

HCP Amendment No. 1

Administrative Amendment to
the Northern Spotted Owl Conservation Strategy
for the Klickitat HCP Planning Unit



April 2004

Authority

This amendment to DNR's 1997 Habitat Conservation Plan is authorized under Section 25 of the implementation agreement, signed January 30, 1997.

Acknowledgments

This amendment was prepared by the Washington State Department of Natural Resources in a collaborative effort with federal and state agencies and the Yakama Nation.

See Appendix F for a list of contributors.

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April 20, 2004

Mr. Ken S. Berg, Manager
U.S. Fish and Wildlife Service
510 Desmond Drive SE, Suite 102
Lacey, WA 98503-1273

Dear Ken,

For the past two years, the Washington Department of Natural Resources (DNR) has been working closely with staff from the United States Fish and Wildlife Service (USFWS) and the Washington Department of Fish and Wildlife (WDFW) to develop a new conservation approach that will provide greater conservation benefits to the northern spotted owl (*Strix occidentalis caurina*) in the Klickitat Planning Unit than what was originally envisioned in the DNR's 1997 Habitat Conservation Plan (HCP). The result of this planning process has led to the document entitled "Administrative Amendment to the Northern Spotted Owl Conservation Strategy for the Klickitat Planning Unit" (enclosed). This amendment will replace specific sections of the original HCP strategy and now be the accepted approach for conserving spotted owls in the Klickitat Planning Unit.

The primary reasons for a modified approach to northern spotted owl conservation in this area is that some forests on the east slopes of the Washington Cascades are experiencing serious forest health problems. Many of these lands are within the range of the northern spotted owl and were designated to contribute to the conservation of the owl in DNR's 1997 HCP. However, in some areas, habitat for the spotted owl is experiencing a significant disease-caused degradation or elimination of suitable habitat that is compromising the effectiveness of the original HCP spotted owl conservation strategy. Moreover, the original commitment was based on land management strategies on adjoining National Forest lands and tribal lands owned by the Yakama Indian Nation. Declining forest health conditions have affected spotted owl habitat across land-ownerships, and different landowners are responding to this decline in their own way. To address these changes, the DNR sought assistance from the USFWS and the WDFW to develop a modified, ecologically sound, and operationally feasible strategy that is consistent with the original HCP northern spotted owl conservation goals and objectives.

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A requirement of the modified approach was that it must allow the DNR to manage forestlands as long term, sustainable forest ecosystems. In cooperation and collaboration with the USFWS and WDFW, the DNR has undertaken a habitat assessment of the Klickitat Planning Unit landscape. The Klickitat Planning Unit habitat assessment consists of four sub-landscapes. Each sub-landscape was assessed by vegetation series, forest health conditions, and use by northern spotted owls. After the landscape assessment was completed, individual approaches were developed for each sub-landscape based on owl demographics and the potential for each landscape to grow historic forest types that may function as owl habitat. Existing DNR forest inventory data was used in conjunction with spotted owl demography data, compiled through August 2003, by the National Council for Air and Stream Improvement, Inc. (NCASI) for the assessment.

This modified conservation strategy contains habitat targets by sub-landscape, upon which the DNR and USFWS have agreed. These targets replace the original HCP targets for the Klickitat Planning Unit. The DNR will meet these new habitat targets by sub-landscape in the Klickitat Planning Unit and annually report their status to the USFWS. In addition, there are other explicit commitments specified in the Klickitat amendment that the DNR will meet or exceed.

The amendment also identifies forest health situations that may arise in the future where the DNR will need to consult with the USFWS to jointly develop appropriate forest management solutions. In these consultation situations, our agencies will rely on the best scientific information available to make our decisions as we cautiously balance short-term risk versus long-term risk to spotted owls and their habitat.

Our agencies have cooperatively developed this proposal with short and long-term spotted owl conservation as a focus. With this amendment, we believe the level of take to spotted owls will be reduced from what the Biological Opinion analyzed and the Incidental Take permit (ITP) authorized. Because of this, the amendment will not involve the ITP, as described in the Implementation Agreement 25.3, and only pertains to the HCP. As such, the existing ITP (PRT-812521) remains in effect.

Overall, this administrative amendment results in:

- moving forests toward historic cover types more resistant to fire and insects;
- improving the DNR's ability to meet its HCP commitment by focusing development of habitat where it can be sustained for the long term;
- using sub-landscapes instead of 1/4 townships for dispersal habitat, and Watershed Administration Units (WAUs) for NRF habitat;
- providing short-term (10 years) protection of known occupied northern spotted owl nest sites regardless of where they are located;

- eliminating requirements to create and protect habitat where it is not sustainable and where no breeding owls exist; and
- promoting active management of entire landscapes over time to meet both habitat and revenue objectives.

Change Between Original HCP Commitment and Amendment Using New Planning Unit Boundary, and Re-designation of NRF and Dispersal/Desired Future Condition (DFC) Areas (not including near-NRF or ponderosa pine DFC).

	Acres of Original HCP Commitment	Acres of Amended HCP Strategy	Acres +/-
NRF Management Area	20,085	39,268	+ 19,183
Existing NRF Habitat on NRF Managed Area	6,731	14,636	+7,905
Dispersal/DFC Management Area	53,155	16,465	-36,690
Existing Dispersal/DFC Habitat on Dispersal/DFC Managed Area	27,091	9,084	-18,007

(Total difference of 17,507 acres reflects removal of non-forested areas, forest cover types not capable of growing NRF habitat, and the ponderosa pine vegetation series. The ponderosa pine vegetation series (15,886 acres) will be managed for ponderosa pine DFC at a sustainable stocking level not meeting the dispersal criteria of 50% canopy closure.)

Trout Lake Sub-Landscape

Much of this sub-landscape was correctly designated as NRF management area in the original HCP. The vegetation series in this sub-landscape are capable of growing and sustaining NRF habitat; the goal for this sub-landscape will be to maintain high quality, sustainable NRF where it currently exists.

1. NRF designation remains 5,257 acres. Maintain 50% of designated NRF management area (2,629 acres) in NRF habitat over space and time by sub-landscape, rather than by WAU. NRF habitat will be maintained and promoted:
 - o first in areas adjacent to known occupied and unoccupied owl nest sites;
 - o followed by areas that appear to have avoided stand-replacing fires in the past; and
 - o then areas that are the most sustainable as older, mature forest.

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2. Redesignate 503 acres of ponderosa pine vegetation series from dispersal management to Ponderosa Pine Desired Future Condition (PPDFC). Since resilient ponderosa pine stands are not normally sustained at the density required to meet dispersal criteria, the pine series will be managed for PPDFC at a stocking level that may not meet 50% canopy closure. DNR's goal is to maintain 50% of this vegetation series in PPDFC.
3. Manage Desired Future Condition management area (6,127 acres) for designated future condition by vegetative series and maintain 50% of each vegetative series.

Glenwood Sub-Landscape

This sub-landscape has experienced significant forest health problems such as spruce budworm, balsam woolly adelgid, armillaria root rot, bark beetles, etc. These symptoms of degraded forest health were largely a result of overstocking and species composition. Some of this sub-landscape contains acreage in the ponderosa pine and sub-alpine fir vegetation series that was designated as NRF habitat in the original HCP. These designations have now been changed to allow for ecologically sustainable management by vegetation series.

1. Change designated NRF management area from 10,806 acres to 7,907 acres based on the vegetation series' ability to grow and sustain NRF habitat. Maintain 50% of designated NRF management area (3,954 acres) in NRF habitat over space and time by sub-landscape. Much of the original NRF management area will be shifted to the Husum sub-landscape. Those acres that remain as designated NRF management areas will be maintained and promoted:
 - first in areas adjacent to known occupied and unoccupied owl nest sites;
 - followed by areas that appear to have avoided stand-replacing fires in the past; and
 - then areas that are the most sustainable as older, mature forest.
2. Redesignate 15,383 acres of ponderosa pine vegetation series from dispersal management to PPDFC. Since resilient ponderosa pine stands are not normally sustained at the density required to meet dispersal criteria, the pine series will be managed for PPDFC at a stocking level that may not meet 50% canopy closure. DNR's goal is to maintain 50% of this vegetation series in PPDFC.
3. Manage DFC management area (5,464 acres) for desired future condition over time by vegetative series and maintain 50% of each vegetative series (2,732 acres) in mature DFC).

Husum Sub-Landscape

The Husum sub-landscape (see Amendment, Appendix A; Map 9 & Map 10) consists primarily of the grand fir warm and grand fir cool vegetation series that are capable of growing and sustaining NRF habitat. The goal for this sub-landscape will be to increase the NRF commitment on those lands better suited to grow and sustain NRF habitat. This large block of habitat supports viable reproductive owls on DNR and adjoining federal lands. A large part of this sub-landscape has recovered from large stand-replacing fires, similar to the Yacolt burn that occurred in the early 1900s. A series of reburns has occurred in this sub-landscape, but no large stand-replacing fires have occurred in this sub-landscape in the last 60 years. Parts of this sub-landscape retain large areas of mature forests that were not consumed or severely altered during the Yacolt-type burns. These areas that appear to have avoided stand-replacing fires are identified as current NRF stands. As similar habitat grows in the sub-landscape, other acres of mature, sustainable forest may replace these currently existing NRF areas.

1. Increase designated NRF management area to 26,104 acres by re-designating 24,004 acres of dispersal management area, removing non-forested land, and combining with the previously designated NRF management acres.
2. Manage entire designated NRF management area over time to grow and maintain 1/3 of the landscape (8,701 acres) in NRF quality habitat (currently 36% of the landscape is in NRF habitat condition). NRF habitat will be maintained and promoted:
 - first in areas adjacent to known occupied and unoccupied owl nest sites;
 - followed by areas that appear to have avoided stand-replacing fires in the past; and
 - then areas that are the most sustainable as older, mature forest.
3. In addition to an 8,701-acre commitment that will be maintained as NRF habitat in the Husum sub-landscape, the DNR will implement a non-binding strategy to manage for an additional 1/3 of the landscape (8,701 acres) in a near-NRF condition (within 10 to 30 years of becoming NRF). Near-NRF is critical to assure adequate healthy sustainable replacement NRF stands. Growing and maintaining sustainable NRF stands through active management is the focal point of this sub-landscape strategy. Active management involves activities that help the stand achieve habitat goals. Each stand may require different active management techniques, depending on the stand age, stocking level, amount of retained structure, and stand history. Thinning will be used in many stands to help increase the number of large trees, reduce the number of small trees, create layers in the stand, or increase small-scale patchiness.

Under-planting shade tolerant species may also be used to increase the level of stand layering. Active management could also involve creation of snags, down wood, and patch cutting small areas on the ¼ acre to 3-acre scale. Regeneration-style harvests that retain structural components for the next rotation also constitute a form of active management. Active management will be used to grow stands toward quality NRF habitat in the shortest amount of time.

Klickitat Scattered Sub-Landscape

This sub-landscape consists of dispersed checkerboard ownership surrounded by privately owned forestland. Much of this sub-landscape is comprised of drier vegetation series and is consequently more difficult to sustain NRF habitat for long periods of time without some form of active management.

1. Within the first 10 years of this amendment, if the area around nest sites is declining due to forest health problems, silvicultural action may be taken, in consultation and collaboration with USFWS, to prevent the loss of habitat. After the first 10-year period, the DNR will consult with USFWS to determine if the nest sites in this sub-landscape continue to be important. Some questions which may be considered to determine the importance of these nest sites are:
 - o Is the nest site providing demographic support to the conservation objectives?
 - o Is the nest site still occupied?
 - o How close is the nest site to other nests or suitable habitat?

If the sites are still deemed important, the DNR will consult with USFWS before silvicultural activities take place.

2. Replace 320 acres of NRF management area and 4,922 acres of dispersal management area with 4,874 acres of DFC acres (see Amendment, Appendix B for description of DFC targets).
4. Redesignate 17 acres of ponderosa pine vegetation series from dispersal management to PPDFC. Since resilient ponderosa pine stands are not normally sustained at the density required to meet dispersal criteria, the pine series will be managed for PPDFC at a stocking level that may not meet 50% canopy closure. DNR's goal is to maintain 50% of this vegetation series in PPDFC.
5. In areas designated for DFC management, manage for DFC and maintain 50% of each vegetative series in DFC condition.

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6. In forested areas designated as no-role under the original HCP, the DNR will manage for DFC, consistent with DNR policies. These acres are not included in the DFC acreage commitment but they will be managed for sustainability.

This amended strategy has undergone fairly rigorous review by a number of experts in the field of northern spotted owl conservation. For example, multi-agency scientific reviews of the proposal were held on February 26, 2003, and again on January 29, 2004. This strategy has also undergone review through the State Environmental Policy Act (SEPA file number #04-020601), and minor modifications were made to the document based on this review.

It is our intent that this amendment will meet or exceed existing HCP commitments for the northern spotted owl in the Klickitat Planning Unit. Because of this, we believe the level of incidental take to spotted owls is actually reduced over what was originally authorized in the Incidental Take Permit (PRT-812521). This amendment applies only to the HCP, and the ITP remains in effect and unchanged.

The DNR will actively monitor this amended strategy according to the following objectives:

1. to determine whether this strategy is implemented as written; and
2. to determine whether implementation of this strategy results in the anticipated habitat conditions.

Detailed procedures will be prepared to implement the monitoring approaches for this strategy. These procedures will identify specific assumptions or hypotheses to be tested, data to be collected, sampling intensity and frequency, field and analysis methods, budgets, and timelines. A team of scientists from the DNR and USFWS will prepare monitoring procedures. At the annual DNR and USFWS HCP review, the DNR will provide implementation and effectiveness monitoring information relative to the commitments of this amendment.

Please signify your concurrence for adopting the Administrative Amendment to the Northern Spotted Owl Conservation Strategy for the Klickitat Planning Unit by signing these two originals. This amendment replaces the original HCP spotted owl approach for the Klickitat Planning Unit. Please return one original to me and retain the other original for your records. This concurrence letter serves as an administrative amendment to the 1997 HCP, a copy of which will be filed with the original HCP document. We look forward to working together on the implementation of this new conservation strategy for managing northern spotted owls in the Klickitat Planning Unit.

Mr. Ken Berg, Manager
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Sincerely,



Gretchen Nicholas, Manager
Land Management Division
Department of Natural Resources

I concur with this HCP Administrative Amendment to the Northern Spotted Owl Conservation Strategy for the Klickitat Planning Unit.



Date: 4-30-04

for Ken S. Berg
U.S. Fish and Wildlife Service
Western Washington Fish and Wildlife Office

c: Craig Hansen, USFWS
Mark Ostwald, USFWS
Bruce Mackey, DNR
Jack Hulse, DNR
Bill Boyum, DNR
Howard Thronson, DNR
Tami Riepe, DNR

HCP Amendment No. 1

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the Northern Spotted Owl Conservation Strategy
for the Klickitat HCP Planning Unit

April 2004



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

DNR Southeast Region

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I. Introduction

Amended Northern Spotted Owl Conservation Strategy for the Klickitat HCP Planning Unit

The goal of the landscape-based process outlined in this document is to meet or exceed the conservation commitment of the original Habitat Conservation Plan (HCP), while reducing risk of catastrophic habitat loss and increasing the quality of habitat that contributes to the conservation objective. This document outlines an administrative amendment to the original HCP. This amendment will be applied within the Klickitat HCP Planning Unit, other HCP lands will continue to be managed under the original HCP. The changes described in this administrative amendment were developed through a collaborative process with federal, state, tribal and private groups.

The northern spotted owl was listed as a threatened species under the Endangered Species Act (ESA) in 1990. Section 10 of the ESA offers non-federal landowners and managers an option of developing a HCP, which allows more flexibility and stability in land management activities in protection of the species listed in the ESA. In 1997, the Washington State Department of Natural Resources (Washington State DNR, hereafter cited as DNR) entered into an agreement with the United States Department of the Interior through the United States Fish and Wildlife Service (USFWS) and the United States Department of Commerce through the National Marine Fisheries Service (NMFS)(now named NOAA Fisheries Service) to manage state lands while providing for the conservation of threatened and endangered species.

II. Original HCP Strategy

DNR's conservation objective for the northern spotted owl is to provide habitat that makes a significant contribution to demographic support, maintenance of species distribution, and facilitation of dispersal. The conservation strategies for the northern spotted owl consist of four main components: identification of DNR-managed lands most important to spotted owl conservation; determination of habitat goals for areas established to provide nesting, roosting and foraging habitat (NRF); guidelines for management activities allowed in NRF habitat area; and guidelines for the provision of dispersal habitat.

DNR has identified several circumstances that impact the conservation objective of the original HCP:

- Some lands designated to provide nesting, roosting and foraging habitat (NRF) are not ecologically suited to grow and sustain this habitat.
- Forest health issues are eliminating or degrading thousands of acres of current NRF habitat in DNR's designated NRF management areas.
- The distribution and numbers of viable northern spotted owl nest sites have changed since the HCP was signed.
- The United States Department of Agriculture Forest Service (USFS) and Yakama Nation have experienced similar dramatic impacts to their forests from deteriorating forest health.

One of the primary features of DNR's HCP was to provide demographic support to spotted owls on these impacted USFS and Yakama Nation lands. In light of these dynamics, DNR submits this administrative amendment to the HCP to meet its spotted owl conservation objectives.

Background

Forests on the east slopes of the Washington Cascades are experiencing significant forest health problems (see Appendix A: Map 1). Many of these lands are within the range of the northern spotted owl (*Strix occidentalis caurina*) and were designated to play a role as part of DNR's 1997 HCP for conservation of the owl. However, habitat for the owl is experiencing significant decrease or loss and is compromising the effectiveness of the original spotted owl conservation strategy. Moreover, the original commitment was also based on the distribution of viable northern spotted owl circles and land management strategies on adjoining USFS lands and tribal lands owned by the Yakama Nation. Forest health conditions in the eastern Cascades have been declining for decades; since the HCP was signed there

have also been changes in spotted owl demographics, land management strategies and forest health conditions of adjoining federal and tribal landowners. To address these changes DNR sought assistance from the USFWS and the Washington Department of Fish and Wildlife (WDFW) to develop a modified, ecologically sound, and operationally feasible strategy that is consistent with the original HCP goals.

A requirement of the new modified plan was that it must allow DNR to manage forestlands as long term, sustainable forest ecosystems. In cooperation and collaboration with the USFWS and WDFW, the DNR has undertaken a habitat assessment of the Klickitat Planning Unit landscape (see Appendix A: Map 2). The Klickitat Planning Unit habitat assessment consists of four sub-landscapes (see Appendix A: Map 4). Each sub-landscape was assessed by vegetation series, forest health conditions, and use by spotted owls. After the landscape assessment was complete, individual approaches were developed for each sub-landscape. Existing DNR forest inventory data was used in conjunction with spotted owl demography data, compiled through August 2003, by the National Council for Air and Stream Improvement, Inc. (NCASI) for the assessment.

Forest Health Issue

Since before 1900, land management practices and wildfire exclusion have changed the composition of forest stands in the eastern Washington Cascades. The historic condition of forests in the eastern Washington Cascades was maintained by frequent low and moderate-severity fire events, or fire regimes. These fire regimes tended to maintain stands by lowering fuel loads and reducing stem densities, creating a sustainable, fire-stable stand. Today, fire exclusion and other management practices have created stands with heavy fuel loading and high stand densities. Stands in this condition are difficult to sustain over time because they are overstocked, often with shade-tolerant tree species that are vulnerable to forest pests and disease. The stress from overstocking affects all tree species, and this stress combined with increased fuel loading puts entire landscapes at higher risk of stand replacing fires. The current overstocked condition has temporarily increased the amount of suitable northern spotted owl habitat by providing dense overstories. However, this habitat is inherently unstable and at increased risk of mortality due to insects, disease, and stand-replacing fire; some form of management must be undertaken to address this issue.

The ability of DNR land managers to treat the forest health issue is somewhat constrained by the original HCP strategies related to habitat threshold targets. In spotted owl nesting, roosting, and foraging (NRF) management areas that are below threshold, waiting until the NRF habitat degrades into non-habitat from forest health impacts is not prudent for a land manager such as DNR. Instead, DNR will use active management (variable density thinning,

changing species composition, while retaining large, difficult to grow structure such as large trees, snags, downed wood) to manage for long-term sustainable habitat. Continued emphasis on stocking control in all habitat types is a primary strategy to address current and future forest health conditions in eastern Washington. In addition, DNR desires to use active management to focus on NRF habitat creation and not merely habitat protection. DNR will address the forest health issue of overstocking and inappropriate species composition by adjusting stand composition to favor long-lived seral species, and by developing mixed species and even-structured stands (dependent on vegetation series). These replacement stands are more representative of historic stand conditions and consequently more resistant to insects, disease, and stand-replacing fire. The goal over time is to establish a more historic forest composition and manage each landscape based on its ability to grow and sustain spotted owl habitat (see Appendix E for more information on DNR's approach to forest health).

III. Amended HCP Strategy

DNR's HCP conservation objectives for the northern spotted owl in the Klickitat Planning Unit are unchanged. The objectives are still to provide functioning habitat that makes a significant contribution to spotted owl demographic support, maintenance of species distribution, and facilitation of dispersal. Each of these objectives is dependent on the geographic proximity to USFS and Yakama Nation lands because of their resident owl populations. Changing conditions such as declining forest health on these federal and tribal lands along with deteriorating conditions on DNR lands create challenges in meeting the original assumptions and achieving the habitat goals set by the original HCP.

In consultation with USFWS and WDFW, the DNR has agreed to draft this amendment to the original HCP to conduct the treatments needed to address forest health conditions in the Klickitat HCP Planning Unit. The administrative amendment may be approved if unanimous consent exists between DNR and USFWS/ NOAA Fisheries, and the level of take and mitigation resulting from the amendment are not significantly different from the original HCP.

Early in the planning process, on February 26, 2003, DNR convened a meeting of technical and scientific experts to evaluate the proposed change to the spotted owl conservation strategy for the Klickitat Planning Unit. George Shelton (DNR) and Paula Swedeen (WDFW) presented the proposed strategy and answered questions regarding the proposed amendment. DNR was interested in evaluating the impacts the new strategy would have on spotted owls, and desired to include participation of leading biologists and forest managers in the Pacific Northwest. At this meeting, DNR encouraged comments and suggestions on what strategies should be included in the administrative amendment. Apart from points discussed and documented at the meeting, DNR received two formal written comments, one from the Yakama Nation and another from inside DNR. These comments have been integrated into the administrative amendment.

The USFWS and DNR held another technical and scientific review on January 29, 2004. The purpose of this follow-up meeting was to receive constructive feedback and further review the amendment and address any additional questions or comments from experts in the field of biology and forest ecology. These comments have been integrated into the administrative amendment. A list of participants for both meetings can be found in Appendix D.

After comments from these reviews and the ongoing collaboration with USFWS and WDFW were incorporated into the amendment, DNR voluntarily decided to submit the amendment through the State Environmental Policy Act (SEPA) process to allow for public comment. Input from the SEPA review

has also been integrated into the amendment. All of these stages of input have resulted in crafting a thorough amendment that should help DNR accomplish its conservation objectives.

Overview

Overall, the DNR and USFWS believe this new administrative amendment will result in:

- Moving forests toward historic cover types more resistant to fire and insects.
- Improving DNR's ability to meet its HCP commitment by focusing development of habitat where it can be sustained for the long term. To help achieve this goal the amendment using sub-landscapes instead of quarter-townships for dispersal habitat, and sub-landscapes instead of Watershed Administration Units (WAUs) for NRF habitat.
- Providing short term (10 years) protection of known occupied northern spotted owl nest sites regardless of where they are located.
- Elimination of requirements to create and protect habitat where it is not sustainable and where no breeding owls exist.
- The promotion of active management of entire landscapes over time to meet both habitat and revenue objectives.

The specific changes listed below were all considered collectively to develop a revised owl conservation strategy. No one element drove the revision in isolation of the others. As discussed later, this revised owl strategy in the Klickitat Planning Unit has been broken down into four distinct sub-landscapes. Later in the discussion on specific owl strategies by sub-landscape, we will detail how each of the elements are applied.

Changes

1. Adjust Planning Unit Boundary: Adjust the Klickitat Planning Unit boundary to include the portion north of the Yakama Nation lands within the Yakima Planning Unit. Approximately 23,000 acres of dispersal management area in the Ahtanum Landscape are now part of the Yakima Planning Unit, and are not included with this amendment. This adjustment by itself makes no acreage change in overall habitat designation. The existing boundary bisects the Ahtanum sub-landscape. This division makes managing the Ahtanum sub-landscape to meet conservation objectives on a landscape basis impractical. As a result of this change the entire Ahtanum sub-landscape will be part of the Yakima Planning Unit (see Appendix A: Map 3 & Map 4). Changes to the Yakima Planning Unit will be addressed at a later date.

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2. **Redesignation of NRF Management Areas:** Based on the physical capability of a site to produce and sustain NRF, some areas previously designated for NRF management are to be reclassified for dispersal management. Other areas capable of producing and sustaining NRF that were previously designated for dispersal management are now reclassified under the NRF management designation. Generally the administrative amendment does the following:
- A. **The administrative amendment adds NRF management goals to lands more suited to growing and sustaining NRF habitat on lands not currently designated as NRF but currently occupied by owls.** Maintenance and creation of NRF stands will focus around active spotted owl nest sites and in areas shown to be most suited to growing and sustaining NRF habitat (such as the grand fir warm vegetation series). Suitable areas will be evaluated based on vegetation series and site quality.
 - B. **The administrative amendment removes NRF goals in overstocked, dry vegetation types such as ponderosa pine, which are not currently occupied by owls and are not capable of growing spotted owl habitat.**
 - C. **The administrative amendment removes NRF goals in cold unproductive vegetation types not currently occupied by breeding spotted owls and not capable of growing suitable spotted owl habitat.** For example, much of the sub-alpine fir and cold grand fir vegetative series are strongly influenced by soil thermal properties. They are not capable of growing and sustaining NRF habitat to meet the long-term HCP objectives. These will be managed as dispersal or DFC (see Appendix B for a description of DFC).
 - D. **The administrative amendment focuses active management on NRF habitat development using sub-landscapes instead of WAUs, to identify habitat that can best sustain desired characteristics.**
 - E. **The administrative amendment recognizes stands in designated NRF management areas that currently have too many trees per acre to meet suitable NRF habitat, but all other habitat elements are present.** These stands will be recognized as NRF habitat, but not counted towards meeting the NRF target until the stocking level has been addressed. DNR will focus on improving these stands through thinning regimes to meet NRF criteria, rather than regeneration-style harvest. This change is needed to protect potential habitat and allow these stands to be thinned to meet the NRF definition while protecting legacy structures such as snags, large remnant trees, and large down wood. These potential habitat stands will be actively managed to meet the parameters of the original NRF definition. This refinement

will also result in more large live trees and snags than the original definition.

F. The administrative amendment utilizes a strategy to promote the creation and maintenance of NRF habitat through the concept of near-NRF (see glossary). Near-NRF resembles NRF except it lacks a stand component, such as canopy closure or snags. An expectation of near-NRF is that this missing component will develop within 30 years. Some of the many avenues available to assist the development of near-NRF into NRF are outlined in Appendix C. This non-binding near-NRF strategy uses active silvicultural management to develop NRF habitat in an accelerated period of time, which will then contribute to the NRF acreage commitment. In addition, stands which currently meet NRF criteria but will degrade out of NRF habitat within 10 years may receive active management to move the stand into the near-NRF category, keeping quality habitat situated in critical areas (USFWS will be consulted to develop a mutually agreeable approach if the sub-landscape is below NRF thresholds). This strategy should allow for the continued sustainability of NRF habitat over a landscape. The near-NRF strategy, using active silvicultural management to create or sustain habitat is the key to meeting HCP commitments in the Klickitat HCP planning unit.

G. The administrative amendment increases the legacy tree retention level in NRF managed areas. The original HCP contained no legacy tree requirements but the administrative amendment formalizes this crucial aspect of landscape management. Retaining large, unique, difficult to replace structure is important to growing NRF habitat for the future. An average target of at least 10 to 12 trees per acre from the largest diameter classes will be retained during harvest to speed the stand's growth into NRF habitat.

3. Provide Protection for Occupied Owl Nest Sites: The original HCP provided no specific protection for most occupied owl nest sites but DNR wishes to provide 10-year nest site protection plans for all occupied northern spotted owl nest sites regardless of location, even in lands currently designated as having no role. Based on new information on owl nest sites from the ongoing work of NCASI, there are currently eleven occupied owl nest sites will receive this added protection. Seven nest sites are situated in designated NRF management areas: #734, #774, #852, #874, #991, #1001, and #1116. Four occupied nest sites are located in areas with no NRF habitat designations: #1085, #992, #1074, and #459. These sites will be reevaluated after 10 years, in consultation with USFWS. If the sites have been unoccupied for 5 years prior to the review, then the sites will be protected as unoccupied sites, in consultation with the USFWS.

Some characteristics which may be considered to determine the level of protection for these nest sites are:

- Is the nest site providing demographic support to the conservation objectives?
- Is the nest site presently occupied, or is there a likelihood of re-occupancy?
- How close is the nest site to other nests or suitable habitat?

Management activities in occupied nest core areas will be conducted in consultation with USFWS. Occupied owl nest sites on land near to DNR's designated NRF managed areas should be positively influenced by the landscape level management outlined in this document.

4. Conserve Unoccupied Owl Nest Sites: The original HCP provided no specific protection for most unoccupied owl nest sites but DNR wishes to conserve these sites for at least 10 years. Owl nest sites that no longer support or contain a northern spotted owl will be provided additional protection above the habitat goals provided as part of the landscape strategy. Nest sites previously selected by spotted owls for nesting may have a higher probability of re-occupancy by other spotted owls than random sites in a landscape. As habitat conditions improve around the conserved nest sites over time, re-occupancy by spotted owls may be expected. The unoccupied conserved nest sites are #632, #735, #828, and #875. Management activities in unoccupied nest core areas will be conducted in consultation with USFWS.

5. Redesignation/Renaming of Dispersal Management Areas: Dispersal management areas will now be referred to as Desired Future Condition (DFC) areas. Based on the physical capability of a vegetation series to produce and sustain dispersal habitat, some areas previously designated for dispersal management are to be reclassified for NRF management. Other areas previously designated for NRF management are to be reclassified under the DFC management designation. Generally, the administrative amendment does the following:

- A. **Lands designated as DFC management areas will be managed based on vegetative series by sub-landscape rather than by quarter-township.** Managing by sub-landscape, rather than by quarter-township, will allow DNR to manage sites based upon their ecological potential. This landscape-based perspective will help to identify habitat that can best sustain desired characteristics.
- B. **DNR will continue to meet dispersal habitat commitments through a strategy to manage for desired future condition (DFC).** DFC habitat commitments are equal to dispersal habitat commitments (40 trees per acre, 11 inches in diameter, 50 percent canopy cover, 60 feet tall) but with the addition of a goal to create more complex habitat through retention of important structural components and managing

stands for sustainability. Each vegetative series will be actively managed to achieve and maintain 50 percent of the vegetative series by sub-landscape in a mature desired future condition (see Appendix B for a list of vegetative series and description of DFC). This change in strategy not only results in dispersal quality habitat that meets the original definition (see glossary) but also provides more diversity to support other species (northern goshawk, white-headed woodpecker, etc). Though not specifically tied to the administrative amendment, habitat created in NRF areas will function as important habitat for other mature forest obligates and associated species. Habitat created in DFC areas may function as important habitat as well. In addition, this move back to a more historic composition promotes a healthy, more sustainable ecosystem.

- C. **The administrative amendment removes 15,886 acres of ponderosa pine vegetation series from the dispersal management designation and these areas will be referred to as ponderosa pine DFC areas (PPDFC).** DNR and USFWS recognize that stands in the ponderosa pine vegetation series do not sustain dispersal habitat because of canopy closure requirements. DNR wishes to manage pine areas as resilient, sustainable forests and it is not possible to move these stands back to more historic conditions and still meet dispersal criteria. Ponderosa pine stands were historically maintained by frequent, low-intensity fires that kept the stands more open and reduced the numbers of shade tolerant, disease-prone trees in the understory. The reduction of fire in this vegetation series has led to large areas of overstocked, unsustainable stands. Young ponderosa pine in this condition can temporarily meet dispersal criteria. However, this density is not sustainable and as the trees grow there will be fewer trees per acre and the stand will not meet the 50 percent canopy closure threshold. DNR's goal is to maintain 50 percent of the ponderosa pine vegetation series in a PPDFC condition by sub-landscape (see Appendix B).
- D. **The administrative amendment increases the retention of large legacy trees in DFC and ponderosa pine DFC managed areas.** The original HCP contained no legacy tree requirements but the administrative amendment formalizes this crucial aspect of landscape management. Retaining large, unique, difficult to replace structure is important to growing DFC habitat for the future. An average target of at least six trees per acre from the largest diameter classes will be retained during harvest to speed the stand's growth into DFC and PPDFC.

Table 1a and Table 1b below show the change in acreage in the planning unit between the original HCP commitment and the administrative amendment (see Appendix A: Map 3 & Map 4).

Table 1a. Change Between Original HCP Commitment and Amendment Using New Planning Unit Boundary and Redesignation of NRF and Dispersal/DFC Areas (not including near-NRF or ponderosa pine DFC).

	Acres of Original HCP Commitment	Acres of Amended HCP Strategy	Acres +/-
NRF Management Area	20,085	39,268	+ 19,183
Existing NRF Habitat on NRF Managed Area	6,731	14,636	+7,905
Dispersal/DFC Management Area	53,155	16,465	-36,690
Existing Dispersal/DFC Habitat on Dispersal/DFC Managed Area	27,091	9,084	-18,007

(Total difference of 17,507 acres reflects removal of non-forested areas, forest cover types not capable of growing NRF habitat, and the ponderosa pine vegetation series. The ponderosa pine vegetation series (15,886 acres) will be managed for ponderosa pine DFC at a sustainable stocking level not meeting the dispersal criteria of 50 percent canopy closure.)

Table 1b. Breakdown of Acreage Change Between Original HCP Commitment and the Administrative Amendment.

NRF Management Area

Original HCP: 19,939 designated NRF acres (acreage from HCP chapter IV, page 30).

- Land exchanges/acquisitions: +146 ac. = 20,085.
- Amendment change: -10 ac. Trout Lake sub-landscape (removed non-forest acres).
- Amendment change: -2,899 ac. Glenwood sub-landscape (vegetation series not capable of growing or sustaining NRF, redesignated as dispersal).
- Amendment Change: +22,412 ac. Husum sub-landscape (acres redesignated from dispersal).
- Amendment change: -320 ac. Klickitat Scattered sub-landscape (small, isolated parcels not suitable for NRF management).

Administrative Amendment to the HCP: 39,268 designated NRF acres.

DFC Management Area

Original HCP: 53,155 designated dispersal acres (76,726 acres (from HCP chapter IV, page 30), minus the 23,571-acre change to planning unit boundary. The acreage is still under dispersal management, but now in the Yakima HCP Planning Unit).

- Amendment change: -763 ac. Trout Lake sub-landscape (removed 503 acres of ponderosa pine vegetation series from dispersal management. These acres will be managed for PPDFC at a stocking level that will not sustain 50 percent canopy closure. Also removed 260 non-forest acres).
- Amendment change: -11,875 ac. Glenwood sub-landscape (removed 15,383 acres of ponderosa pine vegetation series from dispersal management. These acres will be managed for PPDFC at a stocking level that will not sustain 50 percent canopy closure. Also added 2,899 acres previously designated as NRF. Improved forest inventory accounts for remaining 609 acres).
- Amendment change: -24,004 ac. Husum sub-landscape (redesignated 22,412 acres as NRF, removed 1,592 acres which are non-forest or not capable of growing NRF).
- Amendment change: -48 ac. Klickitat Scattered sub-landscape (removed 17 acres of ponderosa pine vegetation series from dispersal management. These acres will be managed for PPDFC at a stocking level that will not sustain 50 percent canopy closure. Also removed 31 non-forest acres).

Administrative Amendment to the HCP: 16,465 designated DFC acres.

Please see the CHANGES BY SUB-LANDSCAPE section for detailed explanation of changes in each sub-landscape.

(Total difference of 17,507 acres reflects removal of non-forested areas, forest cover types not capable of growing NRF habitat, and the ponderosa pine vegetation series, The ponderosa pine vegetation series (15,886 acres) will be managed for ponderosa pine DFC at a sustainable stocking level not meeting the dispersal criteria of 50 percent canopy closure.)

6. Utilize Monitoring: To ensure habitat goals are met and strategies are appropriate given population status through time, DNR will monitor the effectiveness of this strategy over time and modify it as needed to better meet the plan objectives. Any monitoring and survey work will be accomplished as outlined in the original HCP document under Section V, Plan Implementation Monitoring. Additionally, DNR will report the amount of NRF habitat and near-NRF conditions after each annual review within the Klickitat Planning Unit.

IV. Changes by Sub-Landscape

Trout Lake Sub-Landscape

Much of this sub-landscape (see Appendix A: Map 5 & Map 6) was correctly designated as NRF management area in the original HCP. The vegetation series in this sub-landscape are capable of growing and sustaining NRF habitat; the goal for this sub-landscape will be to maintain high quality, sustainable NRF where it currently exists.

Table 2 summarizes specific sub-landscape goals. Other specific sub-landscape changes are:

1. NRF designation remains 5,257 acres. Maintain 50 percent of designated NRF management area (2,629 acres) in NRF habitat over space and time by sub-landscape, rather than by WAU. NRF habitat will be maintained and promoted:
 - First, in areas adjacent to known occupied and unoccupied owl nest sites.
 - Second, in areas that appear to have avoided stand-replacing fires in the past.
 - Third, in areas that are the most sustainable as older, mature forest.
2. Re-designated 503 acres of ponderosa pine vegetation series from dispersal management to PPDFC. Since resilient ponderosa pine stands are not normally sustained at the density required to meet dispersal criteria, the pine series will be managed for PPDFC at a stocking level that may not meet 50 percent canopy closure. DNR's goal is to maintain 50 percent of this vegetation series in PPDFC.
3. Manage DFC management area (6,127 acres) for desired future condition by vegetative series and maintain 50 percent of each vegetative series (3,064 acres) in mature DFC (see Appendix B for description of DFC targets). Harvests will be distributed throughout the sub-landscape over time to avoid concentrating impacts in any one area.
4. Developed an unoccupied nest site plan for site #828 (see pages 25-28).

Table 2. Trout Lake Sub-Landscape Summary

	Acres of Original HCP Commitment	Acres of Amended HCP Strategy	Acres +/-
NRF Management Area	5,267	5,257	- 10*
Existing NRF Habitat on NRF Managed Area	2,545	1,319	-1,226**
Dispersal/DFC Management Area	6,890	6,127	- 763*
Existing Dispersal/DFC Habitat on Dispersal/DFC Managed Area	2,731	2,547	-184

**Reflects removal of the ponderosa pine vegetation series and non-forest acres.*

***Difference in method for determining canopy closure, not the result of any harvest activity.*

Glenwood Sub-Landscape

This sub-landscape (see Appendix A: Map 7 & Map 8) has experienced significant forest health problems such as spruce budworm, balsam woolly adelgid, Armillaria root rot, bark beetles, etc. These symptoms of degraded forest health were largely a result of overstocking and species composition. Some of this sub-landscape contains acreage in the ponderosa pine and sub-alpine fir vegetation series that was within the designated NRF area in the original HCP. These designations have now been changed to allow for ecologically sustainable management by vegetation series.

Table 3 summarizes specific Glenwood sub-landscape goals. Other specific sub-landscape changes are:

1. Change designated NRF management area from 10,806 acres to 7,907 acres based on the vegetation series' ability to grow and sustain NRF habitat. Maintain 50 percent of designated NRF management area (3,954 acres) in NRF habitat over space and time by sub-landscape. Much of the original NRF management area will be shifted to Husum sub-landscape. Those acres that remain as designated NRF management areas will be maintained and promoted:
 - First, in areas adjacent to known occupied and unoccupied owl nest sites.

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- Second, in areas that appear to have avoided stand-replacing fires in the past.
 - Third, in areas that are the most sustainable as older, mature forest.

It is important to note that DNR has some reservation about the long-term sustainability of NRF habitat (under its current definition) in the northern portion of the Glenwood sub-landscape, due to aggressive growth of disease-prone species (grand fir) in the area. DNR will continue to manage this area as NRF habitat but will reevaluate the status of this location during the decadal review.

2. Re-designated 15,383 acres of ponderosa pine vegetation series from dispersal management to PPDFC. Since resilient ponderosa pine stands are not normally sustained at the density required to meet dispersal criteria, the pine series will be managed for PPDFC at a stocking level that may not meet 50 percent canopy closure. DNR's goal is to maintain 50 percent of this vegetation series in PPDFC.
3. Manage DFC management area (5,464 acres) for desired future condition over time by vegetative series and maintain 50 percent of each vegetative series (2,732 acres) in mature DFC (see Appendix B for description of DFC targets).
4. Developed occupied nest site protection plans for owl nest sites #1001 and #774, and an unoccupied nest site plan for site #632 (see pages 25-28).

Table 3. Glenwood Sub-Landscape Summary

	Acres of Original HCP Commitment	Acres of Amended HCP Strategy	Acres +/-
NRF Management Area	10,806	7,907	- 2,899*
Existing NRF Habitat on NRF Managed Area	2,210	3,812	+ 1,602**
Dispersal/DFC Management Area	17,339	5,464	-11,875
Existing Dispersal/DFC Habitat on Dispersal/DFC Managed Area	7,507	4,035	-3,472

* A primary feature of this amendment would increase the amount of NRF managed area in the Klickitat Planning Unit by 19,183 acres. The reduction of NRF acreage in the Glenwood sub-landscape would be shifted to NRF management acres in the Husum sub-landscape.

** Difference in method for determining canopy closure.

(The difference of 14,774 acres reflects removal of the ponderosa pine vegetation series and better forest inventory data.)

Husum Sub-Landscape

The Husum sub-landscape (see Appendix A: Map 9 & Map 10) consists primarily of the grand fir warm and grand fir cool vegetation series that are capable of growing and sustaining NRF habitat. The goal for this sub-landscape will be to increase the NRF commitment on those lands better suited to grow and sustain NRF habitat. This large block of habitat supports viable reproductive owls on DNR and adjoining federal lands. A large part of this sub-landscape has recovered from large stand replacing fires, similar to the Yacolt burn, that occurred in the early 1900's. A series of reburns has occurred in this sub-landscape, but no large stand-replacing fires have occurred in this sub-landscape in the last 60 years. Parts of this sub-landscape retain large areas of mature forests that were not consumed or severely altered during the Yacolt-type burns. These areas that appear to have avoided stand-replacing fires are identified as current NRF stands. As similar habitat grows in the sub-landscape, other acres of mature, sustainable forest may replace these currently existing NRF areas.

Table 4 summarizes specific sub-landscape goals. Other specific sub-landscape changes are:

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1. Increase designated NRF management area to 26,104 acres by re-designating 24,004 acres of dispersal management area, removing non-forested land and combining with the previously designated NRF management acres.
 2. Manage entire designated NRF management area over time to grow and maintain one-third of the landscape (8,701 acres) in NRF quality habitat (currently 36 percent of the landscape is in NRF habitat condition). NRF habitat will be maintained and promoted:
 - First, in areas adjacent to known occupied and unoccupied owl nest sites.
 - Second, in areas that appear to have avoided stand-replacing fires in the past.
 - Third, in areas that are the most sustainable as older, mature forest.
 3. Developed owl nest site protection plans for five occupied owl nest sites, #734, #852, #1116, #874, and #991 and one unoccupied owl site, #875 (see pages 25-28).
 4. In addition to an 8,701 acre commitment that will be maintained as NRF habitat in the Husum sub-landscape, DNR will implement a non-binding strategy to manage for an additional one-third of the landscape (8,701 acres) in a near-NRF condition (within 10 to 30 years of becoming NRF). Near-NRF is critical to assure adequate healthy sustainable replacement NRF stands. Growing and maintaining sustainable NRF stands through active management is the focal point of this sub-landscape strategy. Active management involves activities that help the stand achieve habitat goals. Each stand may require different active management techniques, depending on the stand age, stocking level, amount of retained structure, and stand history. Thinning will be used in many stands to help increase the number of large trees, reduce the number of small trees, create layers in the stand, or increase small-scale patchiness. Underplanting shade tolerant species may also be used to increase the level of stand layering. Active management could also involve creation of snags, down wood, and patch cutting small areas on the ¼ acre to 3 acre scale. Regeneration-style harvests that retain structural components for the next rotation also constitute a form of active management. Active management will be used to grow stands toward quality NRF habitat in the shortest amount of time.

Table 4. Husum Sub-Landscape Summary

	Acres of Original HCP Commitment	Acres of Amended HCP Strategy	Acres +/-
NRF Management Area	3,692	26,104	+ 22,412
Existing NRF Habitat on NRF Managed Area	1,976	9,505**	+ 7,529
Existing near-NRF Habitat on NRF Managed Area	0	5,798	+ 5,798
Dispersal/DFC Management Area	24,004	0	- 24,004*

**These acres are now managed as NRF.*

***The 9,505 acres of existing NRF have been field checked, with an additional 817 remote acres not yet checked.*

(Difference of 1,592 total acres reflects removal of non-forested areas and forest cover types not capable of growing NRF habitat.)

Klickitat Scattered Sub-Landscape

This sub-landscape (see Appendix A: Map 11) consists of dispersed checkerboard ownership surrounded by privately-owned forestland. Much of this sub-landscape is comprised of drier vegetation series and is consequently more difficult to sustain NRF habitat for long periods of time without some form of active management.

Table 5 summarizes specific Klickitat Scattered sub-landscape goals. Other specific sub-landscape changes are:

1. Developed occupied owl nest site protection plans for owl nest sites #1074, #992, #1085, and #459. Developed an unoccupied nest site plan for nest site #735 (see pages 25-28).
2. Within the first 10 years of this amendment, if the area around nest sites is declining due to forest health problems (see Forest Health section), silvicultural action may be taken, in consultation and collaboration with USFWS, to prevent the loss of habitat. After the first 10 year period, DNR will consult with USFWS to determine if the nest sites in this sub-landscape continue to be important. Some characteristics which may be considered to determine the importance of these nest sites are:

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- Is the nest site providing demographic support to the conservation objectives?
 - Is the nest site still occupied?
 - How close is the nest site to other nests or suitable habitat?

If the sites are still deemed important, DNR will consult with USFWS before silvicultural activities take place (see Appendix E for more information on forest health).

3. Replaced 320 acres of NRF management area and 4,922 acres of dispersal management area with 4,874 acres of DFC acres (see Appendix B for description of DFC targets).
4. Re-designated 17 acres of ponderosa pine vegetation series from dispersal management to PPDFC. Since resilient ponderosa pine stands are not normally sustained at the density required to meet dispersal criteria, the pine series will be managed for PPDFC at a stocking level that may not meet 50 percent canopy closure. DNR's goal is to maintain 50 percent of this vegetation series in PPDFC.
5. In areas designated for DFC management, manage for DFC and maintain 50 percent of each vegetative series in DFC condition.
6. In forested areas designated as no-role under the original HCP, DNR will manage for DFC, consistent with DNR policies. These acres are not included in the DFC acreage commitment but they will be managed for sustainability.

Table 5. Klickitat Scattered Sub-Landscape Summary

	Acres of Original HCP Commitment	Acres of Amended HCP Strategy	Acres +/-
NRF Management Area	320	0	- 320*
Existing NRF Habitat on NRF Managed Area	0	0	0
Dispersal/DFC Management Area	4,922	4,874	- 48**
Existing Dispersal/DFC Habitat on Dispersal/DFC Managed Area	2,553	2,502	-51

* *Small isolated NRF parcels not suitable for NRF management*

** *Reflects removal of the ponderosa pine vegetation series and non-forest acres*

V. Spotted Owl Nest Site Plans

Nest site plans are documented on orthophotos as well as in DNR's Planning and Tracking System and the GIS database. Any nest site plan may involve field review/ID team review prior to any planned harvest activities.

Management activities in occupied and unoccupied nest core areas will be conducted in consultation with USFWS. In NRF sub-landscapes, nest core areas will also be part of existing NRF acreage commitments. Outside NRF sub-landscapes, nest core areas will be managed on an individual basis. These are generally areas in the Klickitat Scattered sub-landscape that require a dry site management strategy.

Occupied Nest Site Plans

There are 11 occupied nest sites that have formal nest site plans. One nest site, #874, is located in a Natural Area Preserve (NAP) and also has a plan, but since NAP lands are not actively managed for timber harvest this plan is different than plans in actively managed landscapes. Seven occupied nest sites occur in NRF landscape areas. The nest site plans for these seven nest sites are also supported by the NRF habitat in the surrounding landscape. The remaining four occupied nest sites are located in areas not previously protected as owl habitat under the original HCP. These areas now have nest cores placed around them. All nest sites have timing restrictions placed on them consistent with original HCP provisions. If possible, harvest will be avoided in the designated nest site cores, but if forest health conditions jeopardize the long-term sustainability of the habitat, some form of management will be undertaken (see Appendix E for more information on forest health). If management is considered necessary in core areas of occupied nest sites, DNR will consult and collaborate with USFWS prior to any harvest activities.

#991

Occupied nest site with a pair in 2000, located in Husum NRF sub-landscape. Nest cores appear to be in non-operable or difficult to harvest areas in non-contiguous, isolated, and sinuously connected patches separated by a ridgeline. Surrounding stands are patchy but could be enhanced by thinning and stocking control; a thorough forest health assessment is needed. Stands should be fairly easy to manage with the goal of mature, sustainable habitat. A 168-acre core is placed around the nest site center that encompasses the nest sites and is compatible with other nearby harvest plans.

#1074

Occupied nest site, pair in 2000. Located in an eastern no-role Klickitat Scattered sub-landscape. Protect nest cores; treat surrounding acres with the

mature habitat goals of maintaining structure, improving sustainability, and having as much canopy closure as possible. Balance forest health needs with these owl habitat goals; use timing restrictions and treat entire area, including the nest cores, when and where needed. Parts of stand around nest are overstocked; treat these stands using appropriate timing restrictions. Nest site is located in a dry, isolated, eastern no-role area. A 255-acre core is delineated around the nest trees.

#1116

Occupied nest site, pair 2001. Husum NRF sub-landscape, nest located near riparian area. A 198-acre nest core is delineated around the known nest trees. This area could be treated for stocking control using timing restrictions if needed. This 198-acre core area will be evaluated and if habitat could benefit from treatment, timing restrictions will be used during any activities inside the core area.

#874

Assumed occupied nest site, no recent data available. Found in 1994, no recent surveys attempted. A 201-acre primary territory is located in recently designated 1153-acre Natural Area Preserve in the Husum sub-landscape.

#992

Occupied nest site, pair 2001, located in an eastern no-role Klickitat Scattered sub-landscape. Existing 84-acre nest core; surrounding DNR land has been thinned or harvested. Nest core may need thinning in future. This nest site does not present any challenges in the immediate future regarding management of the territory aside from some possible immediate needs in the nest core itself. An assessment of stand sustainability is needed to determine if any action will be needed in the next two decades.

#852

Occupied nest site, pair in 1999. Variable habitat with suitable patches and clumps mixed with overstocked small diameter stands situated in Husum NRF sub-landscape. Nest core is comprised of 209 acres, part of which may need stocking control. A goal for this area is the creation of habitat that is sustainable and of higher quality and quantity than at present. This is compatible with the NRF landscape goals, which are similar.

#1085

Occupied nest site, pair 2001. Nest core consists of 277-acre mature forest patch located in an eastern no-role Klickitat Scattered sub-landscape; adjacent stands are oak or pine/oak. All parts of section may need stocking control in future to improve sustainability and protect from loss to fire. Timing restrictions could be used to enter areas close to nest trees. This is an isolated DNR section and sustainability of the nest site may depend upon land management decisions by private landowners.

#459

Occupied nest site, pair in 2001. Isolated DNR 41-acre site located in an eastern no-role Klickitat Scattered sub-landscape. The nest trees may be immediately south on adjacent private land (Boise), but use of DNR parcel is definite. The designated nest core is the 40-acre DNR parcel. This nest core parcel may need stocking control or other management to sustain the habitat over time. The nearest DNR ownership is over 1 mile southeast (Section 36); this ownership does contain suitable habitat. NCASI plans radio telemetry work in spring of 2004 to track owl habitat use. This will provide DNR with data on use of Section 36 by spotted owls and other habitat around nest core.

#1001

Occupied nest site, pair in 2001. Semi-isolated DNR parcel, nest core is in the far southeast corner of a section situated in a Glenwood NRF sub-landscape. Nest core is 429-acres, comprised largely of the riparian area associated with Klickitat River. Harvest activities in the core area should be undertaken only to improve habitat quality and timing restrictions will need to be used. Areas in the west half of the core will need to be assessed for possible thinning in the near future.

#774

Occupied nest site in the Glenwood sub-landscape, pair in 1995. Single owl in 1996 followed by no detections until the summer of 2003. The last known nest is located near the southeastern corner next to private land. A 356-acre nest core is placed around the known nest trees. DNR manages most of the township, and the nest core and surrounding stands appear to be overstocked. Large structure exists in Section 9 and many of the adjacent sections, along with dense stands of tolerant grand fir under story. Thinning of some kind may be necessary in and around this owl nest site to promote sustainability.

#734

Occupied nest site located near Husum NRF sub-landscape. This is a recently acquired site and at the present time, is nearly isolated by surrounding private land. The nest core will consist of all current DNR ownership in the section. The nest core has some overstocked areas that may need treatment in the future, and stands on DNR ownership are patchy but could be enhanced by thinning and stocking control. A thorough habitat and forest health assessment is needed. Prior to any type of harvest, a specific site plan will be developed through consultation with USFWS.

Unoccupied Nest Site Plans in Designated NRF Management Areas

These nest sites had pairs of owls in the past but no pair activity has been documented since 1998. Unoccupied nest sites in NRF areas will have a 40-acre core around the known nest site and any even-aged harvest activity in the next two decades will, if possible, avoid the general 200-acre vicinity around the core. If it is determined that the vicinity of the nest site or the core itself could benefit from some type of harvest to enhance habitat quality or improve stand sustainability then harvests will be conducted in consultation with USFWS. Since these nest sites are not occupied, timing restrictions will not be necessary for activities conducted in and around nest site numbers #875 (in the Husum sub-landscape), #828 (in the Trout Lake sub-landscape), and #632 (in the Glenwood sub-landscape).

Unoccupied Nest Site Plan Outside Designated NRF Management Area

#735

Nest site #735, in the Klickitat Scattered sub-landscape, is located outside NRF areas and will have a 5-acre nest core around the nest tree; timing restrictions will also not be necessary at this nest site. If it is determined that the core could benefit from some type of harvest to enhance habitat quality or improve stand sustainability then harvest will be conducted in consultation with USFWS.

Glossary

Glossary

DFC	<p>(Desired Future Condition) Areas managed for dispersal habitat have been renamed as DFC areas. The desired future condition represents a sustainable, realistic forest structure that could be expected for a properly managed vegetation series at a stand age of 60 years. DFC is a set of stand parameters that can be measured and compared against the current stand condition, and if necessary, management activities can be conducted to grow the current stand toward the DFC stand. DFC is a strategy to create more complex habitat, while still meeting the original commitment of dispersal criteria.</p> <p><i>(The ponderosa pine vegetation series will be managed for ponderosa pine DFC at a sustainable stocking level that will not sustain the dispersal definition of 50% canopy closure.)</i></p>
Dispersal Habitat	<p>Dispersal habitat has the following characteristics:</p> <ul style="list-style-type: none">■ Canopy closure of at least 50 percent■ Overstory tree density of at least 40 trees per acre that are at least 11 inches diameter at breast height (DBH)■ Top height of at least 60 feet■ Retention of four green trees per acre from the largest size class present for recruitment of snags and cavity trees
DMR	<p>(Dwarf Mistletoe Rating) Canopy evaluated by thirds for infection. Zero being no visible infection and 2 being heavy infection.</p>
Mature DFC	<p>Stands that meet desired future condition and are 60 years or older.</p>
Near-NRF	<p>Mature forest condition in each vegetation series, but lacking a component, such as canopy closure, top height or snags, with respect to existing HCP NRF definitions. An expectation of the near-NRF definition is that this missing component will be created within 30 years (see Appendix C for some possible options to grow near-NRF into NRF).</p>

Nest Core

The stand immediately around an identified nest tree. Cores vary in acreage depending on the kind of landscape in which they are found. Nest core areas could have management activities (such as harvests) conducted inside their boundaries if it is determined that some kind of management is needed to promote the long-term sustainability of the habitat. These activities would be conducted through consultation with USFWS.

Nest Site Protection Plan Specific management recommendations around an owl nest site. There are three types of nest site plan:

Occupied Nest Site Plan: Nest cores for these nest sites vary from 100-400 acres in NRF management areas. Timing restrictions will be used consistent with the original HCP around these nest sites. Harvests will be avoided in the core area if possible, but if forest health conditions jeopardize stand and habitat sustainability, harvest will be conducted to sustain habitat. Harvest activities in core area will be conducted only after consultation with USFWS.

Unoccupied Nest Site Plan in NRF Landscape: Nest cores around unoccupied nest sites in these landscapes will be approximately 40 acres; in addition even aged harvests will be avoided in a 200-acre vicinity of the nest core for the first two decades. Harvests will be conducted in these nest sites if forest health conditions warrant treatment to sustain habitat. These nest sites are available for active management.

Unoccupied Nest Site Plan outside NRF management areas: Nest cores around unoccupied nest sites will be 5 acres for each known nest site tree(s). Only one nest site, #735, occurs in this category.

Non-Binding

A strategy which is not a monitored requirement of the HCP.

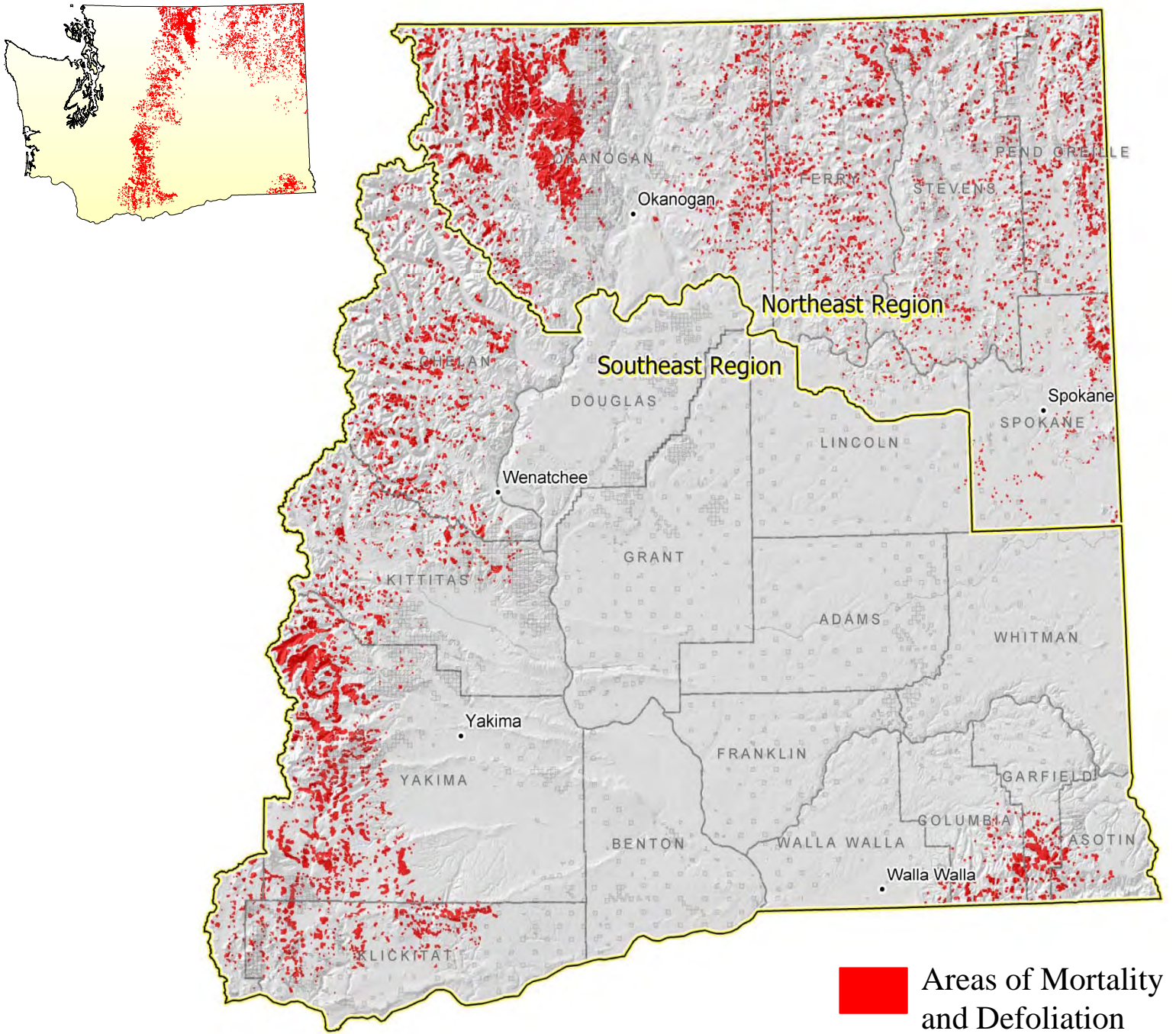
NRF	<p>Mature forest condition using original HCP definition:</p> <ul style="list-style-type: none"> ■ 40 percent Douglas-fir or grand fir ■ Canopy closure of at least 70 percent ■ Tree density of between 110-260 (may be less with larger trees that meet canopy closure of 70 percent) ■ Tree height of 90 feet (dominant and co-dominant) or vertical diversity of two or more canopy layers ■ Three or more snags or cavity trees per acre, 20 inches DBH or greater, or a moderate to high infection of mistletoe ■ Five percent ground cover of dead and down wood averaged over the stand
NRF Management Area	<p>Lands identified that will be managed to provide demographic support and contribute to maintaining species distribution for the spotted owl. Also called NRF areas.</p>
Occupied Owl Nest Site	<p>An owl nest site with verified spotted owl presence for at least one year since 1998. Presence may be as a single or owl pair.</p>
Owl Nest Site	<p>Any known physical location of a breeding spotted owl pair, past or present, based on NCASI and WDFW databases. New locations of spotted owls will be protected using nest cores if the sub-landscape is below the targeted habitat level. If the sub-landscape is at or above the targeted habitat level DNR will consult with USFWS regarding actions at the new location.</p>
PPDFC	<p>(Ponderosa Pine Desired Future Condition) The sustainable, realistic forest structure that could be expected for the ponderosa pine vegetation series at a stand age of 60 years. PPDFC is a set of stand parameters that can be measured and compared against the current stand condition, and if necessary management activities can be conducted to grow the current stand toward the PPDFC stand. PPDFC areas will be managed at a sustainable stocking level that will not maintain the dispersal criteria of 50 percent canopy closure.</p>

Regeneration Harvest	Any harvest activity that reduces the residual leave tree number below 21 trees per acre. Regeneration-style harvests are frequently designed to mimic stand-replacing fire events. Regeneration harvests in NRF stands are subject to the DNR's legacy tree procedures and will leave adequate and meaningful structure for the next NRF stand.
Sub-Landscape	A component of the Klickitat Planning Unit. There are four sub-landscape components in the Klickitat Planning Unit: The Glenwood Sub-landscape, the Trout Lake Sub-landscape, the Husum Sub-landscape, and the Scattered Klickitat East Sub-landscape (see Appendix A: Map 2 & Map 3). Sub-landscapes are more efficient than WAU's, since they encompass all DNR ownership in a large area.
Thinning	Site driven, but in general a harvest operation that leaves a fully stocked overstory stand. Actual density is dependent on stand age, species composition, and plant association.
Unoccupied Nest Site	An owl nest site that previously had an owl or owl pair, but no detections have been verified since 1998.

Appendix A

Maps

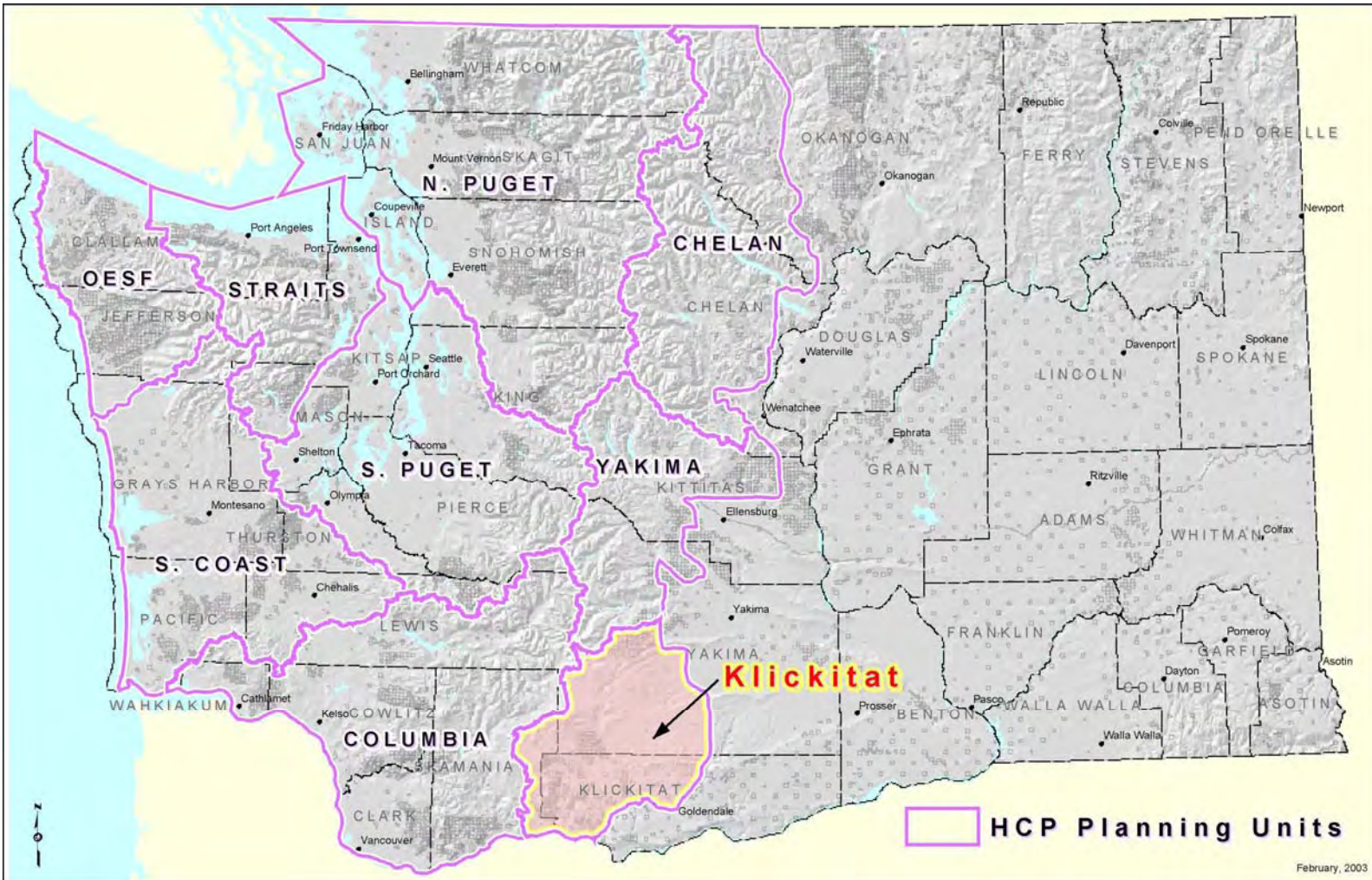
Aerial Detection of Mortality and Defoliation from Forest Insects and Diseases 2002



Eastern Washington Forest Pest Conditions 2002

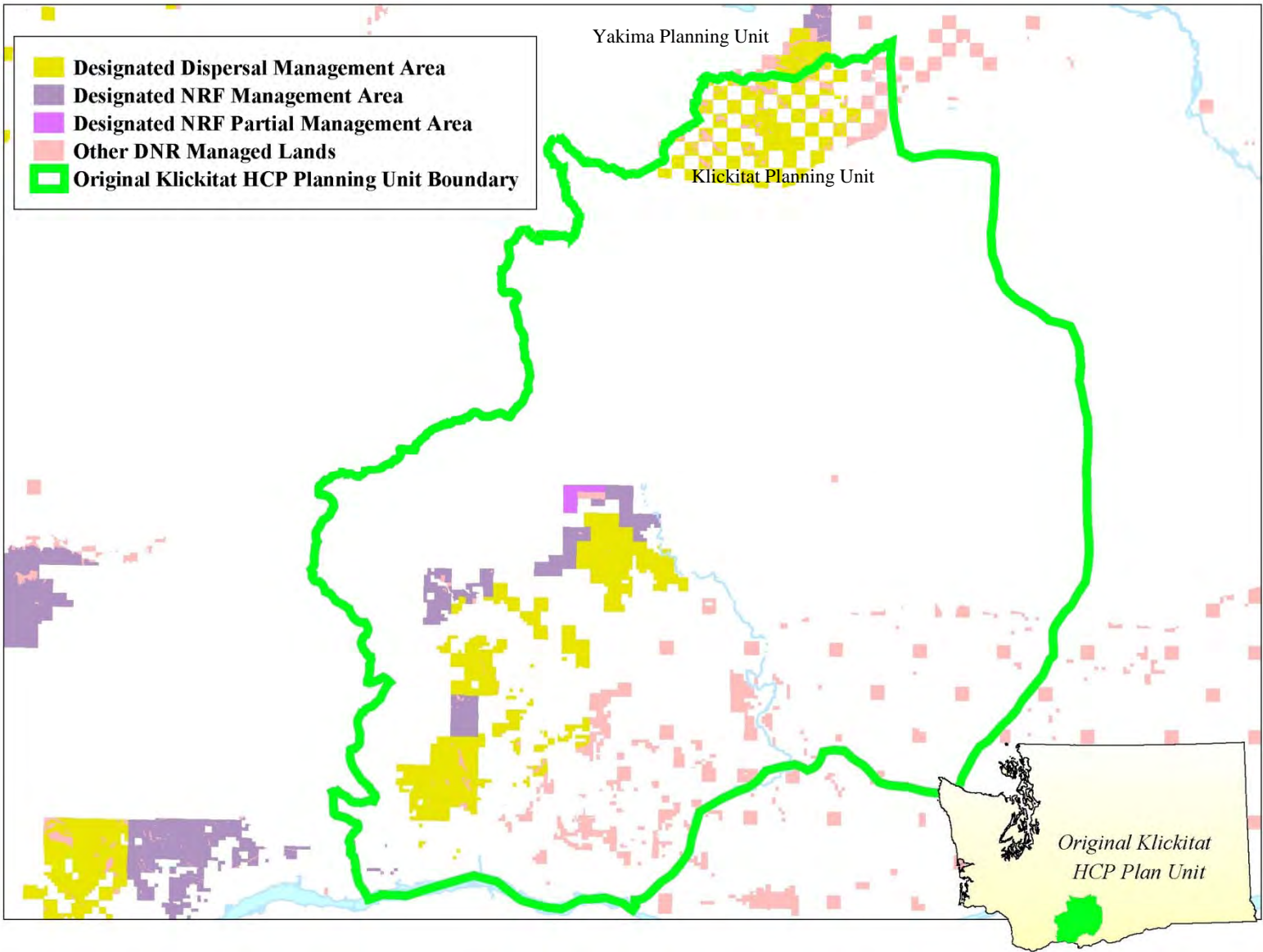
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Washington State DNR HCP Planning Units



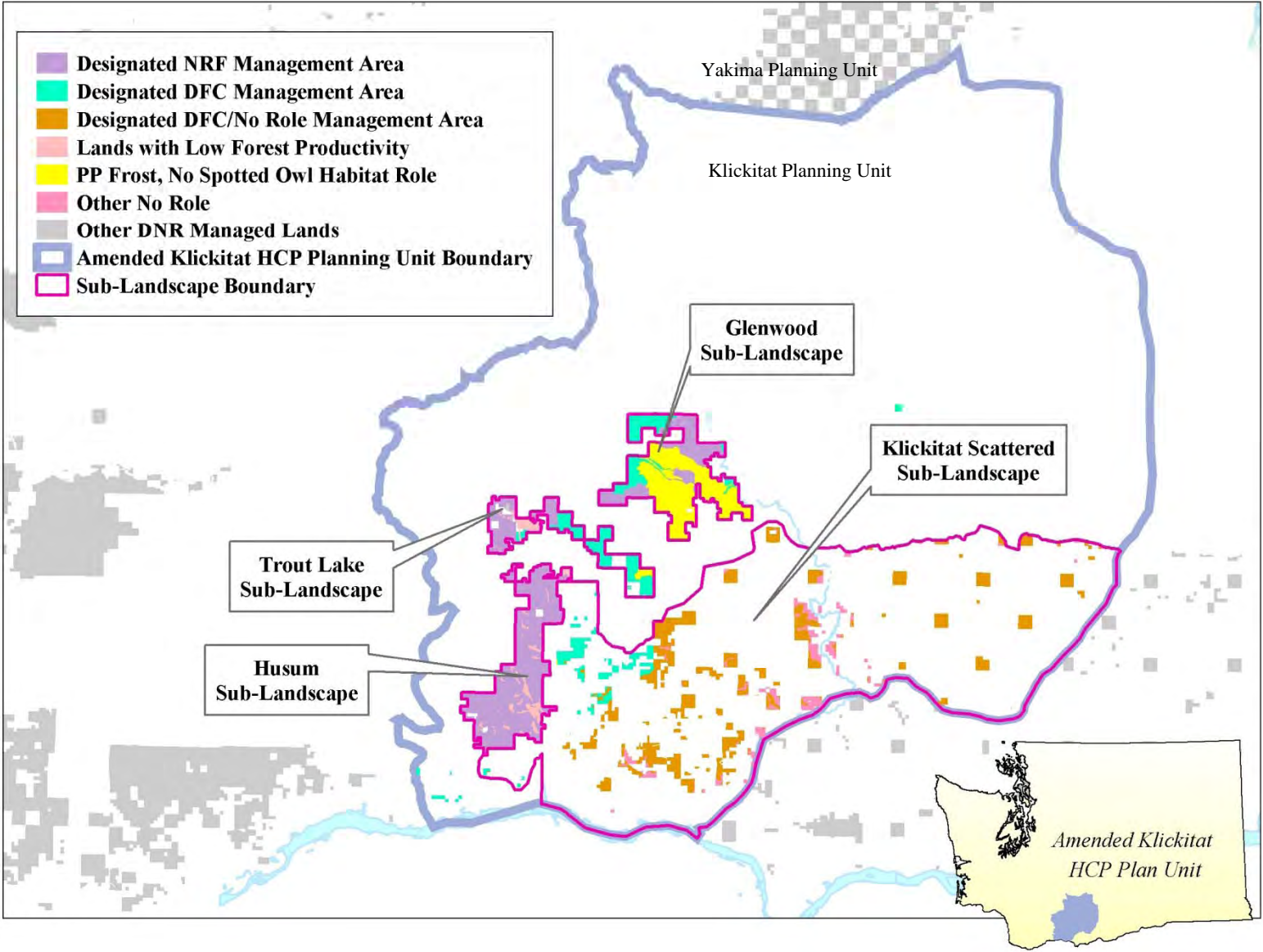
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Klickitat Planning Unit Original HCP Strategy



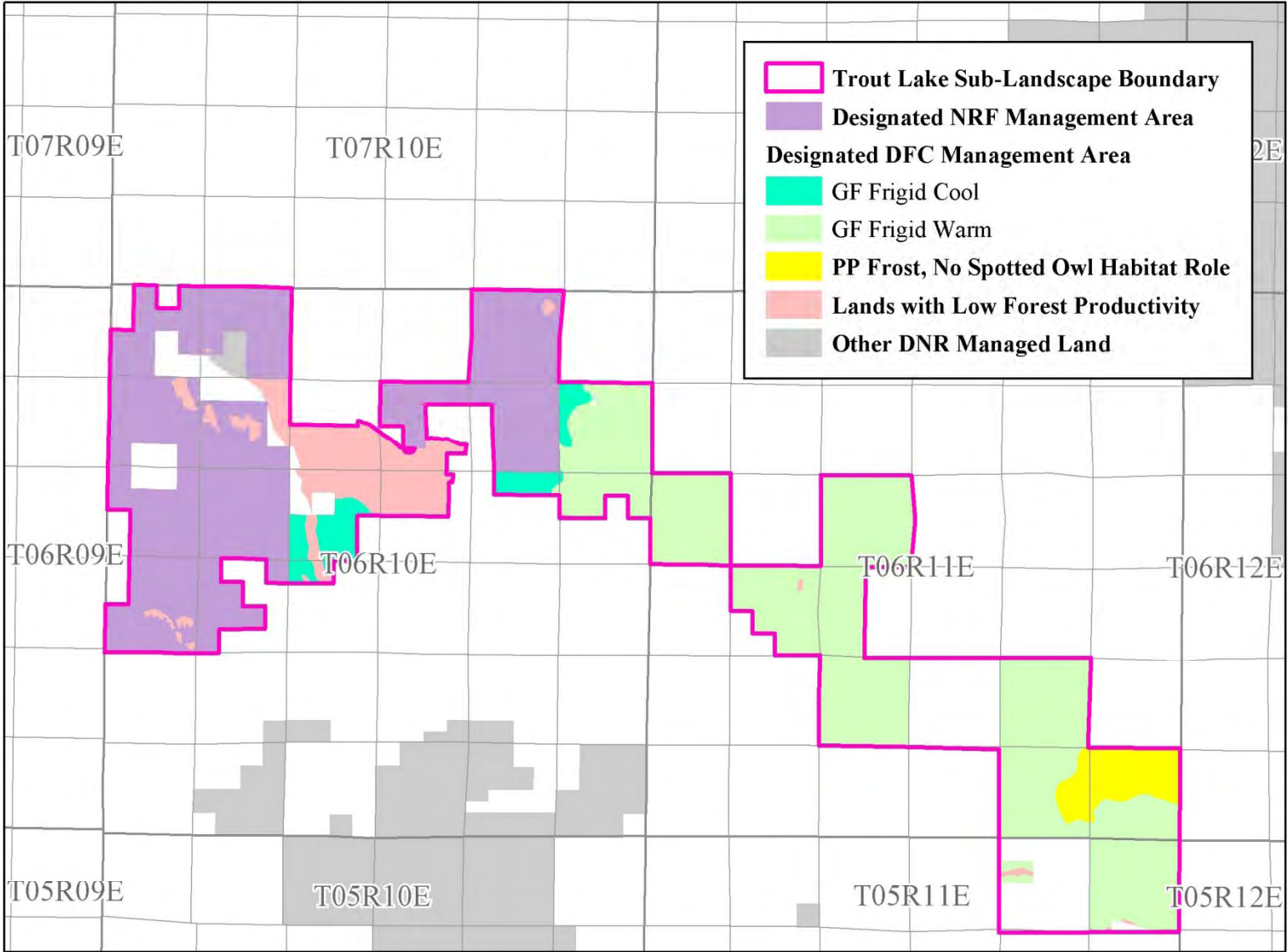
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Klickitat Planning Unit Amended HCP Strategy



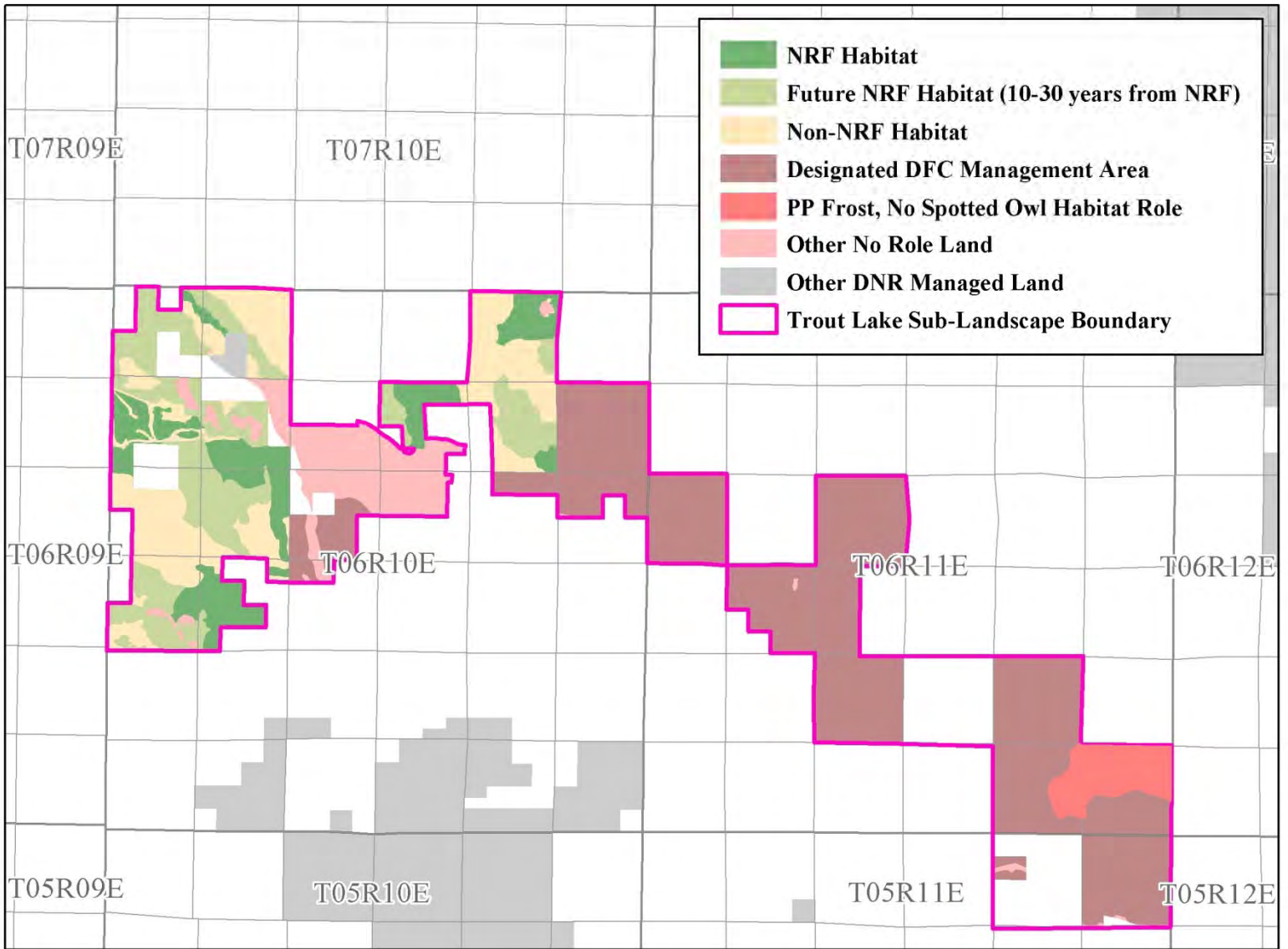
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Trout Lake Sub-Landscape Amended HCP Strategy



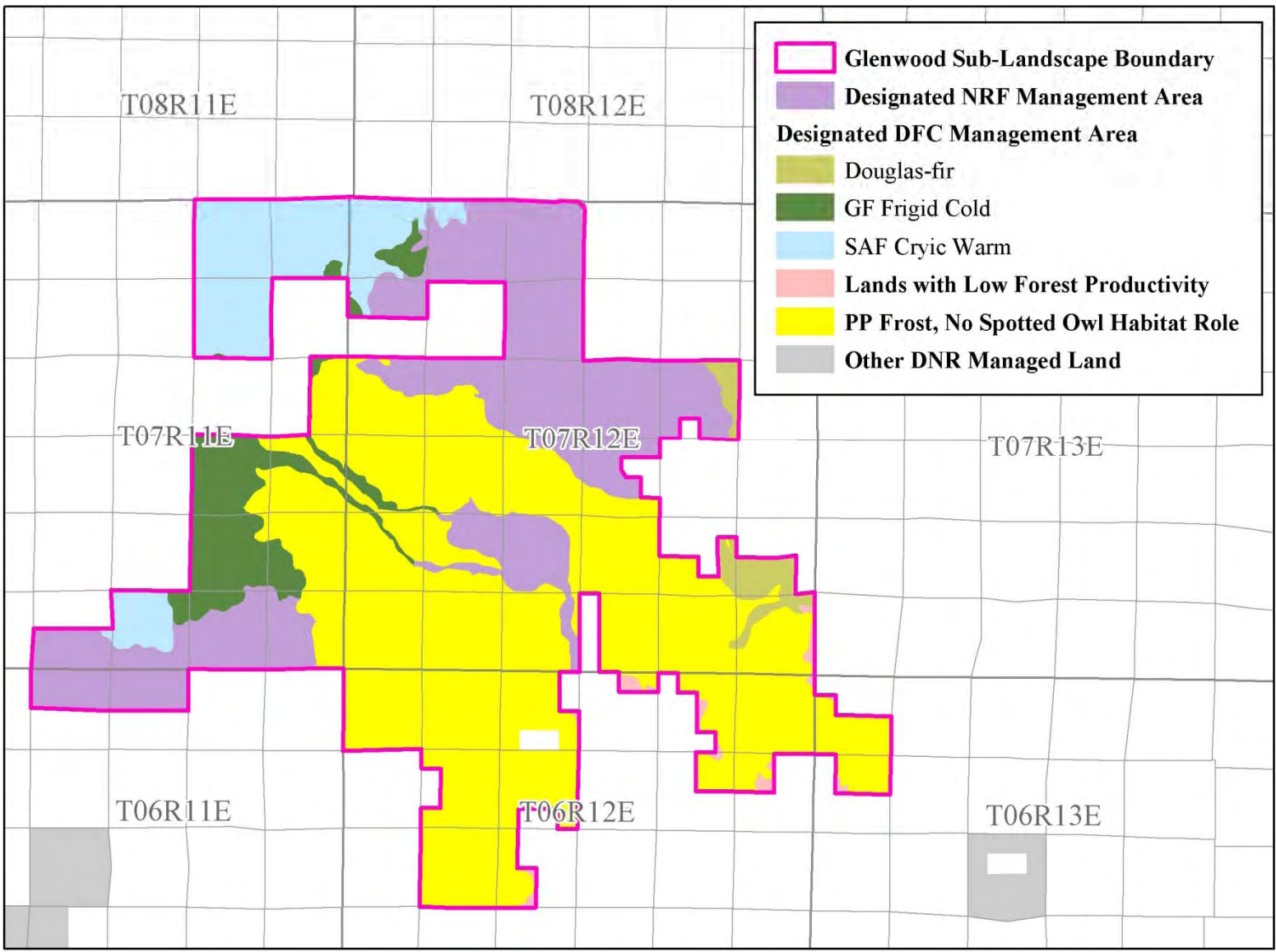
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Trout Lake Sub-Landscape NRF Habitat on NRF Managed Land



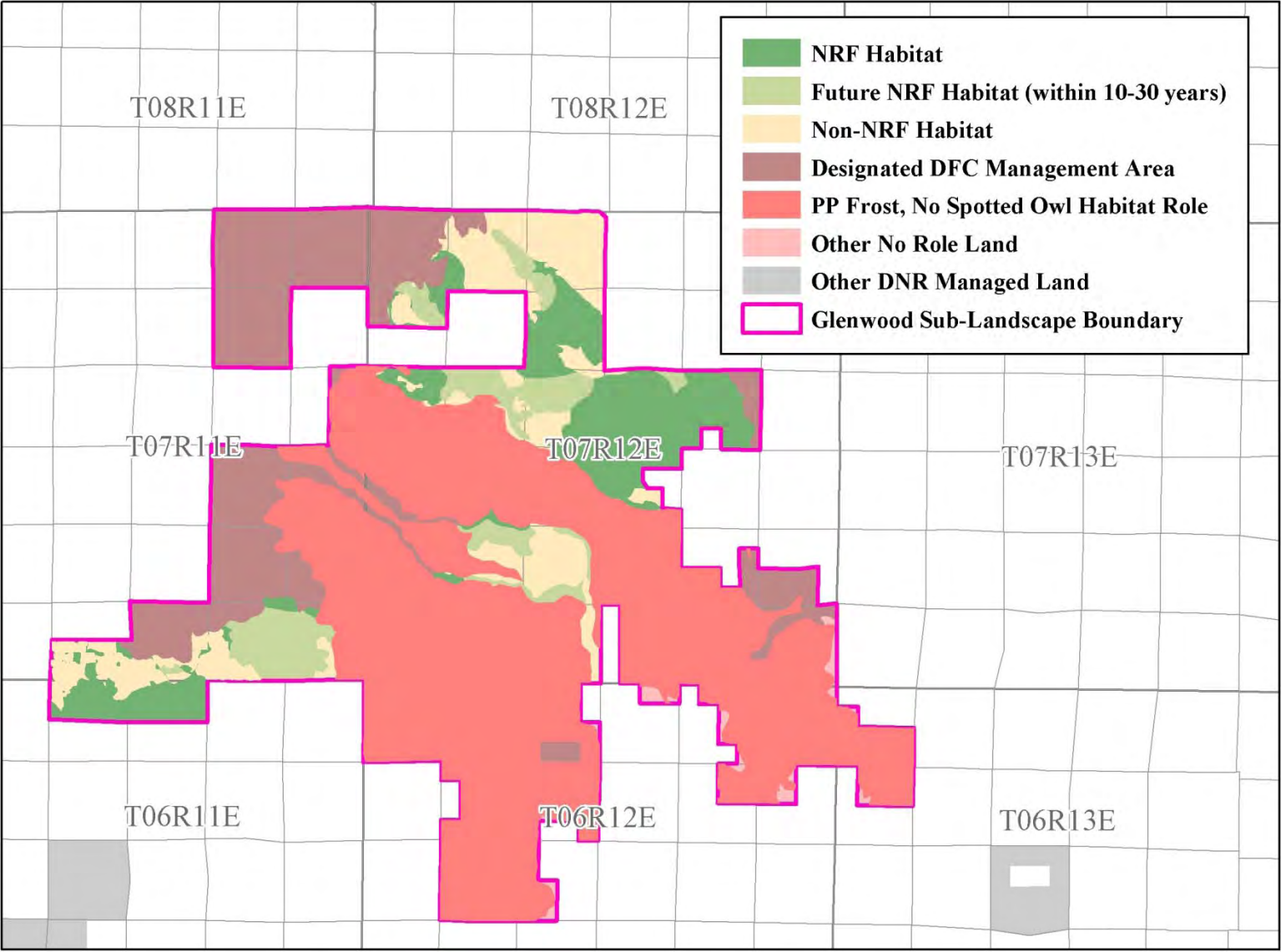
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Glenwood Sub-Landscape Amended HCP Strategy



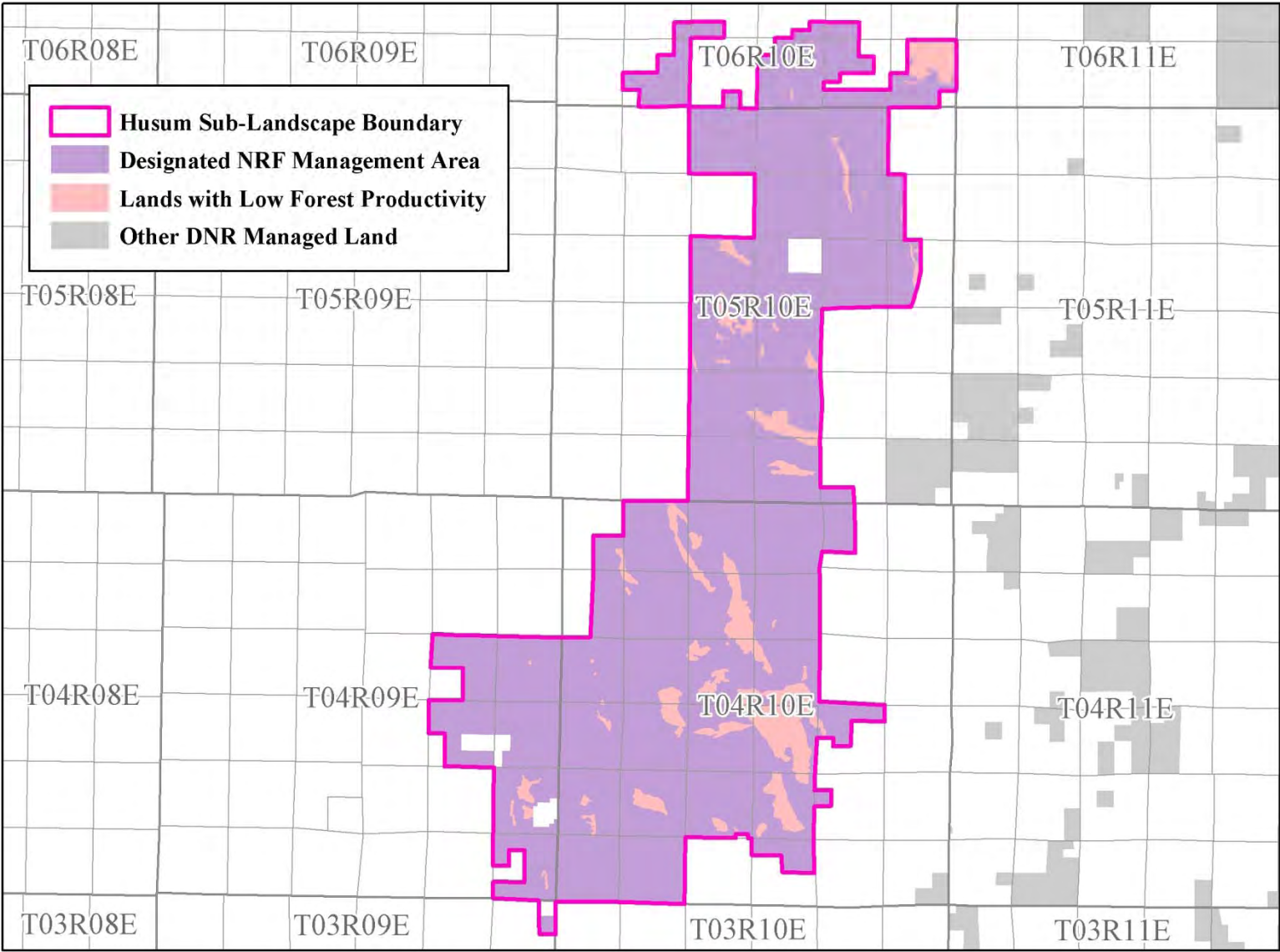
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Glenwood Sub-Landscape NRF Habitat on NRF Managed Land



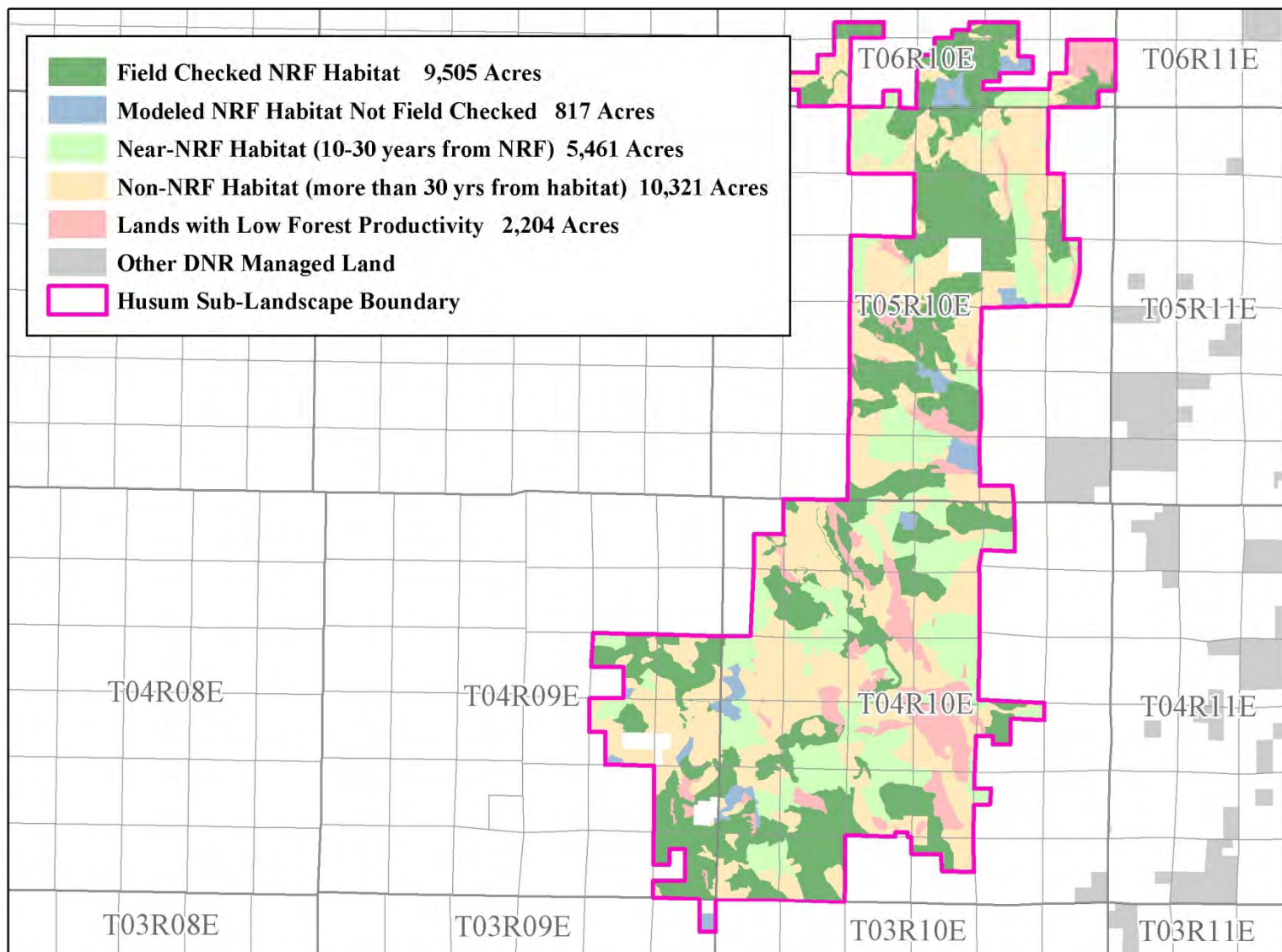
Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Husum Sub-Landscape Amended HCP Strategy



Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Husum Sub-Landscape Field Checked NRF Habitat on NRF Managed Land

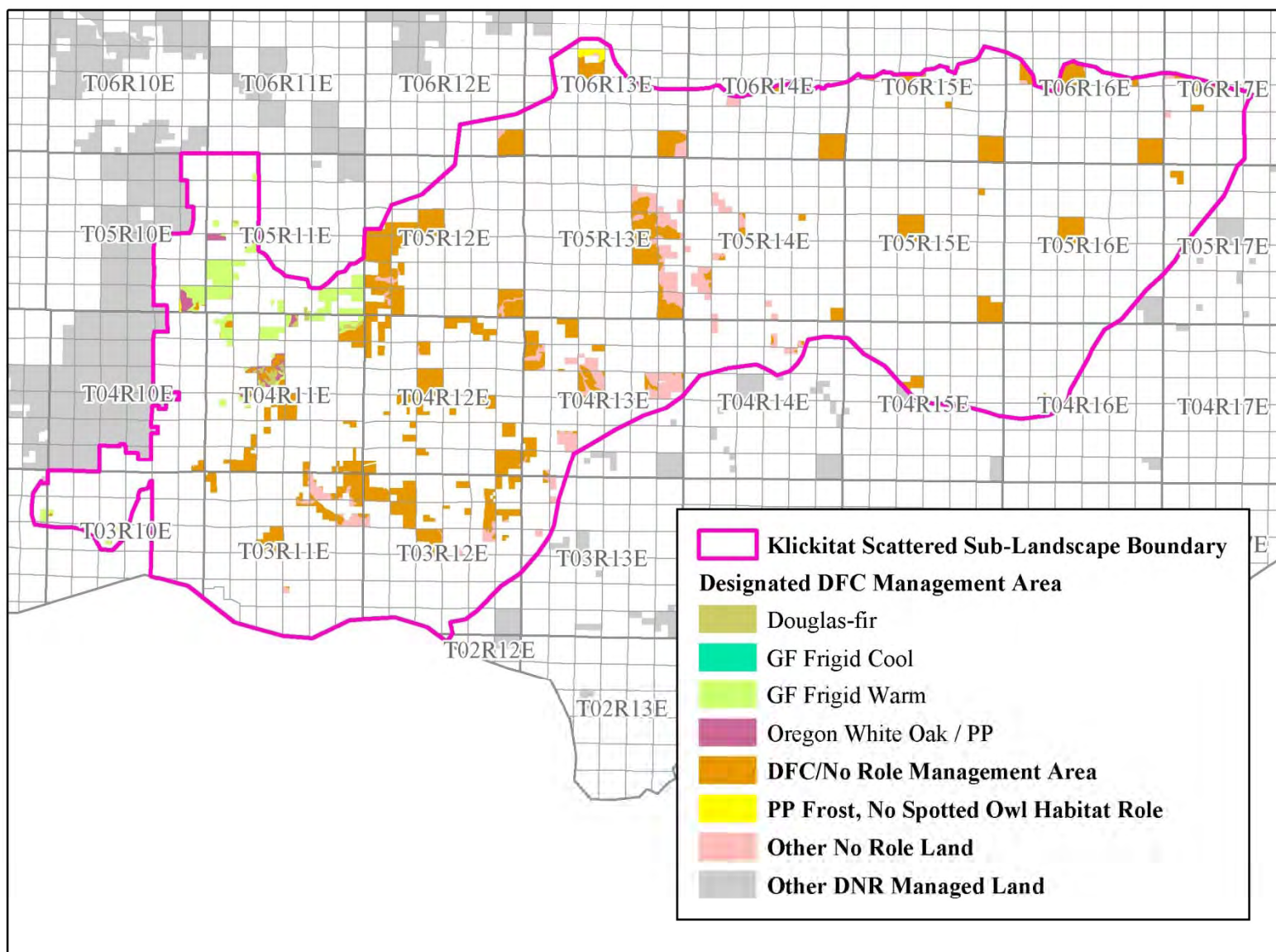


9,505 acres of field checked NRF habitat

(Entire landscape has not been surveyed)

Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Klickitat Scattered Sub-Landscape Amended HCP Strategy



Source: DNR Geographic Information System, 10/2003.
For planning purposes only. Information subject to change.

Appendix B

Desired Future Condition (DFC) management strategy

Desired Future Condition (DFC) management strategy

This appendix was created to allow comparison between stands managed solely for dispersal criteria and stands managed with a general vision of desired future conditions (DFC). The stand information adjacent to the images for DFC stands does not represent DFC thresholds, it is intended to demonstrate how stands managed for DFC can still meet the definition of dispersal habitat. DFC is a strategy to create more complex habitat, while still meeting the commitment of dispersal criteria.*

**USFWS and DNR have agreed to remove the ponderosa pine vegetation series from dispersal management. Ponderosa pine will be managed for ponderosa pine DFC at a stocking level that will not sustain the dispersal definition of 50 percent canopy closure.*

OREGON WHITE OAK SERIES (hot dry grass, hot mesic shrub/herb)	B2
PONDEROSA PINE SERIES	B3
DOUGLAS-FIR SERIES (frigid-warm)	B5
GRAND FIR SERIES (frigid-warm)	B7
GRAND FIR SERIES (frigid-cool)	B9
GRAND FIR SERIES (frigid-cold)	B11
SUBALPINE FIR SERIES (cryic-warm)	B13
WHITEBARK PINE/MOUNTAIN HEMLOCK SERIES (cryic-cold)	B15

OREGON WHITE OAK SERIES (hot dry grass, hot mesic shrub/herb)

Probable plant associations: Oregon white oak/bluebunch wheatgrass
Oregon white oak/pine grass elk sedge
Oregon white oak/California hazel common snowberry

Desired future condition (DFC): Natural fire-maintained stands that are dominated by oak are most desired.

Composition: Oregon white oak is the best-adapted species. Limited opportunities exist for ponderosa pine and Douglas-fir, but only as minor components of the stand.

Structure: Oregon white oak is not considered a major commercial tree species, and is valued by the Department as special habitat. The primary use of these stands is for wildlife.

Stocking: Some management activities may be anticipated to address conifer in growth that will shade out the white oak. Maintaining the dominance of oak over conifer species is the most important issue in these stands. Also, depending on feasibility some thinning may be beneficial; prescribed fire is desirable since the natural fire return interval is 5-30 years. Poor fire suppression tactics and aggressive suppression efforts can damage these stands.

Sample stand:

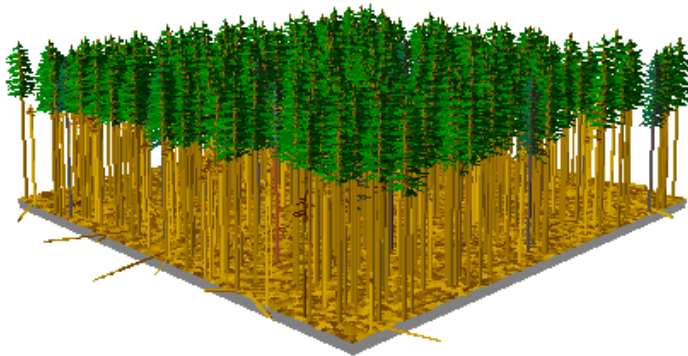


PONDEROSA PINE SERIES

Probable plant associations: There are no established plant associations that properly describe the ponderosa pine series in the Klickitat vicinity. In this vicinity, the ponderosa pine series is controlled by topography more so than by soils. Landforms that trap or funnel cold air and soils conducive to temperature extremes support ponderosa pine rather than frost sensitive species such as Douglas-fir.

Dispersal habitat: Young pine stands may temporarily meet dispersal criteria of 60 feet tall, 40 trees per acre 11" DBH and larger and marginally meets 50 percent canopy closure. However, this density is not sustainable and as the trees get larger there will be fewer trees per acre and will not meet 50 percent canopy closure. In addition, wider spacing helps minimize root contact and the spread of *Armillaria* inoculum. Due to these considerations, DNR and USFWS have agreed to remove the ponderosa pine vegetation series from the dispersal management designation.

Sample dispersal stand:



Sample stand managed for dispersal is unsustainable with canopy closure of 62%, 83 trees per acre (>11" DBH) and a top height of 65 feet.

Desired future condition (DFC): Shift stands to a more historic open pine stand. Larger, taller but significantly fewer pine per acre. Although managed for ponderosa pine, stands should retain a portion of diversity consisting of lodge pole pine thickets, dense juvenile thickets, snag patches and the old remnant legacy trees that still dot the landscape.

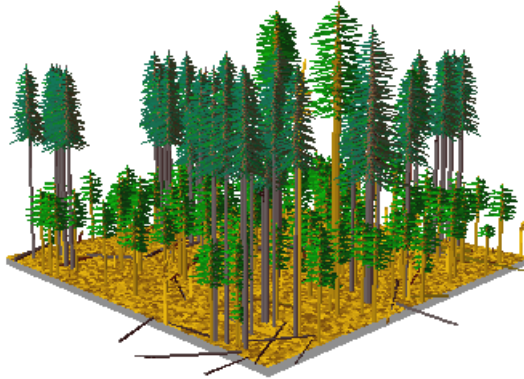
Composition: Ponderosa pine is the best-adapted species. Limited opportunities exist for western larch.

Structure: Shift structure to minimize spread of *Armillaria* and dwarf mistletoe by controlling stocking. A portion of each stand should be allocated to diversity. Increase structural diversity by retaining some thickets of juvenile timber and some large mature trees.

Stocking: Evaluate for thinning when relative density exceeds 25 to 30. An RD of 25 to 30 is equivalent to an average spacing of 18 to 20 feet in small

sawlog-size timber. Wider spacing helps minimize root contact and disease spread.

Sample PPDFC stand:



Sample stand managed for PPDFC has canopy closure of 48%, 65 trees per acre (>11" DBH) and a top height of 78 feet.

General management actions for a sustainable forest:

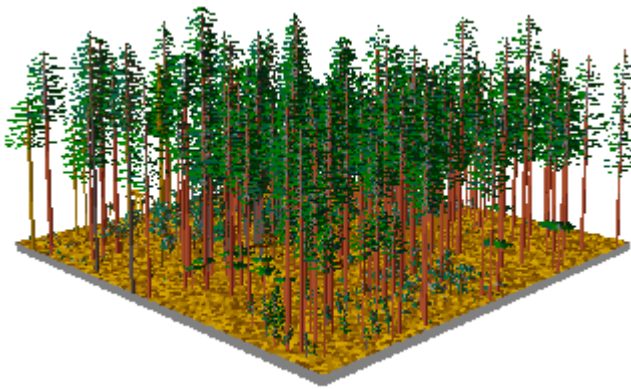
- Thin from below to properly space the overstory. Post-thinning relative density should be 15 to 25 on drier sites.
- Favor for retention ponderosa pine with crown ratios exceeding 40 percent.
- Target for possible removal ponderosa pine with DMR's greater than three. Retain components of stand for structural habitat needs.
- Favor early thinning to minimize creation of *Armillaria* inoculum. Avoid commercial thinning at periodic intervals.
- Avoid creating a need to plant nursery seedlings. *Armillaria* patches suitable for clearcutting may be planted with western larch seedlings in some situations.
- Create loose mineral soil seedbeds to encourage natural regeneration.
- Operate tracked equipment and rubber tired skidders from designated trails.
- Repeated underburning is acceptable to reduce *Armillaria* inoculum.

DOUGLAS-FIR SERIES (frigid-warm)

Probable plant associations: Douglas-fir/pinegrass
Douglas-fir/shiny-leaf spirea/pinegrass
Douglas-fir/common snowberry/pinegrass

Dispersal habitat: Dispersal habitat will meet dispersal criteria of 60 feet tall, 40 trees per acre 11" DBH and larger. Currently these are mixed stands dominated by Douglas-fir with some ponderosa pine. These stands are not required by the original HCP to have complex vertical or structural diversity except that required by the Department's forest management procedures and policy.

Sample dispersal stand:



Sample stand managed for dispersal has canopy closure of 67%, 77 trees per acre (>11" DBH) and a top height of 67 feet.

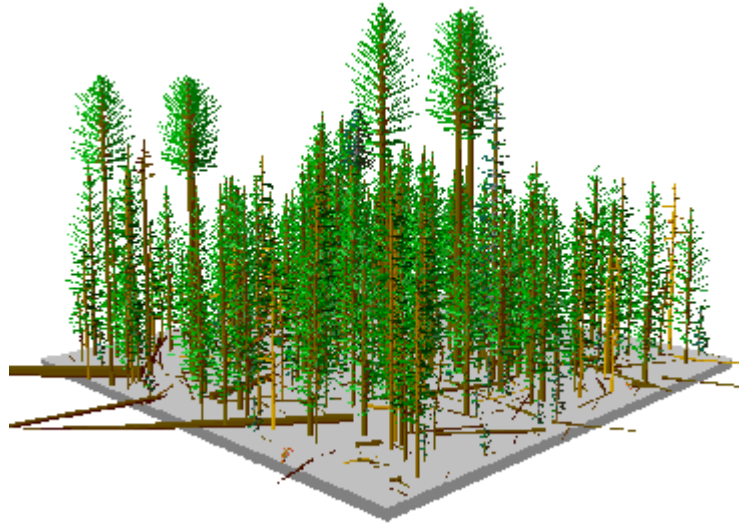
Desired future condition (DFC):

Composition: Ponderosa pine is preferred, but Douglas-fir is acceptable. The component of Douglas-fir should not exceed 30 to 50 percent.

Structure: Stands should be shifted to minimize spread of dwarf mistletoe and *Armillaria*. A portion of each stand should be allocated to larger structural diversity. Retain some thickets of juvenile timber, large mature trees, and trees infested with dwarf mistletoe.

Stocking: Evaluate for thinning when relative density exceeds 35. An RD of 35 is equivalent to an average spacing of 17 feet in small sawlog-size timber.

Sample DFC stand:



Sample stand managed for DFC has canopy closure of 58%, 42 trees per acre (>11" DBH) and a top height of 74 feet.

General management actions for a sustainable forest:

- Shift stand structure by thinning from below and spacing the overstory. Post-thinning relative density should be approximately 20 to 30.
- Favor for retention ponderosa pine and Douglas-fir with crown ratios exceeding 40 percent.
- Target for possible removal ponderosa pine with DMR's greater than three. Components needed for structural diversity should be retained.
- Favor early thinning to minimize creation of *Armillaria* inoculum. Avoid commercial thinning at periodic intervals.
- Limit stand management activities to the period between July and first snowfall.
- Avoid creating a need to plant nursery seedlings. If necessary, select ponderosa pine for planting, either large container stock or transplant stock. Plant at least 150 seedlings per acre.

GRAND FIR SERIES (frigid-warm)

Probable plant associations Grand fir/pinegrass
Grand fir/vine maple tall Oregon
grape/starflower
Grand fir/oceanspray

Dispersal Habitat: Dispersal habitat will meet dispersal criteria of 60 feet tall, 40 trees per acre 11" DBH and larger. Currently these are mixed stands dominated by grand fir and Douglas-fir with some ponderosa pine. These stands are not required by the original HCP to have complex vertical or structural diversity except that required by the Department's forest management procedures and policy.

Sample dispersal stand:



Sample stand managed for dispersal has canopy closure of 58%, 135 trees per acre (>11" DBH) and a top height of 65 feet.

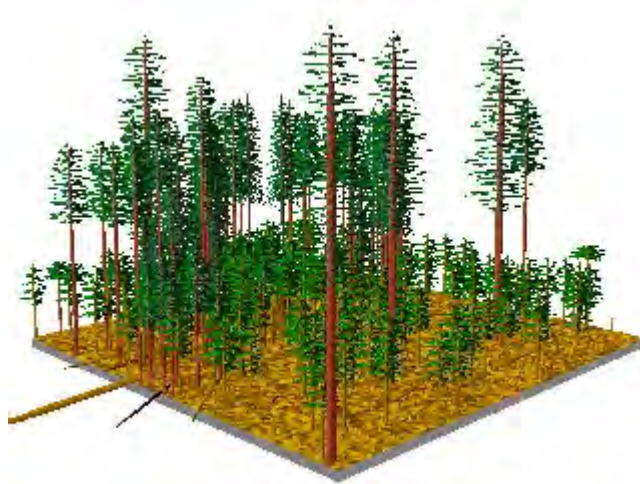
Desired future condition (DFC):

Composition: Ideal stands should be about 50 percent ponderosa pine and 50 percent Douglas-fir. A component of grand fir can be maintained, too.

Structure: Shift structure to minimize spread of dwarf mistletoe, root diseases, and to reduce future vulnerability to defoliators. A portion of each stand should be allocated to components of diversity. Retain some thickets of juvenile timber, large mature trees, soft and hard snags, and isolated trees infested with dwarf mistletoe including larch spires.

Stocking: Evaluate for thinning when relative density exceeds 40. An RD of 40 is equivalent to an average spacing of 16 feet in small sawlog-size timber.

Sample DFC stand:



Sample stand managed for DFC has canopy closure of 60%, 110 trees per acre (>11" DBH) and a top height of 100 feet.

General management actions for a sustainable forest:

- Thin from below to space the overstory; post-thinning relative density should be 20 to 30. Regeneration harvests should retain adequate structure capable of remaining in place until the end of the next rotation.
- Favor for retention ponderosa pine, Douglas-fir, and larch with crown ratios >40 percent.
- Target for possible removal ponderosa pine and western larch with DMR's greater than three, and Douglas-fir with DMR's greater than two. Components needed for structure should be maintained.
- Favor early thinning to minimize creation of root disease inoculum. Avoid commercial thinning at periodic intervals in stands with dispersed root disease.
- Favor ponderosa pine and Douglas-fir for planting, either transplant or large container stock. Douglas-fir is suitable for planting particularly on sites with significant *Armillaria*. Plant at least half the desired stocking or 150 seedlings per acre. A loose mineral soil seedbed encourages timely natural regeneration by ponderosa pine, Douglas-fir, and western larch where present.

GRAND FIR SERIES (frigid-cool)

Probable plant associations Grand fir/creeping snowberry/vanillaleaf
Grand fir/California hazel/vanillaleaf
Grand fir/dwarf Oregongrape/vanillaleaf
Grand fir/Pacific dogwood/vanillaleaf

Dispersal habitat: Dispersal habitat will meet dispersal criteria of 60 feet tall, 40 trees per acre 11" DBH and larger. Currently these are mixed stands dominated by grand fir and Douglas-fir with some ponderosa pine. These stands are not required by the original HCP to have complex vertical or structural diversity except that required by the Department's forest management procedures and policy.

Sample dispersal stand:



Sample stand managed for dispersal has canopy closure of 53%, 110 trees per acre (>11" DBH) and a top height of 80 feet.

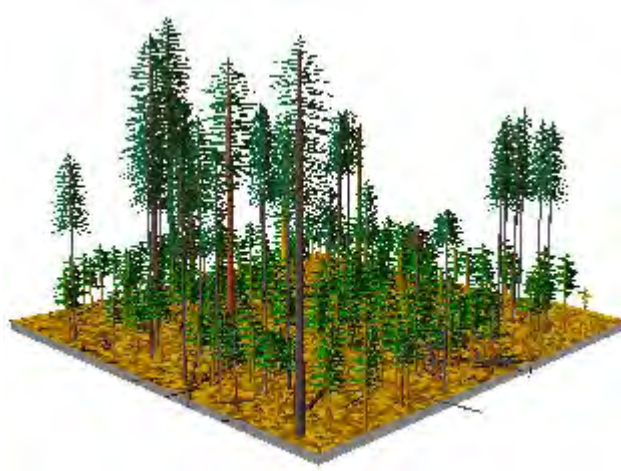
Desired future condition (DFC):

Composition: An appropriate mix is 50 percent ponderosa pine and 50 percent Douglas-fir. A mix for the coolest sites is 40 percent ponderosa pine, 30 percent Douglas-fir, and 30 percent western larch. This proportion of species will help minimize losses to defoliators and root diseases. Grand fir stocking targets should not exceed 10 percent.

Structure: Shift structure to minimize spread of mistletoe, root diseases, and to reduce vulnerability to defoliators. Maintain components of diversity. Retain thickets of juvenile timber, large mature trees, soft and hard snags, and isolated trees infested with dwarf mistletoe including larch spires.

Stocking: Evaluate for thinning when relative density exceeds 45. An RD of 45 is equivalent to an average spacing of 15 feet in small sawlog-size timber.

Sample DFC stand:



Sample stand managed for DFC has canopy closure of 52%, 55 trees per acre (>11" DBH) and a top height of 80 feet.

General management actions for a sustainable forest:

- Thin from below and space the overstory or by implementing a regeneration harvest. Post-thinning relative density should be 20 to 30.
- Favor for retention Douglas-fir, larch, and ponderosa pine with crown ratios >40 percent.
- Target for possible removal larch and ponderosa pine with DMR's greater than three and Douglas-fir with DMR's greater than two. Retain components needed for structural diversity.
- Favor early thinning to minimize creation of root disease inoculum. Avoid commercial thinning at periodic intervals in stands with dispersed root disease.
- Favor ponderosa pine, Douglas-fir, and western larch for planting, either transplant or large container stock. Plant at least half the desired stocking or 150 seedlings per acre. Loose mineral soil seedbeds encourage natural regeneration.

GRAND FIR SERIES (frigid-cold)

Probable plant associations Grand fir/big huckleberry/queencup beadlily
Grand fir/elk sedge
Grand fir/thimbleberry/fairybells

Dispersal habitat: Dispersal habitat will meet dispersal criteria of 60 feet tall, 40 trees per acre 11" DBH and larger. Currently these are mixed stands dominated by grand fir and Douglas-fir with some ponderosa pine. These stands are not required by the original HCP to have complex vertical or structural diversity except that required by the Department's forest management procedures and policy.

Sample dispersal stand:



Sample stand managed for dispersal has canopy closure of 55%, 65 trees per acre (>11" DBH) and a top height of 62 feet.

Desired future condition (DFC):

Composition: Most of this unit is not well suited for an abundance of ponderosa pine or Douglas-fir. An appropriate mix is western larch (40 percent), Douglas-fir (20 percent), ponderosa pine (20 percent), and grand fir (20 percent). A component of lodgepole pine and western white pine is acceptable.

Structure: Shift structure to minimize spread of mistletoe, root diseases, and to reduce vulnerability to defoliators. Maintain components of diversity. Retain thickets of juvenile timber, large mature trees, soft and hard snags, and larch spires.

Stocking: Evaluate for thinning when relative density exceeds 50 to possibly 60. An RD of 50 is equivalent to an average spacing of 14 feet in small sawlog-size timber.

Sample DFC stand:



Sample stand managed for DFC has canopy closure of 58%, 65 trees per acre (>11" DBH) and a top height of 78 feet.

General management actions for a sustainable forest:

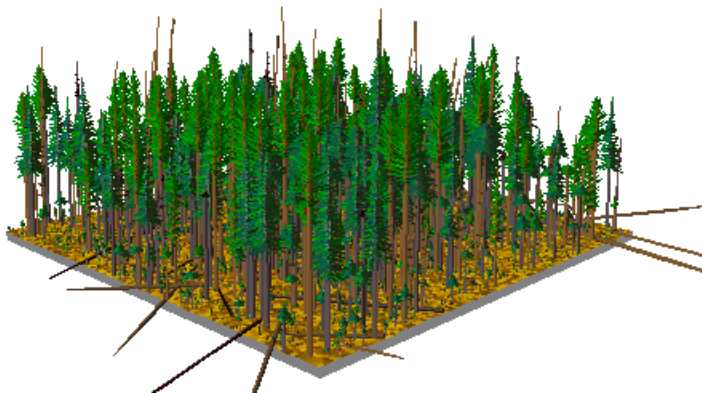
- Shift stand structure by thinning from below and then spacing the overstory or by implementing a regeneration harvest with frost mitigation. Post-thinning relative density should be 20 to 30.
- Favor for retention western larch, ponderosa pine, and Douglas-fir with crown ratios exceeding 40 percent. Lodgepole pine can be retained to provide natural seeding.
- Target for possible removal western larch with DMR's greater than three. Structural components needed for habitat should be retained.
- Favor early thinning to minimize creation of root disease inoculum. Avoid commercial thinning at periodic intervals in stands with dispersed root disease.
- Favor western larch for planting. Douglas-fir should not be planted on sites with less than about eight percent slopes unless frost reduction strategies are planned. Ponderosa pine should not be planted as a major species unless snow break and branch stripping are acceptable. Other candidates for frost-prone sites are Engelmann spruce and western white pine. Container stock is recommended. Total planted seedling stocking need not exceed 300 trees per acre.

SUBALPINE FIR SERIES (cryic-warm)

Probable plant associations Subalpine fir/grouse huckleberry
 Subalpine fir/pinegrass
 Subalpine fir/elk sedge

Dispersal habitat: Dispersal habitat will meet dispersal criteria of 60 feet tall, 40 trees per acre 11" DBH and larger. Currently these are mixed stands dominated by subalpine fir and lodgepole pine with some ponderosa pine. These stands are not required by the original HCP to have complex vertical or structural diversity except that required by the Department's forest management procedures and policy.

Sample dispersal stand:



Sample stand managed for dispersal has canopy closure of 62%, 102 trees per acre (>11" DBH) and a top height of 72 feet.

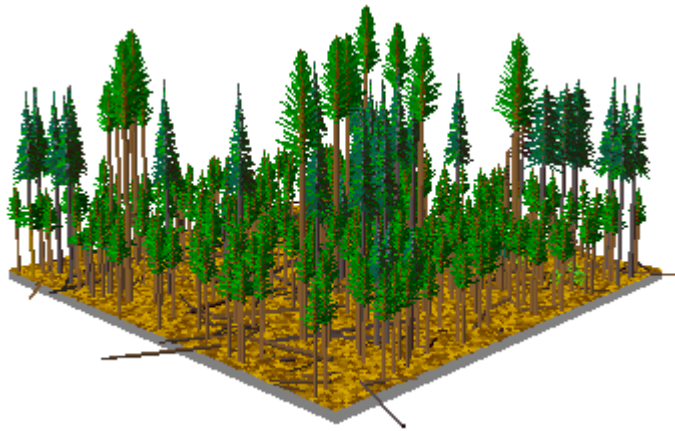
Desired future condition (DFC):

Composition: Post-harvest composition should favor western larch and lodgepole pine. A component of Douglas-fir, ponderosa pine, and western white pine is acceptable on warm sites. Retaining healthy advance regeneration Engelmann spruce and subalpine fir is acceptable. Western larch and lodgepole pine should comprise at least half of future stocking.

Structure: Shift structure toward evenness where western larch and lodgepole pine are regenerated. Maintaining structural evenness will help minimize spread of dwarf mistletoe. Uneven structure is acceptable in subalpine fir dominated stands.

Stocking: Evaluate for thinning when relative density exceeds 40 to 50. A relative density of 45 is equal to an average spacing of 15 feet in small sawlog-size timber.

Sample DFC stand:



Sample stand managed for DFC has canopy closure of 65%, 82 trees per acre (>11" DBH) and a top height of 85 feet.

General management actions for a sustainable forest:

- Shift stand structure toward evenness with regeneration harvests. Retain structural habitat components during regeneration harvests.
- Avoid regeneration harvests without frost mitigation on sites with slopes less than eight percent. Anticipate conversion to lodgepole pine.
- Favor natural regeneration by western larch and lodgepole pine by creating loose mineral soil seedbeds. Excessive seedbed preparation will encourage an abundance of lodgepole pine along with unattractive PCT costs.
- The warm phase is suitable for planting western larch and western white pine. Engelmann spruce may be planted, too. Container stock is preferred. Fall planting is an option. Total planted seedling stocking need not exceed 300 trees per acre, preferably much less.

WHITEBARK PINE/MOUNTAIN HEMLOCK SERIES (cryic-cold)

Probable plant associations: Whitebark pine/green fescue
Whitebark pine/grouse huckleberry/smooth
woodrush
Whitebark pine/pinegrass
Mountain hemlock/smooth woodrush
Mountain hemlock/grouse
huckleberry/smooth woodrush

Desired future condition (DFC): Generally, this is non-productive forestland and does not provide timber suitable for harvesting. The whitebark pine component is not sustainable. On some sites, expect mountain hemlock and perhaps subalpine fir to replace whitebark pine.

Sample stand:

Not available at this time (no forest inventory data for this series).

General management actions for a sustainable forest:

Evaluate all fire suppression activities in these series; suppression activities are often damaging, counter-productive, and expensive. Wildlife habitat is the primary management objective in the whitebark pine/ mountain hemlock series.

Appendix C

**Thinning options – some possible options
to grow near-NRF into NRF**

Thinning options - some possible options to grow near-NRF into NRF

There are many options available to assist in growing near-NRF forest into NRF quality habitat. The technique used will depend on the site, circumstances and time required to grow NRF habitat. For instance, snag creation may be used in areas that are snag-poor and do not have time to develop enough snags naturally. Underplanting may be employed when an additional, smaller canopy layer is desired for structural or species diversity. The various forms of thinning may be used to manage overstocking or improper mixes of species and create spatial diversity within stands. These and other tools may be used depending on the needs of the stand to grow into NRF quality habitat.

The non-inclusive table below illustrates some of the possible management avenues.

30 year near-NRF	20 year near-NRF	10 year near-NRF
Gap and patch creation	Gap and patch creation	Fertilization
Pre-commercial thinning	Pre-commercial thinning	Gap and patch creation
Prescribed burn	Prescribed burn	No action
No action	No action	Snag creation
Thinning from below	Snag creation	Thinning from below
Underplanting	Thinning from below	Variable density
Variable density thinning	Underplanting	thinning
	Variable density thinning	

General Examples:

30 year near-NRF: Stand is understocked with some larger diameter trees in the overstory but with little natural regeneration.

Possible treatment – underplant shade-tolerant conifer species to create 2nd canopy layer and increase trees per acre to meet NRF guidelines.

20 year near-NRF: Stand is overstocked with many intermediate size trees in the overstory and a 2nd canopy layer of small, suppressed trees.

Possible treatment – thin from below with diameter limit to protect understory and allow it to develop into healthier 2nd layer. Reduce competition between overstory trees and help them achieve desired diameters.

10 year near-NRF: Stand lacks a snag component and overstory is well stocked but very homogeneous without enough larger diameter trees.

Possible treatment – Variable density thinning to introduce horizontal diversity into overstory and release the remaining trees to grow faster into desired size classes. Snag creation to provide habitat and green trees damaged during harvest will grow into larger trees with defects.

Appendix D

Peer review meetings in Ellensburg and Lacey

Peer review meetings in Ellensburg and Lacey

Attendees of the February 26, 2003 Review of Proposed Changes to DNR Northern Spotted Owl Conservation Strategy For the Klickitat Planning Unit of the DNR's Habitat Conservation Plan

Ellensburg, WA

Ken Bevis	WDFW
Richard Bigley	DNR
Steve Brown	DNR
Joe Buchanan	WDFW
Vicki Christiansen	DNR
Tracy Fleming	NCASI
John Haddon	DNR
Scott Horton	DNR
Gina King	YN
Jeff Kozma	YN/TFW
Jill Johnson	DNR
Terry Johnson	USFWS
John Lehmkul	USFWS-PNW
Ken McNamee	DNR
Jim Michaels	USFWS
Mark Nuetzmann	YN-Wildlife
Mark Ostwald	USFWS
Tami Riepe	DNR
Dennis Rock	NCASI
Lislie Sayers	DNR
George Shelton	DNR
Clay Sprague	DNR
Paula Swedeen	WDFW
Ted Thomas	USFWS
Bill Weiler	WDFW
Steve Wetzel	DNR

Attendees of the January 29, 2004 Biological Review of Proposed
Administrative Amendment to DNR Northern Spotted Owl Conservation
Strategy For the Klickitat HCP Planning Unit of the DNR's Habitat
Conservation Plan

Lacey, WA

Joe Buchanan	WDFW
Tim Cullinan	Audubon
Tracy Fleming	NCASI
Gina King	YN
Jeff Kozma	YN/TFW
Jim Michaels	USFWS
Teodora Minkova	DNR
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Appendix E

Forest health – DNR's approach

Forest health – DNR’s approach

Since before 1900, land management practices and wildfire exclusion have changed the composition of forest stands in the eastern Washington Cascades. The historic condition of forests in the eastern Washington Cascades was maintained by frequent low and moderate-severity fire events, or fire regimes. These fire regimes tended to maintain stands by lowering fuel loads and reducing stem densities, creating a sustainable, fire-stable stand. Today, fire exclusion and other management practices have created stands with heavy fuel loading and high stand densities. Stands in this condition are difficult to sustain over time because they are overstocked, often with shade-tolerant tree species that are vulnerable to forest pests and disease. The stress from overstocking affects all tree species, and this stress combined with increased fuel loading puts entire landscapes at higher risk of stand replacing fires; some form of management must be undertaken to address this issue.

The DNR will use active management (variable density thinning, changing species composition, while retaining large, difficult to grow structure such as large trees, snags, downed wood) to manage for long-term sustainable habitat. *Continued emphasis on stocking control in all habitat types is a primary strategy to address current and future forest health conditions in eastern Washington.* In addition, the DNR desires to use active management to focus on habitat creation and not merely habitat protection. The DNR will address the forest health issue of overstocking and inappropriate species composition by adjusting stand composition to favor long-lived seral species, and by developing mixed species and even-structured stands (dependent on vegetation series). These managed stands will be more representative of historic stand conditions and consequently more resistant to insects, disease, and stand-replacing fire.

The use of the “forest health” designation begs the question: What is a healthy forest? Basically, a healthy forest should be **sustainable, resilient and productive**. Therefore, an unhealthy forest would be lacking some or all of those characteristics.

The “productive” characteristic refers to production of wood, habitat, ecosystem function, etc.

Some of the familiar indicators that signify a possible problem are:

- Root rots
- Spruce budworm
- Other defoliators/borers
- Overstocking
- Improper species mix
- Low crown ratio
- Excessive mortality
- Dwarf mistletoe

Forests on the east side of the Cascades are extremely complex and diverse. Due to this variation, DNR does not believe it is prudent to define specific thresholds for forest health. A condition which may devastate one stand may be well-tolerated, or even beneficial, in another stand. The conditions listed below are general guidelines which can be used to help identify a potential problem:

Stands in the GF series with a $RD > 50$
Stands in PP/DF series with a $RD > 40$
Dwarf mistletoe rating for > 2.5 for > 20 percent of the stand
Lodgepole pine $> 12''$ on > 10 percent of the stand
Spruce budworm topkill for ≥ 3 years on ≥ 10 percent of GF/DF
Balsam woolly adelgid present on > 10 percent of GF
Annosus presence on > 15 percent of GF
Average crown ratio < 40 percent

Individually, any one of these could simply be a component of a functioning ecosystem, or could be significant enough to devastate an entire landscape. Several of these elements together can magnify each other and overwhelm a stand. It is important to note that DNR does not manage for a sterile landscape or a tree farm - some level of these pathogens and pests are necessary for a natural forest ecosystem. When entering a stand to address forest health issues, the DNR will strive to leave some areas untreated and if possible, elements of the pest or pathogen may be retained in strategic locations. This approach should allow the DNR to retain a portion of these important components of a functioning forest.

If a forest health issue is identified, DNR will work with USFWS as described in the situations below:

Forest Health in sub-landscapes above HCP targets

The DNR will use active management to sustain and create habitat when forest health issues like those listed above are readily apparent. This active management will help to sustain long term, productive habitat.

Forest Health Activities in sub-landscapes below HCP targets that will move NRF habitat into a near NRF condition (30 years or less from returning to NRF habitat)

It is not prudent to wait for forest health issues to degrade NRF habitat into non-habitat. If a forest condition appears to be unsustainable over the long term, the stand will be evaluated, in consultation with USFWS, to reach a mutually agreeable approach for treatments that will move NRF habitat into a near NRF condition. This entry will make a “course correction” in the lifecycle trajectory of the stand that should prolong the stand’s contribution to the quantity and quality of NRF habitat. This approach will help to retain large, difficult to grow structure (such as large trees, snags, downed wood) and manage a landscape for long-term, sustainable habitat.

Forest Health Activities in sub-landscapes below HCP targets that will conduct regeneration-style harvest in NRF habitat OR forest health activities in owl nest sites (occupied or unoccupied)

If forest health problems are:

- Extreme – Readily apparent and alarming to the layman OR
- Extensive – Not just isolated sick/dying pockets but many acres OR
- Causing excessive mortality – Trees are dying or imminently at risk OR
- Threatening values – Loss of value to timber or wildlife habitat

AND if the situation:

Endangers sustainability – disease or stand conditions may preclude the establishment of the desired species or stocking for the ecotype OR threaten short or long term HCP commitments.

Then the DNR will consult with USFWS to develop a mutually agreeable approach to address forest health issues.

Forest Health Activities in sub-landscapes below DFC targets

If possible, treat forest health problem and strive to still meet DFC criteria.

If it is not possible to treat the problem and still meet DFC criteria, design the harvest so as to return the stand to DFC conditions as soon as possible.

If a regeneration-style harvest is necessary USFWS will be notified.

Forest Health in no-role/PPDFC areas

The DNR will manage these areas in accordance with Department policies and procedures.

Appendix F

List of contributors

List of contributors

The DNR would like to thank the Yakama Nation for their advice and leadership in managing forest health challenges in eastern Washington forests. The Yakama Nation and their management vision, to move eastern Washington forests back to more historical stocking and species composition, were instrumental in forming the basis of this amendment.

The administrative amendment is a result of over three years of collaborative efforts by people from widely varied backgrounds. This breadth of experience and perspective has resulted in a landscape-based plan that will greatly assist the DNR in managing for its conservation objectives and trust obligations.

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