mile between stands of dispersal habitat should be limited to less than 20 percent of the forest landscape.
- Owls roost in a range of habitat types while dispersing, but show a preference for mature and old-growth forest. Sapling/pole coniferous forest is used roughly in proportion to its availability by roosting owls during dispersal (it is neither selected for nor avoided).
- A period of "settling" occurs in mid-winter, during which time the dispersing owls establish a temporary home range of up to 5,000 acres.
- Mortality is high during dispersal. The principal causes of death are starvation and predation. It is not known whether this high mortality is an artifact of habitat fragmentation caused by timber harvest or something that also occurs in landscapes having no harvest activity.
- The total straight-line distance traveled by dispersing owls ranges up to 30 miles or more. Roughly two-thirds of the owls studied to date moved net distances of 12 miles or more.

Based on this model of dispersal, Weyerhaeuser will manage the Millicoma Tree Farm to provide a general landscape conducive to the movement of spotted owls. The rapid and random nature of dispersal movements precludes management entirely within narrow dispersal corridors. Rather, the emphasis will be on managing the entire tree farm as a dispersal landscape where there is a

Section 5.0 Habitat Conservation Measures to be Implemented Under the HCP

reasonable expectation for owls to move successfully from one publicly-managed population center to another.

The primary needs of dispersing owls are protective cover (from weather and predators) and food. Approximately 5,450 acres of reserve areas on the Millicoma Tree Farm established for other reasons (riparian areas, bald eagle nest sites, forested wetlands, etc.) will be present for at least the term of this HCP and will contribute to meeting the life requirements of dispersing owls. Data available on spotted owl dispersal suggest these life requirements also can be met by managed stands meeting the criteria listed in Table 5-1 (also see Appendix A). These criteria are comparable to the federal "50-11-40" prescription, as discussed in subsection 8.5 of this HCP. Weyerhaeuser will take measures during all phases of timberland management on the Millicoma Tree Farm to promote the development of these characteristics in managed stands. Growth models for the tree farm demonstrate these conditions can be produced at stand ages of 22 years (Site Class I) to 30 years (Site Class IV) under management regimes specifically designed to promote the development of dispersal habitat (Table 5-2). Stem density, tree height, tree diameter, and canopy lift can be controlled through a number of silvicultural activities, including planting, pre-commercial and commercial thinning, fertilization, and pruning. One potential scenario is presented in Table 5-2. These projected growth rates are slightly faster than those estimated for other managed stands in the region (Curtis et al. 1982) because of Weyerhaeuser's use of genetically-improved growing stock and intensive silvicultural practices. The projections shown in Table 5-2 have been validated on the Millicoma Tree Farm based on existing stands of dispersal habitat.

The dispersal landscape condition described in this HCP is a commitment by Weyerhaeuser that will be verified through future monitoring (see Section 6.0). Projections of future dispersal habitat on the tree farm show that the area of dispersal habitat will increase and the area of gap will decrease over the term of the HCP (Figures 5-1, 5-2, and 5-3). The distribution of habitat displayed

Section 5.0 Habitat Conservation Measures to be Implemented Under the HCP

Table 5-1. Structural characteristics of forest stands meeting the minimum requirements of spotted owl dispersal habitat¹.

SPECIES COMPOSITION:	Greater than 70 percent coniferous trees in the dominant canopy.
TREE SIZE AND DENSITY:	At least 120 trees per acre with a minimum diameter at breast height of 10 inches; or equivalent basal area of larger trees. No more than 300 trees per acre total ² . Total codominant tree height at least 70 feet. Height to the bottom of the live crown at least 20 feet; lower boles relatively clear of dead limbs.
RESIDUAL LIVE TREES AND SNAGS:	An average of at least two live trees or two snags per acre at least 30 feet in height and 11 inches in diameter at breast height ³ . Give preference to Douglas-fir and western redcedar.
LOGS:	A minimum of two hard logs per acre at least 12 inches in diameter and 16 feet in length; distributed throughout the stand.
STAND SIZE:	Minimum stand size of 5 acres ⁴ .

¹ Some stands planted prior to 1993 may not meet all of the listed characteristics due to stand history.

² Stand criteria will be reviewed and modified as needed during reviews of the HCP by Weyerhaeuser and the USFWS. In particular, the feasibility of providing suitable dispersal habitat at stem densities of up to 400 trees per acre will be explored.

³ Stands planted prior to 1993 may be deficient in residual live trees and snags due to past harvest practices.

⁴ Some riparian management areas may be less than 5 acres, but will contribute to the dispersal landscape, especially when surrounded by managed stands of dispersal quality.

Section 5.0 Habitat Conservation Measures to be Implemented Under the HCP

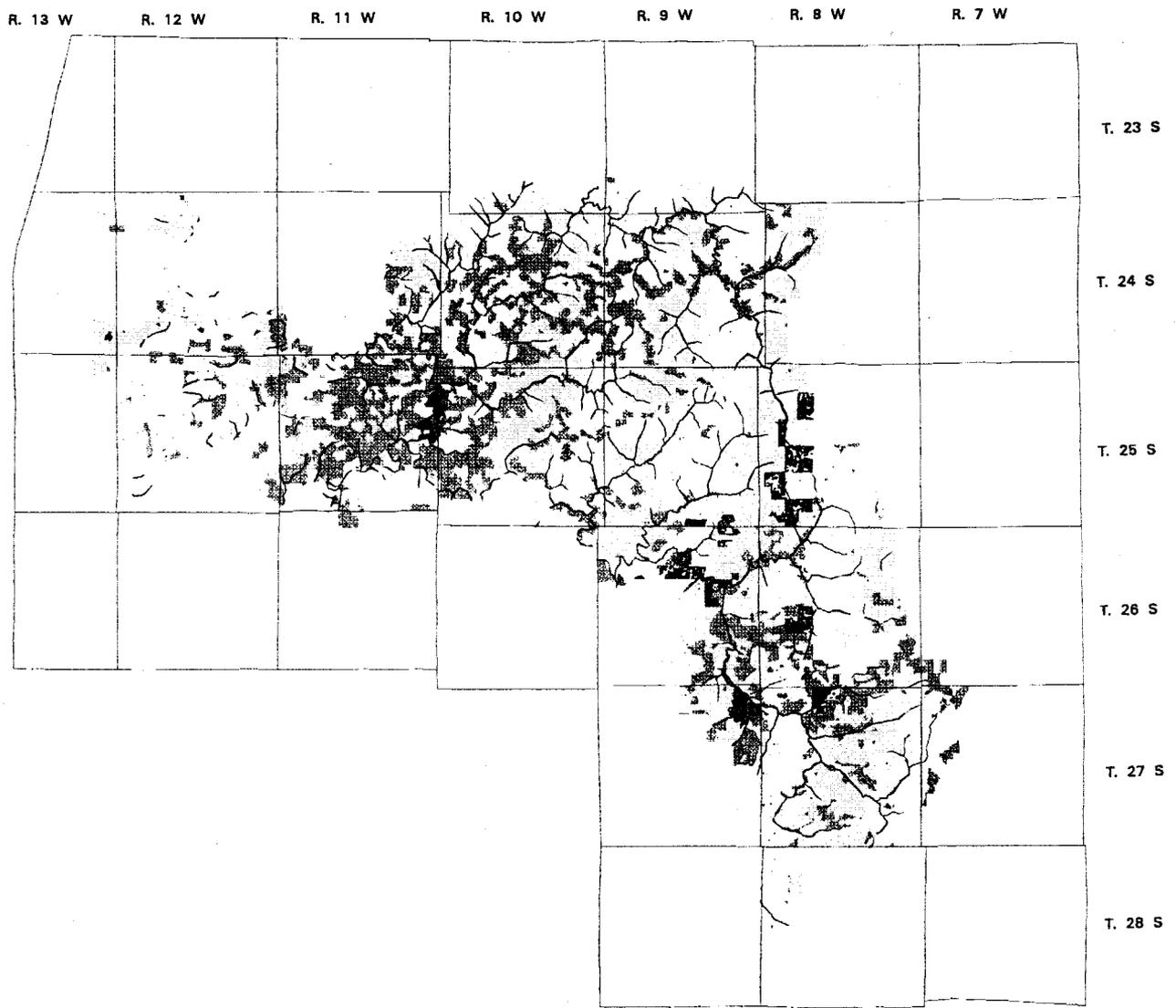
Table 5-2. Projected stand characteristics of managed Douglas-fir on the Millicoma Tree Farm under one possible regime to promote the development of dispersal habitat. (All stands first meet the definition of dispersal habitat at the ages indicated).

Site Index (50-year)	Stand Age (Years)	Mean dbh (in.)	Stand Ht. (ft.)	Height to Live Crown (ft.)	Total Trees/Ac.	Trees/Ac. > 10 in. dbh
145	22	10.0	70	20	245	141
125	23	10.1	70	20	243	146
105	25	10.8	70	20	237	174
85	30	12.1	70	20	221	178

Management Assumptions:

1. Use of genetically-improved trees.
2. Initial planting density of 400 seedlings per acre.
3. One pre-commercial thin (PCT) after stands reach an average dbh of 6.5 inches.
4. Post pre-commercial thin density of 250 trees per acre.
5. Fertilization occurs at stand ages 20 and 28 years.

Section 5.0 *Habitat Conservation Measures to be Implemented Under the HCP*



LEGEND

-  Weyerhaeuser habitat
-  Reserve habitat
-  Weyerhaeuser non-habitat
-  BLM habitat
-  BLM non-habitat

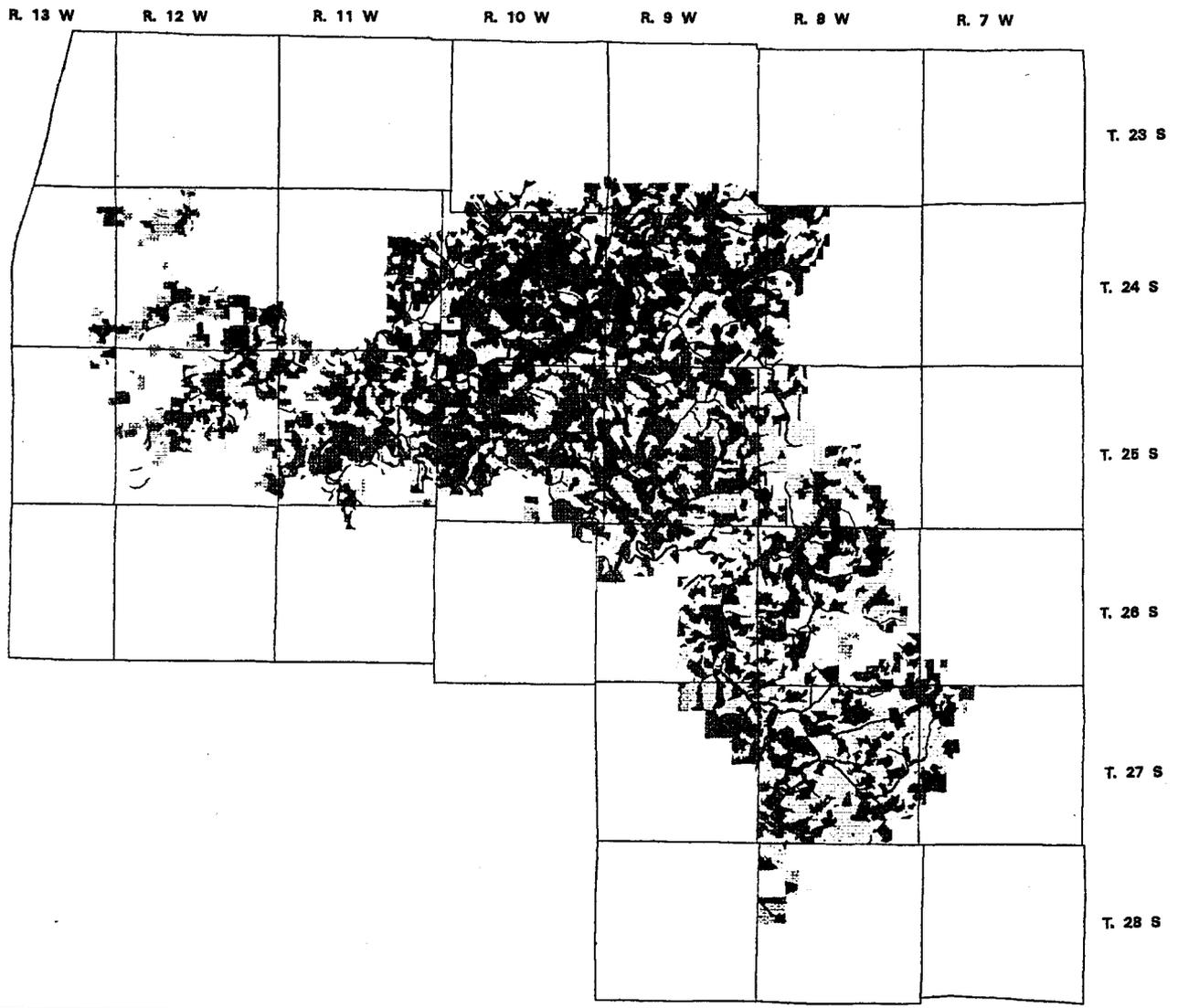


UTM zone-10

Forest inventory as of: May 31, 1994

Figure 5-1. Spotted owl dispersal habitat on the Millicoma Tree Farm in 1994.

Section 5.0 *Habitat Conservation Measures to be Implemented Under the HCP*



LEGEND

- Weyerhaeuser habitat ■ Reserve habitat
- ▨ Weyerhaeuser non-habitat
- BLM habitat
- BLM non-habitat



UTM zone-10

Forest inventory as of: May 31, 1994

Figure 5-2. Potential distribution of spotted owl dispersal habitat on the Millicoma Tree Farm in 2045 under the HCP.

Section 5.0 *Habitat Conservation Measures to be Implemented Under the HCP*

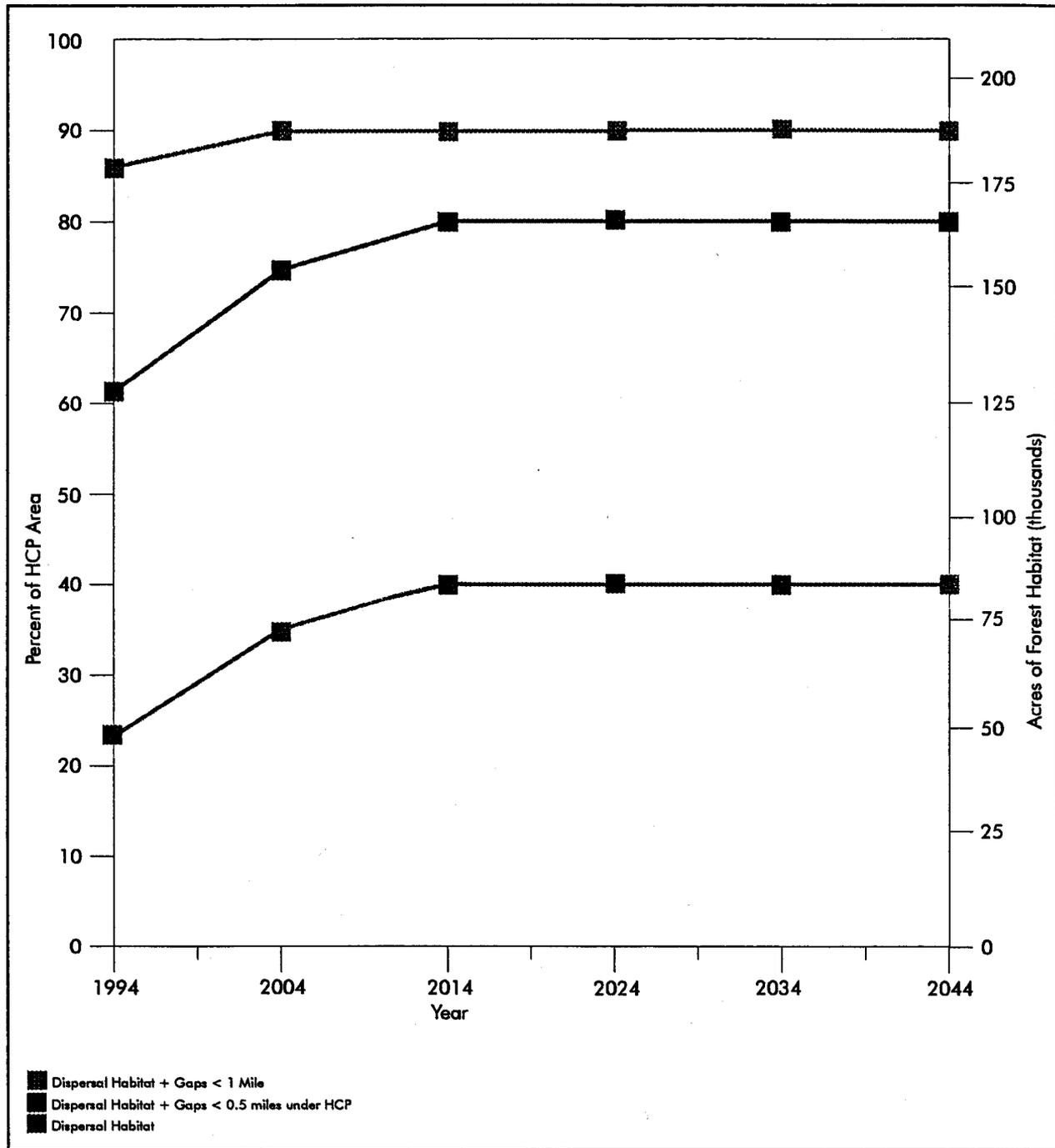


Figure 5-3. Projected trends in dispersal habitat on the Millicoma Tree Farm under the HCP.

in Figure 5-2 is the result of a computer simulation of future tree growth and harvest. It incorporates existing environmental and economic constraints, (such as green-up requirements, riparian and wetland management, and standard assumptions concerning the economics of forest management) along with the dispersal habitat criteria described in Table 5-1. It illustrates one "potential" arrangement of habitat on the landscape that is achievable on the Millicoma Tree Farm and meets the commitment of the HCP. To verify this landscape condition, Weyerhaeuser measured the amount and size of gaps between dispersal stands with the aid of a computerized Geographic Information System (GIS). The GIS enables Weyerhaeuser to predict for any given management scenario the amount of future dispersal habitat as well as the amount and distribution of gaps in the dispersal landscape, all of which become important to describing the landscape in a manner which is meaningful to spotted owl dispersal. Based on the GIS simulation, Weyerhaeuser is able to commit to a landscape that meets the criteria stated in subsection 5.1 concerning the total area of dispersal habitat and the area of gaps greater than 0.5 mile, 1.0 mile, and 3.0 miles.

5.2 Retention of Existing NRF and Other Forest Habitat Around Four Spotted Owl Activity Centers on Weyerhaeuser Lands to Augment the Dispersal Landscape for at Least 20 Years

Weyerhaeuser will retain 873 acres of NRF habitat, 656 acres of dispersal habitat and 63 acres of young intermingled forest habitat surrounding four existing spotted owl activity centers on the Millicoma Tree Farm to augment the dispersal landscape by providing a potential source of NRF habitat for dispersing owls. The sites will be protected from harvest for at least 20 years (through 13 February 2015). If other dispersal landscape criteria are not met on 13 February 2015, the retained habitat will not be made available for harvest until the criteria are met.

Weyerhaeuser will retain existing forest habitat around four known spotted owl sites to enhance the dispersal landscape at key locations on the tree farm and increase the potential survival of dispersing owls. The retained forest stands will include 873 acres of NRF habitat, 656 acres of mid-successional and mature forest that currently lack the structural components to be optimal NRF habitat, and 63 acres of early-successional forest interspersed between the stands of older forest. The younger forest stands will be maintained along with the NRF habitat to maintain overall stand integrity (Table 5-3). The sites were selected based on a combination of recent reproductive history (the most successful sites had higher priority), current habitat condition (sites with large blocks of contiguous habitat were preferred), and location relative to late-successional habitat reserves on adjacent public lands. Two of the sites are between the Elliott State Forest and DCA OD-33, while the other two are between DCAs OD-33 and OD-34 (Figure 2-1).

The forest around the four site centers will be protected from harvest for at least 20 years. After that time, Weyerhaeuser's forest growth projections indicate the landscape around the sites will meet the dispersal objectives in subsection 5.1. If the surrounding dispersal landscape does not meet the spatial and structural conditions in subsection 5.1 by 13 February 2015, the forest stands will be retained until such conditions can be met by the younger forest alone.

The prescription for dispersal habitat presented in subsection 5.1 is designed to meet the minimum life requirements of dispersing owls over a broad landscape. It is based on the assumption that management at a low level of intensity over a wide area is preferable to intensive management within confined corridors. This assumption is supported by field research which shows no strong preference for corridors among dispersing spotted owls (Miller 1989). Owls are not expected to disperse along discrete corridors within the Millicoma Tree Farm, but dispersal is likely to be greater in two general areas that lie directly between the reproductive populations on public lands. One area lies between the Elliott State Forest to the north and BLM-managed habitat to the south (Figure 2-1). The other area lies between the BLM-managed habitats to the south and northeast of the tree farm. The four sites to be retained by Weyerhaeuser lie in these areas.

Section 5.0 Habitat Conservation Measures to be Implemented Under the HCP

Table 5-3. Current habitat conditions of forest stands to be retained for at least 20 years under the Millicoma HCP.

I.	Stands to be Retained Around Spotted Owl Activity Centers on Weyerhaeuser Lands	
A.	NRF Habitat	873 acres
B.	Coniferous Forest >40 Years Old But Not Classified as NRF Habitat	656 acres
C.	Coniferous Forest <40 Years Old	63 acres
		<hr/>
	TOTAL	1,592 acres
II.	Stands to be Retained Around BLM Spotted Owl Activity Centers	
A.	NRF Habitat	314 acres
B.	Coniferous Forest >40 Years Old But Not Classified as NRF Habitat	52 acres
C.	Coniferous Forest <40 Years Old	5 acres
		<hr/>
	TOTAL	371 acres

The retention of NRF habitat in these areas will increase the overall value of the areas to dispersing owls above that which could be expected in a landscape dominated entirely by managed second-growth forest. The areas should provide suitable conditions for roosting and foraging and could serve as temporary "settling" areas known to be used by juvenile owls in their first winter. A permanent landscape of late-successional forest would not be economically feasible on a managed commercial forest, but the inclusion of NRF habitat in two key areas for 20 years is a practicable contribution under these circumstances.

5.3 Retention of NRF and Other Forest Habitat Around Four Known Spotted Owl Activity Centers on or Near Federal Lands to Supplement and Enhance Those Sites for at Least 20 Years

Weyerhaeuser will protect from harvest approximately 314 acres of NRF habitat, 52 acres of dispersal habitat and 5 acres of intermingled young forest associated with four spotted owl activity centers on or near adjacent BLM lands. The habitat will be protected for at least 20 years.

Weyerhaeuser owns late-successional forest that can contribute to the long-term viability of four spotted owl sites within 1.5 miles of the Millicoma Tree Farm. The retained forest will include 314 acres of NRF habitat, 52 acres of late-successional forest that is not considered NRF habitat and 5 acres of early-successional forest connecting the older stands. These lands will be reserved from timber harvest for 20 years, or until such time as dispersal objectives are achieved.

As noted in Sections 2.0 and 3.0, the primary purpose of this HCP is to provide for the interconnection of owl populations in federal reserves in order to increase the effective size of the populations and give them greater resistance to local extirpation. The same objective could be met at least partially by managing the tree farm for a reproductive population, but this would be

economically prohibitive for a private land owner. There are, however, four activity centers to which Weyerhaeuser can economically make significant contributions to the maintenance of potentially-reproductive pairs for the short term (20 years). Owls at these activity centers can supplement the federal reserve populations for two decades, and bridge the gap of interconnection on the landscape while dispersal habitat conditions improve. Once the dispersal landscape condition is met, the interconnection will be provided by dispersal and the retained areas will be available for harvest.

5.4 Protection of Occupied Spotted Owl Site Centers

Weyerhaeuser will protect the best 70 acres of nesting, roosting, and foraging habitat surrounding each of the 35 known spotted owl site centers on the Millicoma Tree Farm as long as the sites are occupied. Occupancy will be determined according to USFWS protocol (U.S. Fish and Wildlife Service 1992). No site will be considered abandoned until protocol surveys fail to detect the presence of owls for 3 consecutive years. Any new site centers discovered on the tree farm also will be protected in a similar manner.

5.5 Seasonal Protection of Active Nests

Weyerhaeuser will avoid timber harvest and road construction within 0.25 mile of any known active spotted owl nest on or near the Millicoma Tree Farm between 1 March and 30 September.

Several of the activity centers on the Millicoma Tree Farm have supported successful reproduction in the past 4 years, and could again in the future while sufficient habitat remains. Weyerhaeuser will determine annually the reproductive status of all known activity centers on the tree farm and

protect all active nests until the owls leave the area or the end of the breeding season (30 September), whichever occurs first. No harvest activity or road building will occur within 0.25 mile of a known activity center between 1 March and 30 September unless non-nesting status, nest abandonment or nest failure is documented according to USFWS survey protocol. Weyerhaeuser also will survey all suitable nesting habitat within 0.25 mile of proposed harvests of nesting habitat, if the proposed harvest lies within 0.5 mile of a known activity center. This will minimize the risk of impacting an actively-nesting owl pair that has moved from its previous activity center.

5.6 Schedule for Implementation

Management under the HCP will begin immediately upon approval by the USFWS and issuance of the Incidental Take Permit. Targets for dispersal landscape condition will be met as specified in Section 5.1. Identified mature forest stands will be protected at least for 20 years, or until such time that dispersal objectives are achieved.



6.0

MONITORING, REVIEW, AND MODIFICATION OF THE HCP

6.0 MONITORING, REVIEW, AND MODIFICATION OF THE HCP

This HCP reflects Weyerhaeuser's current understanding of spotted owl biology, silvicultural practices, and forest management activities within the HCP area. Weyerhaeuser has used its best efforts to anticipate possible changes in scientific knowledge, government policies, business developments and exigencies, and similar variables and to design the spotted owl dispersal habitat standards and NRF retention areas in ways that should meet the objectives of the USFWS and the company over a wide range of possible changes in circumstances. Nevertheless, because of the long time frame involved, Weyerhaeuser has committed in the HCP area to a system of annual monitoring of the owl, monitoring of the dispersal habitat, reporting of findings, periodic review of the progress of the HCP, and procedures to amend or terminate the HCP, while minimizing and mitigating potential impacts to the regional spotted owl population. The following sections explain these procedures in more detail.

6.1 Weyerhaeuser Habitat Monitoring

- Weyerhaeuser will systematically sample at least 10 percent of dispersal stands in the field every 5 years. During the field sampling, they will measure the stand structural characteristics presented in Table 5-1 of this HCP.
- Maps showing the distribution of dispersal habitat on the tree farm and calculations of the total amount of habitat and gaps will be updated every 5 years based on the results of the field sampling.
- Projections of future dispersal habitat conditions also will be updated every 5 years to demonstrate that the tree farm is continuing on the course charted in Figure 5-3.

6.2 Weyerhaeuser Owl Population Monitoring

- All known spotted owl activity centers on the tree farm will be monitored annually to determine occupancy and reproductive status according to USFWS survey protocol. Monitoring will cease when a site is determined to be vacant for 3 consecutive years. Where possible, owls will be banded with USFWS metal bands and color-coded plastic bands in keeping with on-going demographic studies of the BLM or Elliott State Forest.

- Where logging of suitable nesting habitat will occur during the nesting season within 0.5 mile of a known nest site, the area to be harvested will be surveyed prior to harvest to minimize the risk of felling an active nest tree or disturbing a nest site. Surveys will cover all suitable nesting, roosting, and foraging habitat within 0.25 mile of the proposed harvest area.

6.3 Weyerhaeuser Reporting

- Results of population and habitat monitoring will be reported in writing to the USFWS. The first report will be submitted by February 1996. Reports will be submitted annually from 1996 through 2000, and every 5 years from 2000 through 2045. Meetings between Weyerhaeuser and the USFWS will be held at each of the reporting periods if requested by the USFWS. All data collected in the period proceeding the respective report date (see Sections 6.1 and 6.2) will be included in the report.

6.4 USFWS Inspections and Audits

USFWS may inspect any of the lands in the HCP area in accordance with its then applicable regulations for the purpose of verifying any information contained in reports filed by the company or to audit Weyerhaeuser compliance with the HCP. Procedures for such inspections and audits shall be established in the Implementation Agreement.

6.5 Addition or Deletion of Lands from the HCP Area

The initial HCP area is described in Section 4 of this document. In the course of its operations, Weyerhaeuser from time to time may acquire lands adjacent or near to the HCP area or, within the conditions and limits set out below, it may sell or exchange lands as it deems appropriate. Such changes in land ownership may result in changes in the HCP area to the extent and in the ways provided below.

6.5.1 Land Acquisitions

Nothing in the ESA, USFWS regulations, the Permit, or this HCP limits Weyerhaeuser's rights to acquire additional lands in the Millicoma Tree Farm area or elsewhere. However, unless added to the HCP area in the manner provided below, any lands Weyerhaeuser may acquire by purchase, exchange, or otherwise will not be covered by the Permit and therefore will be subject to the same ESA provisions and USFWS regulations with respect to owls as if owned by another private party.

Likewise, nothing in the ESA, USFWS regulations, the Permit, or this HCP requires Weyerhaeuser to include in the HCP or the Permit any additional lands it may acquire. However, if Weyerhaeuser acquires any additional lands adjacent to or within a reasonable distance of any lands initially

Section 6.0 Monitoring, Review, and Modification of the HCP

covered by the Permit and this HCP, and such additional lands would contribute to biological connectivity of owl populations resident on nearby public lands, Weyerhaeuser may elect or seek to include them in this HCP and the Permit under the procedures described below.

Weyerhaeuser may, as a matter of right, elect to include in the HCP and Permit any lands it may acquire which are surrounded on at least three sides by lands initially covered by the HCP and the Permit and are within 1.5 miles of those lands. The HCP assumes in its analysis that operations on the lands initially covered could result in incidental take of all owls which may, at any time during the Permit term, have activity centers within the HCP area boundary or within 1.5 miles of the boundary. Inclusion of an inholding surrounded on at least three sides by initially covered lands would not increase the level of take analyzed in this HCP, and the Environmental Assessment.

Weyerhaeuser may, as a matter of right, add to the HCP any other lands it may acquire within 3.0 miles of lands initially covered by the HCP. Weyerhaeuser may count such lands in determining whether it has met the dispersal habitat standards, (i.e., the 40 percent habitat requirement and the gap limits). However, such lands will not be covered by the Permit unless: a) pursuant to paragraph 6.7.1 of the HCP, USFWS concurs that their use could not result in incidental take of any owls for which incidental take was not analyzed in connection with and authorized by the original Permit; or (b) the Permit is amended, in accordance with USFWS regulations, to include them. Where lands have been added to the HCP but not the Permit, Appendix C must contain a conspicuous notation to that effect. Weyerhaeuser has not waived any other rights it may have to add lands to the HCP and the Permit under applicable laws and regulations.

6.5.2 Land Dispositions

Transactions Where the New Owner Elects to Become a Party to the HCP

Weyerhaeuser also may sell portions of the HCP area to, or exchange portions of the HCP area with, other parties. Weyerhaeuser may sell or exchange lands where the new landowner elects to become a party to the Permit and the new owner and USFWS have executed an implementing agreement to ensure that the standards of the HCP are met. If the new owner so elects to accept this HCP, each owner will be responsible for compliance with the HCP as to its lands, but will not be responsible for any failure of any other owner to comply with the HCP.

In addition, Weyerhaeuser may sell or exchange covered lands to government agencies or to non-profit organizations for purposes of conserving wildlife habitat or other purposes compatible with maintaining owl habitat, where the agency or organization elects to become a party to the Permit and executes with USFWS an implementation agreement or provides other assurances that conveyed lands will be managed in a manner consistent with the HCP. Weyerhaeuser has informed the USFWS that it is willing to sell or exchange certain parts of the HCP area, with the highest priority being given to NRF retention areas established under Chapter 5 of this HCP.

If an acquiring government agency or non-profit organization provides a covenant or other assurances satisfactory to USFWS that no timber will be harvested on the acquired lands except in ways that maintain habitat suitable for owl dispersal, Weyerhaeuser will continue to receive credit for any habitat on such lands for purposes of compliance with the dispersal standards of this HCP. If such sales or exchanges involve retention areas in which harvesting is restricted under Chapter 5 of this HCP, and the acquiring governmental agency or non-profit organization provides a covenant or other assurances satisfactory to USFWS that no timber will be harvested on the acquired lands except in ways that maintain or enhance NRF habitat for owls within the retention

areas, Weyerhaeuser also will continue to receive credit for any habitat on such lands as reserve habitat (as well as for dispersal habitat) under this HCP.

Transactions Involving Certain *Non-Core* or Small Parcels of Land

If a new owner does not so elect to accept this HCP and the Permit, Weyerhaeuser may not sell or exchange any of the lands initially covered by this HCP and the Permit without amending the Permit, except certain *non-core* lands described in Table 6-1 and certain small parcels discussed below.

The *non-core* lands described in Table 6-1 are lands on the periphery of the HCP area and are not material to the functioning of the conservation plan because such lands do not significantly add to the connectivity between identified source populations of owls on adjacent public lands. These lands may be sold without prior review by USFWS. However, Weyerhaeuser will notify USFWS of these transactions pursuant to paragraph 6.5(f) of the Implementation Agreement.

Upon 30 days notice to USFWS pursuant to paragraph 6.5(g) of the Implementation Agreement, Weyerhaeuser may sell or exchange small parcels of land if the transaction meets the following conditions: a) the parcel is not in excess of 320 acres; b) the parcel does not involve any NRF retention area so long as harvest is prohibited under Chapter 5 of the HCP; c) the transaction would not preclude Weyerhaeuser from meeting dispersal habitat standards of this HCP; d) the cumulative total of such transactions does not exceed 5 percent of the acreage initially covered by the Permit; and e) the cumulative total of such transactions within any one township does not exceed 1,920 acres (approximately 7.5 percent of the township). The USFWS will use the 30-day notice period to ensure that these conditions have been met prior to completion of the transaction. Disposition of such lands will not materially affect the functioning of the HCP because of their limited size, the cumulative limits on the amounts of land conveyed, and the fact that such dispo-

Table 6-1. Non-core areas within the Millicoma Tree Farm which could be removed from the HCP area without significant impact to the maintenance of a dispersal landscape.

**ALL WEYERHAEUSER LANDS WITHIN THE FOLLOWING SECTIONS
ARE CONSIDERED NON-CORE AREAS:**

- All Sections in Township 28 South, Range 8 West
 - All Sections in Township 24 South, Range 13 West
 - All Sections in Township 25 South, Range 13 West
 - The Western ½ of Township 25 South, Range 12 West
 - The Western ½ of Township 24 South, Range 12 West
 - All Sections in Township 26 South, Range 11 West
-

sitions do not affect the requirement of Weyerhaeuser to continue to meet the dispersal standards overall as if it still owned those lands. The existing ownership patterns and the permissible changes in ownership patterns have been taken into account in developing this HCP.

If Weyerhaeuser does convey any covered lands not listed as *non-core* lands on Table 6-1 to a party which does not accept this HCP, Weyerhaeuser must continue to meet the dispersal habitat standards (i.e., the 40 percent habitat requirement and the gap limits) as if such lands were still covered by this HCP, unless USFWS otherwise agrees.

Reservation of Rights

Weyerhaeuser has not waived any other rights it may have to sell or convey lands covered by the HCP and the Permit under applicable laws and regulations.

6.5.3 Weyerhaeuser Option to Seek USFWS Approval

Weyerhaeuser may seek USFWS approval of any addition of lands to the HCP or any disposition of lands covered by the HCP, without prejudice to any claim that such consent is not required. Any requests for such consent will be treated by USFWS as requests for an amendment of the HCP. However, to the extent this Section 6.5 allows Weyerhaeuser to add, sell, or exchange lands without consent of USFWS, such additions, sales, and exchanges will be considered to occur in the ordinary course of implementing the HCP (rather than as amendments to the HCP) if Weyerhaeuser elects to proceed without seeking USFWS consent.

6.5.4 Additions of Lands or Parties and Deletions of Lands as Grounds for Review of HCP Terms

Under subsection 6.6.2 of this HCP, an unscheduled review of the HCP may be called for whenever either party deems it necessary and appropriate. Weyerhaeuser acknowledges that USFWS may consider addition of lands or parties or conveyances of covered lands without USFWS consent as sufficient grounds to justify such an unscheduled review.

6.6 Review of the HCP

Given the long period of time covered by the HCP and continuously evolving scientific evidence concerning the spotted owl, unforeseen events could render parts or all of this HCP outmoded or unsatisfactory. To ensure that such changes do not frustrate the objectives of the parties, the USFWS and Weyerhaeuser have agreed to regularly scheduled reviews and to procedures for unscheduled reviews of the HCP, during which potential amendments to the HCP may be considered.

6.6.1 Periodic Scheduled Reviews

Approximately 6 months before every fifth anniversary of approval of this HCP, the parties will review the HCP to respond to changes in circumstances since the time of the initial approval or subsequent review or otherwise to further the goals and objectives of this HCP. The review may also identify any amendments that might more effectively and economically mitigate any take of owls that would be prohibited by the ESA but for the Permit. Procedures for conducting such reviews, including proposing amendments and resolving disagreements, shall be established in the Implementation Agreement.

6.6.2 Unscheduled Reviews

An unscheduled review may be called for whenever either party deems it necessary and appropriate. After such review, the HCP may be amended to reflect, among other things: improved knowledge of spotted owl biology; widespread catastrophic damage from wildfires, storms, insects, disease or other extraordinary events affecting the dispersal habitat; unforeseen circumstances; or other material changes in circumstances since the Permit was issued or last revised. Procedures for conducting such reviews shall be established in the Implementation Agreement.

6.7 HCP Modifications

The HCP may be modified at the request of either USFWS or Weyerhaeuser in accordance with procedures established in the Implementation Agreement.

6.7.1 Minor HCP Modifications

Certain minor modifications to this HCP will be effective 30 days after Weyerhaeuser provides USFWS notice, unless USFWS objects during that period. Such modifications include:

- a) Corrections of typographic and grammar errors and similar editing errors, which do not change the intended meaning;
- b) Correction of any maps or exhibits to reflect previously approved changes in the HCP or other new information;

Section 6.0 Monitoring, Review, and Modification of the HCP

- c) Addition of any inholding acquired by Weyerhaeuser to the lands covered by the Permit and HCP (Appendix C), where inholdings are defined as lands which are surrounded on at least three sides by lands initially covered by the HCP and Permit and where all portions are within 1.5 miles of lands covered by the HCP and Permit;

- d) Addition to the lands covered by the HCP any other lands acquired by Weyerhaeuser within 3 miles of any lands initially covered by the HCP. Such lands also may be added to the Permit if USFWS concurs that their use could not result in incidental take of any owls for which incidental take was not analyzed in connection with and authorized by the original Permit. Where lands have been added to the HCP but not the Permit; Appendix C must contain a conspicuous notation to that effect;

- e) Removal from the Permit and HCP any lands Weyerhaeuser has conveyed to a governmental agency or non-profit organization, where USFWS has approved covenants or other assurances under Section 6.5 of the HCP and Section 5 of the Implementation Agreement in connection with such conveyance;

- f) Removal from the Permit and HCP certain *non-core* lands, as described in Table 6-1 of the HCP, where Section 6.5 of the HCP allows such lands to be conveyed without USFWS approval; and

- g) Removal from the Permit and HCP small parcels of land not in excess of 320 acres which Weyerhaeuser has conveyed with USFWS approval under Section 6.5 of the HCP provided that Weyerhaeuser must continue to meet the dispersal standards with respect to its remaining covered lands as if the deleted lands were still covered by the HCP. The cumulative total of all such transactions shall not exceed 5

percent of the acreage initially covered by the Permit, and the cumulative total of such transactions within anyone township shall not exceed 1,920 acres.

Procedures for submission and acceptance of minor modifications shall be established in the Implementation Agreement.

6.7.2 Other HCP Modifications

For all other proposed modifications of the HCP, Weyerhaeuser shall provide a written description of the proposed modification, the effects of the proposal on the HCP, and any alternative ways in which the objectives of the proposal might be achieved. Within 60 days of receipt of the proposal, USFWS will either: a) approve the proposed modification, or b) notify Weyerhaeuser that the proposed modification must be processed as an amendment to the Permit in accordance with the Implementation Agreement.

6.8 Substitution of Alternative Stands

Weyerhaeuser does not expect that any legal challenge to the Permit would cause its invalidation or suspension. But in the event that any court order or governmental action precludes Weyerhaeuser from harvesting timber that could be harvested under the Permit, Weyerhaeuser may harvest a comparable volume of replacement timber from other parts of the HCP area. Weyerhaeuser has agreed that it will, to the maximum extent it reasonably and prudently can:

- Delay such replacement harvest as long as practicable by accelerating other harvests that are fully consistent with achieving the desired dispersal standards of the HCP;

- Select timber stands for such replacement harvests so as to maintain dispersal opportunities for owls within the HCP area as consistent as practicable with the desired dispersal standards of the HCP; and
- Notify USFWS of the location of any proposed replacement harvests so that it may propose, as an alternative, harvest of other Weyerhaeuser timber stands covered by the HCP that USFWS considers more consistent with the purpose of the HCP.

6.9 Termination

Regulations allow for the termination of the Permit. Any termination of the Permit automatically terminates this HCP. However, Weyerhaeuser recognizes that a termination may be inopportune for the regional spotted owl population, and therefore the Company has agreed to certain conditions to minimize the impact in the event termination is necessary.

Specifically, if the Permit is terminated by Weyerhaeuser or by the USFWS by reason of actions or omissions of Weyerhaeuser, the USFWS may require Weyerhaeuser to mitigate any incidental take of owls which actually occurred under the Permit and would have been prohibited by the ESA but for the Permit. Such mitigation may require Weyerhaeuser to continue carrying out some or all mitigation provisions as to some or all portions of the HCP area for some or all of the period that would have been covered by the Permit. However, mitigation may not extend to new lands or beyond the initial term of this HCP unless the Permit was or would have been extended under the criteria described in the Implementation Agreement, and then in no circumstances will mitigation extend beyond 13 February 2075 without the consent of Weyerhaeuser.



7.0

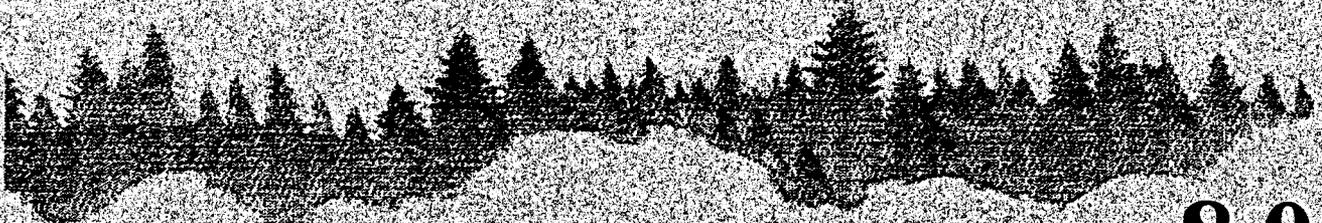
COSTS AND FUNDING OF THE HCP

7.0 COSTS AND FUNDING OF THE HCP

7.1 Costs and Funding

This HCP will require Weyerhaeuser to apply intensive silviculture to create and maintain suitable spotted owl dispersal habitat on the Millicoma Tree Farm. Silvicultural methods such as thinning, fertilization, and pruning will be used, and some timber harvests may be deferred beyond optimal economic rotation age, including designated set-aside areas. These management prescriptions, along with reduced flexibility to adapt operations to changing market conditions, will result in opportunity costs that must be incurred by Weyerhaeuser to implement this HCP.

Due to its long history and stable financial condition, Weyerhaeuser has the resources to fund the implementation of the HCP. The company as a whole held over 5.6 million acres of timberlands and had total assets in excess of \$8.9 billion in 1993. Net earnings in that year exceeded \$579 million on net revenues of \$9.5 billion (Weyerhaeuser Company 1994).



8.0

ALTERNATIVES TO THE PROPOSED HCP

8.0 ALTERNATIVES TO THE PROPOSED HCP

Weyerhaeuser and the USFWS identified five alternatives to the proposed HCP that would mitigate, minimize, or avoid the incidental take of spotted owls on the Millicoma Tree Farm. All five were eliminated because of economics, operational impracticability, and/or environmental impacts. The alternatives, and the reasons they were not chosen over the proposed HCP, are discussed in the remainder of this chapter.

8.1 No Action (Avoid Incidental Take of Spotted Owls)

Under the No Action alternative, Weyerhaeuser would exercise the necessary precautions to avoid the incidental take of spotted owls. On a case-by-case basis, known resident spotted owl sites would be protected from incidental take by maintaining existing NRF habitat in the vicinity of sites as long as sites remain occupied. It is unlikely that new NRF habitat would be grown under this alternative, and habitat currently unsuitable for spotted owls would be harvested on a rotation that would preclude it from developing into NRF habitat. The total amount, type, and configuration of protected habitat would vary depending on site-specific conditions. Of the 16,275 acres of NRF habitat currently available on the tree farm, the majority probably would be maintained in the short term until individual sites are abandoned. The number of owls that would be maintained on the tree farm also could vary. Some owls with sufficient amounts of habitat at the present time could persist on the tree farm. Owls with insufficient amounts of habitat, and probably some of those with sufficient amounts, eventually would abandon the sites, and the sites would be harvested. A site would be considered abandoned when it met USFWS survey protocol (3 years of owl absence during protocol surveys). Given the fragmented condition of NRF habitat on the tree farm at the present time, it is unlikely that more than half of the 35 known site centers would remain occupied under the No Action alternative, and probably no more than seven to eight would be reproductively active. Weyerhaeuser did not select the No Action alternative because it could result in shorter

rotation ages and less intensive silviculture that could significantly reduce the ability of the tree farm to support spotted owl dispersal (see subsection 9.1). This approach also could prevent the tree farm from contributing to the long-term recovery of the species in the region. Timber harvest and other forest management activities would continue under the No Action alternative on those portions of the tree farm not occupied by resident spotted owls, as would collateral uses such as rock quarries and electronic communication facilities. The area harvested annually on those portions of the tree farm could increase under the No Action alternative, due to the inability to harvest high-volume stands now occupied by owls. Older forest typically supports a greater volume of timber per acre than young forest, so Weyerhaeuser could be required to harvest a greater area of the tree farm in the short-term to compensate for the NRF habitat encumbered under the No Action alternative. In order to maintain projected harvest volumes over the long-term, Weyerhaeuser also could be required to harvest forest stands at younger ages than previously planned. The protection of NRF forest habitat would allow for some reproduction and dispersal across the tree farm in the future, but the lack of a long-term requirement to manage for owls leaves no guarantee that either of these benefits would persist. The dispersal habitat conditions that would result under the No Action alternative are compared to the proposed HCP in Section 9.0 of this document.

In addition to biological reasons stated above, Weyerhaeuser did not choose the No Action alternative because it is not considered economically feasible to delay or preclude harvest on significant portions of the Millicoma Tree Farm. Avoiding the incidental take of spotted owls could require Weyerhaeuser to delay indefinitely the harvest of thousands of acres of mature forest, with the loss of timber volume in the short term, and uncertain availability of timber in the future.

8.2 Manage the Tree Farm for Dispersal Without the Retention of NRF Habitat

Weyerhaeuser considered the alternative of managing the tree farm for dispersal habitat without retaining any NRF habitat in the short-term. The net effect of this alternative would be the creation and maintenance of a dispersal landscape similar to the proposed HCP, except that no NRF habitat would be retained to supplement younger stands for the first 20 years. This alternative would meet the long-term dispersal objectives, but it would not meet short-term objectives for the dispersal landscape, and therefore would not minimize and mitigate the effects of the proposed incidental take to the maximum extent practicable.

8.3 Manage the Tree Farm for Dispersal Habitat and Avoid the Incidental Take of Selected Spotted Owl Pairs

Weyerhaeuser could manage the tree farm for dispersal habitat, and simultaneously avoid the incidental take of selected spotted owl pairs. For purposes of analysis, it was assumed ten pairs of owls would be protected from incidental take to correspond with the maximum number known to have reproduced in recent years. Incidental take would be avoided by retaining existing NRF habitat within the vicinity of ten sites that are considered to be reproductively viable. This would increase the level of site protection from the four sites proposed in the HCP, and would more than double the acreage of mature forest retained for resident owls. Dispersal habitat would be created and maintained as described in the proposed HCP.

Weyerhaeuser dismissed this alternative for two reasons. First, there is no assurance that the ten sites would contribute significantly to the overall population of spotted owls in the southern Oregon Coast Range, since the simple avoidance of the take does not improve the reproductive potential of sites already affected by habitat loss and fragmentation. All ten sites have been sporadically reproductive in recent years, and future reproduction is unlikely to be more consistent. Second,

it would substantially increase both the short-term and long-term economic costs associated with the retention of NRF habitat.

8.4 Manage the Tree Farm for Dispersal Habitat According to the Federal 50-11-40 Rule

The ISC and the federal Recovery Team proposed managing portions of federal lands within the range of the northern spotted owl as dispersal habitat (Thomas et al. 1990; U.S. Fish and Wildlife Service 1992a). The prescription for dispersal habitat originally developed by the ISC became known as the 50-11-40 Rule. The goal of the rule was a landscape with 50 percent of the land area covered by coniferous forest with an average tree dbh of at least 11 inches and canopy closure of at least 40 percent. Within the landscape, the ISC also recommended that NRF habitat be retained in up to seven patches of 80 acres each per township (36 square miles) to contribute to the support of reproductive pairs in the future.

The Weyerhaeuser HCP is a comparable model for private lands that meets the same overall objective of the 50-11-40 Rule, which is to provide a landscape conducive to the dispersal of juvenile spotted owls between federally-managed LSRs, while at the same time reducing the size of gaps. Weyerhaeuser's proposed HCP is not appreciably different from the 50-11-40 rule from a biological standpoint. It applies the same underlying principles to the unique conditions of the private industrial forest. It will provide a landscape of 40 percent coniferous forest (compared to 50 percent under the ISC) with trees averaging at least 10 inches in dbh (compared to 11 inches dbh). Canopy closure will exceed 70 percent in stands of dispersal habitat under the Weyerhaeuser HCP, as compared to 40 percent under the ISC.

The ISC would prescribe 5,080 acres of mature forest reserves for an area the size of the tree farm, while Weyerhaeuser will retain 5,450 acres in permanent riparian and other reserves and 1,963 acres in existing forest habitat until at least 13 February 2015. The ISC prescription might

support a higher level of support for pair occupancy beyond 13 February 2015 than the Weyerhaeuser HCP, but the 50-11-40 rule probably would not achieve that level in the commercial forest because of the intensive nature of management practiced on private lands.

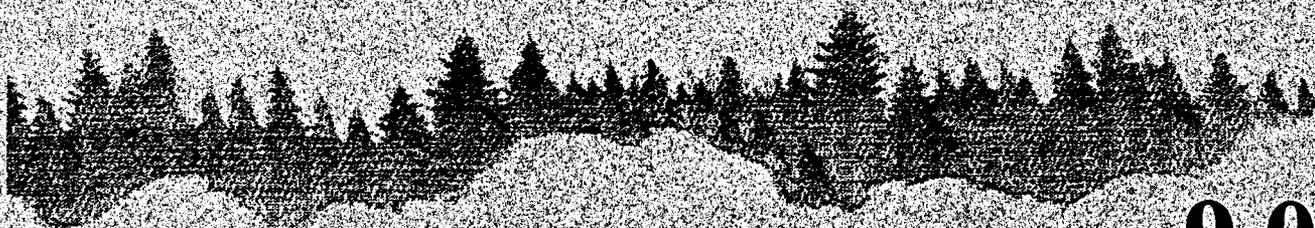
8.5 Manage the Tree Farm to Provide a Viable Population of Reproductive Spotted Owls

An alternative to the proposed HCP would be managing the tree farm to improve the spatial distribution of NRF habitat and maintain a long-term capability of seven or more pairs of owls. The Millicoma Tree Farm currently supports up to 35 spotted owl sites, but the capability of the tree farm is estimated to be seven pairs of owls because of the high degree of habitat fragmentation and home range overlap. The number of sites that are viable in the long term may be even less than seven.

Weyerhaeuser could retain and grow NRF habitat in patches of sufficient size and spacing to ensure a viable population of seven pairs over the long term. This could be accomplished by permanently dedicating mature habitat, or by managing portions of the tree farm on extended rotations to provide a constant amount, but varying configuration, of NRF habitat. Such a program could require the commitment of up to 10,007 acres of mature forest (1,906 acres per pair with 25 percent overlap of home ranges as per Thomas et al. 1990). Recent demographic data for the tree farm suggest that successful reproduction can be achieved with less than 1,906 acres of NRF habitat, but the long-term viability of such sites is unknown. Dispersal habitat would not be an objective of this alternative, but dispersing owls could make use of the NRF habitat retained for resident owls. The amount of dispersal habitat would likely be less than under the proposed HCP, and the number of large gaps greater.

Weyerhaeuser did not pursue this alternative because of the short-term and long-term economic impacts. In the short term, a significant amount of the merchantable timber on the tree farm would

remain protected for current and/or future spotted owl pairs. In the long term, the commitment of up to five percent of the productive area of the tree farm (10,007 acres), and a larger percentage of the currently merchantable timber to the maintenance of spotted owls, is not considered economically feasible by Weyerhaeuser.



9.0

EFFECTS OF THE HCP ON PLANTS AND ANIMALS

9.0 EFFECTS OF THE HCP ON PLANTS AND ANIMALS

9.1 The Northern Spotted Owl

The primary benefit of the HCP will be to provide a landscape conducive to the dispersal of juvenile spotted owls between populations in federal LSRs, as well as between the LSRs and the Elloit State Forest. The tree farm will contribute to the eventual recovery of the spotted owl in Oregon by linking the three populations on public lands and allowing them to function as one large population. As described in Section 2.0 of this HCP, this is a fundamental part of the overall plan to recover the species and it is consistent with recommendations of the federal Recovery Team for private lands in the southern Oregon Coast Range province (U.S. Fish and Wildlife Service 1992a).

The tree farm currently contains 48,708 acres of forest (23 percent of the total land area) in a condition capable of functioning as roosting and foraging habitat for dispersing juvenile owls (Figure 5-1). The existing dispersal habitat is clumped, and gaps greater than 0.5 mile between stands of dispersal habitat make up 38 percent of the landscape. If the HCP were not implemented, harvest of young timber would be accelerated on the tree farm to compensate for protected NRF habitat, and the resulting landscape would be appreciably less favorable to spotted owl dispersal than its current condition. By 13 February 2015, the total area of dispersal habitat on the tree farm without the HCP would be only 67,091 acres (Figure 9-1). By 2045, the total would be 30,096 acres, the distribution of the habitat would be patchy, and gaps greater than 0.5 mile would make up more than 48 percent of the landscape (Figure 9-2). In contrast, under the HCP, the total area of dispersal habitat will increase to over 84,000 acres by 13 February 2015, and will remain at that level for at least 30 years. Gaps over 0.5 mile in the landscape will be reduced to less than 20 percent of the tree farm (Figure 5-2).

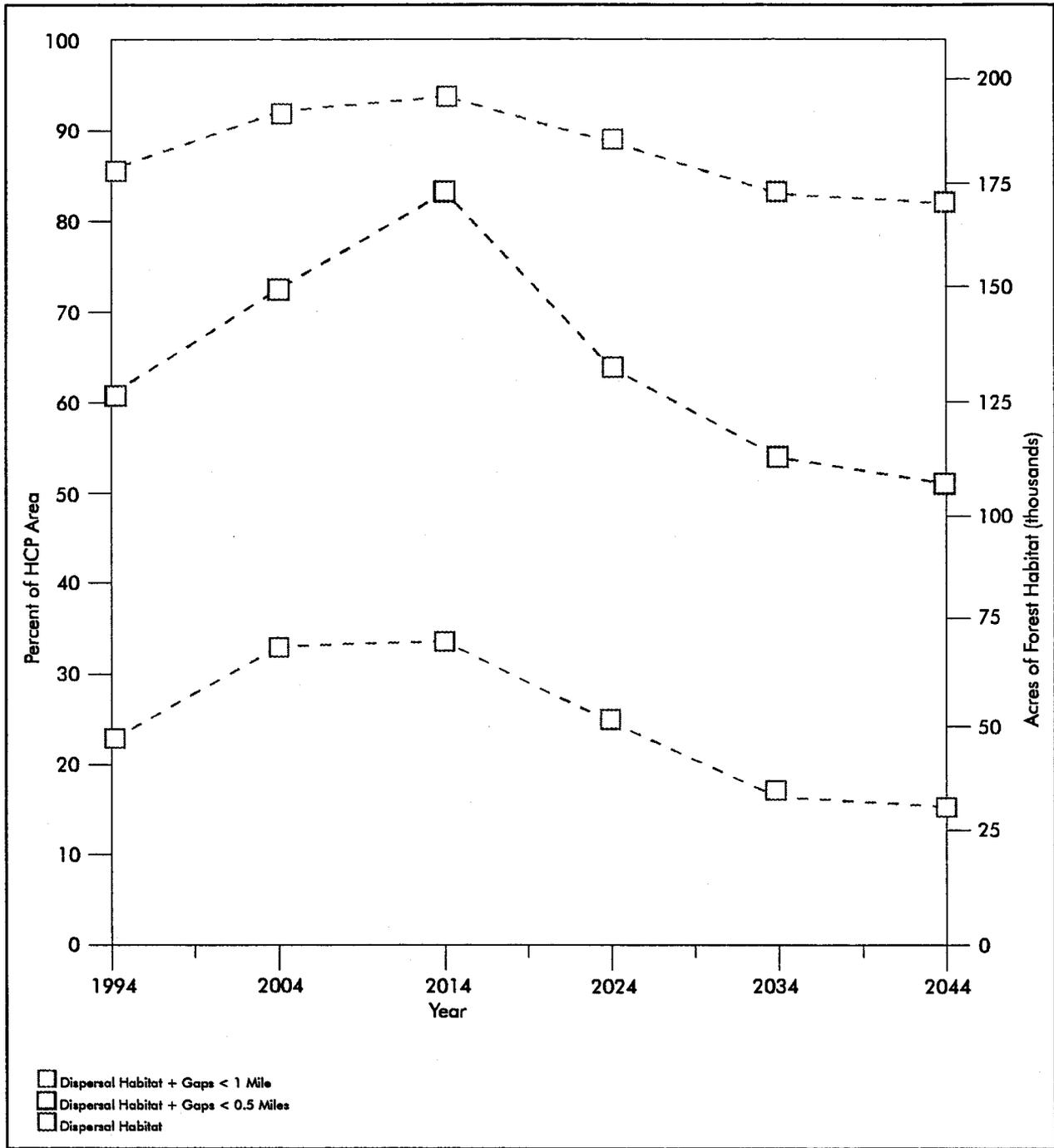
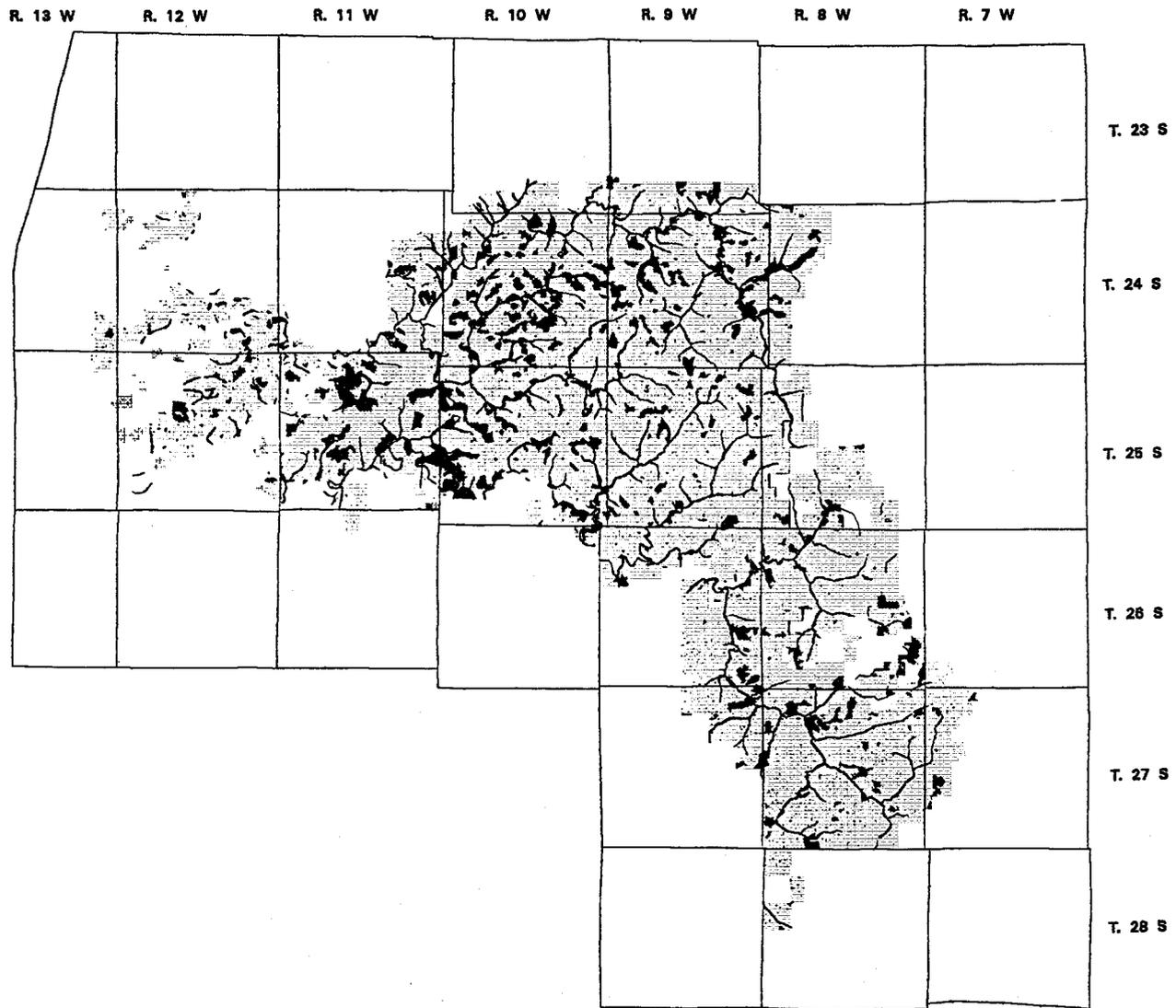


Figure 9-1. Projected trends in dispersal habitat on the Millicoma Tree Farm under the No Action alternative.

Section 9.0 Effects of the HCP on Plants and Animals



LEGEND

- Weyerhaeuser habitat
- Reserve habitat
- ▨ Weyerhaeuser non-habitat
- BLM habitat
- BLM non-habitat



UTM zone-10

Forest inventory as of: May 31, 1994

Figure 9-2. Potential distribution of spotted owl dispersal habitat on the Millicoma Tree Farm in 2045 without the proposed HCP.

The management measures described in this HCP will reduce the capability of the Millicoma Tree Farm to support reproductive spotted owls. The tree farm currently is occupied by up to 35 known spotted owl pairs and resident singles. Of the 35, only ten pairs are known to have reproduced at least once since 1990 (Table 4-3). It is unlikely that more than seven pairs of spotted owls could persist on the tree farm if protection of the existing habitat continued, because of the limited amount and fragmented nature of the habitat (Appendix B). Timber harvest under the HCP eventually could displace all reproductive owls from the tree farm, and effectively reduce the capability of the tree farm from seven pairs to none.

Over the life of the Permit, the location of individual owl sites is likely to change substantially. Some sites will be lost, others may be discovered or newly established. New sites may or may not be affected by management activities conducted under the HCP, depending on their location, habitat condition, and harvest activity at the time. There is no accurate way to anticipate the location of future sites. Therefore, to estimate the impact of the Permit and HCP on individual owl sites, Weyerhaeuser has used the currently known sites as surrogates for the potential impacts. However, the analysis assumes that any or all owl sites with centers located within 1.5 miles of the covered area, currently or in the future, may be affected or taken by the activities allowed under the Permit and HCP.

In addition to the 35 known spotted owl activity centers on the tree farm, Weyerhaeuser owns land within 1.5 miles of 44 activity centers on adjacent private, state, and federal lands, but owns suitable NRF habitat within 1.5 miles of only 34 of these (Table 9-1). Depending on the amount and distribution of NRF habitat available to owls inhabiting these activity centers, harvest of NRF habitat on Weyerhaeuser lands could reduce the reproductive viability of some of the owls and contribute to eventual abandonment of some of the activity centers (Table 9-1).

Table 9-1. Summary of effects of the Millicoma HCP on spotted owl activity centers (sites) located off the tree farm.

Category	Number of Sites	Effects of HCP
a. Sites With No NRF Within 1.5 Miles on Tree Farm	10	None
b. Sites with At Least 1,906 Acres of NRF Protected in LSR	7	None
c. Sites With Less Than 10 Acres of NRF With in 1.5 Miles on Tree Farm	7	Loss of 2 to 7 acres per site (32 acres total) in isolated patches. Negligible effect on sites.
d. Sites With 20 To 62 Acres of NRF Within 1.5 Miles On Tree Farm	6	Loss of 20 to 62 acres per site (162 acres total) in isolated patches. Negligible effect on sites.
e. Sites With Substantial Acres of NRF Within 1.5 Miles on Tree Farm	14	Loss of 24 to 769 acres per site. Potential significant effect on nine reproductive sites and five sites with no known reproduction.

Seven of the 34 activity centers lie within LSRs and have at least 1,906 acres of NRF habitat protected in the LSR (Table 9-1; item b). These seven activity centers would likely remain reproductively viable regardless of harvest activities on the tree farm. Another seven activity centers receive negligible contributions of NRF habitat from the tree farm (Table 9-1; item c). Only 32 total acres of NRF habitat on the tree farm lie within 1.5 miles of any of the seven activity centers, and the largest patch within 1.5 miles of any of those activity centers is 7 acres. All patches are isolated and distant from the activity center. Weyerhaeuser's harvest of this 32 acres of NRF is unlikely to have a measurable affect on the future viability of the activity centers or the regional owl population. In a similar manner, Weyerhaeuser owns from 20 to 62 acres of fragmented NRF habitat within 1.5 miles of six additional activity centers (Tale 9-1; item d). The harvest of these 162 acres could have negligible effects on the respective activity centers.

Finally, Weyerhaeuser owns substantial amounts of NRF habitat within 1.5 miles of 14 activity centers (Table 9-1; item e). The harvest of this habitat is unlikely to in itself lead to the abandonment of any activity center, but it could reduce the viability of one or more of the activity centers. None of the activity centers lies within an LSR or is proposed for long-term retention by the current landowner. Some of these owls could contribute to the regional population if they remained, particularly the nine that have been reproductively successful over the past 5 years, but none are included in long-term reserve areas for the region.

Habitat will be harvested gradually to accommodate other environmental and economic concerns. The NRF habitat around few, if any, known activity centers will be completely harvested in a single year. Efforts will be made to concentrate annual harvests and impact as few activity centers as possible, so that the remaining activity centers can remain intact (and potentially occupied) as long as possible. The times at which individual owls will be displaced from the tree farm are unknown. Displacement will occur over a number of years, but because the actual timing cannot be predicted, the analysis assumes all loss could occur immediately.

Harvest activities will be scheduled to avoid disturbance of active spotted owl nests. Known sites will be surveyed to monitor for site status and nesting activity. No harvesting will occur within 0.25 mile of a known active nest from 1 March to 30 September. In addition, 70 acres of suitable habitat will be protected around all activity centers as long as they are occupied. An activity center will be determined to be unoccupied after protocol surveys have been conducted for 3 years with no spotted owls being present. The Millicoma Tree Farm was surveyed from 1990 through 1994, and few new spotted owl activity centers are likely to be located in the future. Nevertheless, in addition to monitoring known activity centers, all scheduled harvests of potential NRF habitat within 0.5 miles of previously known active nests will be surveyed to prevent the felling of a spotted owl nest that may have been relocated into the area.

There is the potential for a limited number of resident spotted owls on the tree farm in the future, given the emphasis on management for dispersal habitat (i.e., marginal roosting and foraging habitat) and the retention of mature forest along riparian corridors. The number of future resident owls is difficult to predict. These owls could periodically be displaced as a result of timber harvest.

9.2 Other Species of Wildlife

The HCP will have no significant effect on threatened or endangered species of wildlife other than the northern spotted owl. The HCP will result in changes in the types and distribution of habitats on the tree farm over the next 50 years. The tree farm will experience a decrease in the amount of early-successional forest (up to 39 years old), an increase in the amount of mid-successional forest (40 to 79 years old) and a decrease in the amount of forest greater than 80 years old. Total area of non-forested cover, including wetland, brush and rock, will remain the same. Species associated with aquatic, riparian, and wetland habitats will not be significantly affected by this HCP. The amount of riparian forest currently protected as spotted owl habitat is a small percentage of the total riparian forest on the tree farm, and these habitats are protected partially by Oregon state

law (Oregon Administrative Rules 629-24-101 through 629-24-121). Management of these areas will not be changed significantly by this HCP. Species associated with these habitats include Burnell's false water penny beetle, Northwestern pond turtle, white-footed vole, Pacific western big-eared bat, and the northern red-legged frog (Table 4-3). The western snowy plover, which inhabits estuarine and coastal habitats, also will not be affected significantly by this HCP.

Species associated with various successional stages of coniferous forest may be affected by changes in habitat distribution under the HCP. While total area of habitat available to some species may be lower under this HCP, none of the species is expected to be eliminated from the tree farm. On-going efforts to manage and protect species with special status, such as the bald eagle, will continue unchanged under the HCP.

The marbled murrelet is known to exist on and adjacent to the Millicoma Tree Farm and could potentially nest in some stands covered by this HCP. The marbled murrelet is protected under the ESA as a threatened species, and the Permit for Incidental Take of spotted owls requested by Weyerhaeuser will not permit the take of murrelets. Potential marbled murrelet nesting habitat (as defined and mapped in Figure 4-5) will be surveyed prior to any harvest or habitat alteration. If murrelet occupancy (i.e., nesting) is determined through surveys or discovered incidental to other activities, Weyerhaeuser will take the necessary management actions to comply with the regulatory requirements relating to nesting murrelets.

9.3 Effects on Plants

Management activities could affect habitat which has the potential to support the crinite mariposa-lily, tall bugbane, shaggy horkelia, and slender meadowfoam. The remaining listed species are associated with unique habitats which are limited in their distribution on the Millicoma Tree Farm. The expected effect of forest management activities upon these species will be minor. These

species include the western lily, which occurs near the ocean in bog habitats; the wayside aster, which prefers grassy forest openings; and bensoniella, which generally occurs above 3,500 feet in elevation. In addition, the Umpqua mariposa-lily generally is restricted to areas east of Interstate 5 (Meinke, pers. comm., 9 December 1993) and is not expected to occur on the Millicoma Tree Farm.

The salinity of the water in Coos Bay east of Highway 101 may be insufficient to support salt-marsh bird's-beak (Rittenhouse, pers. comm., 13 December 1993). This species could potentially occur within the salt marsh located within the western portion of the Millicoma Tree Farm.

9.4. Post-HCP Effects

This HCP represents a significant investment in silvicultural techniques for the development of habitat conditions beneficial for the spotted owl and other species. Weyerhaeuser is an industry leader in silvicultural research and technology and it can be expected that over the course of this Permit new techniques will be developed to foster certain habitat conditions. The HCP provides for monitoring of progress and for amendment if appropriate based on, among other things, changed circumstances or habitat conditions or development of new information.

It is expected that the habitat conditions achieved under this HCP will extend beyond the term of the Permit across much of the HCP Area and therefore continue to benefit the owl and other species. This is true in part because it is assumed that state laws and regulations will continue to regulate forest practices such as size of harvest areas and timing restrictions and to protect against environmental degradation into the foreseeable future. It is also true because no reasonable economic or management scenario would permit the accelerated rate of harvest necessary to fundamentally alter in the short-term those habitat conditions achieved under the HCP. Accordingly, even though the Permit may end in 50 years, it likely would not be permissible (or

economically feasible) to alter the landscape significantly in the short term to the detriment of the owl or other protected species. In other words, harvest limitations inherent in state regulations and forest economics would prevent any large-scale destruction of the habitat conditions achieved under the HCP after the Permit expires.

In any event, it is reasonable to assume that the USFWS will continue to enforce the ESA into the foreseeable future and that any owls in the HCP Area after the Permit expires will be subject to the take prohibition of Section 9. Indeed, it is expected that some owls may persist within the HCP Area throughout the term of the Permit and thereafter. Thus, Weyerhaeuser may desire to extend the Permit beyond its initial term. Current regulations (50 C.F.R. § 13.22) allow Weyerhaeuser to apply for a renewal of the Permit and to continue its activities until the USFWS acts on the renewal application.

In sum, it can be expected that the beneficial aspects of the HCP will have a positive effect on the HCP Area and the region that will persist long after the initial Permit expires.



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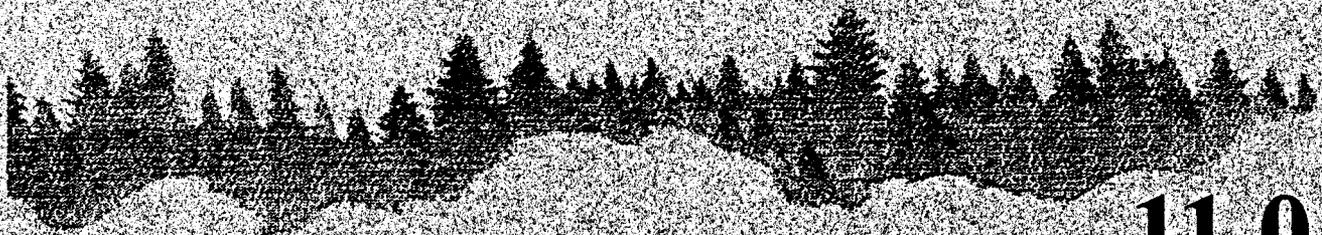
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11.0

GLOSSARY

11.0 GLOSSARY

Activity center	A nest site or primary roost area for northern spotted owls, as determined by USFWS spotted owl survey protocol.
Age class	A management classification using the age of a stand of trees.
Anadromous fish	Those species of fish that mature in the ocean and migrate into freshwater rivers and streams to spawn; an example is salmon.
BLM	Bureau of Land Management.
Candidate species, category 1	See "threatened and endangered species."
Candidate species, category 2	See "threatened and endangered species."
Canopy closure	The degree to which the canopy (forest layers above one's head) blocks sunlight or obscures the sky. It can only be accurately determined from measurements taken under the canopy as openings in the branches and crowns must be accounted for.
Clearcut	A harvest method in which all or almost all of the trees are removed in one cutting.
Connectivity	A measure of the extent to which conditions among forest areas provide habitat for breeding, feeding, dispersal, and movement of associated wildlife and fish species.
Diameter at breast height (dbh)	The diameter of a tree, measured 4.5 feet above the ground on the uphill side of the tree.
Endangered species act	The federal Endangered Species Act of 1973, as amended, sets up processes by which plant or animal species can be designated as threatened or endangered. Two federal agencies, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service, administer the act. Once species are listed, the Act also provides

Endangered Species Act Continued

that these agencies develop recovery plans for these species, including conserving the ecosystems on which listed species depend.

The Oregon Endangered Species Act was enacted in 1987, and establishes processes by which plant or animal species can be designated as threatened or endangered at the state level.

Fragmentation

The spatial arrangement of successional stages across the landscape as the result of disturbance; often used to refer specifically to the process of reducing the size and connectivity of late-successional or old-growth forests.

Geographic Information System (GIS)

A computer system that stores and manipulates spatial data, and can produce a variety of maps and analyses.

Habitat

The place where a plant or animal naturally or normally lives and grows; see also "spotted owl habitat" and "marbled murrelet habitat."

Habitat Conservation Plan

An agreement between the Secretary of Interior and either a private entity or a state that specifies conservation measures that will be implemented in exchange for a permit that would allow taking of a threatened or endangered species.

Habitat enhancement

Management activities that speed up the development of late-successional forest structure.

Incidental take

The taking of a federally-listed wildlife species, if the taking is incidental to, and not the purpose of, carrying out otherwise lawful activities. See also "take".

Interagency Scientific Committee (ISC)

A committee of scientists that was established by federal government agencies, including the U.S. Forest Service, Bureau of Land Management, Fish and Wildlife Service, and National Park Service, to develop a conservation strategy for northern spotted owls.

Juvenile

For spotted owls, a juvenile is normally considered to be any bird that is less than 1 year old.

Landscape	Large regional units of lands that are viewed as a mosaic of communities, or a unit of land with separate plant communities or ecosystems forming ecological units with distinguishable structure, function, geomorphology, and disturbance regimes.
Large woody debris	Large pieces of wood on the ground or in streams that includes logs, pieces of logs, and large chunks of wood.
Late-successional forest	A mature and/or old-growth forest stand. Typical characteristics are moderate to high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; numerous large snags; and abundant large woody debris (such as fallen trees) on the ground.
Listed	Formally listed by a state or federal agency; example is a species on the threatened species list.
Meta-population	A population comprising local populations that are linked by migrants, allowing for recolonization of unoccupied habitat patches after local extinction events.
Monitoring	The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.
ODFW	Oregon Department of Fish and Wildlife.
ONHP	Oregon Natural Heritage Program.
Physiographic province	A geographic area having a similar set of biophysical characteristics and processes due to effects of climate and geology which result in patterns of soils and broad-scale plant communities. Habitat patterns, wildlife distributions, and historical land use patterns may differ significantly from those of adjacent provinces.
Population	A collection of individual organisms of the same species that potentially interbreed and share a common gene pool. Population density refers to the number of individuals of a species per unit area, population persistence to the capacity of the population to maintain sufficient density to persist, well distributed, over time.

Recovery plan	A plan developed by a government agency that, if implemented, will result in the recovery of a threatened or endangered species, to the point that the species can be delisted from threatened or endangered status.
Riparian area	Areas of land directly influenced by water or that influence water. Riparian areas usually have visible vegetative or physical characteristics reflecting the influence of water. Riversides and lake borders are typical riparian areas.
Rotation	The planned number of years between regeneration of a forest stand and its final harvest (regeneration cut or harvest). A forest's age at final harvest is referred to as rotation age.
Salmonids	Fish species belonging to the family Salmonidae; includes trout, salmon, and whitefish species.
Second-growth	Relatively young forests that have developed following a disturbance (e.g., harvesting, serious fire, or insect attack) of the previous old-growth forest.
Site center	See Activity center.
Silviculture	The theory and practice of controlling the establishment composition, growth, and quality of forest stands in order to achieve management objectives.
Site class	A measure of an area's relative capacity for producing timber or other vegetation. It is measured through the site index.
Site index	A measure of forest productivity. It is expressed as the height of the tallest trees in a stand at an index age.
Snag	A dead tree that is still standing.
Stand (tree stand)	An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.

- Structure** The physical parts of an ecosystem that we can see and touch; typical structures in a forest are trees, standing dead trees (snags), and fallen dead trees.
- Succession** A series of changes by which one group of organisms succeeds another group; a series of developmental stages in a plant community.
- Take** To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a federally-listed threatened or endangered species, or to attempt to do so. See also "incidental take."
- Threatened and Endangered Species** Formal classifications of species. Federal designations are made by the U.S. Fish and Wildlife Service. State of Oregon designations include all federal species listed as of May 15, 1987; and those species determined by the Oregon Department of Fish and Wildlife since then to qualify for listing.

Definitions for federally designated species:

Candidate species, category 1 - Species for which there is substantial information to support listing the species as threatened or endangered; listing proposals are either being prepared or are delayed by work on higher priority species.

Candidate species, category 2 - Species for which information indicates that listing is possibly appropriate, but conclusive data are not available; additional information is being collected.

Endangered species - A species determined to be in danger of extinction throughout all or a significant portion of its range.

Threatened species - Any native wildlife species determined by the State Fish and Wildlife Commission to be in danger of extinction throughout any significant portion of its range within Oregon; or any native wildlife species listed as endangered by the federal ESA.

Proposed threatened or endangered species - Species proposed by the USFWS for listing as threatened or endangered; not a final designation.

Sensitive species - Species proposed for listing as threatened or endangered; or species recognized by a federal land management agency as needing special management to prevent the species from being listed.

Definitions for State of Oregon Designated Threatened and Endangered Species

Endangered species - Any native wildlife species determined by the State Fish and Wildlife Commission to be in danger of extinction throughout any significant portion of its range within Oregon; or any native wildlife species listed as endangered by the federal ESA.

Threatened species - Any native wildlife species that the State Fish and Wildlife Commission determines is likely to become endangered within the foreseeable future throughout any significant portion of its range within Oregon; or any native wildlife species listed as a threatened species by the federal ESA.

Sensitive species - Species that are likely to become threatened or endangered throughout all or a significant portion of their range in Oregon; functions as a state candidate species list.

USFWS

U.S. Fish and Wildlife Service.

Viability

The ability of a wildlife or plant population to maintain sufficient size so that it persists over time in spite of normal fluctuations in numbers; usually expressed as a probability of maintaining a specific population for a specified period.

Wetlands

As defined in Oregon forest practices rules OAR 629-24-101 (57), wetlands are "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." See also "significant wetlands."

Glossary Sources: Oregon Department of Forestry 1993; Forest Ecosystem Management Assessment Team 1993.

APPENDIX A
REVIEW OF DISPERSAL HABITAT

APPENDIX A: REVIEW OF DISPERSAL HABITAT¹

Dispersal has been defined as "... the movement the animal makes from its point of origin to the place where it reproduces or would have reproduced if it had survived and found a mate" (Howard 1960). It is distinguished from movements made by individual animals within their home ranges and seasonal migrations made between winter and summer habitats. Juvenile dispersal best fits the definition offered by Howard (1960) of "*innate dispersal*", which is a spontaneous, random movement related more to the genetics of the individual rather than proximal environmental conditions. "*Environmental dispersal*", as defined by Howard (1960) is the movement of animals in response to unfavorable conditions and it is usually more directed and of a shorter distance than innate dispersal.

In a review of movements among a wide range of vertebrates, Howard (1960) found that innate disperses: a) initiate dispersal at about the time of puberty or the onset of sexual maturation; b) disperse regardless of environmental conditions at the natal area such as over-crowding, lack of food or aggressive behavior by the parents; c) move rapidly away from the natal area and select a new territory within a short period of time; d) move randomly through the landscape during dispersal, frequently crossing unfavorable habitat while passing-up favorable habitat; e) move farther than they need simply to avoid competition with their parents or locate a suitable breeding site; and f) rarely re-initiate dispersal once they have settled and become sexually active.

Juvenile spotted owls initiate dispersal in September and October of their first year. In Oregon, Forsman et al. (1984) monitored two owls that moved out of the nest area during the second week of October. Miller (1989) found initiation of dispersal to occur between 21 August and 4 November in Oregon, with 84 percent of his owls dispersing between 11 September and 20 October. Gutierrez et al. (1985) reported a similar trend in California, where 64 percent of the juvenile owls

¹ Excerpted from the Habitat Conservation Plan for the Northern Spotted Owl on Timberlands Owned by the Murray Pacific Corporation, Lewis County, Washington.

initiated dispersal between 19 and 23 September. In Washington, Allen and Brewer (1985) reported that owls dispersed in September and early October and Herter (1992) found owls at high elevations in the Washington Cascades began dispersing in early October.

Dispersal is rapid at first, but is interrupted by a period of "settling" in winter. Both Gutierrez et al. (1985) and Miller (1989) reported active and settled phases to dispersal. After a few weeks of active dispersal, during which the owls moved an average of 1.0 mile a day (Miller 1989) or 1.3 to 5.0 miles a day (Gutierrez et al. 1985), they settled into winter areas. During the settled phase, home range size ranged from 882 to 1,125 acres in California (Gutierrez et al. 1985) and from 128 to 5,414 acres in Oregon (Miller 1989). Juveniles that died during the settled phase in Oregon had considerably smaller home ranges than those that survived and re-initiated dispersal. Average home range size for juveniles that survived the first winter in Oregon was 3,173 acres, with a range from 1,213 to 5,414 acres (Miller 1989).

Total straight-line distance between the nest and the final point of detection (which represented the location of death for many juvenile owls) has been reported to average 28.3 miles in California (Gutierrez et al. 1985), 17.5 miles in Oregon (Miller 1989) and more than 30 miles in some cases in Washington (Allen and Brewer 1985). Gutierrez et al. (1985) also reported maximum distances traveled by owls of 19.0 to 97.6 miles, but since the dispersal movements were not strongly directional the total distance from the nest to final location was considerably less. Miller (1989) noted that owls that survived until their second year had a mean straight-line dispersal distance of only 9.4 miles, considerably less than the overall average of 17.5 miles that included first-year mortalities. It could be inferred from this that first-year survival depends on how quickly an owl locates suitable, vacant habitat in which to settle.

Spotted owls appear to move randomly across the landscape while dispersing, but they tend to show some preference for roosting in older forest stands. Forsman et al. (1984) noted that one dispersing juvenile they studied, "*apparently traveled across extensive areas of open ponderosa*

pine forest," to reach a stand of old-growth Douglas-fir, true fir and pine. Gutierrez et al. (1985) documented dispersing juveniles readily crossing major topographic ridges and rivers as well as habitats that would otherwise be considered unsuitable. They noted, however, that the owls frequently died in these unsuitable habitats. Dispersing juveniles in Washington followed by radio-telemetry were found to use a variety of habitats, only a few of which fit the definition of suitable adult spotted owl habitat (Allen and Brewer 1985). Miller (1989), who performed the most detailed analysis to date of habitat used during dispersal, found no correlation between the degree of fragmentation of the landscape (i.e., inter-mixing of old and young forest) and either the total distance traveled or the ultimate survival of the owl. He did find, however, that dispersing owls selected mature and old-growth forest for roosting. The owls were observed roosting in a wide variety of habitats, but mature and old-growth forest were used disproportionate to their availability. Closed sapling pole/sawtimber habitat was used roughly in proportion to its availability, while younger forest types were avoided. The closed sapling pole/sawtimber forest stand condition is defined by Hall et al. (1985) as coniferous forest with average stand dbh between 1 and 21 inches and canopy closure exceeding 60 percent. Understory ground cover is typically sparse in this stand condition. Obviously, the wide range of tree sizes included in this stand description makes accurate estimation of spotted owl habitat requirements difficult, and probably accounts for the neutral preference for this habitat type observed by Miller (1989). In all likelihood, dispersing owls selected for the stands of larger trees in this type, and against stands at the smaller end of the range.

A model of spotted owl dispersal emerges from the available data, and it fits the definition by Howard (1960) of innate dispersal. Juveniles leave the natal area rather abruptly during their first fall, at about the time they reach physical maturity. Few data exist on parent-juvenile interactions prior to dispersal, but the fact that dispersal takes place during a time when adult territoriality is at an annual low suggests juveniles are not forced to leave by their parents. Mean final dispersal distances exceeded 15 miles in all studies (Allen and Brewer 1985, Gutierrez et al. 1985 and Miller 1989) which is considerably longer than the average home range radius of 1.2 to 2.2 miles

(Thomas et al. 1990), further suggesting that juveniles are not dispersing simply to avoid competing with their parents. It is possible that juveniles disperse in response to decreased availability of prey in the natal area, as this has been suggested as a reason for the seasonal shift in home range among adults (Forsman et al. 1984), or they may leave in search of food after the adults stop feeding them in late August or early September (Miller, pers. comm. 1992), but the tendency for juvenile owls to pass over patches of suitable habitat along the dispersal path suggests they are searching for something other than the nearest available foraging habitat. While the exact reasons for dispersal are not known, Howard's hypotheses of gene flow and recolonization of vacated habitats are the most likely (Howard 1960).

Once they begin dispersing, juvenile owls move quickly through the landscape, utilizing mature and old-growth habitat in their paths, but apparently not being deferred in their movements by fragmentation of the habitat. Dispersing owls select the traditional "suitable" habitat types when they are available, but they will readily cross and roost in other habitat types if older forest is not present. This is not necessarily maladaptive behavior, given the assumption that dispersal serves to maintain the flow of genes between segments of the population and re-colonize vacant habitats. The habitats and populations in most need of contact by dispersing juveniles are those that are physically isolated by interruptions in the habitat. The hazards associated with crossing unsuitable habitat are probably outweighed by the genetic advantages of reaching a vacant habitat patch or introducing a new genotype into a population. Nevertheless, from a management standpoint it would be futile to create a landscape that would require juvenile owls to follow a particular course during dispersal. If they are truly moving in a random manner, they are just as likely to move into unsuitable habitat as into suitable. Rather, the emphasis should be on providing suitable roosting and foraging habitat in such a manner that an owl moving randomly across the landscape is more likely to encounter suitable habitat than unsuitable habitat. This is the approach described in the ISC Report as a "*general forest landscape ... amenable to dispersal*" (Thomas et al. 1990).

Most dispersing owls move well beyond the limits of their parents' territories before settling. Some settle temporarily during their first winter, only to settle on a more permanent basis once they establish a territory and become reproductively active. Dispersal among adults is rare, and may be due to disruption of the territory and/or loss of a mate rather than in response to innate drives. Dispersal among adults, when it does occur, is usually not far; adults that do move are frequently found paired in subsequent years with neighboring owls.

First-year mortality is high but variable among dispersing owls (averaging 81 percent and ranging from 78 to 95 percent over 3 years in Oregon; Miller 1989). Starvation and predation are the major causes of death. High dispersal mortality is not entirely unexpected in a long-lived species inhabiting an historically stable environment, but mortality rates in "unmanaged" or unfragmented habitats are not known. All data currently available are for juvenile owls dispersing through at least some degree of managed forest with recent harvest. It is not known whether juveniles die because they are made more vulnerable by habitat that encourages predation and contains few prey, or simply because they have not yet fully developed the skills necessary to feed themselves and avoid predation. In any event, a landscape designed to accommodate dispersal should include protective cover and available prey. Owls ultimately move an average of 15 to 30 miles (straight-line distance) from their natal areas, and sometimes further. A plan to allow successful dispersal between local populations should have the spacing between population centers with the range traveled by a reasonable proportion of dispersing birds.

The ISC conducted a review of the above-referenced research on dispersal and made recommendations for landscape management for dispersing spotted owls (Thomas et al. 1990). They emphasized the need to manage for a general landscape rather than corridors due to the lack of evidence that owls use corridors and the concern for increased predation pressure in corridors. Recognizing the lack of any definitive means of determining an appropriate spacing between blocks of breeding habitat, the ISC recommended the distance traveled by at least two-thirds of all juveniles studied (12 miles). Lacking extensive field data on habitat used by dispersing spotted

owls, the ISC relied upon data collected for resident adult owls to define suitable dispersal habitat at the stand level (Hays, pers. comm. 1992). The youngest, and least structurally diverse habitat used by resident owls was considered by the ISC to be coniferous forest with an average dbh of 11 inches and a minimum canopy closure of 40 percent (Thomas et al. 1990). The ISC recognized that dispersing owls probably have less stringent habitat requirements than resident owls, and believed habitat that provides minimal roosting and foraging opportunities for resident owls would meet the minimum requirements of disperses. To describe suitable habitat at the landscape level, the ISC used a consensus approach among the expert researchers on the team. In this manner, the ISC prescribed a landscape in which 50 percent of the area is occupied by forest stands with an average dbh of 11 inches and canopy closure of 40 percent (Thomas et al. 1990). They also recommended retention of up to seven, 80-acre blocks of suitable breeding habitat per township, but noted these are intended not specifically for dispersal but for future reproduction. The Federal Recovery Team recommended a similar prescription for non-federal lands between DCAs, but allowed for flexibility on a site-by-site basis (U.S. Fish and Wildlife Service 1992).

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APPENDIX B

**CALCULATION OF THE SPOTTED OWL
LANDSCAPE CAPABILITY FOR THE
MILLICOMA TREE FARM**

APPENDIX B: INTRODUCTION

The Spotted Owl Landscape Capability is defined as the number of potentially reproductive spotted owl pairs a given landscape is capable of supporting, based on the amount and distribution of suitable nesting-roosting-foraging (NRF) habitat. Methods for calculating the landscape capability were originally developed by the Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl (ISC) (Thomas et al. 1990), and refined by the U.S. Forest Service (1992) during preparation of the Environmental Impact Statement for the ISC strategy. Ultimately, the refined methodology was used by the federal Spotted Owl Recovery Team to calculate the landscape capability of Designated Conservation Areas (DCAs). The refined methodology was used to calculate the landscape capability of the Millicoma Tree Farm, with minor modifications as described below.

The concept of a landscape capability is based on the assumption that the number of animals a landscape can support is dependent in a predictable manner on the amount, type, and distribution of habitat present on the landscape. Specifically, the Spotted Owl Landscape Capability is determined by:

- **The proportion of the landscape that is NRF habitat for spotted owls.** Each pair of owls requires a given amount of NRF habitat to meet its life requirements and successfully reproduce. As the amount of NRF habitat on the landscape increases, the capability of the landscape to support owls increases.

- **The relationship between the annual home range size of a spotted owl pair and the proportion of the home range that is NRF habitat.** Spotted owl pairs spend most of their lives in a fixed home range. All their life requirements must be met within that home range. As the density of NRF habitat within the home range decreases, the size of the home range increases. The number of spotted owl home

ranges that a landscape can accommodate therefore decreases as the density of NRF habitat decreases. Below a certain density of NRF habitat, the landscape becomes incapable of supporting successful reproduction because owls are unable to meet the energy demands of hatching and fledging young. They center their activities during the reproductive season around the nest and hunt in the surrounding forest. Their foraging efficiency, and ultimately their ability to successfully hatch and fledge young, are affected by the distance they travel between hunting areas and the nest, and by the amount of time they spend avoiding openings in the forest. The lower limit of NRF habitat density that is capable of supporting a spotted owl pair depends on the specifics of the site and the owl pair. Some sources have suggested that 40 percent NRF in the annual home range is the average minimum for successful reproduction (Ripple et al. 1991; Thomas et al. 1990), but home ranges with less than 40 percent NRF habitat have been shown to be reproductive.

- **The overlap of home ranges among adjacent pairs of owls.** Empirical data have shown that the annual home ranges of adjacent owl pairs typically overlap. The ISC estimated the average overlap to be 25 percent for purposes of calculating the landscape capability (Thomas et al. 1990). The Recovery Team used an overlap of 30 percent (U.S. Fish and Wildlife Service 1992).

- **A correction for expected long-term occupancy of sites based on the influence of local population size and proportion of suitable habitat in the landscape.**

METHODS

Calculation of the Spotted Owl Landscape Capability for the Millicoma Tree Farm was a seven-step process, as outlined below. The process followed the methodology of the federal Recovery Team (U.S. Fish and Wildlife Service 1992), with modifications to accommodate the specific conditions on the tree farm. All modifications are shown in italics in the following steps:

STEP 1. All suitable NRF habitat on the tree farm was identified and mapped using Weyerhaeuser's forest inventory system. *The definition of NRF habitat used for the tree farm was broader than the definition used by the Recovery Team. The definition used for the tree farm included younger forest types known to be used by spotted owls in Oregon. The total area of NRF habitat calculated on the tree farm was greater than the total that would be calculated according to the methods of the Recovery Team. For a detailed discussion of the NRF habitat definition used in the analysis, see subsection 4.3.3 of the HCP.*

STEP 2. A grid of square, 5,000-acre cells was superimposed on the habitat map of the tree farm using a geographic information system (GIS). Each 5,000-acre cell represented the median annual home range for spotted owl pairs in Oregon.

STEP 3. The density of suitable NRF habitat in each 5,000-acre cell was calculated as:

The Acres of NRF on Weyerhaeuser Company Lands

The Total Acres of Weyerhaeuser Ownership in the Cell

- STEP 4.** *Cells with habitat densities less than 20 percent were excluded from further analysis because they were considered incapable of supporting potentially-reproductive spotted owl pairs.*
- STEP 5.** The predicted home range size for each cell remaining after Step 4 was calculated according to the formula:
- $$[8,688 - (7,054 \times \text{Habitat Density})] \times 0.7$$
- STEP 6.** The total area of Weyerhaeuser Company ownership in each cell was divided by the predicted home range size for that cell to determine the pair capability for the cell.
- STEP 7.** Pair capabilities for all cells were totaled to determine the landscape capability.

RESULTS

The total area of the Millicoma Tree Farm is 209,000 acres. The total area of NRF habitat on the tree farm is 16,275 acres. Due to minor rounding errors in the GIS, the total area of the tree farm used in the landscape capability analysis was 207,910 acres, and the area of NRF habitat was 16,465 acres (Table B-1). The analysis therefore assumed a slightly greater amount of NRF habitat and higher density of habitat than exists on the tree farm, but the difference is negligible.

A total of 70 5,000-acre cells were required to analyze the 207,910-acre tree farm (Table B-1). Of the 70 cells, 11 included no NRF habitat, while only one had more than 40 percent NRF habitat. Fifty-nine cells with less than 20 percent habitat were removed from the analysis as described in

Appendix B: Calculation of the Spotted Owl Landscape Capability

Step 4, leaving 11 cells for analysis. Those 11 cells accounted for 9,084.9 acres of the total NRF habitat on the tree farm. Based on the amount and distribution of NRF in those 11 remaining cells, the landscape capability for the tree farm is 6.9 pairs of spotted owls.

Table B-1. Results of the Landscape Capability Analysis for the Millicoma Tree Farm.

Cell Number	Cell Index	Total Area (acres)	NRF Acres	NRF/Total	HR Size	Pair Cap.
1	K-1	187.5977	0	0	NA	0
2	H-3	4981.6	0	0	NA	0
3	G-6	41.75215	0	0	NA	0
4	J-11	197.832	0	0	NA	0
5	J-2	3567.23	0	0	NA	0
6	H-2	4981.6	0	0	NA	0
7	H-1	4413.746	0	0	NA	0
8	G-1	3805.119	0	0	NA	0
9	A-2	184.129	0	0	NA	0
10	L-9	1598.289	0	0	NA	0
11	B-5	0.063135	0	0	NA	0
12	I-2	4940.97	2.5	0.000506	NA	0
13	K-5	3469.702	1.9	0.000548	NA	0
14	I-1	4434.293	4	0.000902	NA	0
15	H-5	4981.6	4.6	0.000923	NA	0
16	E-1	791.068	0.9	0.001138	NA	0
17	H-4	4981.6	5.8	0.001164	NA	0
18	I-3	4981.6	12.7	0.002549	NA	0
19	G-2	4981.6	12.9	0.00259	NA	0
20	F-1	3060.676	10.8	0.003529	NA	0
21	G-4	4979.611	35.8	0.007189	NA	0
22	L-6	110.4057	0.8	0.007246	NA	0
23	K-6	4511.832	34.4	0.007624	NA	0
24	J-4	3511.459	31.8	0.009056	NA	0
25	J-3	2973.454	30.9	0.010392	NA	0
26	J-10	1527.382	17.6	0.011523	NA	0
27	B-1	1031.68	14.8	0.014346	NA	0
28	G-3	4981.6	87.5	0.017565	NA	0
29	L-8	3812.696	77.3	0.020274	NA	0
30	B-4	2798.473	58.2	0.020797	NA	0
31	K-4	908.6084	21	0.023112	NA	0
32	F-2	4672.122	114.6	0.024528	NA	0
33	I-4	4981.6	134.9	0.02708	NA	0
34	J-1	3110.499	105.9	0.034046	NA	0
35	K-10	160.957	6	0.037277	NA	0
36	J-5	4080.509	153.9	0.037716	NA	0
37	A-1	491.1474	19.8	0.040314	NA	0
38	I-5	4699.963	206.4	0.043915	NA	0
39	A-3	1532.149	67.7	0.044186	NA	0
40	B-2	1791.651	85.7	0.047833	NA	0
41	J-6	4792.211	280.3	0.058491	NA	0
42	J-9	4357.11	262.8	0.060315	NA	0
43	H-6	1988.905	123.6	0.062145	NA	0
44	I-6	3922.821	249.7	0.063653	NA	0
45	E-2	3363.094	242.5	0.072106	NA	0
46	G-5	3125.141	249.4	0.079804	NA	0
47	K-9	4841.758	394.5	0.081479	NA	0
48	A-5	212.4562	17.7	0.083311	NA	0
49	A-4	576.9482	49	0.08493	NA	0
50	F-3	4908.1	439.1	0.089464	NA	0

Table B-1. Continued.

Cell Number	Cell Index	Total Area (acres)	NRF Acres	NRF/ Total	HR Size	Pair Cap.
51	F-4	4944.173	470.3	0.095122	NA	0
52	I-8	2576.761	268	0.104007	NA	0
53	C-2	956.2624	121.4	0.126953	NA	0
54	E-5	823.7963	108.6	0.131829	NA	0
55	K-8	4675.443	687.1	0.146959	NA	0
56	J-8	4756.797	711	0.14947	NA	0
57	C-4	2190.115	332.6	0.151864	NA	0
58	C-3	4255.734	758	0.178113	NA	0
59	D-5	1349.385	253.7	0.188012	NA	0
60	F-5	897.4945	187.5	0.208915	5050.02	0.177721
61	L-7	1787.326	390.4	0.218427	5003.052	0.357247
62	I-7	4587.611	1038.2	0.226305	4964.15	0.924148
63	B-3	1795.276	420.5	0.234226	4925.04	0.36452
64	K-7	2369.641	616.1	0.259997	4797.786	0.493903
65	D-4	4401.867	1165	0.26466	4774.76	0.921903
66	E-4	4554.971	1337.5	0.293635	4631.688	0.983437
67	E-3	4656.581	1399.1	0.300456	4598.006	1.012739
68	J-7	4035.568	1269.8	0.314652	4527.911	0.891265
69	C-5	581.7159	196	0.336934	4417.886	0.131673
70	D-3	2375.529	1064.8	0.448237	3868.295	0.614102
	Total Acres	207910.457	16465.3			6.872659

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APPENDIX C
LIST OF MILLICOMA TREE FARM
LANDS COVERED BY THE HCP

APPENDIX C: LIST OF MILLICOMA TREE FARM LANDS COVERED BY THE HCP

The following list of legal descriptions includes all Weyerhaeuser lands covered by the Permit for Incidental Take of the Northern Spotted Owl and included within the Millicoma Habitat Conservation Plan.

Temporary File Number: P94-1002
Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Min Acres	Ownership Type	**
E2NE/FR NW4/NESW/FR S2SW/W2SE	31-26S	07W	41-019		437.25	437.25	01	
FR N2/SW4/W2SE	05-27S	07W	41-019		553.76	553.76	01	
ALL FR	06-27S	07W	41-019		617.81	617.81	01	
ALL FR	07-27S	07W	41-019		633.60	633.60	01	
W2NW	08-27S	07W	41-019		80.00	80.00	01	
NW4/NWSW	17-27S	07W	41-019		200.00	200.00	01	
FR N2/FR SW4/NWSE	18-27S	07W	41-019		515.80	515.80	01	
NESE/S2SE	18-27S	07W	41-019		120.00		02	
ALL FR	19-27S	07W	41-019		639.90	639.90	01	
FR W2NW	30-27S	07W	41-019		82.43	82.43	01	
FR W2	04-24S	08W	41-019		323.01	323.01	01	
ALL FR	05-24S	08W	41-019		644.94	644.94	01	
ALL FR	06-24S	08W	41-019		481.28	481.28	01	
ALL FR	07-24S	08W	41-019		484.38	484.38	01	
ALL	08-24S	08W	41-019		640.00	640.00	01	
NW4/W2SW	09-24S	08W	41-019		240.00	240.00	01	
N2NE/SWNE/W2	17-24S	08W	41-019		440.00	440.00	01	
ALL FR	18-24S	08W	41-019		486.78	486.78	01	
ALL FR	19-24S	08W	41-019		490.40	490.40	01	
NW4	20-24S	08W	41-019		160.00	160.00	01	
ALL FR	30-24S	08W	41-019		492.80	492.80	01	
ALL FR	31-24S	08W	41-019		493.18	493.18	01	
FR W2NE/FR W2/W2SE	05-25S	08W	41-019		523.64	523.64	01	
FR NW4/FR S2	06-25S	08W	41-019		514.38	514.38	01	

** 01 = Fee Surface & Minerals, 02 = Fee Surface Only, 03 = Timber Only,
04 = Long Term Timber Lease, 05 = Murphy Long Term Lease,
06 = Long Island Timber, 10 = Mineral Rights Only

Temporary File Number: P94-1002
Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
ALL FR	07	25S	08W	41-019	645.63	645.63	01		
W2	08	25S	08W	41-019	320.00	320.00	01		
ALL FR	17	25S	08W	41-019	687.12	687.12	01		
W2NE/FR W2/W2SE	18	25S	08W	41-019	487.63	487.63	01		
ALL FR	19	25S	08W	41-019	639.88	639.88	01		
ALL	21	25S	08W	41-019	640.00	640.00	01		
W2NE/W2/W2SE	22	25S	08W	41-019	480.00	480.00	01		
SW4	26	25S	08W	41-019	160.00	160.00	01		
ALL	27	25S	08W	41-019	640.00	640.00	01		
S2NE/NW4/S2	28	25S	08W	41-019	560.00	560.00	01		
ALL FR	29	25S	08W	41-019	646.52	646.52	01		
FR W2NW/FR SW4	30	25S	08W	41-019	240.52	240.52	01		
ALL FR	31	25S	08W	41-019	641.30	641.30	01		
SE4	32	25S	08W	41-019	160.00	160.00	01		
ALL	33	25S	08W	41-019	640.00	640.00	01		
ALL	35	25S	08W	41-019	640.00	640.00	01		
ALL FR	02	26S	08W	41-019	648.31	648.31	01		
ALL FR	03	26S	08W	41-019	639.52	639.52	01		
ALL FR	04	26S	08W	41-019	640.40	640.40	01		
ALL FR	05	26S	08W	41-019	642.40	642.40	01		
ALL FR	06	26S	08W	41-019	649.60	649.60	01		
ALL FR	07	26S	08W	41-019	640.80	640.80	01		
ALL	08	26S	08W	41-019	640.00	640.00	01		

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Temporary File Number: P94-1002
 Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
ALL	09	26S	08W	41-019	640.00	640.00	01		
N2NE/SWNE/NW4/S2	10	26S	08W	41-019	600.00	600.00	01		
ALL	11	26S	08W	41-019	640.00	640.00	01		
W2SW	13	26S	08W	41-019	80.00	80.00	01		
ALL	14	26S	08W	41-019	640.00	640.00	01		
ALL	15	26S	08W	41-019	640.00	640.00	01		
ALL	16	26S	08W	41-019	640.00	640.00	01		
ALL	17	26S	08W	41-019	640.00	640.00	01		
ALL FR	18	26S	08W	41-019	640.32	640.32	01		
ALL FR	19	26S	08W	41-019	641.04	641.04	01		
NW4	20	26S	08W	41-019	160.00	160.00	01		
ALL	21	26S	08W	41-019	640.00	640.00	01		
N2N2	22	26S	08W	41-019	160.00	160.00	01		
N2/N2SW/SESW/SE4	23	26S	08W	41-019	600.00	600.00	01		
N2NW/SENW/N2SW	24	26S	08W	41-019	200.00	200.00	01		
NE4/SENW/NESW/S2SW/SE4	25	26S	08W	41-019	480.00	480.00	01		
NWNE/N2NW/SWNW/SW4	27	26S	08W	41-019	320.00	320.00	01		
ALL	29	26S	08W	41-019	640.00	640.00	01		
FR N2/E2SW/W2SE	30	26S	08W	41-019	480.77	480.77	01		
ALL FR	31	26S	08W	41-019	640.92	640.92	01		
S2NE/NENW/S2NW/S2	32	26S	08W	41-019	520.00	520.00	01		
ALL	33	26S	08W	41-019	640.00	640.00	01		
SE4	34	26S	08W	41-019	160.00	160.00	01		

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Temporary File Number: P94-1002
Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Min Acres	Ownership Type	**
NE4/S2NW/SW4/S2SE	35	26S	08W	41-019	480.00	480.00	01	
N2SE	35	26S	08W	41-019	80.00		02	
N2NE/SENE/W2NW/SESW/SE4	36	26S	08W	41-019	400.00	400.00	01	
ALL FR	01	27S	08W	41-019	633.84	633.84	01	
FR N2N2/S2SW/NESE/S2SE	02	27S	08W	41-019	359.88	359.88	01	
ALL FR	03	27S	08W	41-019	639.80	639.80	01	
SE4	04	27S	08W	41-019	160.00	160.00	01	
ALL FR	05	27S	08W	41-019	639.68	639.68	01	
ALL FR	06	27S	08W	41-019	639.88	639.88	01	
ALL FR	07	27S	08W	41-019	639.36	639.36	01	
ALL	08	27S	08W	41-019	640.00	640.00	01	
ALL	09	27S	08W	41-019	640.00	640.00	01	
ALL	10	27S	08W	41-019	640.00	640.00	01	
ALL	11	27S	08W	41-019	640.00	640.00	01	
ALL	12	27S	08W	41-019	640.00	640.00	01	
ALL	13	27S	08W	41-019	640.00	640.00	01	
ALL	14	27S	08W	41-019	640.00	640.00	01	
ALL	15	27S	08W	41-019	640.00	640.00	01	
ALL	16	27S	08W	41-019	640.00	640.00	01	
ALL	17	27S	08W	41-019	640.00	640.00	01	
ALL FR	18	27S	08W	41-019	639.52	639.52	01	
ALL FR	19	27S	08W	41-019	639.68	639.68	01	
ALL	20	27S	08W	41-019	640.00	640.00	01	
ALL	21	27S	08W	41-019	640.00	640.00	01	

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Temporary File Number: P94-1002
Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
ALL	22	27S	08W	41-019	640.00	640.00	01		
ALL	23	27S	08W	41-019	640.00	640.00	01		
ALL	24	27S	08W	41-019	640.00	640.00	01		
ALL	25	27S	08W	41-019	640.00	640.00	01		
ALL	26	27S	08W	41-019	640.00	640.00	01		
ALL	27	27S	08W	41-019	640.00	640.00	01		
ALL	28	27S	08W	41-019	640.00	640.00	01		
ALL	29	27S	08W	41-019	640.00	640.00	01		
ALL FR	30	27S	08W	41-019	639.36	639.36	01		
ALL FR	31	27S	08W	41-019	639.60	639.60	01		
ALL	32	27S	08W	41-019	640.00	640.00	01		
ALL	33	27S	08W	41-019	640.00	640.00	01		
ALL	34	27S	08W	41-019	640.00	640.00	01		
ALL	35	27S	08W	41-019	640.00	640.00	01		
ALL FR	06	28S	08W	41-019	640.64	640.64	01		
W2	08	28S	08W	41-019	320.00	320.00	01		
ALL FR	18	28S	08W	41-019	639.62	639.62	01		
PT LOT 4	30	23S	09W	41-019	33.50	33.50	01		
ALL FR	31	23S	09W	41-019	633.56	633.56	01		
ALL FR	32	23S	09W	41-019	352.40	352.40	01		
ALL FR	33	23S	09W	41-019	654.40	654.40	01		
ALL FR	34	23S	09W	41-019	648.72	648.72	01		
ALL FR	35	23S	09W	41-019	643.84	643.84	01		

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Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec Twp Rng	St-Cty	Surface Acres	Net Min Acres	Ownership Type	**
ALL FR	36-23S-09W	41-019	706.55	706.55	01	
ALL FR	01-24S-09W	41-019	635.88	635.88	01	
ALL FR	02-24S-09W	41-019	630.54	630.54	01	
ALL FR	03-24S-09W	41-019	629.89	629.89	01	
ALL FR	04-24S-09W	41-019	633.22	633.22	01	
ALL FR	05-24S-09W	41-019	638.96	638.96	01	
ALL FR	06-24S-09W	41-019	627.99	627.99	01	
ALL FR	07-24S-09W	41-019	535.39		02	
ALL FR	08-24S-09W	41-019	575.04		02	
ALL FR	09-24S-09W	41-019	578.81		02	
ALL FR	10-24S-09W	41-019	613.12	613.12	01	
ALL	11-24S-09W	41-019	640.00	640.00	01	
ALL	12-24S-09W	41-019	640.00	640.00	01	
ALL	13-24S-09W	41-019	640.00	640.00	01	
ALL	14-24S-09W	41-019	640.00	640.00	01	
FR NE4/N2NW/SENW/FR S2	15-24S-09W	41-019	593.15	593.15	01	
ALL	16-24S-09W	41-019	640.00	640.00	01	
ALL	17-24S-09W	41-019	640.00		02	
ALL FR	18-24S-09W	41-019	589.62		02	
ALL FR	19-24S-09W	41-019	594.24		02	
ALL	20-24S-09W	41-019	640.00		02	
ALL	21-24S-09W	41-019	640.00		02	
ALL FR	22-24S-09W	41-019	637.94	637.94	01	

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Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min	Ownership Type	**
ALL	23	24S	09W	41-019	640.00	640.00	01		
ALL	24	24S	09W	41-019	640.00	640.00	01		
ALL	25	24S	09W	41-019	640.00	640.00	01		
ALL	26	24S	09W	41-019	640.00	640.00	01		
ALL	27	24S	09W	41-019	640.00	640.00	01		
ALL	28	24S	09W	41-019	640.00			02	
ALL	29	24S	09W	41-019	640.00			02	
ALL FR	30	24S	09W	41-019	600.21			02	
ALL FR	31	24S	09W	41-019	608.20			02	
ALL	32	24S	09W	41-019	640.00			02	
ALL	33	24S	09W	41-019	640.00			02	
ALL	34	24S	09W	41-019	640.00	640.00	01		
ALL	35	24S	09W	41-019	640.00	640.00	01		
ALL	36	24S	09W	41-019	640.00	640.00	01		
ALL FR	01	25S	09W	41-019	599.40	599.40	01		
ALL FR	02	25S	09W	41-019	600.80	600.80	01		
ALL FR	03	25S	09W	41-019	602.56	602.56	01		
ALL FR	04	25S	09W	41-011	604.52			02	
ALL FR	05	25S	09W	41-011	606.40			02	
ALL FR	06	25S	09W	41-011	428.59			02	
ALL FR	07	25S	09W	41-011	452.36			02	
ALL	08	25S	09W	41-011	640.00			02	
ALL	09	25S	09W	41-011	640.00			02	

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 Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
ALL	10	25S	09W	41-019	640.00	640.00	01		
ALL	11	25S	09W	41-019	640.00	640.00	01		
ALL	12	25S	09W	41-019	640.00	640.00	01		
ALL	13	25S	09W	41-019	640.00	640.00	01		
ALL	14	25S	09W	41-019	640.00	640.00	01		
ALL	15	25S	09W	41-019	640.00	640.00	01		
ALL	16	25S	09W	41-011	640.00	640.00	01		
ALL	17	25S	09W	41-011	640.00			02	
ALL FR	18	25S	09W	41-011	449.92			02	
ALL FR	19	25S	09W	41-011	448.48			02	
ALL	20	25S	09W	41-011	640.00			02	
N2NE	21	25S	09W	41-011	80.00	80.00	01		
S2NE/NW4/S2	21	25S	09W	41-011	560.00			02	
ALL	22	25S	09W	41-019	640.00	640.00	01		
ALL	23	25S	09W	41-019	640.00	640.00	01		
ALL	24	25S	09W	41-019	640.00	640.00	01		
ALL	25	25S	09W	41-019	640.00	640.00	01		
ALL	26	25S	09W	41-019	640.00	640.00	01		
ALL	27	25S	09W	41-019	640.00	640.00	01		
ALL	28	25S	09W	41-011	640.00	640.00	01		
ALL	29	25S	09W	41-011	640.00	640.00	01		
ALL FR	30	25S	09W	41-011	449.60	449.60	01		
ALL FR	31	25S	09W	41-011	449.56	449.56	01		
ALL	32	25S	09W	41-011	640.00	640.00	01		

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Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Type	Ownership **
ALL	33	25S	09W	41-011	640.00	640.00	01	
N2/N2SW/SWSW/N2SE	34	25S	09W	41-019	520.00	520.00	01	
ALL	35	25S	09W	41-019	640.00	640.00	01	
ALL	36	25S	09W	41-019	640.00	640.00	01	
ALL FR	01	26S	09W	41-019	654.28	654.28	01	
S2NE/FR W2/S2SE	02	26S	09W	41-019	487.87	487.87	01	
ALL FR	03	26S	09W	41-019	653.20	653.20	01	
ALL FR	04	26S	09W	41-011	648.80	648.80	01	
ALL FR	05	26S	09W	41-011	647.00	647.00	01	
ALL FR	06	26S	09W	41-011	610.71	610.71	01	
N2NE/SWNE LESS .62 ACRE SOLD/ SENE/NENW LESS .11 ACRE SOLD/ FR W2NW/SEW LESS 30.23 ACRES SOLD/NESW LESS 11.15 ACRES SOLD/LOT 3/FR S2SW/NESE/NWSE LESS 1.75 ACRES SOLD/S2SE	07	26S	09W	41-011	568.10	568.10	01	
ALL	08	26S	09W	41-011	640.00	640.00	01	
N2/W2SW	09	26S	09W	41-011	400.00	400.00	01	
NE4	10	26S	09W	41-019	160.00	160.00	01	
ALL	11	26S	09W	41-019	640.00	640.00	01	
N2/N2SW/SESW/SE4	12	26S	09W	41-019	600.00	600.00	01	
ALL	13	26S	09W	41-019	640.00	640.00	01	
S2NE/SEW/NESW/SE4	14	26S	09W	41-019	320.00	320.00	01	
ALL	15	26S	09W	41-019	640.00	640.00	01	
FR N2N2	18	26S	09W	41-011	153.03	153.03	01	
ALL	22	26S	09W	41-019	640.00	640.00	01	

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Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
ALL	23	26S	09W	41-019	640.00	640.00	01		
ALL	24	26S	09W	41-019	640.00	640.00	01		
ALL	25	26S	09W	41-019	640.00	640.00	01		
W2NE/W2/W2SE	26	26S	09W	41-019	480.00	480.00	01		
E2E2	26	26S	09W	41-019	160.00		02		
ALL	27	26S	09W	41-019	640.00	640.00	01		
N2/SE4	34	26S	09W	41-019	480.00	480.00	01		
ALL	35	26S	09W	41-019	640.00	640.00	01		
ALL	36	26S	09W	41-019	640.00	640.00	01		
ALL FR	01	27S	09W	41-011	664.36	664.36	01		
ALL FR	02	27S	09W	41-011	671.04	671.04	01		
ALL FR	03	27S	09W	41-011	672.04	672.04	01		
ALL	11	27S	09W	41-011	640.00	640.00	01		
ALL	12	27S	09W	41-011	640.00	640.00	01		
ALL	13	27S	09W	41-011	640.00	640.00	01		
STRIP OF LAND IN SWSE/SESE	25	23S	10W	41-019	41.19	41.19	01		
NESE/FR S2SE	31	23S	10W	41-011	121.75		02		
SENE/FR SW4/NESE/FR S2SE	32	23S	10W	41-011	330.12		02		
FR E2SW/FR W2SE	33	23S	10W	41-011	164.62	164.62	01		
PT N2NENE/SENE/SENE/SWSW/ E2SE	33	23S	10W	41-011	187.42		02		
SE4	34	23S	10W	41-019	160.00	160.00	01		
FR N2/FR SW4	34	23S	10W	41-019	490.26		02		
NENE/PT NWNE/NW4/S2	36	23S	10W	41-019	536.90	536.90	01		
ALL FR	01	24S	10W	41-011	623.12	623.12	01		

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Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
ALL FR	02	24S	10W	41-011	601.48	601.48	01		
ALL FR	03	24S	10W	41-011	587.24	587.24	01		
ALL FR	04	24S	10W	41-011	577.92	577.92	01		
ALL FR	05	24S	10W	41-011	579.48	579.48	01		
FR E2	06	24S	10W	41-011	289.76	289.76	01		
ALL FR	07	24S	10W	41-011	825.08	825.08	01		
NE4/N2NW/SWNW/PT NWSW/SE4	08	24S	10W	41-011	476.19	476.19	01		
SE4/PT NESW, S2SW	08	24S	10W	41-011	130.51		02		
ALL	09	24S	10W	41-011	640.00	640.00	01		
ALL	10	24S	10W	41-011	640.00	640.00	01		
ALL	11	24S	10W	41-011	640.00	640.00	01		
ALL	12	24S	10W	41-011	640.00	640.00	01		
ALL	13	24S	10W	41-011	640.00	640.00	01		
ALL	14	24S	10W	41-011	640.00	640.00	01		
ALL	15	24S	10W	41-011	640.00	640.00	01		
ALL	16	24S	10W	41-011	640.00	640.00	01		
NE4/NENW/PT W2NW/SE4/S2	17	24S	10W	41-011	608.70	608.70	01		
N2NE/N2 LOT 1/PT LOT 2/LOTS 3, 4, 8, 11 & 12/SE4	18	24S	10W	41-011	495.32	495.32	01		
LOT 9/PT LOT 10	18	24S	10W	41-011	90.00		02		
NE4/LOTS 1, 2, 5 & 6/FR S2	19	24S	10W	41-011	732.47	732.47	01		
ALL	20	24S	10W	41-011	640.00	640.00	01		
ALL	21	24S	10W	41-011	640.00	640.00	01		
ALL	22	24S	10W	41-011	640.00	640.00	01		
ALL	23	24S	10W	41-011	640.00	640.00	01		

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Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min	Ownership Type	**
ALL	24	24S	10W	41-011	640.00	640.00	01		
ALL	25	24S	10W	41-011	640.00	640.00	01		
ALL	26	24S	10W	41-011	640.00	640.00	01		
ALL	27	24S	10W	41-011	640.00	640.00	01		
ALL	28	24S	10W	41-011	640.00	640.00	01		
ALL	29	24S	10W	41-011	640.00	640.00	01		
NE4/LOTS 1, 2, 3, 5, 10, 11 & 12/SE4	30	24S	10W	41-011	611.40	611.40	01		
ALL FR	31	24S	10W	41-011	821.24	821.24	01		
ALL	32	24S	10W	41-011	640.00	640.00	01		
ALL	33	24S	10W	41-011	640.00	640.00	01		
ALL	34	24S	10W	41-011	640.00	640.00	01		
ALL	35	24S	10W	41-011	640.00	640.00	01		
ALL	36	24S	10W	41-011	640.00	640.00	01		
ALL FR	01	25S	10W	41-011	636.80	636.80	01		
ALL FR	02	25S	10W	41-011	633.18	633.18	01		
ALL FR	03	25S	10W	41-011	633.98	633.98	01		
ALL FR	04	25S	10W	41-011	635.68	635.68	01		
ALL FR	05	25S	10W	41-011	635.68	635.68	01		
ALL FR	06	25S	10W	41-011	812.71	812.71	01		
ALL FR	07	25S	10W	41-011	818.68	818.68	01		
ALL	08	25S	10W	41-011	640.00	640.00	01		
ALL	09	25S	10W	41-011	640.00	640.00	01		
ALL	10	25S	10W	41-011	640.00	640.00	01		

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Temporary File Number: P94-1002
Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min	Ownership Type	**
ALL	11	25S	10W	41-011	640.00	640.00	01		
ALL	12	25S	10W	41-011	640.00	640.00	01		
ALL	13	25S	10W	41-011	640.00	640.00	01		
ALL	14	25S	10W	41-011	640.00	640.00	01		
ALL	15	25S	10W	41-011	640.00	640.00	01		
ALL	16	25S	10W	41-011	640.00	640.00	01		
ALL	17	25S	10W	41-011	640.00	640.00	01		
ALL FR	18	25S	10W	41-011	820.38	820.38	01		
ALL FR	19	25S	10W	41-011	821.18	821.18	01		
ALL	20	25S	10W	41-011	640.00	640.00	01		
ALL	21	25S	10W	41-011	640.00	640.00	01		
ALL	22	25S	10W	41-011	640.00	640.00	01		
ALL	23	25S	10W	41-011	640.00	640.00	01		
ALL	24	25S	10W	41-011	640.00	640.00	01		
ALL	25	25S	10W	41-011	640.00	640.00	01		
ALL	26	25S	10W	41-011	640.00	640.00	01		
N2NE/SENE NORTH OF RIVER/N2NW/ E2SE EAST OF RIVER	27	25S	10W	41-011	217.00	217.00	01		
LOT 1/NWNE/LOT 2/NW4/LOT 7/ FR W2SW/LOTS 9 & 5	29	25S	10W	41-011	441.01	441.01	01		
ALL FR	30	25S	10W	41-011	824.80	824.80	01		
PT NENE NORTH OF RIVER/W2	34	25S	10W	41-011	321.00	321.00	01		
ALL	35	25S	10W	41-011	640.00	640.00	01		
ALL	36	25S	10W	41-011	640.00	640.00	01		

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Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
FR N2/PT NESW, N2SE, SESE EAST OF RIVER	01	26S	10W	41-011	489.88	489.88	01		
S2S2	11	24S	11W	41-011	160.00	160.00	01		
S2	12	24S	11W	41-011	320.00	320.00	01		
ALL	13	24S	11W	41-011	640.00	640.00	01		
ALL	14	24S	11W	41-011	640.00	640.00	01		
ALL FR	23	24S	11W	41-011	643.16	643.16	01		
N2/NESW/FR S2SW/N2SE/SWSE	24	24S	11W	41-011	559.45	559.45	01		
PT NENE/N2NW/SWNW/100 FOOT STRIP IN S2SW	25	24S	11W	41-011	156.64	156.64	01		
N2NE/NW4/PT SESW, SE4	26	24S	11W	41-011	306.11	306.11	01		
SWNE/N2SW/SWSW/PT SESW, W2SE	26	24S	11W	41-011	234.70		02		
LOT 4	30	24S	11W	41-011	60.26	60.26	01		
WEST 1320 FEET OF LOTS 2 & 3	30	24S	11W	41-011	80.00		02		
PT LOTS 1 & 2/LOTS 3 & 4/ PT NWSE, N2SWSE/SESE	31	24S	11W	41-011	332.13	332.13	01		
FR SWSW	32	24S	11W	41-011	43.12	43.12	01		
100 FT STRIP IN SWSW	33	24S	11W	41-011	0.35	0.35	01		
SWNE/PT SENE/100 FOOT STRIP IN SENE/NESW EXCEPT NORTH 15 ACRES/SESW/SE4	34	24S	11W	41-011	297.01	297.01	01		
SWNE/SWSW/NWSENE/N2SWSENE/ PT NENW, S2NW/SW4/SWNESE/ NESWSE/W2SWSE/SESE	35	24S	11W	41-011	373.68	373.68	01		
NWNE/SENE/NWNE/N2SWNE/ SESWNE/E2SENE/S2SWSENE/N2NESE/ SENESE/NWSE/SESWSE	35	24S	11W	41-011	195.00		02		
NENE/S2NE/100 FOOT STRIP IN NENW/SENWNW/NWSWNW/E2NESW/ E2NWSW/NESES/S2SESW/SE4	36	24S	11W	41-011	373.18	373.18	01		

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Temporary File Number: P94-1002
Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
N2NWNW/SWNWNW/NESWNW/S2SWNW/ SENW/W2NESW/W2NWSW/SWSW/NWSESW	36	24S	11W	41-011	190.00			02	
FR N2/NESW/S2SW/SE4	01	25S	11W	41-011	596.80	596.80		01	
NWSW	01	25S	11W	41-011	40.00			02	
ALL FR	02	25S	11W	41-011	633.60	633.60		01	
ALL FR	03	25S	11W	41-011	629.60	629.60		01	
PT LOTS 1 & 2, SWNE/SENE/ PT LOT 3 SOUTH OF RIVER/ PT LOT 4, SWNW/SENW/NESW/ STRIP IN NWSW/S2SW/SE4 PT LOT 2, SWNE	04	25S	11W	41-011	489.40	489.40		01	
	04	25S	11W	41-011	11.20			02	
STRIP IN S2NE/LOT 4/S2NW/ PT NESW/NWNESE/STRIP IN N2SE/ NESESE/S2SESE PT NENESE/S2NESE/NWSESE	05	25S	11W	41-011	192.39	192.39		01	
	05	25S	11W	41-011	35.00			02	
PT LOT 1/PT S2NE/LOT 5/FR SW4/ PT N2SE/S2SE	06	25S	11W	41-011	420.18	420.18		01	
NWNWNE/NENW/FR W2W2	07	25S	11W	41-011	211.44	211.44		01	
NENWNE/S2NWNE	07	25S	11W	41-011	30.00			02	
NESW/S2SW/LOTS 7 & 6/N2SWSE/ SESE	08	25S	11W	41-011	252.50	252.50		01	
ALL	09	25S	11W	41-011	640.00	640.00		01	
ALL	10	25S	11W	41-011	640.00	640.00		01	
ALL	11	25S	11W	41-011	640.00	640.00		01	
ALL	12	25S	11W	41-011	640.00	640.00		01	
ALL	13	25S	11W	41-011	640.00	640.00		01	
ALL	14	25S	11W	41-011	640.00	640.00		01	
ALL	15	25S	11W	41-011	640.00	640.00		01	
ALL	16	25S	11W	41-011	640.00	640.00		01	

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Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
S2	17	25S	11W	41-011	320.00	320.00	01	01	
PT LOT 6/NENW/PT LOT 8/SESW/ NENESE/S2NESE/W2NWSE/S2SE	18	25S	11W	41-011	242.62	242.62	01	01	
NE4/NENW/FR S2	19	25S	11W	41-011	520.20	520.20	01	01	
ALL	20	25S	11W	41-011	640.00	640.00	01	01	
ALL	21	25S	11W	41-011	640.00	640.00	01	01	
FR N2/SW4/LOTS 5, 6 & 7/ PT LOT 8	22	25S	11W	41-011	599.35	599.35	01	01	
FR N2/FR N2SW/LOT 6 EXCEPT NORTH 500 FEET/LOT 7/FR N2SE/ SWSE/LOT 13	23	25S	11W	41-011	563.01	563.01	01	01	
NORTH 500 FEET OF LOT 6	23	25S	11W	41-011	8.95		02	02	
N2/NESW/LOTS 1, 2 & 3/SE4	24	25S	11W	41-011	575.78	575.78	01	01	
N2NE/LOT 9/SENE/LOTS 12, 11 & 10/SW4/NESE/LOTS 4 & 5	25	25S	11W	41-011	446.33	446.33	01	01	
NENE/LOTS 2, 10, 9, 3, 1, 11, 6, 7, 5, 8 & 4/NWSW/S2SW/SE4	26	25S	11W	41-011	394.66	394.66	01	01	
LOTS 9, 7 & 6/PT LOT 11/ LOT 5/NWNW/LOTS 4 & 3	27	25S	11W	41-011	208.64	208.64	01	01	
N2NE/LOT 4/LOT 5/NW4/PT N2SW/ LOT 7/PT LOT 6	28	25S	11W	41-011	435.03	435.03	01	01	
N2/N2SW/PT LOT 4/N2SE/ PT LOT 3/LOT 2	29	25S	11W	41-011	539.85	539.85	01	01	
NE4/NENW/FR S2NW/FR SW4/N2SE/ SWSE/LOT 2	30	25S	11W	41-011	593.17	593.17	01	01	
LOT 12/WEST 900 FEET LOT 11/ PT LOTS 10 & 3	31	25S	11W	41-011	94.56	94.56	01	01	
NE4/LOTS 6, 3, 2 & 1/SESW/SE4	33	25S	11W	41-011	483.01	483.01	01	01	
W2W2	34	25S	11W	41-011	160.00	160.00	01	01	

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Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Type	Ownership Type **
NW4/S2SW/NESE/S2SE	36	25S	11W	41-011	360.00	360.00	01	
FR NE4/FR E2NW/E2SW/SE4	04	26S	11W	41-011	432.00	432.00	01	
LOT 1/FR W2NE EXCEPT ROAD/ S2SW/NWSE EXCEPT ROAD/S2SE	04	24S	12W	41-011	320.91	320.91	01	
SWSE	05	24S	12W	41-011	40.00	40.00	01	
W2SESE	05	24S	12W	41-011	20.00			02
LOT 7	06	24S	12W	41-011	40.58	40.58	01	
PT E2NE/NENW/LOT 3	07	24S	12W	41-011	94.75	94.75	01	
SWNE/NENW/S2NW/NESW/S2SW/N2SE	08	24S	12W	41-011	360.00	360.00	01	
SENE	08	24S	12W	41-011	40.00			02
W2NE/N2NW/S2S2SWNW/SENW/NESW/ N2NWSW	09	24S	12W	41-011	270.00	270.00	01	
N2SWNW/N2S2SWNW	09	24S	12W	41-011	30.00			02
NENE	18	24S	12W	41-011	40.00	40.00	01	
NESE	20	24S	12W	41-011	40.00	40.00	01	
NWSW/S2SW/SWSE	21	24S	12W	41-011	160.00	160.00	01	
S2SE	22	24S	12W	41-011	80.00			02
E2SW/FR SE4	25	24S	12W	41-011	241.95	241.95	01	
S2NE/PT SWNW/W2SW	25	24S	12W	41-011	171.20			02
SEWNNE/E2SENE/NWNW	26	24S	12W	41-011	70.00	70.00	01	
NENE/N2NWNE/SWNWNE/SWNE/ W2SENE/PT NENW/SWNW/PT SENW/ NWSW/N2 LOT 4/FR E2SE	26	24S	12W	41-011	384.11			02
N2NENE/SWNENE/NWNE/S2SWSWNE/ FR N2NW/W2 LOT 2/SENW/SENESEW/ FR S2SW/NESE/NENWSE	27	24S	12W	41-011	357.16	357.16	01	
SENESE/N2SWNE/N2SWSWNE/SESWNE/ SENE/E2 LOT 2/N2NESW/SWNESW/ LOT 3/NWNWSE/S2NWSE/N2 LOT 6/ N2 LOT 7	27	24S	12W	41-011	245.51			02
NE4/N2NW/SWNW/NWSENW/SESW/SE4	28	24S	12W	41-011	490.00	490.00	01	

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Temporary File Number: P94-1002
Operating Unit: COOS BAY - TIMBERLANDS

Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Acres	Ownership Type	**
NE4/N2NWSW/SWNWSW/SWSW/SE4	29	24S	12W	41-011	390.00	390.00		01	
NESW/W2SESW	29	24S	12W	41-011	60.00			02	
NE4/FR S2NW/FR N2SW/PT NESE/ NWSE	31	24S	12W	41-011	397.25	397.25		01	
PT N2NE, NENW, S2NW	32	24S	12W	41-011	128.76	128.76		01	
NWNW	32	24S	12W	41-011	40.00			02	
S2NESE/SESE	33	24S	12W	41-011	60.00	60.00		01	
N2NESE	33	24S	12W	41-011	20.00			02	
E2NWNW/SWNW/SW4/PT SESE	34	24S	12W	41-011	230.25	230.25		01	
W2NWNW	34	24S	12W	41-011	20.00			02	
E2SENE/S2SW/SE4	35	24S	12W	41-011	260.00	260.00		01	
LOT 1/S2 LOT 2/SWNE/W2SENE/ S2NENW/S2NW/N2SW	35	24S	12W	41-011	296.91			02	
FR N2/FR SW4	36	24S	12W	41-011	478.18	478.18		01	
SE4	36	24S	12W	41-011	160.00			02	
FR N2/N2NESW/NWSW/SE4	01	25S	12W	41-011	534.40	534.40		01	
S2NESW/S2SW	01	25S	12W	41-011	100.00			02	
ALL FR	02	25S	12W	41-011	632.80	632.80		01	
S2NE/PT LOT 4 EXCEPT ROAD/ NESW/SE4	03	25S	12W	41-011	313.45	313.45		01	
PT LOT 1/LOT 4/S2NW/S2SE	04	25S	12W	41-011	222.50	222.50		01	
LOT 2/FR E2NW	05	25S	12W	41-011	105.18	105.18		01	
FR S2SW	07	25S	12W	41-011	81.24	81.24		01	
FR NE4/FR N2SE/LOT 11	09	25S	12W	41-011	294.89	294.89		01	
FR NE4/LOT 3/LOT 5 EXCEPT SOUTH 8 ACRES/LOTS 6 & 11/ N2 LOT 13/S2SW LOT 13/ SE4 LOT 13/LOT 14/FR N2SE/ LOT 15 EXCEPT 1 ACRE IN THE NORTHWEST CORNER/LOT 16	10	25S	12W	41-011	556.21	556.21		01	
ALL	11	25S	12W	41-011	640.00	640.00		01	

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Operating Unit: COOS BAY - TIMBERLANDS

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N2/NENESW/S2NESW/NWSW/ S2NESWSW/SESW/SE4	12	25S	12W	41-011	595.00	595.00		01	
NWNESW/N2NESWSW/NWSWSW/S2SWSW	12	25S	12W	41-011	45.00			02	
STRIP IN N2NE/N2NWNW	13	25S	12W	41-011	21.94	21.94		01	
S2NWNW	13	25S	12W	41-011	20.00			02	
SENE/NE/S2NE/W2/N2SE	14	25S	12W	41-011	530.00	530.00		01	
N2NENE/SWNENE	14	25S	12W	41-011	30.00			02	
N2NE/E2SWNE/SENE/N2NENW/NWNW/ S2NW/N2SW/SWSW/N2SESW/SWSESW/ NESE/SWNWSE	15	25S	12W	41-011	480.00	480.00		01	
W2SWNE/S2NENW/SESESW/N2NWSE/ SENWSE/S2SE	15	25S	12W	41-011	160.00			02	
ALL	16	25S	12W	41-011	640.00	640.00		01	
S2SW/NESE/N2NWSE/S2SE	17	25S	12W	41-011	220.00	220.00		01	
S2NWSE	17	25S	12W	41-011	20.00			02	
FR N2NW	18	25S	12W	41-011	80.98	80.98		01	
N2NE/PT SWNE/LOT 4/PT LOT 3, SENW, LOTS 2 & 1	19	25S	12W	41-011	246.35	246.35		01	
N2/N2SW/SWSW/SESE	20	25S	12W	41-011	480.00	480.00		01	
N2NE/NW4/N2SW/SWSW/PT SESW/ W2SE	21	25S	12W	41-011	479.09	479.09		01	
N2NE/SENE/N2NW/E2SENE	22	25S	12W	41-011	220.00	220.00		01	
N2NW/PT SWNW, W2SW	23	25S	12W	41-011	133.99	133.99		01	
SENW/NESW/S2SW/SE4	24	25S	12W	41-011	320.00	320.00		01	
NENE/PT LOT 1/NESE/PT LOTS 3 & 2/SESE	25	25S	12W	41-011	191.69	191.69		01	
PT NENE/NWNE/PT SWNE, E2NW, LOT 4	29	25S	12W	41-011	159.82	159.82		01	
N2NE/PT LOT 3/SENE/PT N2NW, LOTS 5, 4 & 2	36	25S	12W	41-011	240.30	240.30		01	

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SESW/S2SE	01	24S	13W	41-011	120.00	120.00	01	
NE4	12	24S	13W	41-011	160.00	160.00	01	
PT LOTS 3, 2 & 1/PT SESW	25	24S	13W	41-011	74.37	74.37	01	
NE4/PT FR W2NW/SENW/SW4/W2SE	36	24S	13W	41-011	479.28	479.28	01	
E2SE	36	24S	13W	41-011	80.00		02	
NE4/NENW/PT W2NW/SENW/NESW/ PT NWSW, S2SW/NWSE	01	25S	13W	41-011	442.16	442.16	01	
NENE/N2N2SENE LESS .49 ACRE SOLD	13	25S	13W	41-011	49.51	49.51	01	

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Legal Description	Sec	Twp	Rng	St-Cty	Surface Acres	Net Acres	Min Ownership Type	**

Totals For:	Report
Surface Acres	208,882.53
Net Mineral Acres	189,653.11

