United States Department of the Interior

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JUN 17 2011

IN REPLY REFER TO:
6841 (ORM00/ORM0600)

Memorandum

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

From: Dayne Barron
District Manager, Medford

Subject: Request for Formal Consultation on the Ashland RA Pilot Joe Project

We request formal consultation in response to the Ashland RA Pilot Joe Biological Assessment (BA). The BA analyzes impacts to northern spotted owls and determines this project "may affect and is likely to adversely affect" northern spotted owls. There is no affect to designated critical habitat or other listed wildlife species. Listed plants and fish that may be affected by this project are evaluated under separate consultations.

The Level 1 Team reviewed this BA from June 8-14, 2011, and their comments and recommendations have been incorporated. We appreciate working with the US Fish and Wildlife Service to conserve listed species.

Attachment

BIOLOGICAL ASSESSMENT

Biological Assessment
For Consultation on the Pilot Joe Portion of the
Middle Applegate Dry Forest Restoration Project
In Northern Spotted Owl Habitat that May Affect the Spotted Owl
In the Middle Applegate Watershed

ASHLAND RESOURCE AREA MEDFORD BLM

June 17, 2011

I. INTRODUCTION

This Biological Assessment (BA) describes and evaluates the potential effects from the Pilot Joe Portion of the Middle Applegate Dry Forest Restoration Project in the Ashland Resource Area, on the northern spotted owl (*Strix occidentalis caurina*). This project does not occur in any US Fish and Wildlife Service (USFWS) designated Spotted Owl Critical Habitat Units. The effects on plants are evaluated in the FY 2009-2013 Programmatic Assessment for Activities that May Affect the listed endangered plant species Gentner's Fritillary, Cook's Lomatium, McDonald's rockcress, and large-flowered wooly meadowfoam (USDI 2008a). Listed fish are evaluated in separate project level consultations. No other listed species or designated critical habitat will be affected by the activities identified in this BA.

The Medford District Bureau of Land Management (BLM) is submitting this BA to the US Fish and Wildlife 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. BLM requests formal consultation for activities we have determined *may affect, are likely to adversely affect (LAA)* the northern spotted owl.

II. DESCRIPTION OF THE PROPOSED ACTION

INTRODUCTION

The project included in this BA is proposed by the Ashland Resource Area (ASRA) of the Medford District BLM on lands in Jackson County, Oregon. This project will occur in spotted owl habitat, but is not located in any Spotted Owl Critical Habitat Units (CHU). This proposed project is located within the Oregon Klamath Mountains Physiographic Province.

The project in this BA was designed to conform to the 1995 Medford District Resource Management Plan (USDI BLM 1995a) and the Northwest Forest Plan (USDA USDI 1994a). There is currently ongoing litigation regarding BLM's land use plan. This project will comply with the plan guidance in place at the date of the Record of Decision (ROD) for the Pilot Joe Project, and the ROD for the Pilot Joe Project will be consistent with the project descriptions and PDC's described in this BA. If inconsistencies arise, these issues will be presented to Level 1 for evaluation to see if reinitiation is necessary.

We expect the project to be implemented after the Biological Opinion (BO) is received and National Environmental Policy Act (NEPA) compliance is completed; the proposed treatments are expected to be implemented at the earliest in the fall of FY 2011 and throughout 2012. BLM defines implementation of timber sales as the date a project is sold. However, harvest activities could take up to five years to complete. Once a sale is sold, purchasers usually have three years to implement (harvest) the sale, but contracts can be extended for seasonal clearances and other reasons. Purchasers have the option to log the entire sale in one season or they may log portions of the sale in different years.

The Medford BLM anticipates the project analyzed in this BA will be completed within a 10 year timeframe from the date of the BO, at which time the BO will sunset. Timber sales are administered by an Authorized Officer and Contract Administrator. All other contracts are administered at the local level by Contracting Officer Representatives (CORs) and Project Inspectors (PI) throughout implementation until the project work is completed, or implemented by BLM staff. Timber sales also have a contract clause (E-4) that authorizes stop work when Threatened and Endangered species are found on the timber sale or to comply with court orders. When (and if) a spotted owl or other listed species is found in the project

area BLM is authorized to stop the work until the issue is evaluated further. If a spotted owl is found, biologists will review PDCs and the BO to confirm both the NEPA and ESA analyses remains valid.

If a new spotted owl site (or other listed species) is detected within the planning area that was not analyzed in the BA, or if a site has moved, or if the project area changes from what was originally analyzed in the BA, or other information is inconsistent with what is authorized in the BO, the Medford District will coordinate with the project proponents, contractors, managers, local biologists and the Level 1 team to ensure the project impacts remain consistent with the BA and the responding BO. If not, the project activities will be suspended until implementation of one or more of the following:

- Modify the proposed action to ensure that impacts remain as described in the consultation documents;
- Impose seasonal protection (if necessary);
- Reinitiate consultation.

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). For the purposes of this Assessment, the Action Area is defined here as 1) all the BLM administered lands located within the southern portion of the Humbug Creek – Applegate River 6th field sub-watershed south of the Applegate River (the Pilot Joe Project Area), and 2) all the lands that collectively comprise the potential home ranges of the northern spotted owls (NSO) that may be affected by this project (Appendix E, Figure 1).

Table 1. Composition of the Land Ownership within the Action Area in Acres.

BLM	Private	Total
9,562 (82%)	2,120 (18%)	11,682

Table 1 depicts the land ownership patterns within the Action Area. In total, the Action Area contains approximately 11,682 acres. A large amount (82%) of the Action Area is under federal administration (Appendix E, Figure 1). All BLM lands within the Action Area are designated as Adaptive Management Area (AMA) under the North West Forest Plan (NWFP) land-use allocations. Of the BLM administered lands, approximately 8,537 (89%) acres are O & C lands, and 1,025 (11%) acres are Public Domain (PD). The Action Area is located within the Klamath Mountains physiographic province, and does not contain any lands currently designated as Critical Habitat for the NSO.

PROJECT BACKGROUND

The Pilot Joe portion of the Middle Applegate Dry Forest Restoration Project is designed under the Dry Forest Restoration Principles as developed by Drs. Jerry F. Franklin and K. Norman Johnson (Johnson and Franklin 2009, 2010). This project is also part of the Secretary of Interior designated Pilot Demonstration Projects in BLM Districts in southwest Oregon to demonstrate the application of principles of restoration as described by Franklin and Johnson.

Franklin and Johnson define “restoration” broadly to encompass activities that are designed to restore forests and landscapes to conditions that are both more resistant and resilient to disturbances and that provide the diversity needed to restore and sustain native biodiversity and essential ecosystem functions. Restoration of ecosystems at the stand and landscape scale are our primary focus, rather than singular

goals, such as fuel and wildfire abatement, timber production, or wildlife habitat (Johnson and Franklin 2009, 2010).

The Secretary of Interior and the Oregon Congressional Delegation have expressed a deep need to break existing administrative and legal gridlock in order to move forward with ecosystem restoration **and** with economic recovery in southwest Oregon. As such, the Secretarial Pilot Demonstration Projects would serve to illustrate the various principles and tools of restoration to aid in gauging whether or not broader social support for active management can be achieved.

PROJECT FRAMEWORK

The Pilot Joe portion of the Middle Applegate Dry Forest Restoration Project was planned and designed under the conceptual framework of the Dry Forest Restoration Principles as described by Drs. Jerry F. Franklin and K. Norman Johnson (Johnson and Franklin 2009, 2010). The primary focus of this project is to provide a landscape demonstration of an approach that integrates ecosystem restoration and conservation of NSO habitat. Specifically, the Ecosystem Restoration Strategy for the Medford District Pilot Project calls for:

- An active management program to restore more ecologically desirable and sustainable conditions in forests and landscapes. Existing Dry Forest landscapes in the Middle Applegate Watershed are characterized by dense maturing forests with relatively simple structure and low tree species diversity; landscape heterogeneity is low and NSO habitat is at significant risk. Functionality, diversity, and sustainability of these forests and landscapes can be improved with management that structurally and compositionally enriches these forests and reduces their vulnerability to wildfire, insects, and other disturbances. Ecosystem restoration -- planned and implemented at the landscape scale -- is needed rather than actions focused primarily upon fire or any other singular objective.
- Landscape-level planning to insure that desirable and sustainable mixtures of forest and non-forest conditions are maintained on the landscape. These efforts can guide restoration of landscapes to desired and heterogeneous conditions, from their current largely homogeneous and high risk state. The desired condition includes retention of denser forest patches needed to provide important habitat for many organisms, such as the NSO and some of its prey species; these dense, multi-layer patches are best maintained by embedding them in a forest matrix that resists, rather than facilitates, the spread of insect epidemics and stand-replacement wildfire.

As part of the landscape level planning process, the Action Area was examined and evaluated in an effort to delineate a proportion of the landscape that would serve as areas of dense, closed-canopy contiguous forests, within which minimal to no treatments would be proposed. These areas, which are called Late-Successional Emphasis Areas (LSEAs) are designed to provide larger blocks (300-500 acres) of dense forest conditions where succession continues uninterrupted by active management, and provide fairly contiguous blocks of mature and late-successional habitat to support those species that rely on and are associated with these forest habitats, such as the NSO and the pacific fisher (*Martes pennanti*).

In addition to the development of the LSEAs, the landscape level planning under the Dry Forest Restoration Principles aim to design strategically located treatments around the LSEAs in order to meet the restoration goals at the stand level. The restoration goal of reducing forest stand densities also results in a lessening of fuel and corresponding fire hazard. This strategy provides a measure of protection to the LSEAs by reducing the chance of high severity fire activity reaching the LSEAs.

A more detailed and comprehensive description of the background and scientific rationale of the Dry Forest Restoration Principles and the need for restoration within the landscape context is available in the Pilot Joe Environmental Analysis (EA) (USDI BLM 2011).

TREATMENT DESCRIPTIONS

The following is a summarized description of all treatment types proposed under the Pilot Joe Project. A more extensive and complete description of these treatments is available in the Pilot Joe EA (USDI BLM 2011). Appendix A provides a table of all the proposed treatment types for each unit in the project. Figure 2 in Appendix E shows the location of all the proposed commercial and non-commercial treatments within the Action Area, and includes unit labels that can be cross-referenced with the table in Appendix A to derive a unit by unit treatment description and the spatial location of each treatment type.

Silvicultural Objectives and Dry Forest Prescriptions

All of the prescriptions included under the Pilot Joe Project were designed to achieve the following over-arching objectives:

- Conserve and improve survivability of older trees (trees >150 years of age) by reducing nearby fuels and competing vegetation.
- Increase resistance/resilience of forest stands and landscape to wildfire, drought, insects, etc. by reducing stand densities, ladder fuels, and shifted tree species diversity.
- Restore more sustainable structure and composition by reducing stand densities and enhancing tree diversity, including hardwoods, and desirable understory species.
- Accelerate development of structural complexity such as larger tree structures and decadence.
- Develop spatial heterogeneity within stands (e.g. fine-scale structural mosaic).
- Create conditions that are favorable for the initiation, creation, and retention of snags, down wood, large vigorous hardwoods, and understory vegetation diversity in areas where these are lacking

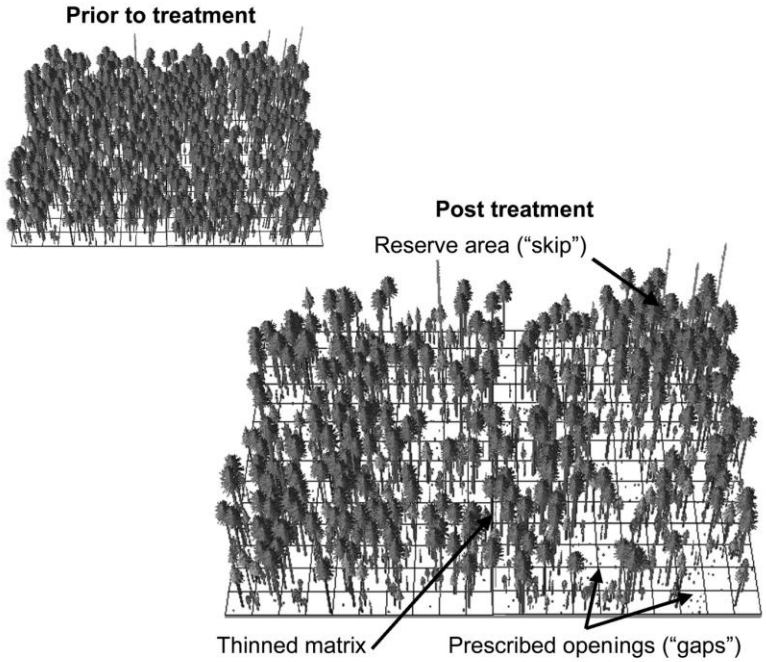
The implementation of these objectives within the project units will be accomplished by BLM personnel, with oversight from the Ashland Resource Area's silviculturist and wildlife biologist, to ensure that stands are marked according to the silvicultural prescriptions. Silvicultural prescriptions are based on the range of desirable conditions by plant series in accordance with the Applegate Adaptive Management Area Ecosystem Health Assessment (Atzet 1995). Basal area ranges are a general guideline to reduce the risk of insect attack, improve vigor, and restore and promote large early seral species (Atzet 1995).

The treatments proposed under the Pilot Joe Project are categorized into two categories: commercial and non-commercial treatments.

Commercial treatments – Variable Density Thinning

The silvicultural prescriptions for this project are designed to restore dry forest stands to site conditions of spatially heterogeneous characteristics. The silvicultural strategy that will be applied to achieve the desired dry forest restoration goals include the use of variable-density management. This uneven-aged management approach encourages the creation of spatial heterogeneity and structural mosaics characteristic of dry forest stands. Stand level features that are desired include a diversity of age class and species within the forest canopy. Variable-density thinning (VDT) for this project will combine thinning with gaps and skips (untreated patches) to replicate historical patterns commonly found in mixed species and mixed-age stands (Talyor and Skinner 2003). The thinned matrix or the area between skips and gaps will be thinned proportionally or from below (illustration 1).

Illustration 1. Visual of a stand before and after thinning with skips and gaps.



Elements of the VDT prescription call for:

- Retaining the older trees (conifer and hardwood) and improving their survival potential by eliminating nearby competing vegetation and ground/ladder fuels.
- Retaining other key structural/compositional elements in the stand.
- Leaving areas in the stand untreated ("skips") to provide:
    - diversity in structural conditions (e.g. heavily shaded areas);
    - desirable snag and down wood features;
    - hiding cover and break up visuals (e.g., for wildlife); and
    - Protection of sensitive areas (e.g., seeps, rock outcrops)
- Thinning the remainder of stand (after old tree protection and skips) to :
    - Favor more drought-and fire-tolerant tree species;
    - Protect hardwood species with high wildlife value (many require removal of some dominant/co-dominant [but never old] conifers);
    - Increase the average diameter of the residual stand; and
    - Reduce overall stocking levels to a target basal area or density.
- Creating some small openings for intolerant tree regeneration (e.g. pines) and plant if seed sources are limited or absent.
- Treating activity fuels, such as by broadcast burning or pile-and-burn; and
- Enhancing heterogeneity and avoid creating homogeneity within a stand.

<u>Ponderosa Pine/Oak Sites (Ponderosa Pine Series)</u>

These are areas with southerly or easterly aspects and shallow soils where pine species are best adapted. These stands may have developed a substantial component of Douglas-fir as a result of fire exclusion and stands have become overstocked with all condition classes of vegetation. These sites are also identified by the presence of ponderosa pine, black or white oak, and white-leaf manzanita (either live or dead) in the understory. They are typically small in size and found on dry ridges and low elevations with Douglas-fir mortality occurring. The goal on these sites is the retention of large ponderosa pine and the subsequent

development of young pine. Specifically, the VDT prescription on ponderosa pine / oak sites aims to achieve the following goals:

- Leave 60-80 ft² basal area per acre at the stand level.
- Reduce competing vegetation from around healthy pines, oak, and incense cedar to ensure their survival.
- Protect exceptional hardwoods (oak trees 10 inches dbh and larger, madrone trees 16 inches dbh and larger with full live crown ratios of 30% or greater).
- Leave all codominant and dominant pine, cedar, and oak; suppressed individuals can be cut.
- Leave SKIPS (15% +/-) to provide visual barriers, hiding cover, protect seeps and intermittent channels, etc.

<u>Douglas-fir Sites (Douglas-fir Series)</u>
Dry Douglas-fir stands are typically found on west, southwest, east, and southeast aspects in Douglas-fir plant associations. Douglas-fir is the predominant conifer species and ponderosa pine is often present in these stands. The goal on these sites is the retention and release of the larger and older conifers and hardwoods, and to increase the spatial heterogeneity of the species composition and the forest structure. Treatment of activity fuels following completion of thinning activity is an essential component of this prescription. Specifically, the VDT prescription on dry Douglas-fir sites aims to achieve the following goals:

- Leave 60-120 ft² basal area per acre at the stand level. Low basal areas (e.g., 60-80 sq ft.) are acceptable in the "driest" Douglas-fir plant associations where the goal is to restore a pine and oak component within the stand.
- Protect exceptional hardwoods.
- Leave all codominant and dominant pine, cedar, and oak; suppressed individuals can be cut.
- Leave SKIPS (+/-15% of the treatment area) to provide dense/shaded forest patches as habitat, hiding cover, and visual barriers; and ecologically significant patches, such as seeps, rock outcrops, and hardwood groves.
- Provide GAPS (+/-15% of the treatment area) to create some larger (1/2 to 2 acre) open areas to the extent of about 1 acre opening every 6 or 7 acres (or ~(+/-15% of the treatment area) for establishing pine regeneration and other understory components. Complete removal of overstory is not encouraged; i.e., generally leave some scattered trees behind. Low density planting of fire resilient or drought tolerant species may be utilized in such gaps, where seed sources are limited or absent. The objective is to maintain a multi-aged and mutli-species mix of drought tolerant and fire resilient species in dry forest stands. Planting would increase species and structural diversity. Following initial treatment (variable-density thinning) units would be assessed for planting needs based on the available planting space and lack of species diversity in the stand. Tree planting spacing would be clumped and random, rather than evenly spaced. Seedlings would be planted no more than 100 trees per acre and planting sites would be dictated by microsite conditions.

Non-commercial Treatments – Understory Reduction

Understory vegetation in stands prescribed for variable-density thinning would be treated using manual techniques (slashing) to desired tree densities. The objective is to maintain a multi-layered mix of conifer, hardwood and shrub species that would occur in the dominant plant series. Conifer, hardwood, and shrub spacing widths and reservation will vary depending on site conditions and plant community.

Understory vegetation density would be reduced by cutting and spacing Douglas-fir <8" DBH, Pacific madrone <6" DBH, and canyon-live oak <4" DBH. Spacing widths may vary from 15 to 25 feet for Douglas-fir and 25 to 35 feet for Pacific madrone and canyon-live oak. Within this range, the wider spacing would be used for species such as pine or oak, which thrive in less dense conditions. These species will be spaced off trees ≥8" DBH and within the driplines of ponderosa pine and sugar pine ≥8" DBH. The spacing of conifers will be independently spaced from hardwoods. Vegetation diversity would be obtained by maintaining species occurring at low frequencies in the stand (i.e. incense cedar, sugar pine, white oak). All shrub species other than whiteleaf manzanita, buckbrush and deerbrush ceanothus will be reserved from cutting. All conifer and hardwood species other than Douglas-fir, Pacific madrone, and canyon-live oak are reserved from cutting, unless pine trees need drip-line treatment, than black oak <6" DBH will be cut. Canyon-live oak and black oak will generally not be cut unless appropriate for the plant community. In some stands all hardwoods will be reserved. Refer to the density management prescription below for the required reserve (no cut) vegetation for understory reduction. The slash created from the understory reduction treatment, including harvest activity slash, could be hand-piled and burned (HP/B) or underburned (UB).

Non-commercial Treatments – Density Management

Density management is used to accomplish forest health thinning and fuels reduction treatments in conifer forests, hardwood woodlands, and shrublands. Density management consists of cutting small trees (generally less than 8 inches diameter) and vegetation with chainsaws and disposing of the material by hand-piling and burning or use of a lop and scatter method in lighter fuels. The objective of the density management prescription is to increase tree growth rates and promote horizontal and vertical structural diversity in stands, and reduce fuels and fire hazard adjacent to conifer stands. Density management is also used in stands where pines and shade intolerant hardwood species are diminishing in vigor and numbers because of overcrowded stand density conditions.

Conifer, hardwood, and shrub spacing widths will vary depending on site conditions and plant community. Spacing widths may vary from 15 to 25 feet for conifers and 25 to 45 feet for hardwoods and shrubs. Within this range, the wider spacing would be used for larger leave trees or for species such as pine or oak which thrive in less dense conditions. Hardwoods ≥6" DBH and conifers ≥8" DBH are reserve vegetation and shall not be cut. These trees shall be included in spacing requirements. A minimum of ¼- to ½-acre "skips" or no-treatment areas (15%+/- at the stand level) would be untreated to further facilitate diversity. Plant buffers, hardwood areas, rock out-crops, wet areas, and areas with large woodrat nests would contribute to or serve as these leave areas. Pre-existing small openings experiencing encroachment would be targeted first to restore open patches. Thinning treatment should maintain species composition similar to the potential vegetation or dominant plant association for the site. Retained stems per acre will vary widely, ranging from 70-200 trees per acre. When considering a group of conifer trees for thinning, select leave trees by the following order of species preference, sugar pine, ponderosa pine, incense cedar, Douglas-fir, and white fir. When considering a group of hardwood trees for thinning, select leave trees by the following order of species preference, black oak, canyon live oak, and Pacific madrone. Depending on plant community one or more species may be reserved from cutting (see below). Vegetation reserved from cutting will always be maple species, dogwood, pacific yew, silk tassel, hazel, willow, and oceanspray, regardless of spacing (i.e., not included in spacing or considered leave trees). No removal of white oak, mountain mahogany and manzanita >12" single stem at one foot above ground. Any species of conifer, hardwood or shrubs considered as rare (less than 5% coverage) within the entire unit shall be left. The slash created from the density management treatment could be handpiled and burned (HP/B) or underburned (UB).

PROJECT SUMMARY

In its entirety, The Pilot Joe Project proposes approximately 299 acres of commercial treatments and 590 acres of non-commercial treatments (table 2). A detailed description of the breadth of treatment types under commercial and non-commercial treatments are given above under the "proposed action – detailed treatment description" section of this document.

Table 2. Treatment acres by prescription type for commercial and non-commercial treatments.

Commercial Prescriptions	**Acres**
Variable Density Thin – Douglas-fir series	203
Variable Density Thin – Ponderosa Pine series	96
Total	**299**
Non-commercial Prescriptions	
Density Management – Pine, Douglas-fir, Oak series	590
Grand Total All Treatments	**889**

Table 2 summarizes the proposed action into broad level treatment types. For more detail, Appendix A provides a table of all the proposed treatment types for each unit in the project. Figure 2 (Appendix E) shows the location of all the proposed commercial and non-commercial treatments within the Action Area, and includes unit labels that can be cross-referenced with the table in Appendix A to derive a unit by unit treatment description and the spatial location of each treatment type.

PROJECT DESIGN CRITERIA

Project Design Criteria (PDC) are conservation measures developed to reduce disturbance impacts to listed species (see Appendix B). Disturbance of listed wildlife species occurs when noise, smoke, vibration, or visual stimuli cause impairment of normal behavior. Mandatory PDC are measures applied to project activities designed to avoid the potential adverse disturbance effects to nesting birds and their young. Mandatory PDC will be incorporated into all activities as integral to the Proposed Action. PDC involving seasonal restrictions will be implemented unless surveys, following approved protocols, indicate either non-occupancy or non-nesting of target species. 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.

II. ENVIRONMENTAL BASELINE

INTRODUCTION

Regulations implementing section 7 of the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, state, or private actions and other human activities in the Action Area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the Action Area that have undergone 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. The Forest Ecosystem Management Assessment Team (FEMAT) (USDA et al. 1993) documents, *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* (USDA and USDI 1994a), and *Record of Decision for Amendments to Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA and USDI 1994b) are relevant to addressing the environmental baseline for this action.

NORTHERN SPOTTED OWL

A detailed account of the taxonomy, ecology, and reproductive characteristics of the NSO can be found in the *2010 Draft Revised Recovery Plan for the Northern Spotted Owl* (USDI FWS 2010), the Sustainable Ecosystems Institute 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), and key monographs (Forsman et al. 1984, Anthony et al. 2006). These documents are incorporated by reference.

Lint et al. (1999) identified 14 sample demographic study areas that would be used to assess the species status across the range of the northern spotted owl. Three of these have been dropped and 11 demography areas remain (Forsman et al. 2011). NSO sites and productivity are annually monitored within these areas to assess changes in population trends and demographic performance of spotted owls on federally administered forest lands within the range of the NSO. The Medford District shares one demographic study area, the Klamath, with Roseburg BLM and the Rogue River Siskiyou National Forest. The Southern Cascades demographic study area is the next closest demographic area to the Medford District.

The population statistics of the NSOs in the demographic study areas have been examined in two separate metadata analyses. The last published metadata analysis was completed in 2006 (Anthony et al. 2006), and a more recent metadata analysis is available in draft (Forsman et al. 2011). The results from the most recent analysis of the demographic data found the annual rate of population change (λ) for the NSO were below 1.0 for all study areas, and there was strong evidence that populations on 7 of the 11 study areas declined during the study (Forsman et al. 2011). In four study areas, the 95% confidence intervals for λ overlapped 1.0, so it cannot be concluded that those populations were declining (Forsman et al. 2011). Two of those four study areas are the Klamath and Southern Cascades study area, indicating that the rate of population change remains statistically stable within these study areas, but that relationship is weaker than reported previously by Anthony et al. (2006).

Fecundity, the number of females born to females known to have bred, is declining in the Klamath and Southern Cascades demographic study areas. Forsman et al. (2011) concluded that fecundity, apparent survival, and/or populations were declining on most study areas, and that increasing numbers of barred owls (*Strix varia*) and loss of habitat were partly responsible for these declines. However, fecundity and

survival showed considerable annual variation at all study areas, little of which was explained by the covariates that were used.

The Service also conducted a status review in 2004 of the spotted owl across its range, in a document known as the 2004 Sustainable Ecosystem Institute Report, which summarized the biology, ecology, habitat associations and trends, as well as current and potential threats to the species (Courtney et al. 2004). The three major operational threats they identified were timber harvest, large-scale stand replacement wildfire, and barred owls. Additional potential threats included effects associated with West Nile Virus, and Sudden Oak Death disease.

Courtney et al. (2004) found that habitat loss, the primary reason for listing of the spotted owl, had declined significantly across the range. However, there was also some concern as to the potential lag effects to spotted owl populations from past timber harvest. The greatest amount of habitat loss due to timber harvest had occurred in the Oregon Klamath and west Cascade provinces.

In a review of the 2008 draft recovery plan for the spotted owl, Courtney et al. (2008) opined that the threat from wildfire was underestimated in the draft recovery plan (DRP) for the dry forest provinces, and is inadequately addressed. They said that this threat is likely to increase given both current forest conditions, and future climatic change. Courtney et al. (2008) also discussed what they thought was an underestimate of the threat of habitat loss from fire and the harvest or 'salvage' of large and very large trees. The DRP threat assessment assumed that there would be no major loss of habitat currently conserved under the Northwest Forest Plan (NWFP). However they thought that this assumption may be incorrect because neither of the options proposed in the DRP either reference nor require continuation of the Late Successional Reserves under the NWFP, which contain much of the remaining NRF habitat. They found it difficult to determine the degree to which the DRP Options reduced protection of habitat and stated that conservation of habitat remained essential to spotted owl conservation and recovery. Courtney et al. (2008) also recommended reducing surface fuels, increasing the height to live crowns**,** decreasing crown densities, and favoring large fire tolerant trees in dry forest types such as southern and eastern Oregon and Washington**.** Specific to the SW Oregon Klamath Province, they recommended that all large and old trees, either living or dead, are important wherever they occur, and suggested landscape designs that promote the increased abundance of large trees of fire tolerant species using ecologically sound landscape design criteria. Courtney et al. (2008) also suggested that existing plantations are one major source of risk of high severity fires and that the fire tolerance of existing plantations can be increased by manipulating species composition, reducing density, promoting spatial heterogeneity in forest structure (avoiding large areas of homogeneous plantations), treating surface fuels, and favoring the development of large, fire tolerant trees. They suggested that this could be accomplished through large scale thinning operations (that include treatment of activity fuels and increasing spatial variability) in plantations outside of NSO habitat (where plantations are generally concentrated), or using a larger regional landscape strategy that prioritizes the risk of high severity fire outside of NSO habitat. They also recommended that the establishment of new plantations should not be favored, but rather activities in dry forest settings that improve overall fire tolerance of the landscape and decrease the likelihood that a few large fires will destroy a significant number of NSO territories. The subsequent Draft Revised Recovery Plan included these recommendations in large part for SW Oregon forests (USDI FWS 2010).

There have been recent large fires in SW Oregon, in particular the Biscuit and the Timbered Rock fires, which reduced spotted owl NRF habitat within the Klamath province. There is uncertainty as to how spotted owls respond to fire in southwest Oregon and research was conducted in the Timbered Rock Fire area in an attempt to answer that question.

Of the 15 spotted owl activity centers affected by the Timbered Rock Fire, initially, 11 of those centers continued to occupy their historic activity centers immediately after the fire even though their habitat was subjected to varying degrees of fire severity. However, a severe decline of occupied NSO centers from the fire area was seen from 2004 to 2006. Survival and productivity also decreased greatly in birds from within the fire area. (Clark 2007).

Both the 2004 Sustainable Ecosystem Institute Report (Courtney et al. 2004) and the 2010 Draft Revised Recovery Plan for the NSO (USDI FWS 2010) identifies competition from the barred owl as a threat to the spotted owl. Barred owls are native to eastern North America, but have moved west into spotted owl habitat. Since barred owls are less selective about the habitat they use and the prey they feed on, they may be out-competing northern spotted owls for habitat and food. Impacts to spotted owls cannot be statistically evaluated to date, but observational data suggests direct competition and aggressive displacement of spotted owls from prime nesting habitat.

Barred owls have increased in southwest Oregon, but not to the extent of other areas within the range of the spotted owl. However, recent data from the Klamath study area suggests this trend may not continue. The percentage of sites surveyed for spotted owls with barred owl detections in the Klamath study area is trending upward from a relatively low 1.7% in 1998, to 10.7% in 2003, 21.8% in 2008, and 25.0% in 2009 (Horn et al. 2010). Within the Klamath study area, the percentage of sites with barred owl detections exceeded 10% for the first time during 2003, and has remained above 10% since (Horn et al. 2010). There have not been any barred owl detections in the Action Area for this project, but barred owls have been detected in adjacent watersheds.

The other new threats of Sudden Oak Death (SOD) and West Nile virus are thought to be potential stressors to the northern spotted owl population. Sudden Oak Death or *Phytopthora* canker disease kills or injures many species of trees and shrubs, and may affect habitat components important to spotted owls and their prey. However, SOD is only known for the coastal region of NW California and SW Oregon. West Nile virus infects birds, although as of April, 2005, no wild NSO infections have been documented; however, West Nile virus has been detected in other bird species in Jackson County. It is unknown when and to what extent this threat may become a risk for the spotted owl.

NORTHERN SPOTTED OWL RECOVERY PLAN

The Service finalized the Recovery Plan for the Northern Spotted Owl on May 13, 2008 (USDI FWS 2008). On July 16, 2009, the Assistant Secretary for Fish, Wildlife and Parks, announced that the Federal government would conduct a thorough review of the Recovery Plan prior to its full implementation. The 2010 Draft Revised Recovery Plan for the Northern Spotted Owl (USDI FWS 2010) is currently out for public review and comment and has not been finalized. 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. BLM continues to work with the Service to incorporate Recovery Goals and Actions that are 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.

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 substantially all of 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 structurally complex forest for project level planning

and NSO consultation needs in SW Oregon. The Ashland Resource Area used the most current methodology (USDA et al. 2010) to identify any potential structurally complex stands within the proposed treatment areas and no structurally complex habitat will receive treatment as part of the Pilot Joe Project.

PROJECT AREA SYNOPSIS

In general, the Action Area contains mostly dry Douglas-fir plant associations. Distribution and landscape patterns of plant species and communities are controlled primarily by physical factors of the environment, which include moisture, temperature, light, and soil type. Waring (1969) found that in the eastern Siskiyous, where the Humbug Creek – Applegate River 6th field sub-watershed is located, moisture and temperature proved to be the most important factors limiting vegetation. The eastern Siskiyous are hotter and drier than the western Siskiyous, and many species found in the western Siskiyous cannot tolerate the lower moisture and heat stress of the eastern Siskiyous (Waring 1969).

The Action Area was examined under the Middle Applegate Watershed Analysis (USDI 1995b). The Middle Applegate Watershed Analysis describes the vegetative condition of the Action Area in detail, and a great deal of pertinent information is available in that document. A condensed summary of the general forest conditions present within the watershed is included here:

"In general, vegetation density levels are much higher than in the past, especially in conifer forests. Conifer stands in the Middle Applegate also seem to be more homogeneous than in the past. Many trees that are over 200 years old with old-growth characteristics have been killed by the competing, second growth trees. Due to fire suppression and past logging, the ponderosa pine, knobcone pine, and incense cedar stands are converting to Douglas-fir, the climax species for the majority of the forested area. Douglas-fir is even encroaching upon the edges of the oak woodlands.

Lack of fire in the shrublands has created maximum vegetation stocking levels and an extremely high fire hazard. Tree species have encroached into the shrublands as well. Without treatment vegetation will continue to die and create even more fire fuels.

Forest openings (i.e., grass, forbs, herbaceous condition class) in the watershed are at risk. This is due to the invasion of trees, shrubs and exotic plant species such as yellow star thistle, hedgehog, dogtail, medusahead rye, cheatgrass, and ripgut brome. Fire is the ecological process that maintained these communities historically. However, it is unknown if a fire would rejuvenate these plant communities or favor the further encroachment of these exotic species.

Trees in the Middle Applegate are growing at the slowest rates since the 1800s. Stand vigor is decreasing because the forest stands are significantly overstocked. Relative density index ratings indicate that stands within the Middle Applegate are at the point of imminent mortality and suppression. Decreases in tree vigor and growth have contributed to the overall decline in forest health.

The Middle Applegate watershed may not be resilient to catastrophic change. Vegetation densities are very high and ladder fuels are abundant. Vegetation mortality is already occurring because of plant competition and expanding bark beetle populations, so the stage is set for stand replacement fires. The replacement of ponderosa pine by Douglas-fir increases the percentage of drought-susceptible trees in the stand. Therefore, the risk of beetle infestation and/or wildfire also increases."

NORTHERN SPOTTED OWL HABITAT

For the purposes of this consultation, all lands within the Action Area were classified into one of three categories of spotted owl habitat. These categories are distinct and not over-lapping. This system of habitat classification is the standard used in consultation efforts across the range of the spotted owl within western Oregon. The three habitat categories are:

- Nesting, Roosting and Foraging (NRF)
- Dispersal-only
- Unsuitable

Nesting, Roosting, and Foraging (NRF) Habitat for the spotted owl consists of habitat used for nesting, roosting, *and* foraging. Spotted owl NRF habitat also functions as dispersal habitat. Generally, this habitat is multistoried, 80 years old or more (depending on stand type and structural condition), and has sufficient snags and down wood to provide opportunities for nesting, roosting, and foraging. The canopy closure generally exceeds 60 percent, but canopy closure or age alone does not qualify a stand as spotted owl NRF habitat. Other attributes of NRF habitat 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 spotted owls to fly (Thomas et al. 1990). Spotted owl NRF habitat in southwest Oregon is typified by mixed-conifer forest, recurrent fire history, patchy habitat components, and a relatively high incidence of woodrats, a high quality spotted owl prey species in the Klamath Province (Forsman et al. 1984, 2001, 2004, Ward et al. 1998, Hamer et al. 2001).

Forsman et al. (1984) described some of the differences in NRF habitat within the Klamath Mountains Province that are typical of large parts of the Medford District:

> "Eighty-one percent of all nests in northwestern Oregon were in cavities, compared to only 50 percent in the Klamath Mountains. These differences appeared to reflect regional differences in availability of the different nest types. Dwarf mistletoe infections in Douglas-fir (and numerous debris platforms that were associated with dwarf mistletoe infections) were common in the mixed coniferous forests of the Klamath Mountains and the east slopes of the Cascades, but did not occur in western Oregon."

Forsman et al. (1984) documented the range of nest trees for platform nests (n=47) as 36 to 179 cm (14.2 to 70.5 inches) DBH averaging 106cm (41.7 inches) DBH. Mistletoe is occasionally used as a nesting substrate in southwest Oregon, which sometimes makes smaller trees suitable as nest trees. For spotted owls, features that support nesting and roosting habitat typically include a moderate to high canopy (70 to 90 percent); a multistoried, multi-species canopy with large overstory trees (greater than 30 inches DBH); a relatively high incidence of larger trees with various deformities, including mistletoe, large snags, large accumulations of fallen trees and wood on the ground; and flying space (Thomas et al. 1990). NRF habitat also functions as dispersal habitat.

Dispersal-Only Habitat is a subcategory of "all dispersal" habitat for northern spotted owls. Throughout this document, "dispersal" will be used to describe dispersal-only habitat. Thomas, et al. (1990), defined dispersal habitat as forested habitat more than 40 years old, with canopy closure more than 40 percent, average diameter greater than 11 inches, and flying space for NSOs in the understory but does not provide the components found in NRF. It provides temporary shelter for NSOs moving through the area between NRF habitat and some opportunity for NSOs to find prey, but does not provide all of the requirements to support a NSO throughout its life. Dispersal 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. NSOs also disperse through NRF habitat.

Unsuitable Habitat for the northern spotted owl is forest land that currently does not meet either the NRF or Dispersal-only habitat definitions. For this assessment, the unsuitable habitat type is derived from the combination of those lands classified as *capable* lands and *non-habitat*.

Capable Habitat for the northern spotted owl is forest land that currently does not meet either the NRF or Dispersal-only habitat definitions but is capable of becoming NRF or dispersal in the future, as trees mature and canopy fills in. Typical capable habitat is young forest stands (early successional forests, plantations).

Non-habitat does not provide habitat for NSO and will not develop into NRF or dispersal in the future. Typical non-habitat is chaparral brush fields, open meadows, agricultural fields, etc.

The Pilot Joe Project is within the Klamath Mountains Province in southwestern Oregon where fire is recognized as a key natural disturbance (Atzet and Wheeler 1982). Fire has played an important role in influencing successional processes and creating diverse forest conditions. Spotted owl habitat patterns in these drier portions of its range are not continuous, but occurred naturally in a mosaic pattern (USDI FWS 2008). Agee (1993), Agee (2003), and Hessburg and Agee (2003) characterized the historical wildfire regime as low- to mixed-severity with fire return intervals of less than 10 to 50 or more years, depending on local conditions. The mosaic pattern described was a direct result of natural fire regimes which are, in general, more frequent and low to mixed severity in SW Oregon within low to mid-elevation habitats compared to those in most areas west of the Cascades in Oregon and Washington.

As a result of effective fire exclusion, many of these stands are now in mid or late-closed condition. It is unknown how northern spotted owls have responded to effective fire suppression over the last 80 -100 years. Most of the NSOs that currently inhabit the Action Area occur in the drainages and on northerly aspects where it is likely that prior to fire suppression these areas acted as refugia from frequent fire and may have been in a condition similar to today.

While elevation and watershed position are somewhat general variables, finer scale variables like slope position, curvature, and distance to streams seem to correspond well with known NSO nest sites. NSOs in Northern California selected the lower third of slopes, used the middle third of slopes in proportion to their availability, and used the upper third of slopes less than expected for roosting and nesting (Blakesley et al, 1992). The NSO nest locations within the project area exhibit a similar trend and tend to occur lower on the slopes and in areas with a convex curvature. These are likely areas with more stable microclimates, and larger trees with more complex forest structure that spotted owls are selecting as nest sites. It may also be that these same areas historically acted as refugia from stand replacement fire, due to being near the bottom of the canyons and on north tending slopes, maintained suitable spotted owl habitat over time.

The primary prey of northern spotted owls in the Klamath Mountains Province in southwestern Oregon is the dusky-footed woodrat (*Neotoma fuscipes*) and the northern flying squirrel (*Glaucomy sabrinus*). Forsman et al. (2004) found NSOs in the Klamath Province consumed woodrats at a rate of 2-3 times higher than most other areas within the range of the NSO, and woodrats comprised nearly one-third of the prey items in the diet and account for nearly half of the biomass. As a result, key features of woodrat habitat (typically brushy areas or younger forest stands) strongly influence how NSOs use the available habitat in the Klamath Province. Where woodrats are the primary food source, NSOs have home ranges that are significantly smaller and contain significantly more edge habitat and less older forest (Zabel et al. 1995, Carey et al. 1992).

NSO HABITAT IN THE ACTION AREA

The existing vegetation within the Action Area was typed utilizing the following methodology. For all BLM administered lands within the Action Area, habitat values were assigned to every stand (as delineated by the BLMs forest operation inventory (FOI)) using the McKelvey habitat rating system. Appendix C includes a complete definition of each of the six habitat categories used under the McKelvey Rating system. In locations where commercial treatments are proposed, field walk-throughs were conducted by the Resource Area (RA) biologist to evaluate the habitat conditions currently present within each proposed treatment area. The remaining areas of the BLM lands that were not field assessed were assigned a habitat value by the RA biologist through the use of aerial photo interpretation, and cross referencing the habitat values attributed to these stands given under other NSO habitat models in the GIS environment, as well as extrapolation of habitat values from stands that appeared to have similar characteristics to those stands that received on-the-ground habitat evaluations. Figure 3 (Appendix E) depicts the results of this habitat typing exercise.

Once typing was complete for all BLM administered lands within the Action Area using the McKelvey rating system, these habitat values were simplified into one of the three (NRF, dispersal-only, or unsuitable) more general habitat categories described under the NSO habitat types section above. In addition, habitat values for the private lands located within the Action Area were obtained from a BLM GIS (Geographical Information System) dataset (BLMs "E-baseline") developed and used for a more extensive NSO analysis representing NSO habitat values across all Medford District BLM lands (USDI BLM 2008b), which also types habitat into NRF, dispersal-only, and unsuitable habitat types. The simplified habitat categories on BLM administered lands and the values on private lands were then combined to create a seamless coverage for the entire Action Area. Figure 4 (Appendix E) depicts the final simplified habitat classification of all lands within the Action Area.

Table 3. Acres of NSO habitat types by land owner across the Action Area.

Habitat Type	BLM	Private	Habitat Type Total
NRF	4,784 (95%)	261 (5%)	5,045 (43%)
Dispersal-only	3,241 (93%)	263 (7%)	3,504 (30%)
Unsuitable	1,537 (49%)	1,596 (51%)	3,133 (27%)
Ownership Total	**9,562 (82%)**	**2,120 (18%)**	**11,682 (100%)**

Percentage values under the BLM and Private columns represent the contribution in percentage of the habitat type for each land owner. Percentage values under the Habitat Type Total column represent the total percentage of each habitat type within the Action Area. Percentage values in the Ownership Total row represent the percentage composition of each land owner within the Action Area.

Table 3 displays the acres of each NSO habitat type by land ownership across the entirety of the Action Area. In total, the Action Area contains approximately 4,784 acres of NRF habitat, which is about 43% of the lands within the Action Area. The vast majority of the NRF habitat is found on BLM administered lands (95%), and private lands contribute a very small percentage (5%) of the total NRF in the Action Area.

All of the areas that will receive commercial treatments were field evaluated to determine the habitat condition within each proposed unit, and this evaluation included an assessment for structurally complex habitat (in relation to the NSO Recovery Plan – Recovery Action 32). None of the areas that will be treated as part of the Pilot Joe Project contained structurally complex habitat. The majority of the structurally complex habitat that occurs within the Action Area is contained with the LSEAs.

SPOTTED OWL SITES WITHIN THE ACTION AREA

All available information on the survey history for each NSO site within the project area was compiled for each site. For each NSO site, the wildlife biologist compiled all the survey detections associated with the site, including individual male and female, pair, juvenile, and nest tree locations into one single comprehensive data layer in the GIS environment. This information provides a more informed understanding of the history of NSO use at these sites in comparison to a single point location. Figure 5 (Appendix E) illustrates the compiled survey history for each site within the Action Area.

The survey history for each site with the Action Area is variable, but the majority of the survey efforts were done throughout the 1990's, and very limited surveys have been conducted in the Action Area over the past 10 years. The BLM is conducting surveys this field season (2011), but survey results are incomplete at this time and the results from this field season will not be compiled until fall, thus the 2011 survey results are not suitable for inclusion in this BA at this time. However, the results from these surveys will be used to inform the project once compiled, and help validate the project design and ensure the project activities conform to the PDC included in Appendix B. Table 4 shows the site names for each historic NSO site within the Action Area, and the most recent successful survey attempts and results for each of these sites. If the most recent detection did not indicate reproductive activity at the site for that year, the most recent date where reproductive activity was detected at the site is listed for the site as well. The complete survey history for each site is provided in Appendix D.

From this compiled survey history, a total of five historic NSO sites could potentially be affected by the Proposed Action. The landscape within the Action Area is fully saturated with historic NSO locations, and thus this BA relies solely on historic NSO detection and occupancy information, and does not include any computer modeled NSO sites.

Table 4. Most recent date of detections and status of NSO sites within the Action Area.

NSO Site Name	Date of Detection	Site Status
BALD BEN	7/3/2003	Pair with 2 juveniles
BLIND CHAP	7/11/2002	Pair with 1 juvenile
CHAPMAN CREEK	7/31/1997	Single Female
CHAPMAN CREEK	6/22/1994	Pair with 1 juvenile
KEELER CREEK	4/23/1999	Single Male
KEELER CREEK	7/15/1997	Pair with 2 juveniles
LIME GULCH	5/30/2002	Single Female
LIME GULCH	7/25/2001	Pair with 2 juveniles

The majority of the NSO sites within the Action Area have a fairly concentrated pattern of use, and nesting activity is generally confined to one stand (Appendix E, Figure 5). It is important to note that these survey results were only collected over the course of the breeding season, and do not necessarily reflect the entire pattern of use at each site. The Keeler Creek site has had a number of nest site locations through time, and these independent nest site locations have been referred to throughout the history of this site as the original, alternate A and alternate B nest sites (Appendix E, Figure 5). The most recent NSO activity has been concentrated at the Keeler Creek Alt B site (1994-1999), with successful breeding occurring in 1994 and 1997, and occupancy at this site in all of those years except 1996. Surveys were conducted at this site every year from 1990-2001, and again in 2007. In 2000, night surveys potentially

detected a single NSO response in the Alt B location, but this was based on a suspected single 4-note response.

The private land to the east of the Keeler Creek Original nest area (38S-04W-36) was intensively harvested starting in the spring of 1994 through fall of 1995, and the existing habitat that was in that area was removed as a result of this timber harvest. Since the time of this harvest, no NSOs have been detected at the Keeler Creek Original nest site, despite numerous survey attempts at this site over multiple years after the private harvest took place. It is likely that this harvest activity rendered the Keeler Creek Original location inhospitable, either from the direct loss of habitat nearby to the nest site, or through the indirect effects of disturbance associated with the timber operations, or the combination of both.

One additional historic NSO site is nearby to the west of the Action Area and is called Maid of the Mist (Appendix E, Figure 5). Although this site was given a Master Site Number and is included in the State-wide Spotted Owl Database, the entirety of the detection history at this site consists of three single male night responses in 1992, despite protocol surveys being conducted at this site in 1992 and 1993, 1996-2002, and 2007. Other than the 1992 detections, none of these surveys detected NSOs at this site. Because this site has never been associated with a pair or even resident singles, this site is not considered in this analysis. The Keeler Creek Alt B site is fairly close to the Maid of the Mist site, and likely represents the most suitable location for NSO nesting in that immediate area.

III. EFFECTS OF THE PROPOSED ACTION

The project analyzed in this BA "may affect and is likely to adversely affect" (LAA) spotted owls due to the downgrading of NRF habitat. There is No Effect (NE) to critical habitat because the Pilot Project does not occur within any designated CHUs.

The proposed action may impact the northern spotted owl in a variety of ways and at differing levels depending on exactly where and when the activity occurs. All effects from the proposed action have been evaluated in this assessment, including effects from activities which are interdependent or interrelated.

SPECIFIC TREATMENT TYPES AND THE ASSOCIATED EFFECTS

The following definitions are used to describe the anticipated effects of the activities associated with the proposed action to the NSO habitat types within the Action Area. The activities proposed under the Pilot Joe Project can be assigned into one of the following general effect types:

Treat and Maintain NRF or Dispersal Habitat means an action or activity will occur within NRF or dispersal habitat but will not change the habitat function post treatment. The NRF stand will retain an average of 60 percent canopy cover post treatment, large trees, multistoried canopy, standing and down dead wood, diverse understory adequate to support prey, and may have some mistletoe or other decay. Dispersal habitat will continue to provide at least 40 percent canopy, flying space, and trees 11 inches diameter at breast height (dbh) or greater, on average. The habitat function of the stand following treatment will be the same as the pretreatment habitat function.

> **The effects determination for treat and maintain type habitat modifications is considered a "may affect not likely to adversely affect" (NLAA) for the spotted owl because spotted owls are expected to utilize the treated stand in relatively the same manner as prior to treatment.**

Downgrade Habitat means to alter the function of spotted owl NRF habitat so the habitat no longer supports nesting, roosting, and foraging behavior, but will retain enough tree cover to support spotted owl dispersal.

> **The effects determination for downgrading of habitat is "may affect, likely to adversely affect" (LAA) the spotted owl because the treatments are likely to alter the existing stand condition to a degree that it no longer supports the function of nesting, roosting and foraging post treatment.**

EFFECTS TO SPOTTED OWL HABITAT

Implementation of the commercial treatments (variable density thinning) proposed under the Pilot Joe Project are anticipated to result in a downgrade in NRF habitat and a treat and maintain in dispersal habitat. All of the non-commercial treatments proposed under the Pilot Joe Project are anticipated to result in a treat and maintain effect to the habitat type where these activities are implemented, or a No Effect in unsuitable habitat.

Table 5 depicts the anticipated effects to each NSO habitat type from the Proposed Action, and how these treatment types are expected to change the amount of each NSO habitat type across the Action Area post implementation.

Table 5. Treatment effects to each NSO habitat type in the Action Area.

Habitat Type	Pre-project Acres (%)	Downgrade	Treat and maintain	Post-Project Acres (%)	Percent Change
NRF	5,045	175	123	4,870	-3.5%
Dispersal-only	3,504	0	406	3,679	+4.8%
Unsuitable	3,133	0	185	3,133	0
Total	11,682	175	714	11,682	NA

Effects to NRF Habitat

In total, the Pilot Joe Project proposes approximately 175 acres of treatments that would result in a downgrade of NRF habitat. Currently, approximately 5,045 acres of NRF habitat is present within the Action Area, and after implementation of the project, approximately 4,870 of NRF habitat would remain across the Action Area. This reduction of 175 acre of NRF habitat across the Action Area represents a 3.5% reduction of the total NRF habitat within the Action Area. This calculation includes the habitat values present on the privately owned lands within the Action Area. Only a small portion of the NRF habitat in the Action Area is located on private lands (261 acres) so the contribution from private is almost immaterial, but if private lands are excluded in this calculation, then the Proposed Action would result in a 3.7% decrease in the total NRF habitat in the Action Area.

The BLM has determined the downgrading of NRF habitat associated with the Pilot Joe Project is likely to adversely affect (LAA) northern spotted owls because:

- The commercial thinning activities that will downgrade suitable NRF habitat to dispersal-only habitat will remove key habitat elements, including some large-diameter trees with nesting cavities or platforms, multiple canopy layers, hunting perches and would reduce the overall canopy cover across the stand below 60%;
- The removal of these key habitat features would reduce the nesting, roosting and foraging opportunities for NSOs within the project area, and lead to increased predation risk; and
- Downgrading of NRF to dispersal-only would reduce the amount of existing NRF present within the Action Area by 3.5 percent.

Effects to Dispersal-only Habitat

The remaining treatments (124 acres of commercial treatments in dispersal-only habitat and 590 acres non-commercial treatments) will minimally alter the forest environment where the treatments are proposed, and are considered a treat and maintain treatment type. Although these treatments will occur within both NRF and dispersal-only habitat types, the utility of the habitat in these treatment areas is anticipated to remain the same post-harvest. Therefore, these remaining treatments will not result in any additional habitat downgrade. In total, 529 acres of NRF and Dispersal-only habitat will be treated and maintained. An additional 185 acres of unsuitable habitat will be treated, which is considered a No Effect as this habitat type does not support any of the life functions of the NSO.

The BLM has determined that the maintenance of dispersal-only habitat associated with the Pilot Joe Project may affect, but is not likely to adversely affect (NLAA) northern spotted owls because:

- The average canopy cover in treated stands will be maintained at 40 percent across the treatment area;
- Decadent woody material, such as large snags and down wood will be retained;
- Maintenance activities within dispersal-only habitat will not remove the habitat components important to NSOs, such as large-diameter trees with nesting cavities or platforms and multiple canopy layers;
- The prey base as measured in total small-mammal biomass within these treated areas is not expected to significantly change following treatment (Converse et al. 2006);
- These treatments will reduce tree density to increase individual tree vigor, leading to increased stand resistance to insects, diseases, and wildfire. This will make the residual habitat healthier and more ecologically-sustainable over time; and
- The proposed treatments will be dispersed throughout the Action Area, which will minimize the potential for negatively affecting NSO dispersal opportunities across the Action Area.

EFFECTS TO SPOTTED OWL SITES

As described in more detail in the Environmental Baseline section of this document, a total of five historic NSO sites are present in the Action Area. This section examines the potential effects to each individual NSO site from the Proposed Action. This analysis does not rely on any estimated (generated) sites.

Analytical Framework

This analysis relies on the analytical process described in more detail in the Methodology for Estimating the Number of Northern Spotted Owls Affected by Proposed Federal Actions (USDI et al. 2008). For each of the Historic NSO sites located with the Action Area, a single point was selected from the digitized survey history that the wildlife biologist felt best represents the location where 1) historic survey information indicates prior nesting activity at that location, and 2) the location was considered to have a reasonable likelihood that NSOs could occupy the site in the future.

After site selection was completed, a series of concentric circles were constructed around each point to be used to analyze the potential effects of the Proposed Action. These concentric circles represent three scales of use that NSOs use during the course of breeding and non-breeding season, and offer a useful evaluation of how NSOs use and depend on the habitat surrounding their nest sites. These areas of use are defined as follows:

- **Provincial Home Range** is defined, for analysis purposes in this document, by a circle located around an NSO activity center and represents the area NSOs are assumed to use for nesting and foraging in any given year. For the Klamath Mountains Province the home range is a 1.3 mile radius circle (approximately 3,400 acres (USDI *et al.* 2008). The home ranges of several NSO sites may overlap.

- **Core Area** is a 0.5-mile radius circle (approximately 500 acres) from the nest or center of activity to delineate the area most heavily used by spotted owls during the nesting season; it is included in the provincial home range circle. Core areas represent the areas which are defended by territorial NSOs and generally do not overlap the core areas of other NSO pairs (USDI *et al.* 2008).

- **Nest Patch** is the 300-meter radius area around a known or likely nest site; it is included in the core area (USDI *et al.* 2008).

This analysis relies on the use of these three concentric circles to examine how the proposed action will affect the NSOs within the Action Area. Each NSO site is examined independently, and the results of this analysis are given below for each NSO site. Figure 6 (Appendix E) illustrates the NSO sites that were selected for this analysis as well as the three concentric circles that surround each NSO site used for this analysis. As some home range circles overlap, the unit acres that fall within two or more home range circles are included separately under the analysis of each site, and thus a strict addition of the treatment acres of each site will result in more acres of proposed treatments then actually is proposed. In other words, if each NSO is analyzed separately, units that occur in multiple home ranges are "double-counted".

The proximity of the proposed treatments to the NSOs sites present within the Action Area is important in evaluating the potential effects of the Proposed Action. Alteration to the habitat found within the nest patch area is likely to have larger impact to the suitability of a NSO site then a similar treatment that occurs at the home range scale. This assumption is supported by an examination of how NSOs utilize the habitat located within each spatial scale around the nest site. A more detailed description the scientific rationale for the development of these three scales is provided in in the Methodology for Estimating the Number of Northern Spotted Owls Affected by Proposed Federal Actions (USDI et al. 2008).

At the nest patch scale, NSOs select habitat that provides nesting structure (complex structure dominated by large diameter trees) and high canopy cover that provides adequate cover from predators and thermoregulatory benefits (Forsman et al. 1984, Weathers et al. 2001). Management activities that result in a reduction of these components within the nest patch area are expected to result in adverse effects to the suitability of the habitat for nesting.

NSOs utilize the habitat within the core and home range scales primarily for foraging. Within Oregon, there is considerable variation in the structural composition of habitat used for foraging. Irwin et al. (2000) reported NSO foraging occurred in a broad array of structural conditions across all successional spectra. Foraging success by NSOs may be optimal in stands with a mix of canopy gaps and patchy ground cover (Carey et al. 1995). Treatments at the core and home range scales, and the associated effects from these treatments should focus on how these treatments would affect the prey species and overall foraging habitat suitability, rather than habitat metrics associated with NSO nesting habitat.

Chapman Creek

In total, 567 acres of treatments are proposed within the home range of the Chapman Creek NSO site. The majority of these treatments (84%) will treat and maintain the existing habitat, however 93 acres of NRF habitat will be downgraded to dispersal-only habitat at the home range scale and 19 acres of NRF habitat would downgraded to dispersal-only habitat at the core scale. Approximately 121 acres of NRF habitat and 295 acres of dispersal-only habitat will be treated and maintained within the Chapman Creek home range. There are no treatments of any type proposed at the nest patch scale for this site.

The proposed action will result in a reduction in the available NRF habitat within the home range and core area scales at the Chapman Creek site by approximately 2% and 4%, respectively. Appendix F includes a table that provides a summary of the acres and percentages before and after treatment of the NRF habitat type for each NSO site within the Action Area.

The treatments that will occur within the home range of the Chapman Creek NSO site, especially the non-commercial treatments in units 31-11NC and 31-14NC (see Appendix E, Figure 2) are designed to reduce vegetative competition and fuel loading in these areas, and were strategically selected during landscape planning to reduce fuel hazard in locations that 1) are in close proximity to private lands and low

elevation valley areas where human caused fires typically start, and 2) in locations that will break up the continuity of fuels across the landscape and provide a short term reduction in fuel hazard between and around the high value Late-Successional Emphasis Areas located within the Action Area.

In total, approximately 17% and 32% of the chapman creek NSO home range and core areas will be treated over the course of implementation. However, implementation of each treatment type is expected to occur across multiple years, so only a portion of the final treatment will occur in any given year.

Bald Ben

In total, 578 acres of treatments are proposed within the home range of the Bald Ben NSO site. The majority of these treatments (78%) are considered treat and maintain, however 126 acres of NRF habitat would downgraded to dispersal-only habitat at the home range scale. There are no treatments proposed that will result in a downgrade of habitat at the core or nest patch scales. This reduction of 126 acres of NRF habitat at the home range scale will result in a reduction in the available NRF habitat at the Bald Ben site by approximately 4%, reducing the amount of available NRF habitat from 54% to 50% at the home range scale (Appendix F).

As part of the Proposed Action, approximately 145 acres at the core scale, and 18 acres at the nest patch scale are targeted for non-commercial treatments (unit 31-14NC). The existing habitat where these treatments are proposed is mostly dispersal-only (75%) or unsuitable (13%) habitat, and the small amount of NRF habitat that will receive treatment (12%) is located at the margins of the treatment unit. This area was previously treated for fuel hazard reduction under a previous project called Appleseed in 1998. The treatments in this area as proposed under the Pilot Joe Project are designed as a maintenance treatment to once again reduce fuel hazard within this strategic location. A field evaluation of the habitat quality across this treatment area, including the nest patch area, and a thorough discussion of the proposed treatments and how they would affect the existing habitat structure was conducted during project development. From this field evaluation, it was determined the proposed treatments would insignificantly impact the existing habitat, and would not alter prey availability or overstory canopy cover, even within the nest patch area. In addition, 10-20% of the hand-piles that will be generated from these treatments will not be burned, and will provide habitat for the land-based NSO prey present within these treatment areas following treatment. These treatments would result in beneficial effects by reducing the continuity of fuels across the treatment area and provide a short term reduction in fuel hazard between and around the high value Late-Successional Emphasis Areas located within the Action Area. Although these treatments should minimally affect habitat at the Bald Ben site, this treatment area will be under a seasonal restriction, so any disturbance effects will occur outside of the breeding season, thus providing an additional measure to minimize any negative effects from this treatment to the Bald Ben NSO site.

In total, approximately 18%, 29% and 26% of the Bald Ben NSO home range, core and nest patch areas will be treated over the course of implementation, respectively. However, implementation of each treatment type is expected to occur across multiple years, so only a portion of the final treatment will occur in any given year.

Blind Chap

In total, 134 acres of treatments are proposed within the home range of the Blind Chap NSO site. Approximately 63% of these treatments are considered treat and maintain, however 49 acres of NRF habitat would downgraded to dispersal-only habitat at the home range scale. There are no treatments proposed at the core or nest patch scales within the Blind Chap NSO site. This reduction of 49 acres of NRF habitat at the home range scale will result in a reduction in the available NRF habitat at the Blind

Chap site by approximately 1%, reducing the amount of available NRF habitat from 44% to 43% at the home range scale (Appendix F).

The anticipated effects to the Blind Chap NSO site from the treatments propose under the Pilot Joe Project are expected to be discountable as all the treatments will occur at the periphery of the home range of this site, and no treatments are proposed at the core or nest patch scale. The entirety of all the proposed treatments that will occur within the Blind Chap home range amount to 4% of the estimated territory.

Lime Gulch

In total, 128 acres of treatments are proposed within the home range of the Lime Gulch NSO site. All of the proposed treatments that will occur within the home range of this site will a treat and maintain the existing habitat. Therefore, there will not be any change to the amount of existing habitat located within the Lime Gulch NSO site after project implementation (Appendix F). There are no treatments proposed at the core or nest patch scales within the Lime Gulch NSO site.

The Lime Gulch NSO site is located in an adjacent 6th field watershed, which is outside of the project area, but the home range of this site extends into the project area, and thus this site was incorporated into the Action Area. However, based on the survey history use pattern at this site and the general behavior patterns that NSOs exhibit in relation to topographic and slope position, it is highly unlikely that the proposed treatments will actually affect the Lime Gulch NSOs. Furthermore, the 128 acres of proposed treatments that are within the Lime Gulch home range are also encompassed in the core area of the adjacent Bald Ben NSO site (see Appendix E, Figure 6), which would suggest these treatments would have no actual effect to the Lime Gulch NSOs because the territorial nature of NSO pairs at the core scale.

Keeler Creek

As described in more detail in the Environmental Baseline – Spotted Owl Sites within the Action Area section of this document, the Keeler Creek site has had three separate nest stands where nesting activity has been documented (Appendix E, Figure 5). Because the distance between the Keeler Creek Original nest stand and the Keeler Creek Alt B nest stand is over one mile apart from each other, it is possible that both sites could be used by NSOs in the same year. Therefore, for the purposes of this analysis, both the original site and the alt B site were selected for use in the effects analysis. Information on the habitat and treatments proposed within both of these sites is given below.

Keeler Creek Original

The private land to the east of the Keeler Creek Original nest area (38S-04W-36) was intensively harvested starting the spring of 1994 through fall of 1995, and the existing habitat that was in that area was removed as a result of this timber harvest. Since the time of this harvest, no NSOs have been detected at the Keeler Creek Original nest site, despite survey efforts at this location across multiple years after the private land harvest. It is unknown if this site was rendered unsuitable for successful NSO nesting at this location by this harvest activity. This site is conservatively included for analysis here.

In total, 330 acres of treatments are proposed within the home range of the Keeler Creek Original NSO site. The majority of these treatments (73%) are considered treat and maintain, however 89 acres of NRF habitat will be downgraded to dispersal-only habitat at the home range scale. There are no treatments proposed that will result in a downgrade of habitat at the core or nest patch scales. This reduction of 89 acres of NRF habitat at the home range scale will result in a reduction in the available NRF habitat at the

Keeler Creek Original site by approximately 2%, reducing the amount of available NRF habitat from 40% to 38% at the home range scale (Appendix F).

The treatment of approximately 49 acres within the core area includes only 7 acres of commercial treatments in dispersal-only habitat, and the remaining 42 acres of non-commercial treatments will occur in a managed early seral plantation, which provides no habitat value.

In total, approximately 10% of both the home range and core areas of the Keeler Creek Original NSO will be treated over the course of implementation. However, implementation of each treatment type is expected to occur across multiple years, so only a portion of the final treatment will occur in any given year.

Keeler Creek Alternate B

The most recent NSO activity for the Keeler Creek site has been concentrated at the Keeler Creek Alternate B site ("Alt B"), with successful breeding documented in 1994 and 1997 at this location, and NSO occupancy at this site from 1994-1999, with the exception of 1996. Survey history across the Keeler Creek NSO site suggests that this Alt B location is most likely to be used by NSOs of any of the historic Keeler Creek nest locations. This is further supported by the detection of a single male NSO at the Alt B nest stand this field season (4/21/2011).

In total, 57 acres of treatments are proposed within the home range of the Keeler Creek Alt B NSO site. All of these treatments are considered a treat and maintain and will occur in dispersal or unsuitable habitats, and there are no treatments proposed at the core or nest patch scales within the Keeler Creek Alt B NSO site. No treatments are proposed to occur within any of the existing NRF habitat within the Keeler Creek Alt B NSO site, and therefore there is will not be any change to the amount of NRF habitat present at this site post implementation (Appendix F).

The Keeler Creek Alt B NSO site will be minimally affected by the treatments propose under the Pilot Joe Project as all the treatments will occur at the periphery of the home range of this site, and no treatments are proposed at the core or nest patch scale. The entirety of all the proposed treatments that will occur within the Keeler Creek Alt B home range amount to 2% of the estimated territory.

EFFECTS TO SPOTTED OWL PREY

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 a circle 0.5 miles in radius (or 500 acres) from 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 above and the indirect effects to prey species can be derived from this data.

The dusky-footed woodrat, northern flying squirrel, and the red tree vole (*Arborimus longicaudus*) are important prey of the northern spotted owl in this Action Area. Timber harvest and fuels reduction projects may impact foraging by changing habitat conditions for prey. Sakai and Noon (1993) stated that dusky-footed woodrats, the primary prey of NSOs in our area, might benefit from some thinning or harvest that would increase shrub and pole stands. 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.

Some information suggests that there may be negative impacts of thinning on flying squirrels in young stands. However, 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 (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 the northern Sierras. However, they concluded that heavy logging and site preparation (burning) in the shelterwoods negatively affected flying squirrels. While flying squirrels may inhabit some of the young stands in the Action Area, it is not likely that they will be significantly affected by the proposed actions and spotted owls will continue to have access to this prey species post-treatment.

Some disturbance of habitat may improve forage conditions, provided that 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.

The residual trees, snags, and down wood that are retained in the treatment units 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. Edges created from harvest can be areas of good prey availability and potentially increased vulnerability (i.e., better hunting for NSOs) (Zabel et al. 1995). Prey animals may be more exposed in the disturbed area or may move away from the disturbed area for the short-term.

Specific to the Pilot Joe Project, 175 acres of commercial thinning will occur in NRF habitat. These treatments are expected to have short-term negative effects on the prey population present within the treatment areas as a result of changes to the habitat structure and the reduction of the existing canopy cover within the treatment areas. The remaining 714 acres of treatments will minimally alter the forest structure where the treatments occur, and any potential negative effects associated with these treatments should be limited to mostly disturbance. Some minor changes in prey availability may occur as cover is disturbed and animals move around in the understory.

The treatments as proposed under the Pilot Joe Project were designed to help reduce any negative effects to NSO prey species by incorporating untreated pockets (leave “islands”) throughout the treatment areas, with a goal of one acre left untreated for every six or seven acres treated (approximately 15%). This strategy will provide un-altered portions of the stand throughout the treatment area that should serve as refugia for prey species during project implementation. The prescriptions also require the retention of all existing snags and coarse wood, which are also key habitat elements for many prey species. The retention of these features should further reduce any negative affects to NSO prey within treatment areas.

Treatment implementation would be spread out temporally and spatially within the Action Area, which would provide areas for NSOs to forage during project implementation and reduce the impact of these short-term effects at the project level. PDC and normal operating procedures applied by the Medford BLM reduce the impacts to the extent possible, while still facilitating tree harvest and other projects. The treatment areas are small enough and dispersed enough that many resident prey species could move to adjacent patches until the stand recovers.

EFFECTS OF DISTURBANCE TO SPOTTED OWLS

Mandatory PDC will be incorporated into all proposed action activities. Applying the Mandatory PDC should avoid harm to nesting NSOs and their young that might occur from noise or activity, but may not reduce the adverse effects of habitat removal. Therefore, since all projects will follow the mandatory PDCs included in Appendix B, that restrict activities to outside of the breeding season and beyond recommended disturbance distance thresholds (Appendix B), no harm to nesting NSOs is expected from project related noise or activities.

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 which have no independent utility apart from the action under consideration. Interdependent actions depend on the Federal action and would make no sense without it.

All of the activities associated with the Proposed Action in this BA will have interrelated and interdependent effects. The commercial treatments often have activities directly or indirectly associated with their completion, such skid road construction or timber hauling on existing system roads. Post-harvest brush disposal is another interrelated and interdependent action to timber harvest. Brush disposal activities vary by timber sale due to fuels management objectives, requirements for retention of down woody material, and other resource management goals. Typical activities associated with this program include biomass removal, pile burning; underburning; and rearranging fuels by crushing, mulching, and lopping and scattering. Another interrelated and interdependent effect from timber harvest is the possible reduction in the size and continuity of existing late-successional stands, and interior forest habitat.

Noise and activity can also be an interrelated interdependent effect that would not occur "but for" the harvest activity. The harvest activity impacts are analyzed as part of the Effects to Spotted Owls Section of this document, and the noise disturbance is mitigated from use of the mandatory PDCs(Appendix B).

CUMULATIVE EFFECTS

Cumulative effects under ESA are "those effects of future State or private activities, not involving Federal activities, that are reasonable 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 under ESA. Cumulative effects analysis of foreseeable state and private actions provide the Service and the Medford BLM an accurate environmental baseline to assess impacts of federal actions.

Unlike many other portions of the Medford BLM District, which are generally comprised of a checker board pattern of ownership of private land interspersed with BLM lands, the Action Area is a fairly contiguous block of BLM ownership (82%). A range of management practices occur on private lands from residential home site development to intensive industrial timber management. Approximately 18% of the land within the boundary of the Action Area is under non-federal ownership.

In the Biological Opinion for the NWFP (USDA and USDI 1994b, Appendix G, 44-45), the Service concluded,

> "Non-federal landowner compliance with the take prohibition of the [Endangered Species] Act does not assure the maintenance of spotted owl dispersal habitat within Areas of Concern and

checkerboard ownership nor provide for improvement of existing populations. Consequently, it is likely that a reduction in dispersal habitat would occur on non-federal lands in certain areas."

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 forest lands 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. We anticipate some loss of NSO habitat on private lands, but cannot predict the rate of loss, or the specific location of harvest.

The Medford BLM assumes these past management practices will continue and reduce the amount of NRF habitat for spotted owl on non-Federal lands over time. 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. Under Oregon Forest Practice Rules (629-665-0210), NSO nest sites (70-acre core areas) are protected for at least three years following the last year of occupation.

At this time, no other future foreseeable activities are planned on the federal lands within the Action Area.

IV. BIOLOGICAL ASSESSMENT CONCLUSIONS

In total, the Pilot Joe Project proposes approximately 175 acres of treatments that would result in a downgrade of NRF habitat, which represents a 3.5% reduction of the total NRF habitat within the Action Area. Of the 175 acres of proposed treatments that would result in a downgrade of NRF habitat, only 19 acres (11%) are proposed for treatment within a core area of one of the NSO territories (chapman creek) present in the Action Area. The remaining 156 acres (89%) of proposed NRF downgrade will occur within the home range scale of the NSO territories present in the Action Area.

It is the conclusion of this biological assessment that proposed actions may affect the spotted owl as documented above. Formal consultation is requested for the Pilot Joe Project because the some of the activities included in the project **may affect, are likely to adversely affect** the NSOs in the project area. All activities are in compliance with the NWFP, Medford RMP, and current spotted owl consultation parameters.

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APPENDIX A: PROPOSED ACTION UNIT TABLE

Pilot Joe Unit Treatment Summary						
Unit	**T R**	**Section**	**Logging System**	**Silviculture Rx***	**Non-Commercial Rx**	**Acres**
1-1	39S-4W	1	Cable	VDT, DF	Activity	13
2-1	39S-4W	2	Cable	VDT, DF	Activity, UR	10
1-3A	39S-4W	1	Tractor	VDT, DF	Activity, UR	22
1-3B	39S-4W	1	Cable	VDT, DF	Activity, UR	14
25-1	38S-4W	25	Tractor	VDT, DF	Activity	7
26-1A	38S-4W	26	Cable	VDT, PP	Activity, UR	23
26-1B	38S-4W	26	Tractor	VDT, PP	Activity, UR	5
26-2	38S-4W	26	Cable	VDT, DF	Activity	13
31-1	38S-3W	31	Tractor	VDT, PP	Activity, UR	6
31-2	38S-3w	31	Cable	VDT, PP	Activity, UR	10
31-3A	38S-3W	31	Cable	VDT, DF	Activity, UR	40
31-3B	38S-3W	31	Cable	VDT, DF	Activity, UR	10
31-4A	38S-3W	31	Tractor	VDT, PP	Activity, UR	27
31-4B	38S-3W	31	Tractor	VDT, PP	Activity, UR	3
32-3	38S-3W	32	Cable	VDT, DF	Activity, UR	32
32-4B	38S-3W	32	Tractor	VDT, DF	Activity, UR	7
32-6	38S-3W	32	Cable	VDT, DF	Activity	15
35-1A	38S-4W	35	Cable	VDT, PP	Activity, UR	17
35-1B	38S-4W	26	Cable	VDT, DF	Activity, UR	19
35-2	38S-4W	35	Tractor	VDT, PP	Activity, UR	9
					Total	**302**
Unit	**T R**	**Section**	**Logging System**	**Silviculture Rx***	**Non-Commercial Rx**	**Acres**
1-4NC	39S-4W	1	N/A	Non-commercial	Density Management	75
25-2NC	38S-4W	25	N/A	Non-commercial	Density Management	7
31-11NC	38S-3W	31	N/A	Non-commercial	Density Management	218
31-14NC	38S-3W	31	N/A	Non-commercial	Density Management	193
35-3NC	38S-4W	35	N/A	Non-commercial	Density Management	40
35-3NC	38S-4W	35	N/A	Non-commercial	Density Management	3
35-4NC	38S-4W	35	N/A	Non-commercial	Density Management	53
					Total	**587**
Silviculture Rx - VDT=Variable Density Thinning, UR = Understory Reduction						

APPENDIX B: PROJECT DESIGN CRITERIA

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 which 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 which 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 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(s)/portions, 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 USFWS 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.

Owl Activity Periods

Table A-1 below displays the spotted owl breeding periods used to determine disturbance effects in this biological assessment.

Table B-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

MANDATORY PROJECT DESIGN CRITERIA

A. Activities (such as tree felling, yarding, road 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 shown in the table below (table A-1) of any documented or projected NSO 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 1 March and 30 June (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 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 B-2. 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-2 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 towards the noise, hiding, assuming a defensive stance, etc. (USFWS 2003).

RECOMMENDED PROJECT DESIGN CRITERIA

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

B. Minimize the use of fire line explosives within one air mile of occupied stands from March 1 through June 30, or until two weeks after the fledging period, unless protocol surveys have determined NSOs are not present, are non-nesting , or nesting has failed.

APPENDIX C: MCKELVEY RATING SYSTEM FOR SPOTTED OWL HABITAT

Rating	Description
1	**Nesting** (Optimal – meets all life requirements) Canopy closure greater than 60% and canopy structure multi-layered. Overstory trees greater than 21" in diameter with large snags, broken top trees present and down trees on the forest floor. Best indication we have for planning purposes to estimate old growth habitat (late-successional).
2	**Foraging** (Foraging, Roosting and Dispersal) Canopy closure greater than 60% and canopy structure generally single-layered. Overstory trees generally greater than 16" in diameter. Snags and down wood not considered a requirement. Best indication we have for planning purposes to estimate mature habitat (late-successional).
3	**Potential** (meets no known requirements for spotted owls) Canopy closure less than 40%. Disturbance (logging, fire, etc.) created condition but the area has the capability of becoming foraging or nesting habitat.
4	**No Potential** (meets no known requirements for spotted owls) Canopy closure less than 40%. Natural limitations of the site will not allow the development of either foraging or nesting habitat. Examples would be meadows, chapparal, etc.
5	**Dispersal/Potential** (provides requirements believed important for spotted owl dispersal) Canopy closure between 40% and 60%. Disturbance (logging, fire, etc.) created condition but the area has the capability of becoming foraging or nesting habitat.
6	**Dispersal/No Potential** (provides requirements believed important for spotted owl dispersal) Canopy closure between 40% and 60%. Natural limitations of the site allow the development of sufficient canopy closure for dispersal but not enough for either foraging or nesting habitat. Examples would be some serpentine influenced Jeffrey pine stands, low elevation ponderosa pine stands, hardwood stands of madrone, madrone/Douglas-fir.

APPENDIX D: SPOTTED OWL SURVEY HISTORY

This section includes a table of the survey results for all the NSO sites found within the Action Area. This survey information was generated from a query of the BLMs Spotted Owl database, and should contain all the survey information related to each NSO site found within the Action Area.

Codes

Response type – A = Auditory only, N = None Observed (No Response), V – Visual
Pair Status – Blank = No Birds Encountered, X = Unknown, P = Pair, U = Pair Relationship Unknown, S = Single, J = Juvenile(s) found, no adults
Nest Status – U = Unknown, C = Pre-nesting Activity, I = Incubation or Brooding, O = Nestlings or Branchers, F = Fledglings Observed, X = Nesting, Stage Unknown, Y = No Young Post June 1, N = Not Nesting

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
CHAPMAN CREEK	3/26/1990	N		U	380S	030W	31	
CHAPMAN CREEK	4/10/1990	N		U	380S	030W	31	
CHAPMAN CREEK	5/2/1990	A	U	U	380S	030W	06	NE
CHAPMAN CREEK	5/16/1990	V	U	U	390S	030W	06	NW
CHAPMAN CREEK	5/23/1990	V	P	O	390S	030W	06	NW
CHAPMAN CREEK	6/18/1990	V	P	F	380S	030W	31	SW
CHAPMAN CREEK	3/19/1991	N		U	390S	030W	06	
CHAPMAN CREEK	3/28/1991	A	S	U	390S	030W	06	
CHAPMAN CREEK	3/29/1991	N		U	390S	030W	31	
CHAPMAN CREEK	4/3/1991	N		U	390S	030W	06	
CHAPMAN CREEK	4/16/1991	A	S	U	390S	030W	06	NW
CHAPMAN CREEK	4/23/1991	N		U	390S	030W	06	
CHAPMAN CREEK	4/29/1991	N		U	390S	030W	06	
CHAPMAN CREEK	5/2/1991	A	S	U	390S	030W	06	SE
CHAPMAN CREEK	5/8/1991	V	P	I	390S	030W	06	NW
CHAPMAN CREEK	6/13/1991	V	P	F	390S	030W	06	NW
CHAPMAN CREEK	7/30/1991	V	S	F	390S	030W	06	NW
CHAPMAN CREEK	3/23/1992	N		U	380S	030W	31	
CHAPMAN CREEK	3/26/1992	V	P	I	390S	030W	06	NW
CHAPMAN CREEK	5/12/1992	V	P	I	390S	030W	06	NW
CHAPMAN CREEK	7/10/1992	V	P	F	390S	030W	06	NW
CHAPMAN CREEK	4/15/1993	A	S	U	380S	030W	31	SE
CHAPMAN CREEK	4/16/1993	V	P	N	380S	030W	31	SE
CHAPMAN CREEK	4/22/1993	V	S	N	380S	030W	31	SE

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
CHAPMAN CREEK	5/20/1993	V	S	N	380S	030W	31	SE
CHAPMAN CREEK	5/25/1993	V	S	N	380S	030W	31	SE
CHAPMAN CREEK	6/3/1993	N		U	380S	030W	31	
CHAPMAN CREEK	6/11/1993	A	P	U	380S	030W	31	SE
CHAPMAN CREEK	7/6/1993	V	P	Y	380S	030W	31	SE
CHAPMAN CREEK	3/15/1994	A	S	U	380S	030W	31	SE
CHAPMAN CREEK	4/25/1994	V	S	U	380S	030W	31	SE
CHAPMAN CREEK	5/5/1994	V	P	I	380S	030W	31	SE
CHAPMAN CREEK	6/14/1994	V	P	F	380S	030W	31	SE
CHAPMAN CREEK	6/22/1994	V	P	F	380S	030W	31	SE
CHAPMAN CREEK	7/12/1994	N		U	380S	030W	31	
CHAPMAN CREEK	8/11/1994	N		U	380S	030W	31	
CHAPMAN CREEK	8/25/1994	V	S	Y	380S	030W	31	SE
CHAPMAN CREEK	4/5/1995	N		U	380S	030W	31	SE
CHAPMAN CREEK	4/10/1995	N		U	380S	030W	31	SE
CHAPMAN CREEK	4/19/1995	N		U	380S	030W	31	SE
CHAPMAN CREEK	5/24/1995	N		U	380S	030W	31	
CHAPMAN CREEK	6/7/1995	N		U	380S	030W	31	
CHAPMAN CREEK	7/12/1995	A	P	U	380S	030W	31	SE
CHAPMAN CREEK	7/13/1995	V	P	Y	380S	030W	31	SE
CHAPMAN CREEK	7/25/1995	N		U	380S	030W	31	
CHAPMAN CREEK	8/2/1995	A	S	U	380S	030W	31	SE
CHAPMAN CREEK	8/3/1995	N		U	380S	030W	31	
CHAPMAN CREEK	8/15/1995	N		U	380S	030W	31	
CHAPMAN CREEK	4/18/1996	N		U	380S	030W	31	
CHAPMAN CREEK	4/23/1996	N		U	380S	030W	31	
CHAPMAN CREEK	5/9/1996	N		U	380S	030W	31	
CHAPMAN CREEK	6/12/1996	N		U	380S	030W	31	
CHAPMAN CREEK	7/31/1996	N		U	380S	030W	31	
CHAPMAN CREEK	8/18/1996	N		U	380S	030W	31	
CHAPMAN CREEK	6/5/1997	N		U	380S	030W	31	
CHAPMAN CREEK	7/17/1997	A	S	U	380S	030W	31	SE
CHAPMAN CREEK	7/18/1997	N		U	380S	030W	31	
CHAPMAN CREEK	7/31/1997	A	S	U	380S	030W	31	SE
CHAPMAN CREEK	8/4/1997	N		U	380S	030W	31	
CHAPMAN CREEK	4/21/1999	N		U	380S	030W	31	
CHAPMAN CREEK	5/13/1999	N		U	380S	030W	31	SE
CHAPMAN CREEK	7/21/1999	N		Y	380S	030W	31	SE
CHAPMAN CREEK	4/19/2000	N		U	380S	030W	31	SE

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
CHAPMAN CREEK	4/26/2000	N		U	380S	030W	31	
CHAPMAN CREEK	7/10/2000	N		U	380S	030W	31	SE
CHAPMAN CREEK	8/14/2000	N		U	380S	030W	31	
CHAPMAN CREEK	8/22/2000	A	S	U	380S	030W	32	SW
CHAPMAN CREEK	8/23/2000	N		U	380S	030W	32	SW
CHAPMAN CREEK	8/30/2000	N		U	380S	030W	32	
CHAPMAN CREEK	4/26/2001	N		U	380S	030W	31	SE
CHAPMAN CREEK	6/20/2001	N		U	380S	030W	31	SE
CHAPMAN CREEK	8/23/2001	N		U	380S	030W	31	SE
CHAPMAN CREEK	4/17/2002	N		U	380S	030W	31	
CHAPMAN CREEK	5/30/2002	N		U	380S	030W	31	
CHAPMAN CREEK	7/22/2002	N		U	380S	030W	31	
CHAPMAN CREEK	7/2/2003	N		U	380S	030W	31	SE
CHAPMAN CREEK	6/15/2006	N			380S	030W	31	
CHAPMAN CREEK	7/5/2007	N			380S	030W	31	
CHAPMAN CREEK	7/26/2007	A	S	U	380S	030W	31	
CHAPMAN CREEK	7/26/2007	A	U	U	380S	030W	31	SE
CHAPMAN CREEK	8/2/2007	A	X	U	380S	030W	31	SE
CHAPMAN CREEK	8/6/2007	A	X	U	380S	030W	31	SE
CHAPMAN CREEK	5/6/2008	N			380S	030W	31	SE
BALD BEN	3/24/1993	A	S	U	400S	030W	31	SE
BALD BEN	4/8/1993	V	S	N	390S	030W	06	NW
BALD BEN	4/22/1993	V	S	N	390S	030W	06	NW
BALD BEN	5/5/1993	N		U	390S	030W	06	
BALD BEN	5/26/1993	V	S	N	390S	030W	06	NW
BALD BEN	6/10/1993	V	S	Y	390S	030W	06	NW
BALD BEN	3/15/1994	V	S	U	390S	030W	06	NW
BALD BEN	4/25/1994	V	P	I	390S	030W	06	NW
BALD BEN	5/5/1994	V	P	I	390S	030W	06	NW
BALD BEN	6/14/1994	V	P	F	390S	030W	06	NW
BALD BEN	6/22/1994	V	P	F	390S	030W	06	NW
BALD BEN	8/11/1994	N		U	390S	030W	06	
BALD BEN	8/16/1994	V	S	Y	390S	030W	06	NW
BALD BEN	8/17/1994	V	P	Y	390S	030W	06	NW
BALD BEN	4/12/1995	N		U	390S	030W	06	NW
BALD BEN	4/19/1995	N		U	390S	030W	06	NW
BALD BEN	5/24/1995	N		U	390S	030W	06	
BALD BEN	6/7/1995	N		U	390S	030W	06	
BALD BEN	7/12/1995	N		U	390S	030W	06	

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
BALD BEN	7/25/1995	N		U	390S	030W	06	
BALD BEN	8/2/1995	N		U	390S	030W	06	
BALD BEN	8/15/1995	V	S	Y	390S	030W	06	NW
BALD BEN	4/18/1996	V	P	I	390S	030W	06	NW
BALD BEN	6/12/1996	V	P	F	390S	030W	06	NW
BALD BEN	7/30/1996	V	P	F	390S	030W	06	NW
BALD BEN	6/10/1997	V	P	Y	390S	030W	06	NW
BALD BEN	6/24/1997	N		U	390S	030W	06	NW
BALD BEN	7/28/1997	V	S	Y	390S	030W	06	NW
BALD BEN	2/9/1998	A	S	U	390S	030W	06	NW
BALD BEN	4/29/1998	V	P	U	390S	030W	06	NW
BALD BEN	5/19/1998	V	P	N	390S	030W	06	NW
BALD BEN	7/21/1998	V	J	F	390S	030W	06	NW
BALD BEN	7/29/1998	V	P	F	390S	030W	06	NW
BALD BEN	8/11/1998	N		U	390S	030W	06	NW
BALD BEN	4/23/1999	V	S	U	380S	030W	06	NW
BALD BEN	7/20/1999	V	P	Y	390S	030W	06	NW
BALD BEN	8/19/1999	V	P	Y	390S	030W	06	NW
BALD BEN	4/19/2000	V	P	I	390S	030W	06	NW
BALD BEN	5/10/2000	V	P	X	390S	030W	06	NW
BALD BEN	6/9/2000	V	P	F	390S	030W	06	NW
BALD BEN	7/27/2000	V	P	F	390S	030W	06	NW
BALD BEN	4/12/2001	V	S	U	390S	030W	06	NW
BALD BEN	5/10/2001	V	S	N	390S	030W	06	NW
BALD BEN	6/4/2001	V	P	Y	390S	030W	06	NW
BALD BEN	6/19/2001	V	P	Y	390S	030W	06	NW
BALD BEN	8/10/2001	V	P	Y	390S	030W	06	NW
BALD BEN	3/25/2002	N		U	390S	030W	06	
BALD BEN	5/30/2002	V	P	U	390S	030W	06	NW
BALD BEN	6/4/2002	A	P	Y	380S	030W	31	SW
BALD BEN	8/19/2002	N		U	390S	030W	06	
BALD BEN	7/2/2003	V	P	F	390S	030W	06	NW
BALD BEN	7/3/2003	V	P	F	390S	030W	06	NW
BALD BEN	7/14/2003	V	S	X	390S	030W	06	NW
BALD BEN	6/15/2006	N			390S	030W	06	
BALD BEN	7/25/2007	N			390S	030W	06	
BALD BEN	8/7/2007	N			390S	030W	06	
BALD BEN	8/20/2007	N			390S	030W	06	
BALD BEN	5/6/2008	N			390S	030W	06	NW

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
BLIND CHAP	7/22/1997	A	S	U	390S	040W	01	SW
BLIND CHAP	7/23/1997	V	S	Y	390S	040W	02	SE
BLIND CHAP	7/29/1997	V	S	Y	390S	040W	02	SE
BLIND CHAP	10/16/1997	A	S	U	390S	040W	01	SW
BLIND CHAP	4/15/1998	V	P	I	390S	040W	01	SW
BLIND CHAP	5/21/1998	N		I	390S	040W	01	SW
BLIND CHAP	6/22/1998	N		Y	390S	040W	01	SW
BLIND CHAP	8/4/1998	N		Y	390S	040W	01	
BLIND CHAP	4/21/1999	A	S	U	390S	040W	12	NW
BLIND CHAP	4/22/1999	V	P	N	390S	040W	12	NW
BLIND CHAP	7/20/1999	A	S	Y	390S	040W	01	SW
BLIND CHAP	7/30/1999	A	S	Y	390S	040W	01	SW
BLIND CHAP	8/4/1999	V	S	Y	390S	040W	02	SE
BLIND CHAP	4/26/2000	V	P	I	390S	040W	12	NW
BLIND CHAP	5/23/2000	V	P	X	390S	040W	12	NW
BLIND CHAP	6/12/2000	V	P	F	390S	040W	12	NW
BLIND CHAP	7/25/2000	V	P	F	390S	040W	12	NW
BLIND CHAP	4/11/2001	V	S	U	390S	040W	01	SW
BLIND CHAP	5/1/2001	V	S	U	390S	040W	02	SE
BLIND CHAP	5/29/2001	N		U	390S	040W	01	
BLIND CHAP	6/19/2001	N		U	390S	040W	01	SW
BLIND CHAP	6/29/2001	N		U	390S	040W	01	SW
BLIND CHAP	7/11/2001	A	P	U	390S	040W	01	SW
BLIND CHAP	7/12/2001	A	P	U	390S	040W	01	SW
BLIND CHAP	8/7/2001	N		U	390S	040W	01	SW
BLIND CHAP	8/10/2001	N		U	390S	040W	01	SW
BLIND CHAP	4/18/2002	V	P	I	390S	040W	01	SW
BLIND CHAP	6/3/2002	V	S	X	390S	040W	01	SW
BLIND CHAP	6/17/2002	V	S	F	390S	040W	01	SW
BLIND CHAP	7/11/2002	V	P	F	390S	040W	01	SW
BLIND CHAP	5/13/2003	N		U	390S	040W	01	SW
LIME GULCH	3/19/1991	N		U	390S	030W	07	NE
LIME GULCH	4/9/1991	A	S	U	390S	030W	08	NW
LIME GULCH	4/16/1991	V	P	U	390S	030W	07	
LIME GULCH	4/23/1991	N		U	390S	030W	07	
LIME GULCH	5/1/1991	V	P	U	390S	030W	07	NE
LIME GULCH	4/6/1992	N			390S	030W	07	
LIME GULCH	4/23/1992	N			390S	030W	08	NW
LIME GULCH	4/27/1992	N			390S	030W	07	

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
LIME GULCH	5/25/1992	A	S	U	390S	030W	07	NE
LIME GULCH	6/11/1992	A	S	U	390S	030W	07	NE
LIME GULCH	6/15/1992	V	S	U	390S	030W	07	NW
LIME GULCH	6/25/1992	V	S	U	390S	030W	07	NE
LIME GULCH	4/6/1993	V	S	U	390S	030W	07	NE
LIME GULCH	4/29/1993	N		U	390S	030W	07	
LIME GULCH	5/1/1993	N		U	390S	030W	07	
LIME GULCH	5/4/1993	N		U	390S	030W	07	
LIME GULCH	6/12/1993	N		U	390S	030W	07	
LIME GULCH	7/5/1993	N		U	390S	030W	07	
LIME GULCH	8/12/1993	N		U	390S	030W	07	
LIME GULCH	8/26/1993	N		U	390S	030W	07	
LIME GULCH	4/12/1994	N		U	390S	030W	07	
LIME GULCH	4/27/1994	N		U	390S	030W	07	
LIME GULCH	6/22/1994	N		U	390S	030W	07	
LIME GULCH	6/30/1994	N		U	390S	030W	07	
LIME GULCH	7/18/1994	N		U	390S	030W	07	
LIME GULCH	8/2/1994	A	S	U	390S	030W	07	NW
LIME GULCH	8/3/1994	N		U	390S	030W	07	
LIME GULCH	8/14/1994	N		U	390S	030W	07	
LIME GULCH	4/3/1995	N		U	370S	030W	07	
LIME GULCH	4/22/1995	N		U	390S	030W	07	
LIME GULCH	6/6/1995	N		U	390S	040W	07	
LIME GULCH	6/7/1995	N		U	390S	030W	07	
LIME GULCH	6/19/1995	N		U	390S	030W	08	
LIME GULCH	7/5/1995	N		U	390S	030W	08	
LIME GULCH	8/8/1995	N		U	390S	030W	08	
LIME GULCH	6/26/1997	N		U	390S	030W	07	NE
LIME GULCH	7/17/1997	A	S	U	390S	030W	07	NE
LIME GULCH	7/29/1997	V	S	Y	390S	030W	07	NE
LIME GULCH	8/25/1997	A	S	U	390S	030W	07	NE
LIME GULCH	9/18/1997	V	P	U	390S	030W	07	NE
LIME GULCH	2/18/1998	A	S	U	390S	030W	07	NE
LIME GULCH	4/10/1998	V	P	I	390S	030W	07	NE
LIME GULCH	5/8/1998	V	P	I	390S	030W	07	NE
LIME GULCH	6/16/1998	N		Y	390S	030W	08	
LIME GULCH	6/22/1998	V	P	F	390S	030W	07	NE
LIME GULCH	6/29/1998	V	P	F	390S	030W	07	NE
LIME GULCH	4/29/1999	V	P	N	390S	030W	07	NE

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
LIME GULCH	4/29/1999	N		U	390S	030W	08	
LIME GULCH	7/8/1999	V	S	Y	390S	030W	07	NE
LIME GULCH	4/25/2000	V	S	U	390S	030W	07	NE
LIME GULCH	5/24/2000	N		U	390S	030W	07	NE
LIME GULCH	5/31/2000	V	S	U	390S	030W	07	NE
LIME GULCH	6/9/2000	V	S	Y	390S	030W	07	
LIME GULCH	7/12/2000	N		U	390S	030W	07	
LIME GULCH	8/23/2000	N		U	390S	030W	07	NE
LIME GULCH	4/4/2001	A	S	U	390S	030W	07	NE
LIME GULCH	4/9/2001	V	S	N	390S	030W	07	NE
LIME GULCH	5/7/2001	V	S	U	390S	030W	07	NE
LIME GULCH	5/21/2001	V	P	X	390S	030W	07	NE
LIME GULCH	6/5/2001	V	P	O	390S	030W	07	NE
LIME GULCH	6/18/2001	V	P	O	390S	030W	07	NE
LIME GULCH	6/27/2001	V	P	F	390S	030W	07	NE
LIME GULCH	7/25/2001	V	P	F	390S	030W	07	NE
LIME GULCH	3/25/2002	N		U	390S	030W	07	
LIME GULCH	4/8/2002	V	S	N	390S	030W	07	NE
LIME GULCH	5/7/2002	N		U	390S	030W	07	
LIME GULCH	5/30/2002	V	S	N	390S	030W	07	NE
LIME GULCH	6/11/2002	N		U	390S	030W	07	NE
LIME GULCH	6/26/2002	N		U	390S	030W	07	NE
LIME GULCH	7/29/2002	N		U	390S	030W	07	NE
LIME GULCH	7/30/2002	N		U	390S	030W	07	NE
LIME GULCH	4/22/2003	N		U	390S	030W	08	NE
LIME GULCH	6/7/2006	N			390S	030W	08	
LIME GULCH	8/10/2006	N			390S	030W	08	
LIME GULCH	7/24/2007	A	S	U	390S	030W	07	NE
LIME GULCH	7/26/2007	N			390S	030W	07	
LIME GULCH	8/7/2007	N			390S	030W	07	
LIME GULCH	8/20/2007	N			390S	030W	08	
KEELER CREEK	3/26/1990	V	P	U	380S	040W	35	SE
KEELER CREEK	4/10/1990	V	P	X	380S	040W	35	SE
KEELER CREEK	5/16/1990	V	P	I	380S	040W	35	SE
KEELER CREEK	6/28/1990	V	P	F	380S	040W	35	SE
KEELER CREEK	7/23/1990	V	P	F	380S	040W	35	SW
KEELER CREEK	7/25/1990	V	P	U	380S	040W	35	SW
KEELER CREEK	8/3/1990	N		U	380S	040W	35	
KEELER CREEK	8/9/1990	N		U	380S	040W	35	

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
KEELER CREEK	3/19/1991	N		U	380S	040W	35	
KEELER CREEK	3/28/1991	A	S	U	380S	040W	35	
KEELER CREEK	3/29/1991	N		U	380S	040W	35	
KEELER CREEK	4/4/1991	A	S	U	380S	040W	35	SW
KEELER CREEK	4/8/1991	V	P	I	380S	040W	35	SW
KEELER CREEK	4/11/1991	A	S	U	380S	040W	35	SW
KEELER CREEK	5/2/1991	V	P	U	380S	040W	35	SW
KEELER CREEK	5/7/1991	N		U	380S	040W	35	
KEELER CREEK	5/30/1991	N		U	380S	040W	35	
KEELER CREEK	7/24/1991	N		U	380S	040W	35	
KEELER CREEK	3/23/1992	A	S	U	380S	040W	35	SW
KEELER CREEK	3/26/1992	V	S	N	380S	040W	35	SE
KEELER CREEK	5/12/1992	N		U	380S	040W	35	
KEELER CREEK	6/2/1992	A	U	U	380S	040W	03	NE
KEELER CREEK	7/10/1992	N		U	380S	040W	35	
KEELER CREEK	7/14/1992	V	S	U	380S	040W	35	SE
KEELER CREEK	7/30/1992	N		U	380S	040W	35	
KEELER CREEK	3/29/1993	A	S	U	380S	040W	35	SW
KEELER CREEK	4/7/1993	V	S	U	380S	040W	35	SE
KEELER CREEK	4/14/1993	V	S	N	380S	040W	35	SE
KEELER CREEK	4/22/1993	N		U	380S	040W	35	
KEELER CREEK	4/22/1993	A	S	U	380S	040W	34	SE
KEELER CREEK	4/26/1993	N		U	380S	040W	35	SW
KEELER CREEK	5/4/1993	V	S	N	380S	040W	35	SW
KEELER CREEK	6/10/1993	V	S	Y	380S	040W	35	SE
KEELER CREEK	8/17/1993	A	S	U	390S	040W	02	NW
KEELER CREEK	8/31/1993	N		U	380S	040W	35	
KEELER CREEK	3/15/1994	A	S	U	390S	040W	02	NW
KEELER CREEK	4/25/1994	N		U	390S	040W	02	
KEELER CREEK	5/5/1994	N		U	380S	040W	35	SE
KEELER CREEK	6/8/1994	N		U	380S	040W	35	SW
KEELER CREEK	6/29/1994	A	S	U	390S	040W	02	SW
KEELER CREEK	6/30/1994	V	S	F	390S	040W	02	SW
KEELER CREEK	7/12/1994	V	P	F	390S	040W	02	SW
KEELER CREEK	8/17/1994	V	S	F	390S	040W	02	SW
KEELER CREEK	4/19/1995	N		U	380S	040W	35	SW
KEELER CREEK	5/19/1995	V	P	N	390S	040W	02	SW
KEELER CREEK	5/22/1995	V	S	U	390S	040W	02	SW
KEELER CREEK	5/24/1995	N		U	380S	040W	35	

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
KEELER CREEK	7/27/1995	V	P	Y	390S	040W	02	SW
KEELER CREEK	4/18/1996	A	S	U	390S	040W	02	
KEELER CREEK	4/23/1996	V	P	I	390S	040W	02	NW
KEELER CREEK	6/12/1996	V	P	F	390S	040W	02	NW
KEELER CREEK	7/30/1996	V	P	F	390S	040W	02	NW
KEELER CREEK	6/9/1997	V	P	F	390S	040W	02	SW
KEELER CREEK	7/15/1997	V	P	F	390S	040W	02	SW
KEELER CREEK	4/14/1998	V	S	U	390S	040W	02	SW
KEELER CREEK	5/5/1998	N		U	390S	040W	02	
KEELER CREEK	4/21/1999	A	S	U	390S	040W	02	NW
KEELER CREEK	4/21/1999	N		U	380S	040W	35	
KEELER CREEK	4/23/1999	V	S	U	390S	040W	02	NW
KEELER CREEK	7/19/1999	N		Y	390S	040W	02	
KEELER CREEK	8/4/1999	N		Y	380S	040W	35	
KEELER CREEK	4/26/2000	N		U	380S	040W	35	SW
KEELER CREEK	4/26/2000	N		U	380S	040W	02	SW
KEELER CREEK	4/26/2000	N		U	380S	040W	35	SE
KEELER CREEK	5/17/2000	N		U	380S	040W	02	
KEELER CREEK	5/17/2000	N		U	380S	040W	35	SE
KEELER CREEK	5/17/2000	N		U	380S	040W	35	SW
KEELER CREEK	5/24/2000	N		U	380S	040W	02	
KEELER CREEK	5/24/2000	N		U	380S	040W	35	SE
KEELER CREEK	5/24/2000	A	S	U	380S	040W	35	SW
KEELER CREEK	5/25/2000	N		U	380S	040W	35	SW
KEELER CREEK	6/6/2000	N		U	380S	040W	35	
KEELER CREEK	6/6/2000	N		U	380S	040W	02	SW
KEELER CREEK	6/6/2000	A	S	U	380S	040W	02	NW
KEELER CREEK	7/11/2000	N		U	380S	040W	35	SE
KEELER CREEK	7/11/2000	N		U	380S	040W	02	SW
KEELER CREEK	7/11/2000	N		U	380S	040W	35	SW
KEELER CREEK	8/22/2000	N		U	380S	040W	02	SW
KEELER CREEK	8/22/2000	N		U	380S	040W	35	SW
KEELER CREEK	8/22/2000	N		U	380S	040W	35	SE
KEELER CREEK	4/23/2001	N		U	380S	040W	35	SW
KEELER CREEK	4/23/2001	N		U	380S	040W	35	SE
KEELER CREEK	4/23/2001	N		U	380S	040W	02	SW
KEELER CREEK	6/20/2001	N		U	380S	040W	35	
KEELER CREEK	6/20/2001	N		U	380S	040W	02	
KEELER CREEK	6/29/2001	N		U	380S	040W	35	

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
KEELER CREEK	6/29/2001	N		U	380S	040W	02	
KEELER CREEK	7/11/2001	N		U	380S	040W	02	
KEELER CREEK	7/11/2001	N		U	380S	040W	35	
KEELER CREEK	4/18/2002	N		U	380S	040W	35	SE
KEELER CREEK	4/18/2002	N		U	380S	040W	35	SW
KEELER CREEK	4/18/2002	N		U	380S	040W	02	SW
KEELER CREEK	5/12/2002	N		U	380S	040W	02	
KEELER CREEK	5/12/2002	N		U	380S	040W	35	
KEELER CREEK	5/12/2002	N		U	380S	040W	35	XX
KEELER CREEK	5/30/2002	N		U	380S	040W	35	SE
KEELER CREEK	5/30/2002	N		U	380S	040W	35	SW
KEELER CREEK	6/3/2002	N		U	380S	040W	02	SW
KEELER CREEK	6/15/2006	N			380S	040W	35	
KEELER CREEK	7/25/2007	N			380S	040W	02	
KEELER CREEK	7/25/2007	A	S	U	380S	040W	35	
KEELER CREEK	7/26/2007	N			380S	040W	35	
KEELER CREEK	7/30/2007	N			380S	040W	35	
KEELER CREEK	8/6/2007	N			380S	040W	35	
KEELER CREEK	8/7/2007	N			380S	040W	02	
KEELER CREEK	8/20/2007	N			380S	040W	35	
MAID OF THE MIST	6/25/1992	A	S	U	380S	040W	34	NW
MAID OF THE MIST	7/29/1992	A	S	U	390S	040W	03	NW
MAID OF THE MIST	7/30/1992	N		U	390S	040W	03	NW
MAID OF THE MIST	4/6/1993	N		U	390S	040W	03	
MAID OF THE MIST	4/20/1993	N		U	390S	040W	03	
MAID OF THE MIST	6/24/1993	N		U	380S	040W	34	
MAID OF THE MIST	8/12/1993	N		U	380S	040W	34	
MAID OF THE MIST	8/24/1993	N		U	380S	040W	34	
MAID OF THE MIST	8/26/1993	N		U	380S	040W	34	
MAID OF THE MIST	4/17/1996	N		U	390S	040W	03	
MAID OF THE MIST	5/2/1996	N		U	390S	040W	03	
MAID OF THE MIST	7/24/1996	N		U	390S	040W	03	
MAID OF THE MIST	8/1/1996	N		U	390S	040W	03	
MAID OF THE MIST	8/7/1996	N		U	390S	040W	03	
MAID OF THE MIST	8/14/1996	N		U	390S	040W	03	
MAID OF THE MIST	6/5/1997	N		U	390S	040W	03	
MAID OF THE MIST	6/19/1997	N		U	390S	040W	03	NW
MAID OF THE MIST	7/16/1997	N		U	390S	040W	03	
MAID OF THE MIST	4/16/1998	N		U	390S	040W	03	NW

Location Name	Visit Date	Response Type	Pair Status	Nest Status	Visit Township	Visit Range	Visit Section	Visit Quarter Sec
MAID OF THE MIST	4/30/1998	N		U	390S	040W	03	NW
MAID OF THE MIST	7/9/1998	N		U	390S	040W	03	NW
MAID OF THE MIST	4/20/1999	N		U	390S	040W	03	
MAID OF THE MIST	4/28/1999	N		U	390S	040W	03	NW
MAID OF THE MIST	5/5/1999	N		U	390S	040W	03	NW
MAID OF THE MIST	6/3/1999	N		U	390S	040W	03	NW
MAID OF THE MIST	8/4/1999	N		Y	390S	040W	03	NW
MAID OF THE MIST	8/11/1999	N		U	390S	040W	03	
MAID OF THE MIST	4/11/2000	N		U	390S	040W	03	NW
MAID OF THE MIST	4/26/2000	N		U	390S	040W	03	NW
MAID OF THE MIST	6/6/2000	N		U	390S	040W	03	
MAID OF THE MIST	6/13/2000	N		U	390S	040W	03	NW
MAID OF THE MIST	7/11/2000	N		U	390S	040W	03	
MAID OF THE MIST	8/17/2000	N		U	390S	040W	03	NW
MAID OF THE MIST	3/27/2001	N		U	390S	040W	03	NW
MAID OF THE MIST	5/8/2001	N		U	390S	040W	03	NW
MAID OF THE MIST	7/16/2001	N		U	390S	040W	03	NW
MAID OF THE MIST	4/18/2002	N		U	390S	040W	03	
MAID OF THE MIST	5/12/2002	N		U	390S	040W	03	
MAID OF THE MIST	5/28/2002	N		U	390S	040W	03	
MAID OF THE MIST	6/4/2002	N		U	390S	040W	03	
MAID OF THE MIST	7/8/2002	N		U	390S	040W	03	
MAID OF THE MIST	7/11/2002	N		U	390S	040W	03	
MAID OF THE MIST	5/20/2003	N		U	390S	040W	03	NW
MAID OF THE MIST	7/12/2006	N			390S	040W	03	
MAID OF THE MIST	8/23/2006	N			390S	040W	03	
MAID OF THE MIST	7/25/2007	N			390S	040W	03	
MAID OF THE MIST	8/7/2007	N			390S	040W	03	
MAID OF THE MIST	8/15/2007	N			390S	040W	03	

APPENDIX E: FIGURES

APPENDIX F – TABLE OF EFFECTS TO NSO SITES

Figure 1. Action Area, including the Pilot Joe Project Location and Land Ownership Patterns

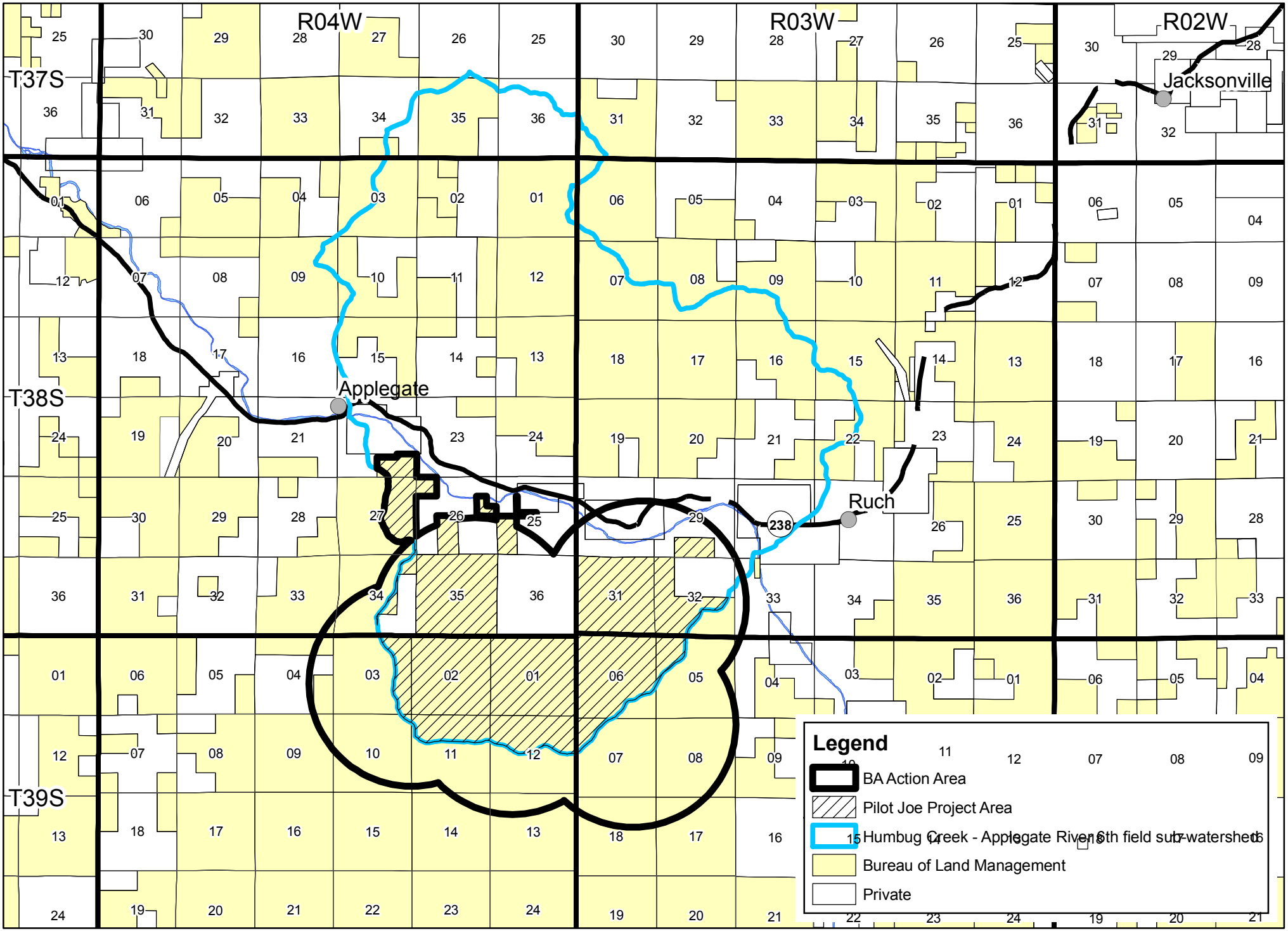
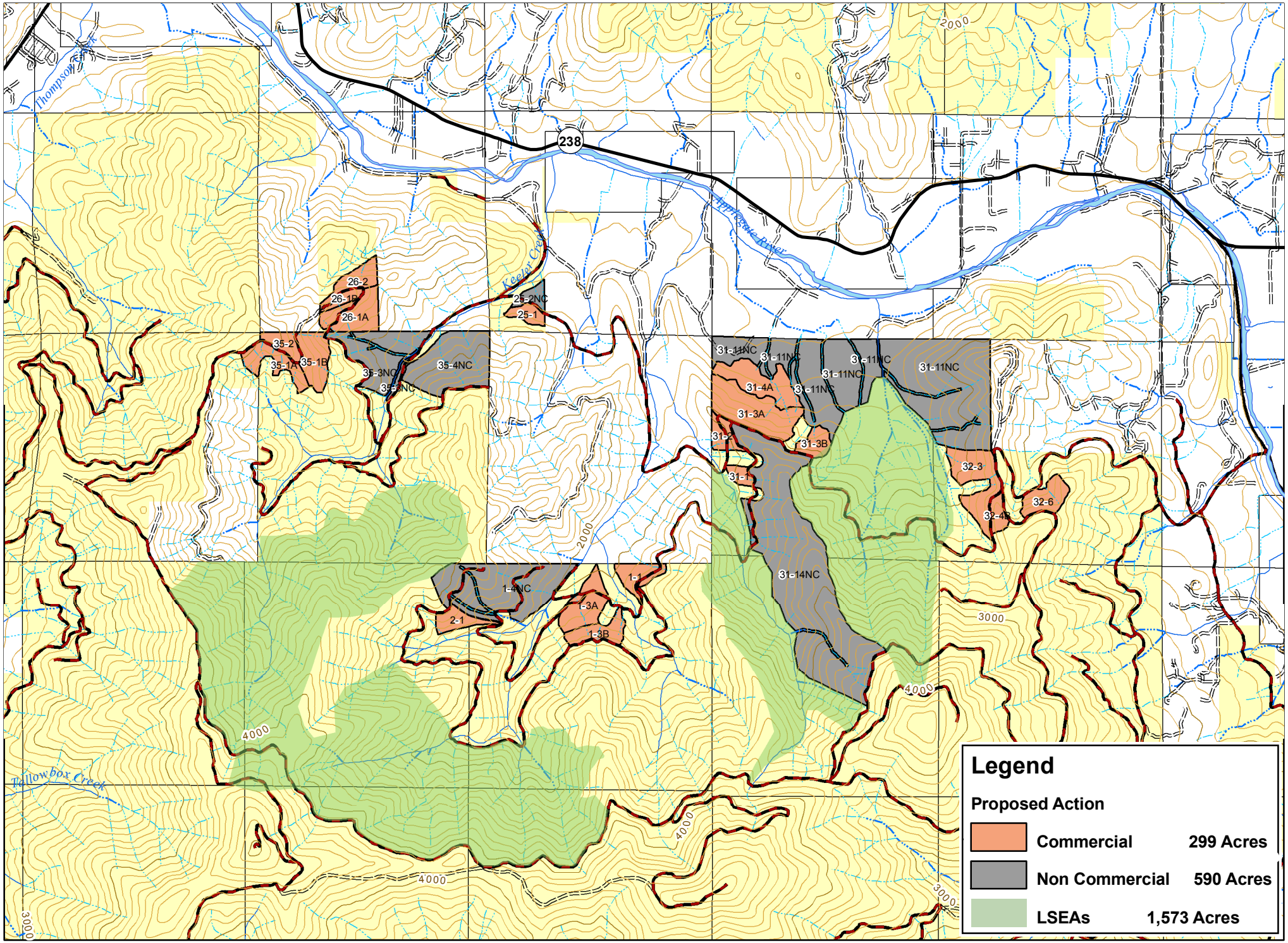


Figure 2. Location of the Proposed Commercial & Non-commercial treatments, and Late-Successional Emphasis Areas



Legend

Proposed Action

	Commercial	**299 Acres**
	Non Commercial	**590 Acres**
	LSEAs	**1,573 Acres**

Figure 3. NSO Habitat Typing Using the McKelvey Rating System within the Action Area

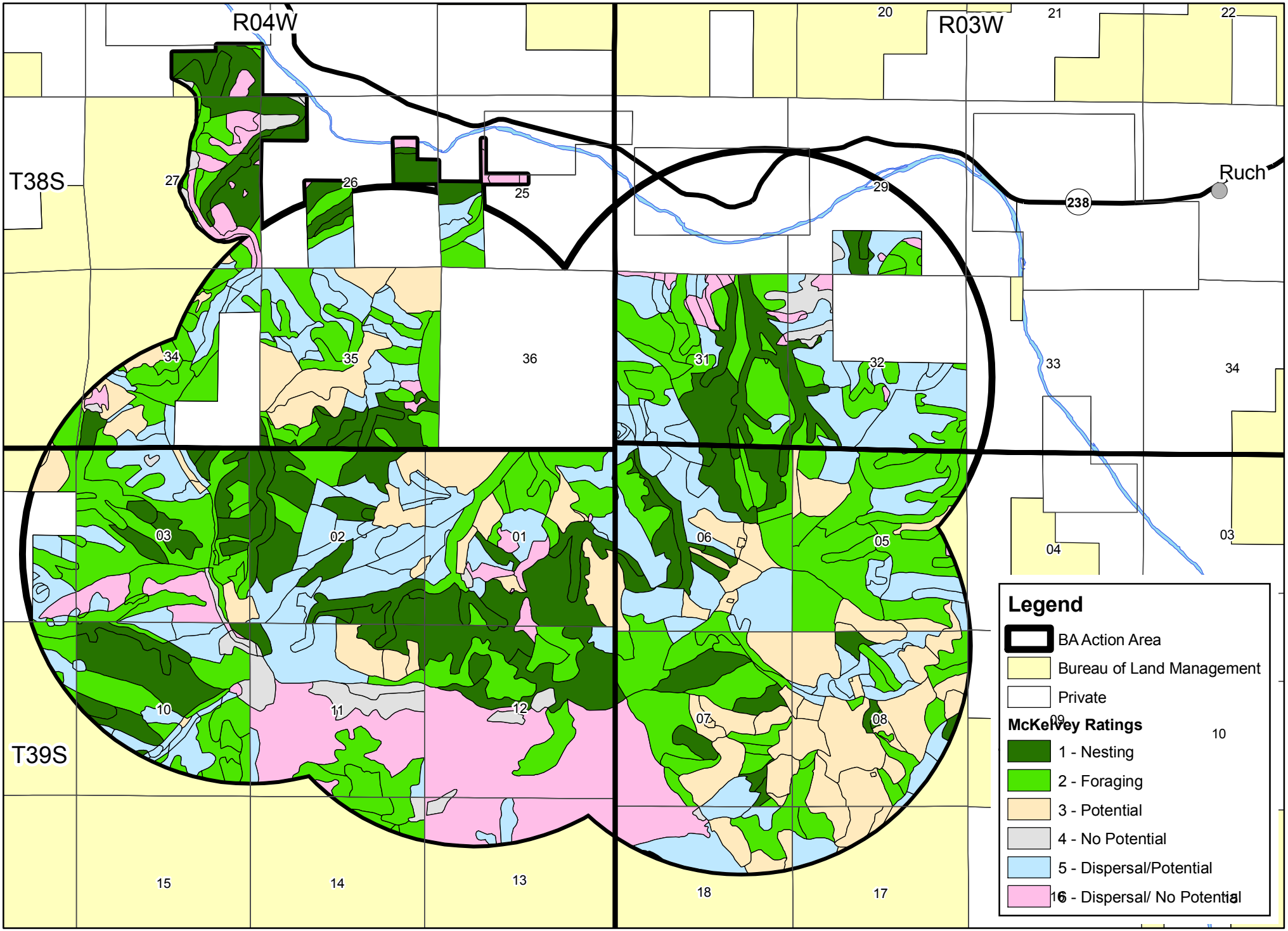


Figure 4. Simplified NSO Habitat for all Lands within the Action Area

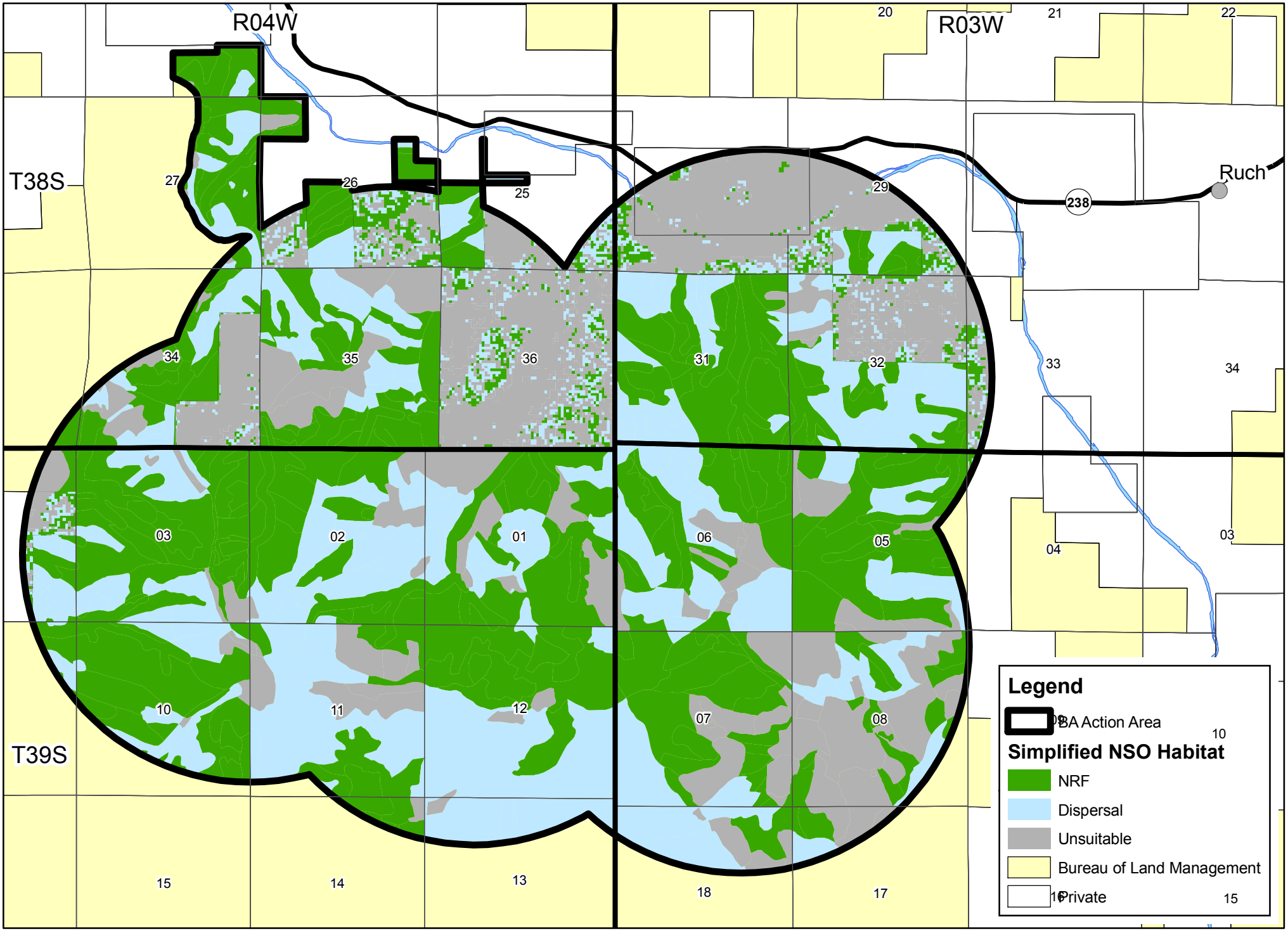


Figure 5. Survey Detection History for the NSO Sites Within The Action Area

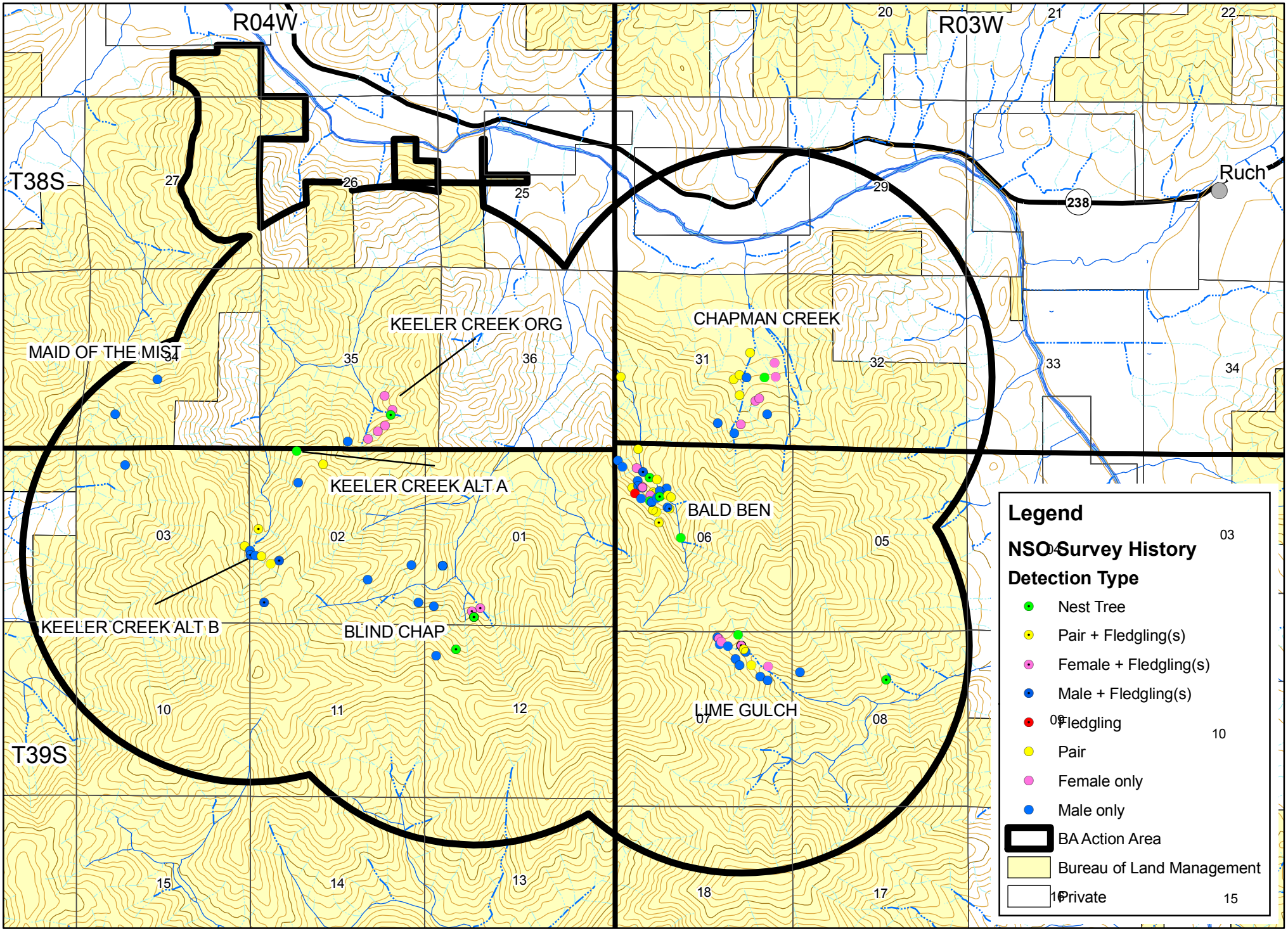
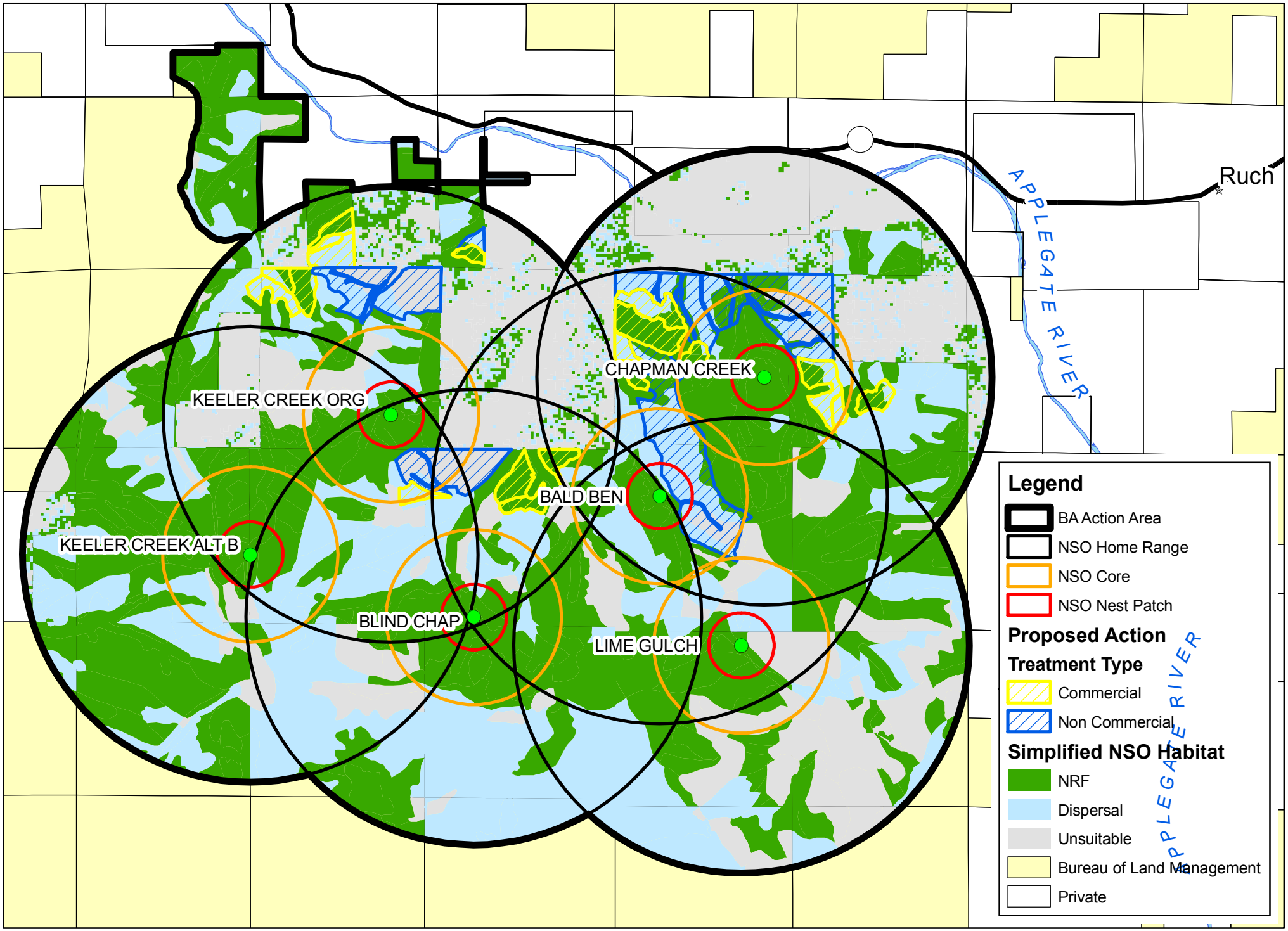


Figure 6. The Home Range, Core, and Nest Patch Areas for the NSO Sites Within the Action Area



Appendix F - Table of NRF habitat changes at 3 spatial scales within the NSO Sites Present in the Action Area.

Site Name	Home Range				Core				Nest Patch			
CHAPMAN CREEK	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF
	1369 (40%)	93	121	1276 (38%)	374 (75%)	19	42	355 (71%)	70 (100%)	0	0	70 (100%)
Site Name	Home Range				Core				Nest Patch			
BALD BEN	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF
	1823 (54%)	126	104	1697 (50%)	234 (47%)	0	18	234 (47%)	46 (66%)	0	1	46 (66%)
Site Name	Home Range				Core				Nest Patch			
BLIND CHAP	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF
	1508 (44%)	49	0	1459 (43%)	372 (74%)	0	0	372 (74%)	67 (95%)	0	0	67 (95%)
Site Name	Home Range				Core				Nest Patch			
LIME GULCH	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF
	1590 (47%)	0	19	1590 (47%)	221 (44%)	0	0	221 (44%)	43 (61%)	0	0	43 (61%)
Site Name	Home Range				Core				Nest Patch			
KEELER CREEK ORG	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF
	1372 (40%)	89	1	1283 (38%)	244 (49%)	0	0	244 (49%)	56 (80%)	0	0	56 (80%)
Site Name	Home Range				Core				Nest Patch			
KEELER CREEK ALT B	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF	Current NRF	Acres of Downgrade	Acres of T & M	Post Treatment NRF
	1699 (50%)	0	0	1699 (50%)	323 (64%)	0	0	323 (64%)	69 (99%)	0	0	69 (99%)