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To: Field Office Supervisor, Roseburg Office, US Fish and Wildlife Service

From: District Manager, Medford

Subject: Submission of the Medford BLM Double Bowen Biological Assessment

This Biological Assessment (BA) evaluates the Double Bowen project in the Butte Falls Resource Area that "may affect and is likely to adversely affect" (LAA) spotted owls. Treatments are proposed in the 2012 revised designated northern spotted owl (NSO) critical habitat (77 Federal Register 233:71876-72068) that "may affect and are likely to adversely affect" (LAA) critical habitat. No other listed wildlife species or critical habitats are affected. Listed plants and fish are evaluated under other consultation documents.

The Medford BLM Biological Assessment for the Double Bowen project is attached. The BA also includes Appendix A, the Project Design Criteria (PDC) for northern spotted owls; Appendix B, the history for NSO sites associated with the project; and Appendix C, the proposed action maps. GIS project, habitat, and spotted owl site layers will be hand delivered to Cindy Donegan at the Medford Interagency Office.

We request formal consultation with the US Fish and Wildlife Service on the Double Bowen Biological Assessment. We look forward to working with the US Fish and Wildlife Service to meet our joint obligations under the Endangered Species Act 7(a) 1 and 7(a) 2.

For further information, please contact Robin Snider 541-618-2496.

Sincerely,

Dayne Barron
District Manager
BLM Medford District

Biological Assessment
for the
Double Bowen
Vegetation Management Project

(Cite as Double Bowen BA)

An Assessment of Effects to the
Northern Spotted Owl

Medford District
Bureau of Land Management
July 2014

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1. INTRODUCTION

1.1 Purpose of the Assessment

The Medford District of the Bureau of Land Management (BLM) is submitting this Biological Assessment (BA) to the US Fish and Wildlife Service (Service) pursuant to Section 7 (a)(2) of the Endangered Species Act (ESA). Section 7 (a)(2) requires federal agencies to consult with the Service to ensure their actions will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats. Conservation measures described in this BA are also intended to meet obligations under Section 7 (a)(1) to conserve listed species.

This Biological Assessment (BA) describes and evaluates the potential effects from the Double Bowen Vegetation Management Project in the Butte Falls Resource Area (BFRA) on the Medford District BLM. This project is designed to meet the BLM's need to manage Matrix lands in a manner that provides for a sustainable supply of timber, help meet the Medford BLM's annual timber volume target, and improve forest health. The project is described in more detail in Section 2.3 below. This project will be consistent with the project descriptions and Project Design Criteria (PDC) described in this BA. If any changes to the proposed action occur after the Biological Assessment has been submitted, the new proposals will be presented to Level 1 for evaluation to see if reinitiation is necessary.

Approximately 741 acres of the proposed treatments of the Double Bowen Project are within the 2012 Revised Designated Northern Spotted Owl (NSO) Critical Habitat (77 Federal Register 233:71876-72068). BLM requests formal consultation for this project because we have determined the proposed action *may affect, and is likely to adversely affect (LAA)* the northern spotted owl and their designated critical habitat.

The Double Bowen Project is located within the known wolf activity area of OR-7, a male wolf that dispersed from the Imnaha pack in September 2011(ODFW 2014). Since March of 2013, ODFW has documented OR-7 spending the majority of his time in the southwest Cascades. This area covers the southeastern portion of Douglas County, the eastern edge of Jackson County, and the western edge of Klamath County. Wolves use a variety of habitats, but use primarily coincides with wild ungulate ranges, including winter range, summer range and calving/fawning areas (ODFW 2010). Important wolf habitat components for reproduction are denning sites and rendezvous sites. Den sites may be in hollow logs, clefts between rocks, deep riverbank hollows, spaces under upturned trees or rock overhangs, or in abandoned dens of other animals. Recently the USFWS and ODFW have narrowed down the area of activity of OR-7 where a female wolf was detected and pups were confirmed. The Double Bowen project is outside of this new area, so effects to wolves will not be discussed in more detail in this assessment.

No other listed wildlife species or designated critical habitat will be affected by the activities identified in this BA. Consultation for federally listed plants is covered in the *Biological Assessment and Letter of Concurrence for Activities that May Affect the Federally Listed Plant Species, Gentner's Fritillary, Cook's Lomatium, and Large-flowered Woolly Meadowfoam, on Bureau of Land Management, Medford District and Cascade Siskiyou National Monument (USDI 2014).* Listed fish will be evaluated separately through consultation with National Marine Fisheries Service (NMFS).

1.2 Consultation History

The Double Bowen Project is a new project. The projects in this BA were presented to the Level 1 team at a briefing meeting on February 10, 2014. The Level 1 team includes the Rogue River-Siskiyou National Forest Biologist, the Medford BLM District Biologist, and the Roseburg Fish and Wildlife Office Biologist. A field trip to the Double Bowen Project Area occurred on January 23, 2014 with the USFWS representative from the Level 1 team.

1.3 Definitions

Table 1. Northern Spotted Owl Breeding Periods

Entire Breeding Period	Critical Breeding Period	Extended Breeding Period
March 1-September 30	March 1-June 30	July 1-September 30

Nesting, Roosting, and Foraging (NRF) Habitat for the northern spotted owl consists of habitat used by owls for nesting, roosting, and foraging. Generally, this habitat is multistoried, 80 years old or older (depending on stand type and structural condition), has high canopy cover, and has sufficient snags and down wood to provide opportunities for nesting, roosting, and foraging. Other attributes include a high incidence of large trees with various deformities (e.g. large cavities, broken tops, mistletoe infestations, and other evidence of decadence), large snags, large accumulations of fallen trees and other woody debris on the ground, and sufficient open space below the canopy for owls to fly (Thomas *et al*., 1990).

In southwest Oregon, NRF habitat varies greatly, but is typified by mixed-conifer habitat, recurrent fire history, patchy habitat components, and a higher incidence of woodrats. It may consist of somewhat smaller tree sizes. One or more important habitat components, such as dead down wood, snags, dense canopy, multistoried stands, or mid-canopy habitat, might be lacking or even absent in portions of southwest Oregon NRF. NRF habitat also functions as dispersal habitat.

Currently, the SW Oregon Level 1 team uses NRF habitat typed in the Biological Assessment to represent both NRF and Roosting/Foraging habitat. Roosting and foraging habitat is different than nesting habitat because even though the stands might have larger trees and higher canopy, they are often single storied, and lack decadent features. NRF and roosting/foraging habitat is often separated in the field by BLM biologists and used to inform more specific project effects determinations.

Dispersal Habitat at a minimum, consists of stands with adequate tree size and canopy cover to provide protection from avian predators and at least minimal foraging opportunities. Dispersal habitat may include younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, but such stands should contain some roosting structures and foraging habitat to allow for temporary resting and feeding for dispersing juveniles (USDI FWS 1992). Dispersal habitat is generally forest stands with canopy cover of 40 percent or greater and an average diameter at breast height (DBH) of 11 inches or greater. It provides temporary shelter for owls moving through the area between NRF habitats and some opportunity for owls to find prey;

but it does not provide all of the requirements to support an owl throughout its life. NRF habitat can also function as dispersal habitat. However, dispersal (or dispersal-only) will be used throughout this document to refer to habitat that does not meet the criteria to be NRF habitat, but has adequate cover to facilitate movement between blocks of NRF habitat.

Capable Habitat for the northern spotted owl is forestland that is currently not habitat but can become NRF or dispersal in the future, as trees mature and the canopy closes.

Non-habitat does not provide habitat for northern spotted owls and will not develop into NRF or dispersal in the future.

Treat and Maintain NRF or Dispersal Habitat is the treatment defined when an action or activity in NRF or dispersal habitat removes some trees, but does not change the intended function of the habitat because the conditions that would classify the stand as NRF or dispersal would remain post-treatment. The treated stand will still function as NRF habitat because it will continue to provide at least 60 percent canopy cover, large trees, multistoried canopy, standing and down dead wood, diverse understory adequate to support prey, and may have some mistletoe or other decay. The treated stand will still function as dispersal habitat because it will continue to provide at least 40 percent canopy cover, flying space, and an average of trees 11 inches diameter at breast height (dbh) or greater.

Remove NRF or Dispersal alters known spotted owl NRF or dispersal-only habitat so the habitat no longer functions as nesting, roosting, foraging, or dispersal habitat. Removal generally drops canopy cover to less than 40 percent, alters the structural diversity and dead wood in the stand or otherwise changes the stand so it no longer provides nesting, roosting, foraging, or dispersal habitat for owls.

2. DESCRIPTION OF THE PROPOSED ACTION

2.1 Project Area History and Current Condition

The Double Bowen project area was significantly impacted in 2008 from a winter wind storm and summer wildfire (See Appendix C, Map 3):

- A series of severe winter windstorms hit Jackson County in early January, 2008. National Weather Service weather stations recorded peak winds up to 70 miles per hour in the Southern Oregon Cascades. Winds may have exceeded this on the ridges. The storm affected Federal forest lands administered by the Medford BLM in the Double Bowen project area. The impact occurred mostly in unmanaged forest stands and recently harvested stands that are generally 80 years or older. Impacts from the windstorm varied from scattered individual windthrown trees that were uprooted and blown over to large areas that sustained severe damage. The severe damage occurred when the majority of the stand had trees uprooted, tops snapped off and crowns defoliated by the loss of branches and needles. Blow down occurred in forest stands across all topographic positions from low riparian areas to the upper ridges. Canopy cover in some areas prior to the windstorm

was 80-to-100 percent. Following the windstorm, canopy in the stands where severe damage occurred is approximately 0-to-30 percent (USDI 2008).

- The Doubleday Fire burned in September of 2008 and burned 451 acres of BLM-administered lands. Of those acres, 179 acres burned at high severity, 259 acres at moderate severity, and 13 acres at low severity. In the northern area of the fire, high severity areas were generally more densely vegetated, but the presence of heavy blow down from the winter storm generally resulted in a greater percentage of overstory mortality, even where the overstory was open. Visual observations indicate that winds and terrain were the strongest drivers of fire severity in southern area of the fire, independent of the amount of blow down present (USDI 2009).

***Double Bowen Project Area Vegetation Conditions*:**

Current conditions:
White fir is the dominant plant series within the Double Bowen project area. The white fir series is one of the most widespread, diverse, and productive plant series of the southern Oregon Cascades. Ponderosa pine, sugar pine, incense cedar, and Douglas-fir represent the early seral tree component of this series. Douglas-fir generally dominates the overstory of most stands before being replaced by white fir. Four plant associations occur in the project area: white fir-Douglas-fir/piper Oregon grape (ABCO-PSME/BEPI), white fir/California hazel-western serviceberry (ABCO/COCOC-AMAL), white fir/vine maple/vanilla leaf (ABCO/ACCI/ACTR), and white fir-poison oak (ABCO/RHDI). The ABCO-PSME/BEPI association is the most common and the ABCO/RHDI association, the least common, is generally restricted to dry ridge tops.

All the plant associations are on the warm and dry end of the environmental gradient, with moisture limitations late in the growing season limiting biomass production. The understory is dominated by white fir, with Douglas-fir common. Shrub species that are present in varying amounts are deerbrush ceanothus, oceanspray, vine maple, hazel, red stem ceanothus, serviceberry, Oregon grape, and thimbleberry. Common herbaceous vegetation includes pathfinder, western starflower, western twinflower, and white inside-out flower.

The structural characteristics of the stands within the proposed units vary from single layer, even-aged stands to multi-layer, uneven-aged stands. Even-aged stands within the project area are generally a result from wildfires that burned at a high intensity. The majority of the even-aged stands are 120 years old or less. Mature stands (150 years or greater) are generally where the multiple canopy stand conditions are found within the project area. In general, two-storied and multi-storied stands have understories that are suppressed and usually dominated by Douglas-fir or incense cedar. In most stands, widely scattered 30- to 40-inch or more Douglas-fir, sugar pine, ponderosa pine, and incense cedar trees are also present as fire remnants of previous stands. With decades of fire exclusion, stand development has stagnated and stand densities have increased.

2.2 Proposed Action Overview

The Double Bowen project was designed to conform to the 1995 Medford District Resource Management Plan (USDI 1995) and the Northwest Forest Plan (NWFP) (USDA USDI 1994a). The project occurs on Matrix, Riparian Reserves, and Connectivity/Diversity Block land use

allocations. No treatments are proposed in Known Spotted Owl Activity Centers (KSOAC). KSOACs are to be managed as LSRs. Late-successional Reserves (LSR) are managed to protect and enhance habitat conditions for late-successional and old-growth related species. These reserves are designed to maintain a functional, interacting late-successional and old-growth ecosystem. Matrix lands are federal lands outside of reserves and special management areas that are available for scheduled timber harvest at varying levels (USDI 1995). Connectivity/Diversity Blocks are a sub-set of Matrix lands and, a minimum of 25 percent of each block will be maintained in late-successional condition in both long- and short-term. Riparian Reserves are areas along all streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis (USDA USDI 1994a).

The BLM expects the projects to be implemented soon after the Biological Opinion is received and National Environmental Policy Act (NEPA) compliance is completed. Timber sales associated with this project is scheduled to be implemented in Fiscal Year 2015. For consultation tracking and monitoring purposes, the Level 1 team defines implementation of timber sales as the date a project is sold or when a task order is issued for a non-timber sale action (plantation thinning or underburning). It is anticipated the project could take multiple years to complete. Project completion includes stand treatments for slash and reforestation post-harvest.

2.3 Detailed Project Objectives and Descriptions

A landscape assessment was done early in the project planning process to determine current stand conditions, stand trajectories, and to identify threats, such as fires and insects. Simplification of forest structure and pattern in the project area has reduced biological diversity, connectivity, and landscape function. The landscape assessment was used to determine where management can occur within the project area to ensure the sustainability and resiliency of forest ecosystems now and in the future. Approximately 241 acres of NRF, 616 acres of dispersal habitat, 23 acres of capable habitat, and 4 acres of non-habitat are proposed for treatment in the Double Bowen Project.

2.3.1 Project Objectives

There are two main objectives for the forest management and timber harvest portion of the Double Bowen Project:

1) *Design and implement commercial timber sales on matrix lands in the Lower South Fork Big Butte Creek sixth field watershed.*
    - The Medford District Resource Management Plan (p. 81) directs the BLM to design and implement forest management activities to produce a sustained yield of products to support local and regional economic activity.
    - The timber harvested from this project would produce revenue for the federal government which would contribute timber toward the Medford District's annual Allowable Sale Quantity during fiscal year 2015.

2) *Improve Forest Health by increasing landscape resiliency to environmental disturbances and accelerate the development of structural complexity and spatial heterogeneity.*

- Reduce stand densities in stands greater than 100 years old in order to make site resources available for remaining trees.
- Accelerate the development of a multiple canopy, multiple age stand.
- Forest stands with densities that exceed historic conditions and natural carrying capacities would be harvested using restoration and small diameter thinning techniques. Restoration and small diameter thinning would be implemented to reduce stand densities and tree mortality, and restore stand vigor, resiliency, and stability.

2.3.2 *Project Prescriptions:*

The prescriptions described below would be used to accomplish the objectives of the Double Bowen Project. The prescriptions applied to each stand would be based on existing stand conditions as well as current northern spotted owl habitat conditions.

Regeneration Harvest

To maximize volume growth and yield, regeneration harvest should occur in older forest stands with declining growth rates or experiencing deterioration from insects, disease, or other factors. Retained trees would be the most vigorous trees and would be selected based on tree crown ratio and form. Healthy understory ponderosa pine, sugar pine, incense cedar, and Douglas-fir trees free of insects, disease, or damage would be left. Wildlife snags and coarse woody debris would be designated for retention. All other trees would be removed. Slash would be lopped and scattered or piled and burned. Conifer seedlings would be planted following harvest.

Regeneration harvest using **Shelterwood** prescription guidelines would retain 12 to 25 green trees per acre greater than 20 inches DBH to provide protection for newly planted and natural seedlings in areas with growing-season frosts. The spatial distribution of trees would be more uniformly distributed. After harvest, canopy cover would be 20 to 30 percent. Overstory trees in excess of 6 to 8 trees per acre may be removed after 15 to 30 years if the understory trees are no longer susceptible to damage caused by late growing-season frost.

Selection Harvest

This treatment would remove poor vigor trees from *all* diameter classes. Stand densities would be reduced and site resources (water, sunlight, nutrients, and growing space) would be available for the remaining trees. The desired basal area and tree crown ratio and form are the primary factors used to determine which trees would be left or removed. The stand structure would be multiaged and multilayered. Canopy cover would range from 40 to 60 percent following treatment.

Riparian Thinning

The purpose of thinning overstocked Riparian Reserves is to improve individual tree and stand health, reduce risk for catastrophic wildfires, to restore ecosystem functions by accelerating the growth of healthier trees, and to provide an increase of large wood sooner than through tree tipping. Treatment would reduce stand densities by thinning from below, removing smaller trees,

with no trees 20 inches in diameter or larger extracted. A minimum of 50 percent canopy cover would remain in dispersal habitat, and a minimum of 60 percent canopy cover would remain in NFR habitat.

Density Management

Density management would thin trees from below to maintain or enhance forest health, stand structure, and function for northern spotted owl habitat. The residual canopy cover would be a minimum of 40 percent or 60 percent, depending on the current owl habitat designation (dispersal or nesting, roosting, and foraging).

Small Diameter Thinning (Plantation Thinning)

This treatment would be applied to young stands to promote stand health, create structural diversity, and increase landscape resiliency to environmental disturbances. Riparian areas located adjacent to upland thinning units would be thinned using a similar prescription with an emphasis on retaining riparian species (e.g., maple, willow). High stand densities in young ponderosa pine and mixed conifer stands have resulted in slow or stagnant growth rates. These stands are overstocked with more trees than the site has water, nutrients, and growing space to sustain. Pre-commercial thinning and commercial thinning would reduce the number of trees per acre to levels that the site has resources to sustain. A minimum or 40 percent canopy cover would remain after the harvest.

Meadow Restoration

This treatment would occur on upland meadows where tree and brush species are encroaching. Meadow restoration would cut, burn, (or both) small conifers and areas of older or decadent brush in an effort to rejuvenate brush species that would benefit wildlife as browse and remove encroaching vegetation. Management practices, including fire, are proposed in the Medford RMP to obtain desired vegetation conditions in special habitats such as meadows. Down wood, snags, and other unique legacy features would be retained. Burn pile scars would be planted with native grass or forb seed.

Fuels Treatment Associated with Forest Management

Activity fuels created from forest management activities would be treated post-harvest. The BLM would conduct a fuels assessment within each unit following harvest activity. This assessment would determine the fuel hazard and fire risk based on surface fuel loading, aspect, slope, access, and location of each unit. Most fuels treatments would begin within 90 days after completion of harvest activities. The following methods would be used to treat activity fuels:

Lop and Scatter

When the slash (live and dead material 9 inches or less) remaining in the units after harvest is less than 11 tons per acre, all stems and branches would be cut from the tree trunk and scattered. Trunks 7 inches in diameter and less would be cut to 3-foot lengths and left on the ground. The depth of the slash would not exceed 18 inches.

Hand Piling and Hand Pile Burning

Slash remaining in the units after harvest is greater than 11 tons per acre, material between 1 and 7 inches in diameter and longer than 2 feet would be piled by hand. The piles would be a minimum of 4 feet high and 6 feet in diameter. Piles would be burned in the fall, winter, or spring.

Underburning
Underburning would remove at least 60 percent of slash less than 3 inches in diameter and a lesser amount of larger fuel size classes in timbered stands. This treatment would move the stands from a timber understory to a timber litter fuel type. Underburning would be implemented in the spring or fall.

Biomass Removal
Whole trees or tree tops would be yarded to log landings, the tree tops and limbs removed and piled at the landings, and the resulting piles of slash hauled away from the landings. Whole tree yarding and tree top yarding would not be required but are options for treating activity slash.

2.3.3 Proposed Action Implementation Methods

The proposed treatments described above will be implemented using a variety of manual and mechanical tools. They are described below because each method has a different impact to existing vegetation and have been considered in the overall effects determinations for the project, including the effects analysis for each unit. For example, the openings created from proposed yarding corridors, landings, and road/routes were assessed and added to the potential treatment effects determination for each unit. Reinitiation will occur if the actual effects from these tools exceed our anticipated effects during analysis.

Ground based extraction: On slopes averaging < 35 percent, woody biomass and saw log material created from harvest operations would be cut, and skidded to landings or road sides using low ground pressure machinery. Skidding machinery would be restricted to approved skid trails. This method requires narrow skid trails, up to 12 feet in width as measured from the outer edges of the standard width dozer blade in the straight position (yarding tractor). Existing skid trails would be used where possible. Skid trail locations would be approximately 150 feet apart, but vary depending on the site-specific terrain, and would be thereby, minimizing soil disturbance. Openings from skid trails will be assessed for the overall unit effects determination.

Skyline-cable based extraction: On slopes ≥35 percent, woody biomass and saw log material created from harvest operations would be yarded to landings or road sides. Cable yarding drags trees with one end suspended and one end on the ground. Corridors would be generally less than 15 feet wide, depending on the size of trees to be removed and the terrain. Corridor locations would be pre-approved by the BLM Contract Administrator. Openings from corridors and landings will be included in the overall effects analysis for each project. When the corridor and landings are located in a unit, the additional openings will be assessed for the overall unit effects determination.

Guyline anchor and tailhold trees are selected to match the size of the yarder. If needed to ensure the safety of logging operations, as specified under Oregon OSHA laws, these trees may be felled and removed. Trees with suitable spotted owl habitat features will be avoided when possible, and anchor trees (i.e. tailhold trees) will be left standing when appropriate with safety considerations. The Butte Falls Resource Area spotted owl nest tree locations were compared with the proposed cable units and no known nest trees are located near potential guy line anchor or tailhold tree estimated locations, so it is unlikely that any known nests would be removed. There is a low

likelihood that new spotted owl nest trees would be located in these areas adjacent to the cable units because the areas above and below the units are primarily in dispersal habitat or small patches of NRF habitat. Trees felled for operational purposes in Riparian Reserves, Critical Habitat, and RA32 stands will remain on site. These measures would help to reduce impacts to spotted owl habitat. The exact number of guyline or tailhold trees that would be cut is unknown, but likely several could be cut adjacent to each unit. However, according to Oregon OSHA Regulations, felled trees would be removed from the site if they cannot be stabilized and pose an additional threat of sliding or rolling onto the roadways (OAR 437-007-0225 and OAR 437-007-0500). As mentioned above, the effects from anchor tree removal will be considered in the overall effects analysis for the Double Bowen Project.

Access Route Construction
Access route construction would be needed to extract timber. The habitat effects from the road/route construction that occur outside of treatment units are analyzed as a separate treatment area and have been incorporated into the total habitat effects for the project (Table 5). The roads were buffered to create polygons to represent the effects from the road building and included in the proposed units GIS layer used to determine effects from the proposed action. Approximately two acres of spotted owl habitat would be removed from temporary road construction. All other roads and openings are within treatment units or existing road beds.

Temporary Route Construction: A temporary route is an access road constructed to minimum standards on undisturbed terrain, or existing footprints when feasible. These are intended for short-term use. Construction includes clearing, grubbing, removing, and disposing of vegetation and debris from within established clearing limits. Work also includes construction of a minimum width subgrade by excavating, placing embankment, leveling, grading, and outsloping. After use, routes would be ripped, water barred, seeded with native grass, mulched, and blocked.

Reconstruction of Existing Routes: Reconstruction of existing routes would occur on existing road prisms that were previously blocked, closed, or decommissioned, or are overgrown, and have not received periodic road maintenance. The road would be made suitable for timber hauling by removing encroaching vegetation, repairing narrowed sections, and blading the road surface. The route would be made suitable for log haul by clearing, grubbing, and disposing of vegetation along with excavating and grading operations to establish a minimum width road prism. After use, the route would be decommissioned by ripping and/or roughing up the surface, water barring, seeding, mulching and blocking. This may involve clearing small diameter conifers within the road prism to allow for better hauling conditions.

2.4 Project Design Criteria and Conservation Measures

2.4.1 Project Design Criteria

Project Design Criteria (PDC) are conservation measures developed to reduce disturbance impacts to listed species (Appendix A). Disturbance of listed wildlife species occurs when noise, smoke, vibration, or visual stimuli cause impairment of normal behavior. PDC are measures applied to project activities designed to avoid the potential adverse disturbance effects to nesting birds and their young. PDC that restrict activities to outside of the critical breeding season (Table 1) and/or occur beyond recommended disturbance distance thresholds will be incorporated into

the Double Bowen Project. PDC involving seasonal restrictions will be implemented unless surveys, following approved protocols, indicate either non-occupancy or non-nesting of target species.

2.4.2 Conservation Measures

The following are conservation measures for the Double Bowen project that were designed to help reduce impacts to northern spotted owls:

- No treatments would occur in spotted owl nest patches.
- Protection of mollusk, great gray owl sites, and sensitive plant sites resulted in no treatment buffers, which provided untreated patches of spotted owl habitat throughout the project area.
- RA 32 field evaluations were completed in the project area. Approximately 30 acres were identified. No harvest activities, temporary road construction, yarding corridors, or skid roads are planned to occur within RA32 stands.
- Large standing (snags and live trees) and down wood will be retained in all project areas to meet RMP (USDI BLM1995) standards and guides or better. Generally the marking guidelines allow the retention of large hardwoods and large (> 20" DBH), broken, forked-top, and deformed trees, which provide nesting opportunities for spotted owls. Some snags may be felled for safety reasons, but will be left on site to provide additional down woody material.
- Limited removal and downgrading of NRF habitat (less than five acres) would occur in NSO home ranges associated with this project.
- No projects occur within Known Spotted Owl Activity Centers (KSOAC). KSOAC are the best 100 acres around northern spotted owl activity centers that were documented as of January 1, 1994 on Matrix and AMA lands, and are managed as Late Successional Reserves (LSR). The criteria for mapping these areas are identified on pages C-10 and C-11 of the Northwest Forest Plan Standards and Guidelines (USDA USDI 1994b).
- If new spotted owl sites are located during surveys, biologists will review PDC and the BO to confirm the ESA analysis remains valid. Timber sales have a contract clause (E-4) that authorizes stop work when threatened and endangered species are found in the timber sale or to comply with court orders. If or when a spotted owl or other listed species is found in the project area the timber operators are authorized to stop the work until the issue is evaluated further. If the impacts to the new site is no longer consistent with the analysis, the project will remain stopped until BLM completes one or more of the following:
    - Modifies the proposed action to ensure that impacts remain as described in the consultation documents.
    - Imposes seasonal protections (if necessary);
    - Reinitiates and completes new consultation

3. ENVIRONMENTAL BASELINE

3.1 Description of the Action Area

The Action Area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action" (50 CFR 402.02). For northern spotted owls, the Action Area is usually based on the radius of a circle that would capture the provincial home range, which is 1.2 miles for the West Cascades Province (Thomas et al. 1990 and Courtney et al. 2004). Therefore, the Action Area represents all lands within 1.2 miles of proposed treatment units and all lands within any overlapped associated provincial home ranges of known spotted sites that could be directly, indirectly or cumulatively impacted by the proposed action. See Appendix C Map 1 to see a display of the Action Area. Table 2 below in Section 3.3 provides habitat baseline data for the Action Area.

3.2 Status of Northern Spotted Owls Range-wide

ESA regulations (50 CFR 402.02) state that *the environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the Action Area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land management activities*.

A detailed account of the taxonomy, ecology, and reproductive characteristics of the spotted owl can be found in the *2011Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2011), the SEI 2004 Northern Spotted Owl Status Review (Courtney *et al.* 2004); the Interagency Scientific Committee Report (Thomas et al. 1990); Forest Service Ecosystem Management Report (USDA et al. 1993), final rule designating the spotted owl as a threatened species (1990), and several key monographs (e.g., Anthony et al. 2006 and Forsman et al. 2011). These documents are incorporated by reference.

Eleven demographic study areas have been established to represent owl status across the range of the northern spotted owl (Forsman et al 2011). Owl sites and productivity are annually monitored within these areas to:

- *Assess changes in population trend and demographic performance of spotted owls on federally administered forest lands within the range of the owl and*
- *Assess changes in the amount and distribution of nesting, roosting, and foraging habitat and dispersal habitat for spotted owls on federally administered forest lands.*

Medford shares one demographic study area, the Klamath, with Roseburg BLM and the Rogue River Siskiyou National Forest. The Southern Oregon Cascades Demographic Study Area is also near the Medford District. The Double Bowen Project is immediately adjacent to the Southern Oregon Cascades Study Area. Metadata analysis evaluates population statistics of the owls in the demographic study areas. The last metadata analysis was completed in 2011, which found that fecundity, the number of female young produced per adult female, is declining. Forsman 2011 concluded that fecundity, apparent survival, and/or populations were declining on most study

areas, and that increasing numbers of barred owls and loss of habitat were partly responsible for these declines.

Two years of annual monitoring reports have been published or drafted since the 2011 the metadata analysis was completed. According to the 2012 Annual Report for the Southern Oregon Cascades Demography Study Area, at least one spotted owl was detected at 71 (42 percent) of the sites. This represented a 3.5 percent increase from 2011. However, the number of pairs (44) located was the fewest recorded during the study. The average fecundity rate in 2012 was 0.24 (averaged across sites matrix, LSR, and wilderness). There were 22 juveniles detected in the Southern Oregon Cascades study in 2012 (22) (Dugger et al, 2013). Preliminary 2013 data indicates the occupancy and fecundity rates declined compared to 2012. At least one spotted owl was detected at 60 (35 percent) of the sites in 2013, which represents a decline in occupancy of 7 percent. The average fecundity rate was 0.20 in 2013 which also represents a decline from 2012. Thirteen juveniles were detected in the study area in 2013 (Dugger et al 2014).

3.3 Status of Northern Spotted Owl Habitat in the Action Area

The environmental habitat baseline for spotted owls on the Medford BLM administered lands for the Action Area is current as of March, 2014. The Medford environmental baseline was initially developed in 2008 using field assessments by experienced wildlife biologists, the Interagency Vegetation Mapping Project (IVMP) imagery from 1996 (as corrected through 2003), and additional stand data. IVMP data is the source for information for non-BLM managed lands. The baseline is updated annually for each BLM project area and the Double Bowen area was updated in March of 2014. Habitat updates within the units were based on field evaluations.

The proposed projects are within the Cascades West physiographic province, which extends the full length of the Oregon Cascades Range. Historically, fire was the primary large-scale, natural disturbance event. Both stand-replacement fires and less intense under burns were common prior to fire suppression. High summer temperatures and moderate precipitation provide conditions favorable for fires. Intense stand-replacement wildfires burned every 80 to 200 years or more; less intense under burns were more frequent.

Table 2 summarizes baseline habitat and ownership information for the Double Bowen Action Area.

Table 2. Environmental Baseline for the Double Bowen Action Area

	ACRES	NSO NRF HABITAT ACRES (% TOTAL)	CAPABLE [4] NSO HABITAT ACRES (% TOTAL)	RESERVED ACRES[1] (% OF TOTAL)	NON-RESERVED ACRES (% OF TOTAL)	DISPERSAL[2,4] ACRES (% OF TOTAL)
OWNERSHIP						
-All Ownerships	24,274	3,618 (15%)	2,166 (9)	519 (2%)	7,949 (33%)	5,991 (25%)
- Non-Federal (Private, State)	15,326	1,388 (9%)	N/A[4]	N/A[4]	N/A[4]	1,388 (9%)
-Federal (BLM, USFS)	8,468	2,230 (26%)	2,166 (26%)	519 (6%)	7,949 (94%)	4,603 (54%)

Table 2. Environmental Baseline for the Double Bowen Action Area							
		ACRES	NSO NRF HABITAT ACRES (% TOTAL)	CAPABLE [4] NSO HABITAT ACRES (% TOTAL)	RESERVED ACRES[1] (% OF TOTAL)	NON-RESERVED ACRES (% OF TOTAL)	DISPERSAL[2,4] ACRES (% OF TOTAL)
LAND ALLOCATION - FEDERAL (*hierarchal, no acres double-counted*)							
-Late-Successional Reserves (mapped)		0	0	0	519 (100%)	0	0
- 100-Acre Spotted Owl Core Areas in the Matrix		519	214 (41%)	111 (21%)			407 (78%)
-Matrix [3]		7,949	2,016 (25%)	2,055 (26%)	0	7,949 (100%)	4,696 (59%)
Spotted Owl Critical Habitat							
Critical Habitat Unit	**Sub-unit**	**Acres[5]**	**NRF Habitat Acres**	**Capable NSO Habitat Acres**	**RESERVED**	**NON-RESERVED**	**DISPERSAL**
10	**KLE4**	849	849 (100%)	0	0	849 (100%)	849 (100%)
10	**KLE5**	4,890	1,140 (23%)	1,566 (32%)	519 (11%)	4,371 (89%)	3,212 (66%)

Notes: 1. Protected = land allocation with no programmed timber harvest which includes Congressionally Reserved land, LSR's, Owl Cores and Wild and Scenic River Corridors. 2. Dispersal includes NRF habitat. 3. Matrix/AMA includes Riparian Reserves (no Riparian Reserved layer is available) 4. Capable and Dispersal-Only acres are primarily calculated on federal lands only in this BLM layer (BLM used the same layer to be consistent with the BA data). 5. Includes CH on State Lands

Table 3 estimates the current NSO habitat conditions within the Section 7 watersheds associated with the Double Bowen Project. Section 7 watersheds were developed by the Level 1 team shortly after the spotted owl was listed for a qualitative evaluation for dispersal function using the concepts of Thomas et al. as described below. They are similar, but not identical, to fifth-field watersheds. This landscape level provides a general dispersal condition. Thomas et al. (1990) along with Lint et al. (2005) and Davis et al. (2011) suggested using a landscape level approach to analyze the effects to dispersal. Thomas et. al (1990) originally recommended assessing dispersal habitat conditions on the quarter-township scale. Since then the Service has generally recommended using a fifth field or larger landscapes for assessing dispersal habitat conditions because watersheds or provinces offer a more biological meaningful way to evaluate dispersal function.

Table 3. Dispersal Habitat Conditions in Section 7 Watersheds					
Section 7 Watershed	**Total Watershed Acres**	**Total NRF Habitat Acres**	**Total Dispersal-Only Habitat Acres[1]**	**Total Dispersal Acres (NRF+ Dispersal Only)**	**% Watershed Dispersal Habitat[1] (NRF +Dispersal-only)**
Rogue-Upper	940,163	234,097	26,291	260,388	28%

1= Private and FS dispersal habitat acres not included

3.4 Status of Northern Spotted Owl Sites in the Action Area

Northern spotted owl site occupancy is defined as locations with evidence of continued use by spotted owls, including breeding, repeated location of a pair or single birds, presence of young

before dispersal, or some other strong indication of continued occupation. Spotted owl sites used in this BA are based on historic information, protocol surveys, or incidental observations. These sites can also be referred to as territories because several alternate nest locations are often associated with each individual site. Spotted owls are generally monogamous and primarily mate for life (Courtney 2004). They are also known to exhibit high site fidelity. However, owls often switch nest trees and use multiple core areas over time, possibly in response to fluctuations of prey availability, loss of a particular nest tree, or presence of barred owls. For this assessment, survey history was used to determine whether the original or alternate nest locations would be analyzed in this BA to represent the territory.

Double Bowen Action Area

The Double Bowen Action Area overlaps the home range of seven historic NSO sites on the Medford BLM and adjacent Forest Service lands. Historic sites within the Double Bowen project area have been surveyed consistently in the past 10 years and monitoring will continue in the future. Additional spotted owl protocol surveys were initiated in the spring of 2013 in previously un-surveyed NRF habitat within 1.2 miles of the proposed treatment units to determine occupancy status of these areas. These surveys will continue over the next two to five years, depending on the harvest schedule and whether or not owls are detected. Since 1988, spotted owls have been detected within four historic KSOACs and at three locations outside of historic KSOACs. See Appendix B for a summary of the survey history, as well as occupancy and reproductive status.

There are approximately 552 acres of NRF habitat on federal lands within the Double Bowen Action Area that occur outside of known spotted owl home ranges. These occur primarily in small patches that are unlikely to support owl occupancy, but there is one larger block in the southeast within the Action Area that also includes proposed harvest units. The BLM is surveying the NRF habitat in this area and the Oregon State University spotted owl crew is surveying the adjacent Forest Service lands as part of South Cascades Demography Study Area. Due to the heavily fragmented and checkerboard landscape, the BLM doesn't anticipate to find owls. However, if owls are found within 1.2 miles of proposed units, the BLM will modify or drop the units to reduce potential effects to spotted owls or reinitiate consultation.

NSO Site Pre-Treatment Habitat Conditions

The pre-treatment NRF habitat acres for spotted owl sites in the Double Bowen Action Area are displayed in Table 7. This table provides the current habitat baseline on federal lands and to help with effects determinations from the proposed actions. NRF habitat is displayed because research has indicated that the quantity and configuration of "older forest" (analogous to NRF Habitat) provides a valid inference into the likelihood of occupancy (Hunter et al 1995), survival, and reproduction (Franklin et al 2000, Zabel et al 2003, Olson et al 2004, Dugger et al, 2005, Dugger et al 2011).

3.5 Spotted Owl Prey Species

The composition of the spotted owl's diet varies geographically and by forest type. Generally, flying squirrels are the most prominent prey for spotted owls in Douglas-fir and western hemlock forests in Washington and Oregon (USDI 2011). In southwest Oregon, dusky-footed woodrats are a primary prey species for spotted owls. They are typically found in high densities in early-seral or edge habitat (Sakai and Noon 1993, 1997), but are also abundant in old growth and

complex forests (Carey et al 1997). Northern flying squirrels are another major source of owl prey in southwest Oregon, while red tree voles (RTVs) may comprise only approximately 2.6 % of the diet of spotted owls in this area (Forsman 2004). Other important prey items include deer mice, red-backed voles, gophers, snowshoe hare, bushy-tailed wood rats, birds, and insects, although these species comprise a small portion of the spotted owl diet (USDI 2011).

3.6 Barred Owls

The 2011Revised Recovery Plan for the Northern Spotted Owl identifies competition from the barred owl as a threat to the spotted owl (USDI FWS 2011). Barred owls (*Strix varia*) are native to eastern North America, but have moved west into spotted owl habitat. Existing evidence suggest that barred owls compete with northern spotted owls for habitat and prey with near total niche overlap and that interference competition (Dugger et al. 2011, Van Lanen et al. 2011, Wiens 2014) is resulting in increased northern spotted owl site abandonment, reduced colonization rates, and likely reduction in reproduction (Olson et al. 2005, Dugger et al. 2011, Forsman et al. 2011, Wiens 2014).

Barred owls are detected opportunistically because the BLM does not conduct barred owl surveys across the District. These incidental observations are increasing within the Medford District, which matches the trend of increasing numbers of barred owls across the range of the northern spotted owl. Incidental observations across the District, as well as information from the Klamath and South Cascades Demography Study Areas indicate that barred owls are increasing in this area. Local populations of barred owls are likely to increase over time. Observational data suggests direct competition with and aggressive displacement of spotted owls from prime nesting habitat.

The BLM did not conduct surveys specifically for barred owls in the Double Bowen Project Area. However barred owls were detected during spotted owl surveys and recorded when detected. Approximately three of the seven spotted owl sites associated with the Double Bowen project have had at least one barred owl detected in the NSO home ranges.

3.7 Status of Northern Spotted Owl Critical Habitat

Critical habitat for the northern spotted owl was designated in 1992 in *Federal Register* 57, and includes the primary constituent elements that support nesting, roosting, foraging, and dispersal. Designated critical habitat also includes forest land that is currently unsuitable, but has the capability of becoming NRF habitat in the future (57 FR 10:1796-1837). Critical habitat was revised for the northern spotted owl and the final designation was published by the USFWS in the *Federal Register* (signed on August 12, 2008, 73 Federal Register 157:47326) and became effective on September 12, 2008. The 2008 USFWS's Critical Habitat delineations were challenged in court and the 2008 designation of northern spotted owl CHU was remanded. The USFWS was ordered to revise the CHU designation. On February 28, 2012, the Service released the proposed critical habitat in the form of maps and the draft form of the *Federal Register* publication. The proposed rule was published in the *Federal Register* on March 8, 2012 (77 *Federal Register* 46:14062-14165). The final Critical Habitat Rule was published in the Federal Register on December 4, 2012 (77 Federal Register 233:71876-72068) and became effective January 3, 2013.

Section 4(a)(3) of the Act specifies that the Service shall designate critical habitat for endangered or threatened species and may, from time-to-time thereafter as appropriate, revise such designation. Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features that are essential to the conservation of the listed species and which may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by the species at the time it is listed that are essential for the conservation of a listed species. Regulations focus on the "primary constituent elements," or PCEs, in identifying these physical or biological features. The physical or biological features essential to the conservation of the northern spotted owl are forested lands that are used or likely to be used for nesting, roosting, foraging, or dispersing.

Primary Constituent Elements of Critical Habitat

Based on current research on the life history, biology, and ecology of the northern spotted owl and the requirements of the habitat to sustain its essential life history functions, as described above, the Service has identified the following PCEs for the northern spotted owl which are as follows:

1) Forest types that may be in early-, mid-, or late-seral states and support the northern spotted owl across its geographical range

2) Habitat that provides for nesting and roosting. This habitat must provide:
- a) Sufficient foraging habitat to meet the home range needs of territorial pairs of northern spotted owls throughout the year.
- b) Stands for nesting and roosting that are generally characterized by:
  - (i) Moderate to high canopy cover (60 to over 80 percent),
  - (ii) Multilayered, multispecies canopies with large (20- 30 in (51-76 cm) or greater dbh) overstory trees,
  - (iii) High basal area (greater than 240 ft^2/acre (55 m^2/ha)),
  - (iv) High diversity of different diameters of trees,
  - (v) High incidence of large live trees with various deformities (e.g., large cavities, broken tops, mistletoe infections, and other evidence of decadence)
  - (vi) Large snags and large accumulations of fallen trees and other woody debris on the ground, and
  - (vii) Sufficient open space below the canopy for northern spotted owls to fly.

3) Habitat that provides for foraging, which varies widely across the northern spotted owl's range, in accordance with ecological conditions and disturbance regimes that influence vegetation structure and prey species distributions.

4) Habitat to support the transience and colonization phases of dispersal, which in all cases would optimally be composed of nesting, roosting, or foraging habitat (PCEs (2) or (3)), but which may also be composed of other forest types that occur between larger blocks of nesting, roosting, and foraging habitat. In cases where nesting, roosting, or foraging habitats are insufficient to provide for dispersing or nonbreeding owls, the specific dispersal habitat PCEs for the northern spotted owl may be provided by the following:

a) Habitat supporting the transience phase of dispersal, which includes:
   (i) Stands with adequate tree size and canopy cover to provide protection from avian predators and minimal foraging opportunities; in general this may include, but is not limited to, trees with at least 11 in (28 cm) dbh and a minimum 40 percent canopy cover; and
   (ii) Younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, if such stands contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the transience phase.
b) Habitat supporting the colonization phase of dispersal, which is generally equivalent to nesting, roosting, and foraging habitat as described in PCEs (2) and (3), but may be smaller in area than that needed to support nesting pairs.

Approximately 741 acres of the proposed Double Bowen Project are within Critical Habitat Unit (CHU) 10, sub-unit KLE-5. The following descriptions for the Critical Habitat Unit (CHU) 10, sub-unit KLE-5 are directly out of the final rule in the *Federal Register* (77 Federal Register 233:71931-71935).

Unit 10: Klamath East (KLE)

Unit 10 contains seven subunits and consists of the eastern portion of the Klamath Mountains Ecological Section M261A, based on section descriptions of forest types from Ecological Subregions of the United States (McNab and Avers 1994, Section M261A), and portions of the Southern Cascades Ecological Section M261D in Oregon. This region is characterized by a Mediterranean climate, greatly reduced influence of marine air, and steep, dissected terrain. Franklin and Dyrness (1988, pp. 137-149) differentiate the mixed-conifer forest occurring on the "Cascade side of the Klamath from the more mesic mixed evergreen forests on the western portion (Siskiyou Mountains)," and Kuchler (1977) separates out the eastern Klamath based on increased occurrence of ponderosa pine. The mixed-conifer/evergreen hardwood forest types typical of the Klamath region extend into the southern Cascades in the vicinity of Roseburg and the North Umpqua River, where they grade into the western hemlock forest typical of the Cascades. High summer temperatures and a mosaic of open forest conditions and Oregon white oak (*Quercus garryana*) woodlands act to influence northern spotted owl distribution in this region. Northern spotted owls occur at elevations up to 1,768 m. Dwarf mistletoe provides an important component of nesting habitat, providing additional structure and enabling northern spotted owls to occasionally nest within stands of relatively younger, small trees.

KLE-5

The KLE-5 subunit occurs in Jackson County, Oregon, and comprises lands managed by the BLM and USFS. The BLM and USFS lands are managed per the NWFP (USDA and USDI 1994, entire). Special management considerations or protection are required in this subunit to address threats to the essential physical or biological features from current and past timber harvest, losses due to wildfire and the effects on vegetation from fire exclusion, and competition with barred owls. This subunit is expected to function primarily for north-south connectivity between subunits, but also for demographic support.

There are approximately 36 total historic spotted owl sites in this critical habitat sub-unit on BLM lands. This critical habitat sub-unit is not within lands managed by the Forest Service.

Northern Spotted Owl Critical Habitat Baseline Data

Table 4 summarizes the NSO habitat baseline for the entire critical habitat sub-unit KLE-5. The habitat baseline acres were created by the USFWS by clipping the NWFP Interagency Regional Monitoring Program NSO habitat layer to the December 2012 critical habitat layer. The USFWS then created a spreadsheet on 12/19/2012 with the baseline habitat acres by CHUs and sub-units. For this BA, the BLM subtracted NSO habitat removed from habitat altering projects (from USFWS monitoring database), to come up with the current CHU habitat baseline for sub-unit KLE-5 Project specific habitat calls are based on field verification, GIS habitat layers, and photo interpretation.

Table 4. Critical Habitat Baseline (acres)

CHU / Sub-Unit	NRF	Dispersal - Only	Dispersal (NRF + Dispersal Only)	Capable	Non-Habitat	Total (Dispersal + Unsuitable + Non-Habitat)
10-KLE-5	18,606	12,141	30,747	5,681	771	37,199

** Total Unit acres, Source: NRF/Dispersal removal and downgrade acres from previous habitat altering projects, subtracted from the USFWS NSOCH_2012_Baseline_Summaries_Dec19_2012 Data.*

4. EFFECTS OF THE PROPOSED ACTION

4.1 Effects to Northern Spotted Owls Analyzed by Habitat

The effects to NRF and dispersal habitats are summarized in Table 5 and displayed in Map 2 in Appendix C. The projects listed in this BA represent the current proposal for the Double Bowen project. It is likely that the effects to habitat described below would be reduced at the time of the NEPA Decision Record because it is anticipated that acres will be deferred for various reasons including logging feasibility issues, resulting in less acres offered in the associated Timber Sale.

Table 5. Effects to NSO Habitat from the Proposed Actions

	NRF Removed (acres)	NRF Downgrade (acres)	NRF T&M (acres)	Dispersal-Only Removed (acres)	Dispersal-Only T&M (acres)	Total Acres Treated
AA Baseline Habitat	***3,617***			***5,991*** *(NRF+Dispersal Only)*		***24,274[1]*** *(total AA)*
Double Bowen (DB) Timber Sale	41	44	153	0	531	769
DB Small Diameter Thinning	0	0	0	0	76	**76**
DB Temporary Roads/Landings	3	0	0	1	0	**4**
DB Underburn/ Meadow Restoration)	0	2	0	0	8	**10**
TOTAL	**44**	**46**	**153**	**1**	**615**	**859**
% Change to AA Baseline Habitat	**- 1.2%**	**-1.3%**	**No Change**	**-0.02%**	**No Change**	**3.5 % of AA treated**

1- Total Action Area acres across all ownership, including 151 acres of non-habitat.

The determinations below describe the general effects to the habitat from the proposed actions. They represent the total acre effects as summarized in Table 5. The determinations cover NRF removal, NRF downgrade, NRF treat and maintain, dispersal removed, and dispersal treat and maintained collectively for each project unit. These general effect determinations serve as a starting point for the more detailed analysis for effects to each NSO site within the Action Area and (Section 4.2) and for effects to critical habitat (Section 4.3).

The BLM has determined the <u>removal</u> of 44 acres of NRF habitat associated with the Double Bowen Project (*shelterwood treatment*) and temporary road construction) may affect and is likely to adversely affect (LAA) northern spotted owls because:

- The removal of NRF habitat through regeneration harvest and temporary road construction would remove key habitat elements, including large-diameter trees with nesting cavities or platforms, multiple canopy layers, adequate cover, and hunting perches.
- Regeneration harvests would reduce the overall canopy near or below 40 percent and the existing multi-canopy, uneven age tree structure, and key habitat features would not remain post treatment. These treatment acres would not be expected to provide suitable NRF habitat for many years post-treatment.
- No canopy would exist after the temporary road construction. These treatment acres would not be expected to provide suitable NRF habitat for many years post-treatment.
- The removal of these key habitat features would reduce the nesting, roosting, foraging, and dispersal opportunities for owls in the project area, and lead to increased predation risk.
- Loss of habitat will reduce opportunities for future reproduction and survival of young.
- Removal of NRF would reduce the amount of existing NRF in the Action Area by 1.2 percent.

The BLM has determined the <u>downgrading</u> of 46 acres of NRF habitat associated with the Double Bowen Project (*selection harvest and underburn*) may affect, and is likely to adversely affect (LAA) northern spotted owls because:

- Thinning that downgrades suitable NRF habitat to dispersal habitat would remove key habitat elements (high percent of canopy cover, multiple canopy layers, and hunting perches).
- The removal of these key habitat features would reduce the nesting, roosting, and foraging opportunities for owls within the Action Area, and may lead to increased predation risk by exposing owls to other raptors.
- The removal of these key habitat features would reduce NRF habitat within the Action Area by 1.3 percent.

In the Double Bowen project, the 46 acres of NRF downgrading can be divided into NRF and Roosting/Foraging habitat. Approximately 23 acres are classified as Roosting/Foraging habitat, and 23 acres are classified as nesting habitat. It is likely that spotted owls would not use these stands for nesting for 20 to 30 years post treatment until the canopy cover returns to above 60 percent. Without treatment in these stands, it is estimated that root rot would continue to spread throughout Douglas fir and true fir tree species, thus weakening them,

killing them directly, or making them more susceptible to pine beetles and wind throw. Over time, the stand would have a tree species shift to more resistant species such as pine, cedar, and hardwood species, and spotted owls would be less likely to use the stand for nesting in the future.

The two acres of NRF downgrading resulting from the underburn/meadow restoration treatment, is expected to downgrade the habitat function to Roosting/Foraging habitat. The overstory canopy is expected to be maintained (over 60%), but the understory would be treated, which simplify the stand and have negative impacts to the prey species.

The BLM has determined that treating and maintaining 153 acres of NRF habitat associated with the Double Bowen project (*selection harvest and density management*) may affect, but is not likely to adversely affect (NLAA) northern spotted owls because:

- The conditions that characterize a stand as NRF would be retained following treatment.
- Canopy cover in treated NRF stands will be retained at or above 60 percent, which would provide the minimum canopy to function as NRF habitat.
- Multiple canopy layers would be retained in stands with more than one layer present prior to treatment, which would provide canopy layering necessary to function as NRF habitat.
- Decadent components important to owls such as large snags, large down wood, and large hardwoods would be retained within the stands.
- The percent of NRF treated in the action area is low (< 5 percent).
- No spotted owl nest trees would be removed.
- Treatments would not occur in spotted owl nest patches.

The BLM has determined that the <u>removal</u> of 1 acre of dispersal-only habitat associated with the Double Bowen Project (*temporary road construction*) may affect, but is not likely to adversely affect (NLAA) northern spotted owls because:

- No dispersal habitat will be removed in nest patches.
- Although this watershed is low in dispersal habitat, dispersal habitat is widely distributed and abundant throughout the Action Area. The removal of one acre dispersal habitat would not preclude owls from dispersing throughout the Action Area. Removal of dispersal-only habitat would result in the reduction of 0.02 percent of the total dispersal habitat (NRF and dispersal-only) in the Action Area.
- The removal of one acre of dispersal-only habitat within the Rogue-Upper Section 7 watersheds would not preclude owls from dispersing throughout the watershed. The removal of one acre of dispersal habitat would result in a reduction of 0.0003 percent in the Rogue-Upper Section 7 watershed.
- Removal of one acre (from temporary road construction) would not affect dispersal patterns or create barriers to dispersal outside of CHU.
- Forest landscapes traversed by dispersing owls typically include fragmented mosaic of roads, clear-cuts, non-forested areas, and a variety of forest age classes ranging from fragmented forests on cutover areas to old-growth forests (Forsman et al., 2002).
- The one acre of dispersal-only removal is within critical habitat and is discussed in more detail in Section 4.3.

The BLM has determined that treating and maintaining 615 acres of dispersal-only habitat associated with the Double Bowen project (*selection harvest, density management, small diameter thinning, and underburn)* may affect, but is not likely to adversely affect (NLAA) northern spotted owls because:

- Canopy cover in treated stands will be maintained at 40 percent and key habitat features would be retained, which would enable the stands to continue to function as dispersal habitat.
- Decadent components important to owls such as large snags, large down wood, and large hardwoods would be retained.
- These treatment acres would be expected to continue to provide dispersal opportunities post-treatment.
- The proposed treatments will be dispersed throughout the Action Area to minimize the potential for adversely affecting spotted owl dispersal.

4.2 Effects to Spotted Owls

4.2.1 Analysis Methods

This section summarizes the analysis used for this consultation. For this particular consultation the BLM developed a set of factors based on NSO resource use across the landscape at various spatial scales (home range, core use area, and nest patch) to inform the effects analysis. The spatial scales and general factors are described below, followed by the effects to individual owl sites.

Habitat reduction from the proposed action will be analyzed at the home range, core, and nest patch scales. These scales are described in more detail below:

Home Range Circle is an approximation of the median home range size used by spotted owls in the Cascades West Province. Medford District uses the median home range estimated for southwestern Oregon of 2,895 acres or a circle with a radius of 1.2 miles. The Home Range Circle provides a coarse but useful analogue of the median home range for northern spotted owl (Lehmkuhl and Raphael, 1993, Raphael et al 1996). Although it provides an imprecise estimate of actual home ranges, the home range circle approach has been used to show that stand age/structure, patch size, and configuration within the circle influences the likelihood of occupancy. When less than 40 to 60 percent of the circle is in NRF habitat, the likelihood of spotted owl presence is lower, and survival and reproduction may be reduced (Thomas et al. 1990, Bart and Forsman 1992, Bart 1995, and Dugger et al. 2005). Therefore, the home range circle is a useful analytical scale for the purpose of quantifying habitat and the impact to owl sites from proposed habitat modification. The provincial home ranges of several owl pairs may overlap.

Core Area Circle has a radius that captures the approximate core use area, defined as the area around the nest tree that receives disproportionate use (Bingham and Noon 1997). The Medford District uses a 0.5 mile radius (~500 acre) circle to approximate the core area. Research has indicated that the quantity and configuration of "older forest" (analogous to NRF Habitat)

provides a valid inference into the likelihood of occupancy (Hunter et al 1995), survival, and reproduction (Franklin et al 2000, Zabel et al 2003, Olson et al 2004, Dugger et al, 2005, Dugger et al 2011). Generally survival and reproduction are supported when there is between 40 and 60 percent older forest within the core (Dugger et al 2005), but local conditions and possibly pair experience, contribute to large variance in actual amounts for individual owls. The amount of habitat within an approximate 0.5 mile radius provides reliable predictor of occupancy, and the quantity and configuration have been shown to provide reasonable inferences into survival and reproduction. Core areas represent the areas that are defended by territorial owls and generally do not overlap the core areas of other owl pairs (Wagner and Anthony 1998, Dugger et al. 2005, Zabel et al. 2003, Bingham and Noon 1997).

Nest Patch is the 300-meter radius (70 acres) around a known or likely nest site and is included in the core and home range area. Nest area arrangement and nest patch size have been shown to be an important attribute for site selection by spotted owls (Swindle et al. 1997, Perkins et al. 2000, Miller et al. 1989, and Meyer et al. 1998). Models developed by Swindle et al. (1997) and Perkins et al. (2000) showed that the 200-300 meter radius (and sometimes greater), encompassing approximately up to 70 acres, around a nest is important to spotted owls. The nest patch size also represents key areas used by juveniles prior to dispersal. Miller et al. (1989) found that on average, the extent of forested area used by juvenile owls prior to dispersal averaged approximately 70 acres.

Analysis Approach

Using best available habitat and spatial use information on northern spotted owls, the BLM developed a general approach, informed by local conditions, to evaluate effects determination for individual sites affected by the proposed action. Table 6 provides the general approach, while recognizing site specific conditions may provide exceptions to the factors.

Table 6. Medford BLM General Factors for NSO Site Effect Determinations

LAA Determination Factors	NLAA Determination Factors
• NRF Removal or Downgrade in a home range with < 40% pre-treatment NRF on federal lands. • NRF Removal or Downgrade in a 0.5 mile core area with < 50% pre-treatment NRF on federal lands. • NRF Removal or Downgrade that would reduce the pre-treatment NRF amounts below 40% at the home range and 50% at the core scale. • NRF treatment in the nest patch. • Site has strong occupancy and reproduction history. • Treatments in NRF or dispersal in the 0.5 mile core areas with low amounts of NRF habitat pre-treatment.	• Protocol surveys have determined the site has been vacant for at least 6 years. • The 2008 wind storm and wildfire reduced the amount of NRF on federal lands within the 0.5 mile and home range scales well below 40%. However, this factor is weighed with local conditions in that many owl sites on the Medford District have years of sustained occupancy and reproductive history even though they may only have approximately 30% NRF at the home range scale. • Proposed units are on the outer edge of the approximated home range and/or in combination with (below): o Proposed units are in low Relative Habitat Suitability (RHS) areas from the MaxEnt model, indicating areas less likely to support owls.

4.2.2 Effects to Individual Owl Sites

As indicated above in the NSO Site Baseline Section, there are approximately seven owl sites within the action area. Some treatments (timber harvest, temporary road construction, small diameter thinning, and underburning) are proposed in all seven home ranges. Effect determinations to NSO sites will be based on habitat alteration and potential noise disturbance

outside of the critical breeding season. The effects to the owl sites are analyzed below and summarized in Table 7. The sites are discussed in more detail below Table 7. Maps displaying owl sites, home ranges, 0.5 mile core areas, nest patches, and proposed units are found in Appendix C.

As indicated in Table 7, the NRF habitat amounts are low on federal lands within all of the home ranges and five of the seven 0.5 mile core areas. As mentioned above, at the home range scale, when less than 40 to 60 percent of the circle is in NRF habitat, the likelihood of spotted owl presence is lower, and survival and reproduction may be reduced (Thomas et al. 1990, Bart and Forsman 1992, Bart 1995, and Dugger et al. 2005). Additionally, adjacent private lands have removed or could remove potential NRF on their lands. Therefore, we cannot assume private lands are contributing to the older forest conditions in these home range and core areas in the 2008 Double Day fire area.

Table 7. Double Bowen NSO Sites Affected by the Proposed Action

Site	Pre-Treatment NRF Habitat[1] (acres/%)		NRF Habitat Reduced[2]			Treat and Maintain in Core		Post-Treatment NRF Habitat (acres/%)		Site Activity in last 6 years [3]	Effects Determination
	HR	Core	HR	Core	NP	NRF	Disp	HR	Core		
0877O	211 (7.3%)	67 (12%)	0	0	0	0	0	211 (7.3%)	67 (12%)	Single owls detected	NLAA
1830O[4]	194 (6.7)	59 (12%)	0	0	0	0	3	194 (6.7)	59 (12%)	Unoccupied	NLAA
2005A[4]	351 (12.1)	64 (13%)	0	0	0	11	52	351 (12.1)	64 (13%)	Single owls detected	LAA
2223A[4]	371 (12.8)	183 (37%)	2.75	2	0	**14**	**47**	**369 (12.7)**	**181 (36.2%)**	Nesting Pair in 2009, but unoccupied until a single male detection in 2014	LAA
2680O	570 (19.7)	217 (44%)	0.85	0	0	**0**	**0**	**569.9 (19.6%)**	217 (44%)	Unoccupied	NLAA
3256O[4]	106 (3.7)	10 (2%)	0	0	0	0	0	106 (3.7)	10 (2%)	Pair confirmed in 2008, but unoccupied since then	NLAA
4380O[4]	125 (4.3)	67 (14%)	0	0	0	0	50	125 (4.3)	67 (14%)	Single owls detected	LAA

1- NRF on federal lands
2- NRF reduced = NRF removed or downgraded from the proposed action
3- More information in Appendix B
4 – Site centers are within Critical Habitat

Owl Site Descriptions

<u>Site # 0887O</u>

- Pair status was confirmed at this site in 1991. The site has been monitored from 1990-2013, but nesting status has never been confirmed here. Single owls have been detected in 1994, 1995, 1999, 2010, and 2012.

- NRF would not be removed or downgraded within the home range, 0.5 mile core area, or nest patch of this site. The only proposed treatments at this site are 10 acres of dispersal treat and maintained on the outer edge of the home range.
- Currently, the NRF habitat amounts are low on federal lands within the home range (7.3 percent) and the 0.5 mile core area (12 percent).
- The proposed action **may affect, and is not likely to adversely affect (NLAA)** spotted owls because the NRF levels at the home range and 0.5 mile core scales would not change and no treatments are proposed within the 0.5 mile core area. Additionally, the low habitat amounts within the home range and core scales reduces the likelihood of pair occupancy in the future. The proposed action is not expected to adversely impact essential habitat for nesting or foraging, which could affect reproduction and survival of the owls associated with the sites

Site # 1830O

- Pair status was confirmed at this site from 1990-2007, and the owls last nested in 2006. However, no owls have been found since 2008. In January, 2008 a winter wind storm blew down 90 acres of large trees in dispersal and NRF habitat in the 0.5 mile core. Then later in the summer of 2008, a subsequent wildfire burned 390 acres of NRF and dispersal habitat within the 0.5 mile core of this site. The remaining NRF habitat within the historic home range has been surveyed to protocol since 2007, but no spotted owls have been detected.
- The combination of the wind storm and the subsequent wildfire resulted in the removal of much of the NRF habitat within the core of this site. Currently, 12 percent of the 0.5 mile core and 6.7 percent of the home range function as NRF habitat on federal lands.
- NRF would not be removed or downgraded within the home range, 0.5 mile core area, or nest patch of this site. The only proposed treatments within the home range of this site include six acres of NRF treat and maintain and 62 acres of dispersal treat and maintain.
- Approximately three acres of dispersal habitat are proposed to be treated within the 0.5 mile core of this owl site. These three acres are part of a ten acre young stand plantation unit (small diameter thinning) that was established in 1983. It is comprised of even-aged rows of 30-year-old Douglas fir trees. This stand lacks tree diversity, structure, and decadence components. The stand would be thinned to increase stand vigor and to remove root rot pockets. It is on the outer edge of the 0.5 mile core use area. Following treatment, the stand would have a minimum of 40 percent canopy cover.
- Currently, the NRF habitat amounts are low on federal lands within the home range (6.7 percent) and the 0.5 mile core area (12 percent).
- The proposed action **may affect, and is not likely to adversely affect (NLAA)** spotted owls because the NRF levels at the home range and 0.5 mile core scales would not change. Additionally, adverse effects are not anticipated to spotted owls from the proposed action because based on survey information and the reduction of habitat from the blow down and wildfire events in 2008, this site is likely unoccupied.

Site # 2005A

- The site has been monitored from 1988 through 2013. Pair status was confirmed at this site from 1990-2002. Successful nesting (two fledglings produced) was confirmed in 1992 at the original site (2005O) and in 2000 at this alternate site (2005A). Failed nesting

attempts were observed in years 1991 and 2002. There were single owl detections in 2003, 2009, and 2012.

- In January, 2008, a winter wind storm blew down trees in NRF habitat resulting in 60 acres of NRF downgrade within the 0.5 mile core. A portion of this NRF downgrade also occurred within the original and alternate site nest patches.
- In 2013, protocol clearance surveys were conducted in NRF habitat on federal land throughout the home range of this site with no detections. Surveys will continue in 2014 and spot checks will begin in 2015 if necessary.
- NRF would not be removed or downgraded within the home range, 0.5 mile core area, or nest patch of this site.
- Approximately 94 acres of NRF and 202 acres of dispersal habitat would be treated and maintained (timber sale units and plantation thinning) within the home range of this site. Of these acres, 11 acres of NRF and 52 acres of dispersal habitat would be treated and maintained (timber sale units) within the 0.5 mile core area. The 63 acres of treat and maintain within the core would represent approximately 32 percent of the NRF and dispersal habitat treated on federal lands within the 0.5 mile core area.
- Currently, the NRF habitat amounts are low on federal lands within the home range (12.1 percent) and the 0.5 mile core area (13 percent).
- The proposed action **may affect, and is likely to adversely affect (LAA)** spotted owls because the amount of treatment of NRF and dispersal habitat within a deficit 0.5 mile core area would be measureable. This site is within a highly fragmented landscape due to the blowdown event and adjacent private lands that do not currently support spotted owl habitat. Even though the NRF levels at the home range and 0.5 mile core scales would not change, treatments in the 0.5 mile core area, especially during the breeding season, could adversely impact essential habitat for foraging, which could affect reproduction and survival of the owls associated with the site. However, the low habitat amounts within the home range and core scales reduces the likelihood of pair occupancy in the future regardless if the proposed action occurs.

Site # 2223A

- Pair status was confirmed in 1990, 1998, and 2009, with single responses in 1991, 1994, 1995, 2000, 2005, 2007, and 2014. Successful nesting was observed at this site in 1998 (one fledgling) and in 2009 (two fledglings). Spotted owls have not been detected between 2010 and 2013. Surveys are being conducted in 2014, and at the time of this assessment, a single male has been detected at night. However, no response occurred during the day time follow-up.
- In January, 2008, a winter wind storm blew down trees in 300 acres of NRF habitat within the 0.5 mile core area, which resulted in NRF downgrade. The owls nested in an area of wind damage the following year (2009), but have not been detected since.
- In 2013, surveys were conducted in NRF habitat on federal land throughout the home range of this site. The original site center is on private land and there is very little NRF habitat remaining on private lands (approximately 4 percent) within this home range. Protocol surveys will continue in 2014 and spot checks will begin in 2015 if necessary.
- The proposed action would downgrade two acres of NRF habitat at the home range and core scales from underburning for restoration of an adjacent meadow. These two acres are on a northern aspect, on the lower third of the slope, and in high habitat suitability according to Relative Habitat Suitability (RHS) output from the MaxEnt model. All of

these factors indicate these units are in a location where frequency of owl use and likelihood of nesting is higher.

- The construction of a landing would remove 0.75 acres of NRF habitat within treat and maintain unit. The unit and proposed landing construction is within the home range, but outside of the 0.5 mile core area. The proposed landing construction would occur in an area of high habitat suitability according to the Relative Habitat Suitability (RHS) output from the MaxEnt model.
- NRF habitat levels are currently low at the home range scale (12.8 percent). Thirty-seven percent of the 0.5 mile core area contains NRF habitat on federal lands. Even though this is lower than the suggested levels by Dugger (2005), it is still at levels similar to other occupied and reproductive sites on the Medford District. No treatment would occur within the nest patch,
- Approximately 48 acres of NRF and 175 acres of dispersal habitat would be treated and maintained (timber sale units and plantation thinning) within the home range of this site. Of these acres, 14 acres of NRF and 47 acres of dispersal habitat would be treated and maintained (timber sale units) within the 0.5 mile core area. The 61 acres of treatment within the core would represent approximately 20 percent of the NRF and dispersal habitat treated on federal lands within the 0.5 mile core area.
- The proposed action **may affect, and is likely to adversely affect (LAA)** this site due to the NRF downgrading in a deficit home range and core area. The NRF downgrading is expected to adversely impact essential habitat for foraging, which could affect reproduction and survival of the owls the site. When foraging habitat is removed, especially in areas deficient of NRF habitat, the pair may not be able to obtain enough food to successfully fledge their young. Additionally, 20 percent of the existing NRF and dispersal within the 0.5 mile core area would be treated but maintained, which could adversely impact essential habitat for foraging and limit the foraging opportunities within this 0.5 mile core area. However, based on surveys conducted in the last 5 years, it is unlikely this site is currently occupied, so direct effects to owls are not anticipated.

Site # 2680O (USFS)

- Surveys have occurred at this site on USFS land from 1989-2013. Pair status was confirmed in 1990-1992, 1994, and in 2002-2003. Successful nesting was observed at this site in 1991 with one fledgling produced. A single owl was detected in 2004, with no owl detections from 1996-1997, 1999-2001, and 2005-2013. The alternate site center is on USFS land to the west, and there was a single owl detected at the alternate in 1993, the same year there were no spotted owls detected at the original site. Barred owls have been observed at the original site in 2004 and from 2006-2012.
- In 2013, protocol surveys were conducted in NRF habitat on federal land throughout the home ranges of this site and an alternate site to the west, but no owls were detected. Protocol surveys will continue in NRF habitat within the home ranges of the original and alternate sites in 2014 and 2015 and spot checks will continue in 2016 if necessary.
- Approximately 0.85 acres of NRF removal would occur from temporary road and landing construction at the outer edge of the home range of this owl site. This temporary road and landing construction would occur in an area of high habitat suitability according to the Relative Habitat Suitability (RHS) output from the MaxEnt model. Currently, the NRF habitat amounts are low on federal lands within the home range (19.7 percent) and the

proposed action would result in a 0.02 percent reduction of NRF habitat within the home range of this site.

- The proposed NRF removal is located at the outer border of the home range and private timber land is located between the historic nest site on Forest Service Land and the proposed road construction on BLM land. According to the aerial photo, the entire 474 acres of non-federal land have been harvested in the past 10-20 years and currently do not provide habitat for spotted owls. It is the field biologist's opinion that it is unlikely the owls would use the habitat in the proposed road construction location because the owls would need to expend more energy and risk predation by crossing the large open space of young conifers and open ground on private land. Contiguous foraging habitat exists on Forest Service land within the core area and on the east side of the home range. The available habitat would provide easier foraging opportunities for the owl pair and it would not be necessary for the pair to use the habitat in the proposed unit.
- Five acres of NRF habitat would be treated and maintained (timber sale units) at the outer edge of the home range of this site. No other treatments would occur in the home range or the 0.5 mile core of this site.
- The proposed action **may affect, and is not likely to adversely affect (NLAA)** spotted owls because based on survey information this site is likely unoccupied. Additionally, due to the habitat arrangement at the home range scale, it's unlikely the 0.1 acres of NRF proposed for removal are necessary to meet essential life functions of this potential owl site.

Site # 3256O

- Pair status was confirmed from 1992-1994, 1996-2000, and 2002-2008. Successful nesting was observed at this site in 1994, 1997, and 2000, with a total of five fledglings produced. Failed nesting attempts were observed in 2003, 2004, 2005, and 2007. There have been no spotted owls detected from 2009-2013.
- In January, 2008, a winter wind storm blew down trees in over 200 acres of NRF habitat within the 0.5 mile core, resulting in NRF downgrade. The remaining NRF habitat on federal lands at the home range scale is 3.7 percent and two percent at the 0.5 mile core scale.
- NRF would not be removed or downgraded within the home range, 0.5 mile core area, or nest patch of this site.
- Nineteen acres of NRF treat and maintain are the only treatments (timber units) proposed in this home range and they occur on the outer edge of the home range.
- The proposed action **may affect, and is not likely to adversely affect (NLAA)** spotted owls because the NRF levels at the home range and 0.5 mile core scales would not change and no treatments are proposed within the 0.5 mile core area. Additionally, adverse effects are not anticipated to spotted owls from the proposed action because based on survey information and the reduction of habitat from the blow down and wildfire events in 2008, this site is likely unoccupied.

Sites #4380O

- Pair status was confirmed from 1995-2001 and from 2003-2007. Successful nesting was observed at this site in 1998, 2001, and 2004, with a total of six fledglings produced. There have been single owl detections in 2008, 2011, 2012, 2013, and 2014. A barred owl was detected at the site in 2008 while performing spotted owl surveys.

- In 2013, protocol surveys were conducted in NRF habitat on federal land throughout the home range of this site. Protocol surveys will continue in 2014 and spot checks will begin in 2015 if necessary. At the time of this assessment, a single male has been detected at night. However, no response occurred during the day time follow-up.
- Approximately two acres of NRF and 87 acres of dispersal habitat would be treated and maintained (timber sale units and small diameter thinning) and 1.1 acres of dispersal habitat would be removed within the home range of this site. Of these acres, 50 acres of dispersal habitat would be treated and maintained (timber sale units) and 0.6 acres of dispersal would be removed within the 0.5 mile core area. NRF would not be treated within the 0.5 mile core area. The 50.6 acres of dispersal treatment within the core would represent approximately 35 percent of the existing NRF and dispersal habitat on federal lands within the 0.5 mile core area would be treated as a result of the proposed action.
- Currently, the NRF habitat amounts are low on federal lands within the home range (4.3 percent) and the 0.5 mile core area (14 percent).
- The proposed action **may affect, and is likely to adversely affect (LAA)** spotted owls because the amount of treatment of NRF and dispersal habitat within a deficit 0.5 mile core area would be measureable. This site is within a highly fragmented landscape due to the limited federal ownership and adjacent private lands that do not currently support spotted owl habitat. Even though the NRF levels at the home range and 0.5 mile core scales would not change, treatments in the 0.5 mile core area, especially during the breeding season, could adversely impact essential habitat for foraging by limiting foraging opportunities, which could affect reproduction and survival of the owls associated with the site. However, the low habitat amounts within the home range and core scales reduces the likelihood of pair occupancy in the future

Effects from Disturbance

Mandatory PDC that restrict activities to outside of the breeding season and/or occur beyond recommended disturbance distance thresholds will be incorporated into the Double Bowen Vegetation Management Project (Appendix A). Applying the Mandatory PDC should avoid noise or activity which would adversely affect nesting owls and their young. Nesting owls are confined to an area close to the nest, but once the young fledge, they can move away from noise and activities that might cause adverse effects.

4.2.3 Proposed Treatments Outside of Known Home Ranges

The BLM is proposing approximately 42 acres of NRF removal, 44 acres of NRF downgrade, 19 acres of NRF treat and maintain, and 176 acres of dispersal treat and maintain outside of the home ranges of the historic spotted owl sites within the Double Bowen Action Area. The BLM will conduct spotted owl protocol surveys in previously un-surveyed NRF habitat within 1.2 miles of the proposed treatment units to determine occupancy status of these areas. These surveys will continue over the next two to five years, depending on the harvest schedule. The Oregon State University spotted owl crew is surveying the Forest Service lands as part of South Cascades Demography Study Area. If spotted owls are found during surveys, the District plans to drop units or modify proposed prescriptions in an effort to reduce adverse effects to newly detected spotted owls, or reinitiate consultation.

4.3 Effects to Northern Spotted Owl Critical Habitat

Portions of the Double Bowen Project are in the 2012 designated critical habitat and the effects to critical habitat are addressed below. Table 8 summarizes effects to the primary constituent elements (Forest Habitat, Nesting Roosting, Foraging, and Dispersal Habitat) from the proposed action.

The consultation process evaluates how a proposed action is likely to affect the capability of the critical habitat to support northern spotted owl nesting, roosting, foraging, or dispersal (primary constituent elements) by considering the scales at which the life-history requirements of the northern spotted owl are based regardless of the species' presence or absence (USDI 2012).

Table 8. Summary of NSO Habitat Effects in Critical Habitat

Sub Unit	Project	NRF Removed (acres)	NRF Downgrade (acres)	NRF T&M (acres)	Dispersal Removed (acres)	Dispersal T&M (acres)	Total Acres Treated
KLE 5	DB Timber Sale	0	44	153	0	429	**626**
	DB Plantation Thinning	0	0	0	0	76	**76**
	DB Temporary Road/Landing construction	1.6	0	0	1	0	**2.6**
	DB Underburn		2	0	0	8	**10**
	TOTAL	**1.6**	**46**	**153**	**1**	**513**	**714.6**

Effects from NRF Removal and NRF Downgrade

The proposed Double Bowen Timber Sale (selection harvest), underburning, and temporary road and landing construction associated with the Double Bowen Project would remove 1.6 acres (landing/road construction) and downgrade 46 acres of NRF habitat (in four treatment units). These proposed actions in NRF habitat would contribute to a reduction of suitable NRF habitat in one designated critical sub-unit (KLE5).

According to the 2012 Final CHU rule (77 *Federal Register* 46:14062-14165), Section 7 consultations need to consider the temporal and spatial scale of impacts a proposed action may have on the PCEs. The USFWS recommends using a scale that is relevant to the needs and biology of the spotted owl and believes the 500 acre core area scale is a reasonable metric for land managers to use as a screen when assessing effects on critical habitat. This 500 acre analysis approach was recommended in the proposed critical habitat rule, and to be consistent with recent critical habitat effects analyses, the 500 acre analysis will be used in this BA. To conduct this recommended analysis, the BLM delineated 500 acre (0.5 mile radius) circles around centroids of proposed treatment units that would remove or downgrade NRF habitat in critical habitat. These units represent the areas of critical habitat that would be most impacted by the proposed action and were used to determine potential localized effects to the critical habitat. Pre-and post-treatment NRF (PCE2 and 3) habitat amounts in the 500 acre analysis areas were compared to determine effects to primary constituent elements and primary biological features of critical habitat (Table 9).

Table 9. Pre and Post Treatment NRF Habitat Amounts in 500 acre buffers						
Project	**CHU Sub-unit**	**Unit ID**	**NRF Acres Pre-Treatment**	**NRF Acres Post-Treatment**	**Percent Changed**	**Effects to CH**
DB Timber Sale	KLE5	168	292	246	- 16%	LAA

Based on the 500 acre analyses the Medford District has determined the NRF downgrading and removal associated with the Double Bowen Project in the KLE5 sub-unit may affect and would **likely adversely affect (LAA)** spotted owl critical habitat because the amount of NRF treatment relative to the existing NRF at the 500 acre scale would be measureable. The removal and downgrading of NRF habitat in the 500 acre landscape surrounding the treatment area could reduce spotted owl foraging opportunities (see Section 4.4, Effects to Spotted Owl Prey below). The proposed treatments are likely to decrease flying squirrel abundance by removing mid-story and overstory structure from those acres (Wilson 2010, Manning et al. 2011), which could reduce spotted owl foraging opportunities. However, dusky-footed woodrats, the primary prey of owls in this area, might benefit from some thinning due to increased increase shrub and pole stands (Sakai and Noon 1993). Also, reducing canopy cover below 60 percent will likely introduce ecological edge effects to the affected stands as well as to adjacent stands of NRF habitat, extending the area of impact beyond the treated areas. These impacts to critical habitat primary constituent elements and principle biological features important to the conservation of spotted owls are measurable and likely to occur. Even with the adverse effects, there could be some beneficial effects anticipated from the project to critical habitat (See below).

Effects from NRF Treat and Maintain

The BLM has determined that treating and maintaining 153 acres of NRF habitat in critical habitat will have an insignificant effect to spotted owl critical habitat and is **not likely to adversely affect (NLAA)** critical habitat because:

- Canopy cover within treated stands will be maintained at 60 percent or greater post-treatment.
- Decadent components important to owls such as large snags, large down wood, and large hardwoods would remain post-treatment.
- Any multi-canopy, uneven-aged tree structure that was present prior to treatment will remain post-treatment.
- No spotted owl nest trees will be removed.

Effects from Dispersal Removal

The Double Bowen Project (temporary road construction) would remove one acre of dispersal-only habitat in one designated critical habitat sub-unit (KLE5) and will contribute to a reduction of suitable dispersal habitat. The BLM has determined the removal of one acre of dispersal-only habitat may affect, but would **not likely adversely affect (NLAA)** spotted owl critical habitat because it would result in an insignificant amount of removal of a primary constituent element. The removal of dispersal-only habitat will not affect the intended north-south and east-west

connectivity conservation function of this sub-unit because the proposed removal of dispersal-only habitat would result in a reduction of 0.003 percent of the dispersal habitat within sub-unit KLE5. Additionally, this one acre of dispersal-only habitat removal would not preclude owls from dispersing through the adjacent landscape because it is small in scope. Forest landscapes traversed by dispersing owls typically include fragmented mosaic of roads, clear-cuts, non-forested areas, and a variety of forest age classes ranging from fragmented forests on cutover areas, to old-growth forests (Forsman et al., 2002). Additionally, when looking at a smaller landscape than the sub-unit, the reduction would still be low. The removal of one acre of dispersal-only habitat would be a reduction of 0.0003 percent in the Rogue-Upper Section 7 watershed.

Effects to the Sub-unit

KLE5

Even with the proposed removal and downgrading of NRF and removal of dispersal habitat within the critical habitat, KLE5 is still expected to maintain the intended function of providing demographic support for spotted owls because only three of the 36 total historic spotted owl sites this critical habitat sub-unit would be adversely affected by the proposed action (see footnote in Table 7 for sites located in critical habitat). The remaining 33 sites (92 percent) of the sites in the sub-unit would not be adversely affected by the proposed action and would continue to provide demographic support in the sub-unit.

Even with the removal and downgrading of NRF and removal of dispersal-only habitat, the proposed action will not affect the intended conservation function of north-south and east-west connectivity between subunits and critical habitat units because the proposed removal and downgrading of NRF habitat and the removal dispersal-only habitat would result in a reduction of 0.15 percent of the dispersal habitat (NRF plus dispersal-only habitat) within sub-unit KLE5. The one acre of dispersal removal would not preclude owls from dispersing through the adjacent landscape because it is small in scope and would not affect the surrounding habitat.

Habitat supporting the transience phase of dispersal contains stands with adequate tree size and canopy cover to provide protection from avian predators and minimal foraging opportunities. This may include younger and less diverse forest stands than foraging habitat, such as even-aged, pole-sized stands, but such stands should contain some roosting structures and foraging habitat to allow for temporary resting and feeding during the movement phase (USDI 2011). Spotted owls are able to move successfully through highly fragmented landscapes typical of the mountain ranges in western Washington and Oregon (Forsman *et al.* 2002).

Beneficial Effects to CHU

The following beneficial effects may be realized as a result of implementation of the proposed action:

- Treated stands are likely to be more ecologically sustainable because residual stands will be less susceptible to suppression mortality.

- Very dense stands will be opened by thinning, thereby improving the ability for spotted owls to disperse within these stands. Thinning stands that currently provide poor quality dispersal habitat will improve the dispersal function for spotted owls by providing more "flying space," and encouraging residual trees to increase in size and develop more structural diversity.
- Thinning young stands that do not currently provide dispersal or NRF habitat, will accelerate the development of spotted owl habitat.
- The 46 acres of NRF downgrade in critical habitat associated with the Double Bowen timber sale is expected to produce long term benefits by reducing potential long term stand loss from disease. Without treatment in these stands, it is estimated that root rot present in this stand would continue to spread throughout Douglas fir and true fir tree species, thus weakening them, killing them directly, or making them more susceptible to pine beetles and wind throw. Over time, the stand would have a tree species shift to more resistant species such as pine, cedar, and hardwood species, and spotted owls would be less likely to use the stand for nesting in the future.

4.4 Effects to Northern Spotted Owl Prey

The northern flying squirrel dusky-footed woodrat, and bushy-tailed woodrat are important prey of the northern spotted owl in this action area (Forsman et al 2004). Spotted owl prey relationships are complex and prey-switching may be important (Courtney et al 2004). Vegetation treatment projects may impact spotted owl foraging by changing habitat conditions for different prey species.

Sakai and Noon (1993) stated that dusky-footed woodrats, the primary prey of owls in the project area, might benefit from some thinning or harvest that would increase shrub and pole stands. Bushy-tailed woodrat presence is more dependent on cover and food availability than on seral stage. They often use areas previously disturbed by fire (Carey 1991). Bushy-tailed woodrats are most abundant along streams, and riparian areas may serve as the principal avenue for woodrat recolonization (Carey et al 1992). Lemkuhl et al. (2006) found that fuels projects in eastern Washington could have impacts on bushy-tailed woodrats, but confirmed the importance of maintaining snags, down wood, and mistletoe. These components will be retained as part of the proposed action.

Some disturbance of habitat may improve forage conditions, provided the understory structure and cover are retained. Removal of some tree canopy, provided it is not too extreme, will bring more light and resources into the stand, stimulating forbs, shrubs and other prey food. Once the initial impact of disturbance recovers (6 months to 2 years), the understory habitat conditions for prey food would increase over the next few years, until shrubs and residual trees respond and once again close in the stand. A dispersal stand that resulted from the downgrade of NRF habitat would begin to develop the pretreatment habitat within 25 to 40 years, depending on treatment type, plant association, and location. Residual trees, snags, and down wood that are retained in the thinned stands will provide some cover for prey species over time, and will help minimize harvest impacts to some prey species. The retained trees may respond favorably to more light and resources and gain height and canopy over time.

Flying squirrel densities are correlated with high cavity density, large amounts of hypogeous fungi, and crown class differentiation (Carey et al 1999, Carey et al 2000). Gomez et al. (2005) noted that commercial thinning in young stands of Coastal Oregon Douglas-fir (35 to 45 years old) did not have a measurable short-term effect on density, survival, or body mass of northern flying squirrels. Similarly, Waters and Zabel (1995) compared squirrel densities and body mass in shelterwoods and in old and young stands in the northern Sierras (old = 3.29/Ha, shelterwood = 0.31/ha, young = 2.28/Ha) and found no difference in body mass or recapture rates between young and old stands in northern more mesic forest habitats, although they concluded that heavy logging and site preparation (burning) in the shelterwoods negatively affected flying squirrels. More recent studies have indicated negative impacts of thinning on flying squirrels (Wilson 2010, Holloway and Smith 2011). Additionally, Ritchie et al (2009) found negative landscape effects on flying squirrels when harvested areas opened the stand to create open conditions. Flying squirrels predation pressure increases and their survival and reproduction decrease in stands with too many gaps, large gaps, lacking a mid-story canopy layer, and low overall stem densities (Wilson and Forsman 2013).

Based on the flying squirrel research, the BLM predicts the treat and maintain projects in this BA would retain cover that would be used by flying squirrels. Removal and downgrade treatments may reduce flying squirrel densities. Residual trees, snags, and down wood that are retained in the units will provide some cover for prey species over time, and will help minimize long term harvest impacts to some prey species. Approximately 88 acres of NRF habitat would be removed or downgraded from the proposed Double Bowen project. These proposed actions would remove flying squirrel habitat, which could decrease flying squirrel abundance (Wilson 2010, Manning et al. 2011) and reduce spotted owl foraging opportunities in these areas. However, it is not likely that they will be significantly affected by the proposed actions because large dead wood would be retained, some canopy diversity will be maintained, and treatment areas make up a small proportion of available habitat.

Edges created from harvest can be areas of good prey availability and potentially increased vulnerability (i.e., better hunting for owls) (Zabel 1995). Prey animals may be more exposed in the disturbed area or may move away from the disturbed area for the short-term. Some minor changes in prey availability may occur as cover is disturbed and animals move around in the understory. They may become more vulnerable and exposed. The disturbance might attract other predators such as hawks, other owls, and mammalian predators. This may increase competition for owls in the treatment area, but the exposure of prey may also improve prey availability for northern spotted owls.

Bingham and Noon (1997) reported that a spotted owl core area is the area that provides the important habitat elements of nest sites, roost sites, and access to prey, benefiting spotted owl survival and reproduction. Rosenberg and McKelvey (1999) reported that spotted owls are "central place" animals with the core area (the area closest to the nest) being the focal area. Several studies (Wagner and Anthony 1998, Dugger et al. 2005, Zabel et al. 2003, Bingham and Noon 1997) indicate the core area size for the Klamath and Western Cascades provinces is 0.5 miles (or 500 acres) of the nest site. Therefore, effects to prey species are most critical at the nest patch and core areas. Effects to spotted owl sites at the nest patch and core areas are analyzed in Section 4.2.2 above and the effects to prey species can also be derived from this data. Sites with NRF removal or downgrading proposed within the 0.5 mile core area will have the greatest effect

to potential prey habitat and reduction of foraging opportunities for spotted owls. The BLM anticipates that impacts to spotted owl prey within the Double Bowen Project will adversely affect spotted owls in the area, especially where treatments are proposed within the 0.5 mile core scale.

For all projects, treatment implementation would be spread out temporally and spatially within the Action Area, which would provide areas for spotted owl foraging during project implementation and reduce the impact of these short-term effects at the project level. Untreated patches will be retained within the project areas for special status species, riparian vegetation, and other constraints. Residual trees, snags, and down wood that are retained in the thinned stands will provide some cover for prey species over time, and will help minimize harvest impacts to some prey species. Flying squirrel habitat may be reduced in quality in some places, but those same places are likely to maintain or improve habitat for woodrats and other small mammals (Courtney et al 2004).

4.5 Interrelated and Interdependent Effects

Interrelated actions are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that might occur independently of the larger action, but have no independent utility apart from the action under consideration. Interdependent actions depend on the federal action and would otherwise not take place.

All proposed projects in this BA have interrelated and interdependent effects, such as noise, road construction or timber hauling on existing system roads, and post-harvest brush disposal. Brush disposal activities can include chipping and slashing, but vary according to conditions post-treatment, fuels management objectives, requirements for retention of coarse woody debris, and other resource management goals. Post project fuels reduction of the activity fuels may include biomass removal and pile burning.

4.6 Cumulative Effects

Cumulative effects under ESA are “those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area of the federal action subject to consultation” (50 CFR 402.02). The effects of future federal actions will be evaluated during future section 7 consultations and are not included in cumulative effects.

The Double Bowen Action Area has a checkerboard pattern of ownership of private land interspersed with BLM. Management practices occurring on private lands range from residential home site development to intensive industrial timber management. The majority of state and private forests in Washington, Oregon, and Northern California are managed for timber production. Non-federal lands are not expected to provide demographic support for spotted owls across and between physiographic provinces (Thomas et al. 1990; USDA and USDI 1994a). Historically, non-Federal landowners practiced even-aged management (clear-cutting) of timber over extensive acreages. Private industrial forestlands are managed for timber production and will

typically be harvested between 40 and 60 years of age, in accordance with State Forest Practices Act Standards.

The Medford BLM assumes past management practices on private lands will continue. The BLM anticipates some loss of owl habitat on private lands, but cannot predict the rate of loss, types of spotted owl habitat affected, or the specific location of harvest. BLM does not track private land harvest activity. Harvest activities on state and private lands can be expected to impact spotted owls located within adjacent Federal lands by removing and fragmenting habitat and through disturbance activities adjacent to occupied sites during sensitive periods. The Oregon Forest Practice Rules (629-665-0210), protects spotted owl nest sites (70-acre core areas) for at least three years after the last year of occupation.

4.7 Consistency with NSO Recovery Plan Recommendations

On June 30, 2011, the US Fish and Wildlife Service (Service) released the *Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina)* (USDI FWS 2011). The Notice of Final Revised Recovery Plan Availability was published in the Federal Register on 07/01/2011 (76 FR 38575-38576) for the Northern Spotted Owl. Recovery plans are not regulatory documents; rather, they provide guidance to bring about recovery and establish criteria to be used in evaluating when recovery has been achieved. The BLM continues to work with the Service to incorporate Recovery Goals and Actions consistent with BLM laws and regulations. The BLM is a participant in the inter-organizational spotted owl working group (Recovery Action 1) and will continue demographic monitoring to address Recovery Actions 2 and 3. Projects in this BA also follow the intent of other Recovery Actions listed in the Revised Recovery Plan, such as Recovery Action 10 and 32.

Recovery Action 10
The BLM worked to meet the intent of Recovery Action 10 because the projects were planned to minimize effects to spotted owl sites. BLM incorporated RA10 to the extent it was compatible with the primary purpose and need of the project: provide for a sustainable supply of timber and help meet the Medford BLM's annual timber volume target and improve forest health. To the extent practicable, the Butte Falls RA biologist followed principles in the SW Oregon Recovery Action 10 Guidance Document (USDA USDI 2013) and worked with the interdisciplinary core team to reduce impacts to spotted owl sites within the project area. All of the sites rated low according to RA10 principles, because they have been unoccupied or only had single responses, and have low NRF habitat amounts at the home range and 0.5 mile core scales. However, the planning team planned the majority of the treatments within the home ranges to treat and maintain NRF and dispersal habitat. The BLM focused on reducing impacts to the core areas, because it is the area that provides the important habitat elements of nest sites, roost sites, and access to prey, benefiting spotted owl survival and reproduction (Bingham and Noon1997). However, underburning is proposed on two acres in site #2223A, which would downgrade NRF habitat at the home range and core scales at this site. Underburning is proposed in this area to restore an adjacent meadow, and it would likely result in a reduction of the understory and prey habitat within the treated unit. The planning team felt that the meadow restoration treatment was necessary for other ecological benefits in order to remove encroaching vegetation, as well as reducing fire danger. As mentioned above, 0.85 acres of NRF removal from temporary

road/landing construction would occur on the outer edge of the home range of site 2680O. However, the proposed action is not anticipated to adversely affect spotted owls at this site.

Recovery Action 32

The BLM is also a collaborator in Recovery Actions that address barred owl issues, such as Recovery Action 32 (RA 32). The intent of RA 32 is to maintain the older and more structurally complex multi-layered conifer forests on federal lands in order not to further exacerbate the competitive interactions between spotted owls and barred owls. Within the administrative units of the Rogue River-Siskiyou National Forest and the Medford District BLM, an interagency, interdisciplinary team was created to develop a methodology for identifying Recovery Action 32/ structurally complex forest for project level planning and NSO consultation needs in SW Oregon (USDA USDI 2010).

RA 32 surveys have been conducted for the Double Bowen project. Approximately 30 acres were located (in three different areas). No harvest activities, temporary road construction, yarding corridors, or skid roads are planned to occur within RA32 stands. Therefore, no effects to RA32 stands are anticipated.

5. BIOLOGICAL ASSESSMENT CONCLUSIONS

It is the conclusion of this biological assessment that proposed actions may affect the spotted owl species as documented above. Formal consultation is requested for the Double Bowen Project.

Table 10. Effects Determination Summary

Project	Effects to NSO	Effects to NSO CHU	Comments
Double Bowen Project	LAA	LAA	NRF removal and NRF downgrade in deficit home ranges and core areas. NRF downgrade within critical habitat.

6. LITERATURE CITED

Anthony, R.G., E.D. Forsman, A.B. Franklin, D.R. Anderson, K.P. Burnham, G.C. White, C.J. Schwarz, J. Nichols, J.E. Hines, G.S. Olson, S.H. Ackers, S. Andrews, B.L. Biswell, P.C. Carlson, L.V. Diller, K.M. Dugger, K.E. Fehring, T.L. Fleming, R.P. Gerhardt, S.A. Gremel, R.J. Gutiérrez, P.J. Happe, D.R. Herter, J.M. Higley, R.B. Horn, L.L. Irwin, P.J. Loschl, J.A. Reid, and S.G. Sovern. 2006. Status and trends in demography of northern spotted owls, 1985–2003. Wildlife Monograph No. 163.

Bart, J. and E.D. Forsman. 1992. Dependence of Northern Spotted Owls, *Strix occidentalis caurina*, on Old-Growth Forests in the Western United States. Biological Conservation 62(2):95-100.

Bingham, B. and B.R. Noon. 1997. Mitigation of Habitat Take: Application to Habitat Conservation Planning. Conservation Biology 11(1):127-139.

Carey, A.B., T.M. Wilson, C.C. Maguire, and B.L. Biswell. 1997. Dens of Northern Flying Squirrels in the Pacific Northwest. J. Wildlife Management 61(3):684-699.

Courtney, S.P., J.A. Blakesley, R.E. Bigley, M.L. Cody, J.P. Dumbacher, R.C. Fleischer, A.B. Franklin, J.F. Franklin, R.J. Gutiérrez, J.M. Marzluff, and L. Sztukowski. 2004. Scientific evaluation of the status of the northern spotted owl. Sustainable Ecosystems Institute. Portland, Oregon. September 2004.

Dugger , K., S. Andrews, E. Fleigel, L. Friar, T. Phillips, T. Tippin, and F. Wagner. 2012. Demographic characteristics of northern spotted owls (Strix occidentalis caurina) in the southern Oregon Cascades. Oregon Cooperative Fish and Wildlife Research Unit (OCFWRU). DRAFT Annual research report for 2013. USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR and Dept. of Fish and Wildlife, Oregon State Univ., Corvallis, OR. *Draft Document.*

Dugger , K., S. Andrews, E. Fleigel, L. Friar, T. Phillips, T. Tippin, and F. Wagner. 2012. Demographic characteristics of northern spotted owls (Strix occidentalis caurina) in the southern Oregon Cascades. Oregon Cooperative Fish and Wildlife Research Unit (OCFWRU), Annual research report for 2012. USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR and Dept. of Fish and Wildlife, Oregon State Univ., Corvallis, OR. 21p.

Davis, Raymond J.; Dugger, Katie M.; Mohoric, Shawne; Evers, Louisa; Aney, William C. 2011. Northwest Forest Plan-the first 15 years (1994-2008): status and trends of northern spotted owl populations and habitats. Gen. Tech. Rep. PNW-GTR-850. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 147 p.

Dugger, K.M., F. Wagner, R.G. Anthony, and G.S. Olson. 2005. "The relationship between habitat characteristics and demographic performance of northern spotted owls in southern Oregon." *Condor* 107:863-878.

Dugger, K.M., R.G. Anthony and L.S. Andrews. 2011. Transient dynamics of invasive competition: barred owls, spotted owls, habitat, and the demons of competition present. Ecological Applications. 21:2459-2468.

Federal Occupational Safety & Health Administration (OSHA). General Duty Standard 29 CFR 1960.8. https://www.osha.gov/pls/oshaweb/owadisp.show_document.

Forsman, E.D., R.G. Anthony, J.A. Reid, P.J. Loschl, S.G. Sovern, M. Taylor, B.L. Biswell, A. Ellingson, E.C. Meslow, G.S. Miller, K.A. Swindle, J.A. Thrailkill, F.F. Wagner and D.E. Seaman. 2002. Natal and breeding dispersal of northern spotted owls. Wildlife Monographs 149:1–35.

Forsman, E.D., R.G. Anthony, E.C. Meslow, and C.J. Zabel. 2004. "Diets and Foraging Behavior of Northern Spotted Owls in Oregon." *J. of Raptor Res.* 38(3):214-230.

Forsman, E. D., R. G. Anthony, K. M. Dugger, E. M. Glenn, A. B. Franklin, G. C. White, C. J. Schwarz, K. P. Burnham, D. R. Anderson, J. D. Nichols, J. E. Hines, J. B. Lint, R. J. Davis, S. H. Ackers, L. S. Andrews, B. L. Biswell, P. C. Carlson, L. V. Diller, S. A.Gremel, D. R. Herter, J. M. Higley, R. B. Horn, J. A. Reid, J. Rockweit, J. Schaberl, T. J. Snetsinger, and S. G. Sovern. 2011. Population demography of Northern Spotted Owls. Studies in Avian Biology 40.

Franklin, A.B., D.R. Anderson, R.J. Gutiérrez, and K.P. Burnham. 2000. Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California. Ecological Monographs 70(4):539-590.

Franklin, J.F., and C.T. Dyrness. 1988. Natural vegetation of Oregon and Washington. Oregon State University Press, Corvallis, OR. 452 pp.

Hunter, J.E., R.J. Gutierrez and A.B. Franklin. 1995. Habitat configuration around spotted owl nest sites in northwestern California. Condor 97:684- 693.

Kuchler, A.W. 1977. The Map of the Natural Vegetation of California. University of Kansas, Lawrence.

Lehmkuhl, J.F. and M.G. Raphael. 1993. Habitat pattern around northern spotted owl locations on the Olympic Peninsula, Washington. J. Wildlife Management 57(2):302-315

Lint, Joseph, tech. coord. 2005. Northwest Forest Plan—the first 10 years (1994–2003): status and trends of northern spotted owl populations and habitat. Gen. Tech. Rep. PNW-GTR-648. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 176 p.

Manning, T., J.C. Hagar, and Brenda McComb. 2011. Thinning of young Douglas-fir forests decreases density of northern flying squirrels in the Oregon Cascades. Forest Ecology and Management 264 (2012): 115-124.

McNab, W.H., and P.E. Avers. 1994a. Ecological subregions of the United States: Chapter 25. Publication WO-WSA-5. USDA Forest Service, Washington, D.C. Downloaded December 21, 2011 from http://www.fs.fed.us/land/pubs/ecoregions/ch25.html.

Meyer, J.S., L.L. Irwin, and M.S. Boyce. 1998. Influence of habitat abundance and fragmentation on northern spotted owls in western Oregon. Wildlife Monog. No. 139.

Miller, G.S. 1989. Dispersal of juvenile spotted owls in western Oregon. M.S. Thesis. Oregon State University, Corvallis, Oregon.

Olson, G.S., E. Glenn, R.G. Anthony, E.D. Forsman, J.A. Reid, P.J. Loschl, and W.J. Ripple. 2004. Modeling demographic performance of northern spotted owls relative to forest habitat in Oregon. J. Wildlife Management 68(4):1039-1053.

ODF (Oregon Department of Forestry). 2010. Southwest Oregon State Forests Management Plan. Revised Plan April 2010. Oregon Department of Forestry. Salem, Oregon

Oregon Department of Wildlife. 2010. Oregon Wolf Conservation and Management Plan. 189 pages. Oregon Department of Wildlife. Salem, Oregon.

Oregon Department of Wildlife. 2014. Website. Oregon Wolf Population, Areas of Known Wolf Activity. http://dfw.state.or.us/Wolves/population.asp

Oregon Occupational Safety and Health Code Division 7 Forest Activities. Oregon Administrative Rules, Chapter 437. 2010 http://www.orosha.org/standards/div_7.html

Oregon Occupational Safety and Health Code Division 1 Rules for the Administration of the Oregon Safe Employment Act. Rules for All Workplaces 437-001-0769. March 2014 http://arcweb.sos.state.or.us/pages/rules/oars_400/oar_437/437_001.html

Perkins, J.P. 2000. Land cover at northern spotted owl nest and non-nest sites, east-central coast ranges, Oregon. M.S. thesis. Department of Forest Resources, Oregon State University, Corvallis, OR.

Raphael, M.G., R.G. Anthony, S. DeStefano, E.D. Forsman, A.B. Franklin, R. Holthausen, E.C. Meslow, and B.R. Noon. 1996. Use, interpretation, and implications of demographic analyses of northern spotted owl populations. Studies in Avian Biology 17:102-112.

Sakai, H.F., and B.R. Noon. 1993. Dusky-footed woodrat abundance in differentaged forests in northwestern California. Journal of Wildlife Management 57:373–382.

Swindle, K.A., W.J. Ripple, E.C. Meslow, and D.J. Schafer. 1997. Old-forest distribution around spotted owl nests in the central Cascade Mountains, Oregon. M.s. Thesis, Oregon State University.

Thomas, J.W., E.D., Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. "A conservation strategy for the northern spotted owl: report of the Interagency Scientific Committee to address the conservation of the northern spotted owl." USDA Forest Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service, and USDI National Park Service. Portland, OR. 427 pp.

USDA Forest Service, USDC National Marine Fisheries Services, USDI Bureau of Land Management, USDI Fish and Wildlife Service, and US Environmental Protection Agency. 1993. "Forest ecosystem management: an ecological, economic, and social assessment." Report of the Forest Ecosystem Management Assessment Team. US Forest Service, US Fish and Wildlife Service, National Marine Fisheries Service, National Park Service, Bureau of Land Management, and Environmental Protection Agency, Portland, OR.

USDA Forest Service, USDC National Marine Fisheries Services, USDI Bureau of Land Management, and USDI Fish and Wildlife Service.1999. "Streamlined Consultation Procedures for Section 7 of the Endangered Species Act (ESA) July 1999." BLM Information Bulletin Number OR-99-276.

USDA Forest Service and USDI Bureau of Land Management. 2013. Recovery Plan Implementation Guidance: Interim Recovery Action 10 Medford Bureau of Land Management Rogue River-Siskiyou National Forest USFWS Roseburg Field Office. Unpublished. Medford BLM and Rogue River Siskiyou National Forest. Medford, OR.

USDA Forest Service and USDI Bureau of Land Management. 2010. Interagency methodology for Recovery Action 32 identification. Unpublished. Medford BLM and Rogue River Siskiyou National Forest. Medford, OR.

USDA Forest Service and USDI Bureau of Land Management. 1994a. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl US Government Printing Office, Portland, OR.

USDA Forest Service and USDI Bureau of Land Management, 1994b. Record of Decision for Amendments to Forest Service and BLM Planning Documents Within the Range of the Northern Spotted Owl. Includes Standards and Guidelines for Management of Late-Successional and Old-Growth Dependent Species Within the Range of the Northern Spotted Owl. US Government Printing Office, Portland, OR.

USDI Bureau of Land Management, Medford District. 1995. *Medford District Record of Decision and Resource Management Plan,* Medford, OR.

USDI Bureau of Land Management, Medford District. 2008. Medford Bureau of Land Management (BLM) 2008 Biological Assessment For Blowdown Salvage That May Affect But Will Not Adversely Affect Spotted Owls And Critical Habitat.

USDI Bureau of Land Management, Medford District. 2009. Double Day Fire Salvage Environmental Assessment (DOI-BLM-OR-M050-2009-0015-EA). Butte Falls Resource Area.

USDI Bureau of Land Management. 2014. Biological Assessment of Activities that May Affect the Federally Listed Plant Species, Gentner's Fritillary, Cook's Lomatium, and Large-flowered Woolly Meadowfoam, on Bureau of Land Management, Medford District and Cascade Siskiyou National Monument. Medford BLM..

USDI Fish and Wildlife Service. 1990. Endangered and threatened wildlife and plants; determination of threatened status for the northern spotted owl; final rule. 55 Federal Register 123:26114-26194.

USDI Fish and Wildlife Service. 1992. Endangered and Threatened Wildlife and Plants; determination of critical habitat for the northern spotted owl. Federal Register 57: 1796-1838.

USDI Fish and Wildlife Service (Sustainable Ecosystem Institute). 2004. Northern spotted owl five year review, summary and evaluation. US Fish and Wildlife Service, Portland, OR.

USDI Fish and Wildlife Service. 2011. "Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*)." US Fish and Wildlife Service, Portland, Oregon xvi + 258 pp.

USDI Fish and Wildlife Service. 2012. Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls. US Fish and Wildlife Service, Portland, OR.

USDI Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; Final Designation of NSO critical habitat; 77 Federal Register 46:14062-14165.

Van Lanen, N. J., A. B. Franklin, K. P. Huyvaert, R. F. Reiser Ii, and P. C. Carlson. 2011. Who hits and hoots at whom? Potential for interference competition between barred and northern spotted owls. Biological Conservation **144**:2194-2201.

Wagner, F.F. and R.G. Anthony. 1998. "Reanalysis of northern spotted owl habitat use on the Miller Mountain study area. A report for the Research Project: Identification and evaluation of northern spotted owl habitat in managed forests of southwest Oregon and the development of silvicultural systems for managing such habitat." Oregon Cooperative Wildlife Research Unit, Depar.Fisheries and Wildlife, Oregon State Univ. Corvallis, OR.

Wiens, J. D., R. G. Anthony, and E. D. Forsman. 2014. Competitive interactions and resource partitioning between northern spotted owls and barred owls in western Oregon. Wildlife Monographs 85:1-50.

Wilson, T.M. 2010. Limiting factors for northern flying squirrels (Glaucomys sabrinus) in the Pacific Northwest: a spatio-temporal analysis. Ph.D. dissertation. Cincinnati, OH: Union Institute & University.

Wilson, Todd M.; Forsman, Eric D. 2013. Thinning effects on spotted owl prey and other forest-dwelling small mammals. In: Anderson, Paul D.; Ronnenberg, Kathryn L., eds. Density management for the 21st Century: west side story. Gen. Tech. Rep. PNW-GTR-880. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 79–90.

Zabel, C.J., K. McKelvey, and J.P. Ward. 1995. “Influence of primary prey on home range size and habitat use patterns of northern spotted owls (*Strix occidentalis caurina*).” *Canadian Journal of Zoology* 73:433-439.

Zabel, C.J., J.R. Dunk, H.B. Stauffer, L.M. Roberts, B.S. Mulder, and A. Wright. 2003. “Northern spotted owl habitat models for research and management application in California (USA).” *Ecological Applications* 13(4):1027-1040.

Appendix A: Project Design Criteria (PDC)

Project design criteria (PDC) are measures applied to project activities designed to minimize potential detrimental effects to proposed or listed species. PDC usually include seasonal restrictions and may also include clumping of retention trees around nest trees, establishment of buffers, dropping the unit(s)/portions, or dropping the entire project. Use of project design criteria may result in a determination of no effect for a project that would have otherwise been not likely to adversely affect. In other cases, project design criteria have resulted in a determination of not likely to adversely affect for a project that might have otherwise been determined to be likely to adversely affect. The goal of project design criteria is to reduce adverse effects to listed or proposed threatened or endangered species.

Physical impacts to habitat and disturbances to spotted owls will be reduced or avoided with PDC. Listed are project design criteria designed for the programmatic impacts discussed in the *Effects of the Action* section.

Medford BLM retains discretion to halt and modify all projects, anywhere in the process, should new information regarding proposed and listed threatened or endangered species arise. Minimization of impacts will then, at the least, include an appropriate seasonal restriction; and could include clumping of retention trees around the nest trees, establishment of buffers, dropping the unit, modifying units, or dropping the entire project.

The seasonal or daily restrictions listed below may be waived at the discretion of the decision maker if necessary to protect public safety (as in the case of emergency road repairs or hazard tree removal). Emergency consultation with the Service will then be initiated in such cases, where appropriate.

PDC for disturbance are intended to reduce disturbance to nesting spotted owls. For this consultation, potential disturbance could occur near either documented owl sites or projected owl sites. To estimate likely occupied habitat outside of known home ranges, nearest-neighbor distances and known spotted owl density estimates were utilized to “place” potential spotted owl occupied sites in suitable habitat

Any of the following Mandatory PDC may be waived in a particular year if nesting or reproductive success surveys conducted according to the SERVICE endorsed survey guidelines reveal that spotted owls are non-nesting or that no young are present that year. Waivers are only valid until March 1 of the following year. Previously known sites/ activity centers are assumed occupied until protocol surveys indicate otherwise.

Mandatory Project Design Criteria

A. Activities (such as tree felling, yarding, road/route construction, hauling on roads not generally used by the public, prescribed fire, muffled blasting) that produce loud noises above ambient levels will not occur within specified distances (Appendix A-1) of any owl site between March 1 and June 30 (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center is non-nesting or failed in their nesting attempt. The distances may

be shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the work location and nest sites.

B. The action agency has the option to extend the restricted season until September 30 during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt) if project would cause a nesting spotted owl to flush. (see disturbance distance).

C. Burning will not take place within 0.25 miles of spotted owl sites (documented or projected) between March 1 and June 30 (or until two weeks after the fledging period) unless substantial smoke will not drift into the nest stand.

D. To minimize the number of potential spotted owl nest trees used for instream structures, only the following sources will be used:

(I) Trees already on the ground in areas where large woody material is adequate;
(II) Trees that lack structural conditions (snags, cavities) suitable for spotted owls.

Appendix A-1. Mandatory Restriction Distances to Avoid Disturbance to Spotted Owl Sites

Activity	**Buffer Distance Around Owl Site**
Heavy Equipment (including non-blasting quarry operations)	105 feet
Chain saws	195 feet
Impact pile driver, jackhammer, rock drill	195 feet
Small helicopter or plane	360 feet*
Type 1 or Type 2 helicopter	0.25 mile*
Blasting; 2 lbs. of explosive or less	360 feet
Blasting; more than 2 lbs. of explosives	1 mile

***** If below 1,500 feet above ground level

Above-ambient noises further than these Table B-1 distances from spotted owls are expected to have either negligible effects or no effect to spotted owls. The types of reactions that spotted owls could have to noise that the Service considers to have a negligible impact, include flapping of wings, the turning of a head toward the noise, hiding, assuming a defensive stance, etc. (SERVICE 2003).

Recommended PDC

Recommended PDC will be incorporated during project implementation when practical. If recommended PDC cannot be incorporated, the project will still be in compliance with this BA.

- No NRF habitat removal will occur within 0.25 miles of any spotted owl site from March 1 through September 30, or until two (2) weeks after the fledging period, unless protocol surveys have determined owls are not present, are non-nesting, or nesting has failed.

Appendix B: NSO Site History

Northern Spotted Owl Sites within the Double Bowen Project Area							
	Site Number and Location Name						
	0887O Esmond Mountain	1830O Ginger[1]	2005A Bowen West	2223A Bowen Creek	2680O Indian Creek (USFS)	3256O Double Prentice[1]	4380O Hukillberry Beak
Pair Status (year)	1991	1990–2007	1990–2002	1990, 1998, 2009	1990–1992 1994–2003	1992–1994 1996–2000 2002–2008	1995–2001 2003–2007
Single Owl (year)	1999, 2010, 2012	2007	2003, 2009, 2012	2000, 2005, 2007	2004	2008	2008, 2011–2014
Confirmed Nesting (year)	None	1988, 1992, 1994, 1995, 1997, 2000, 2002, 2005	1992, 2000	1998 2009	1991	1994, 1997, 2000	1998, 2001, 2004
Number of Young Fledged	None	8	2	3	1	5	6
Barred Owl (year)	None	None	2014	None	2004, 2006–2012	None	2008
Affected by 2008 Windstorm?	Yes	Yes	Yes	Yes	No	Yes	No
Affected by 2008 Wildfire?	No	Yes	No	No	No	No	No

[1] The 0.5-mile core areas of these two sites are no longer suitable for nesting as a result of the 2008 winter windstorm or wildfire.

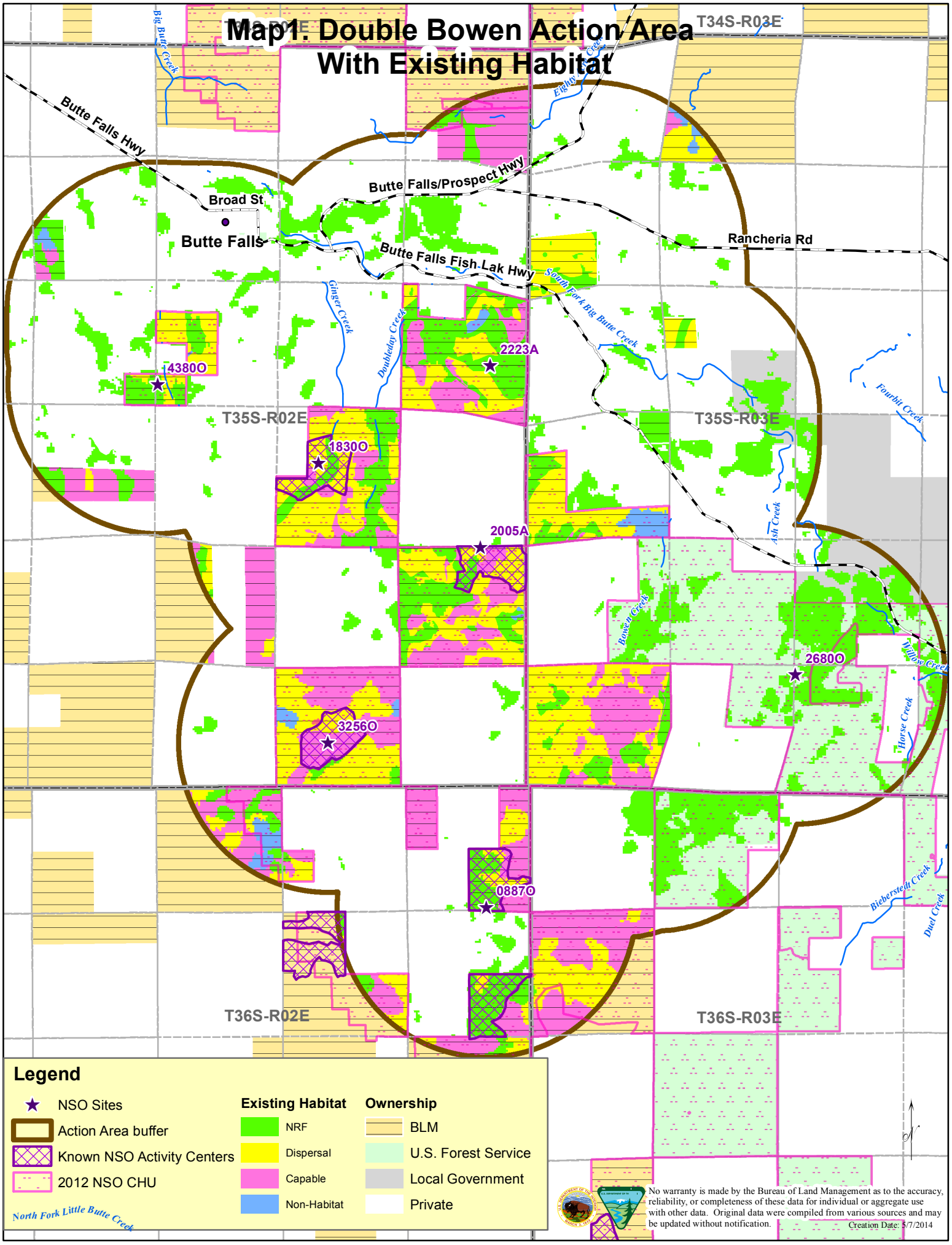
Appendix C: Maps

Map 1: Double Bowen Action Area

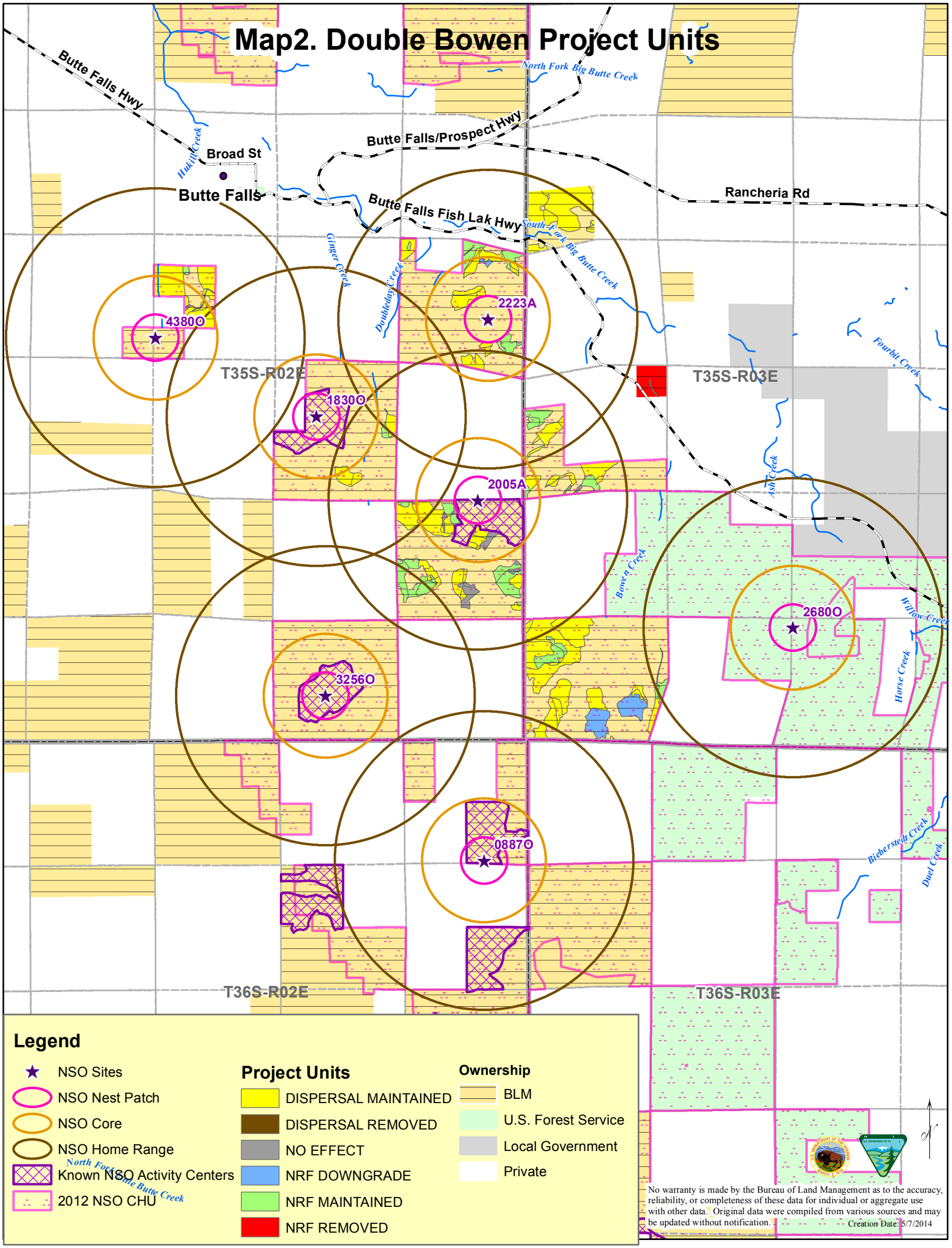
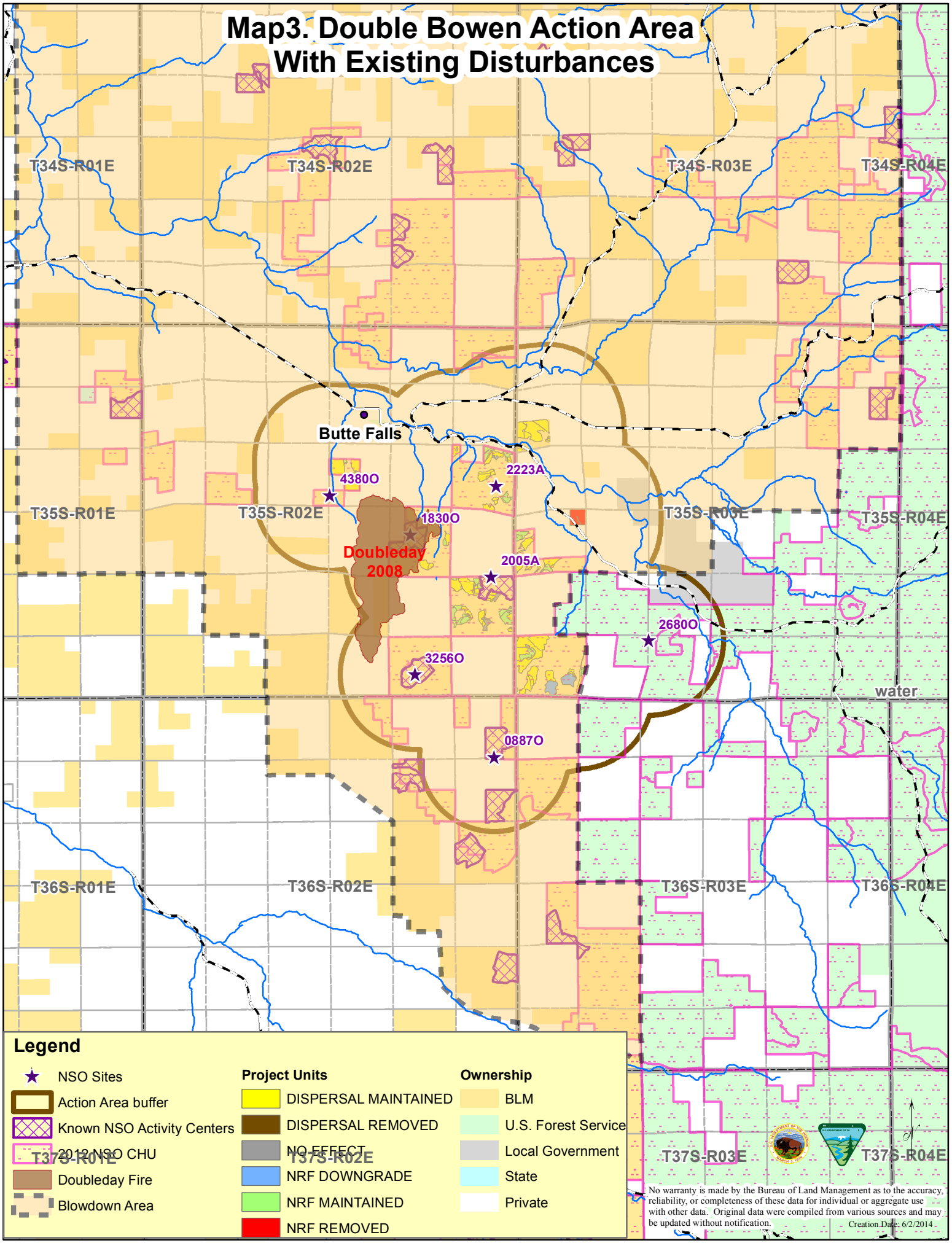
Map 2: Double Bowen Project Units

Map 3: Previous Disturbance and the Double Bowen Action Area

Map1. Double Bowen Action Area With Existing Habitat



Map2. Double Bowen Project Units



Map3. Double Bowen Action Area With Existing Disturbances