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Subject: Evaluation of oak restoration possibilities within APN: 210-072-009

Introduction

This report presents the results of an evaluation of oak woodland habitat located at APN: 210-072-009 conducted by Timberland Resource Consultants. The intent of this report is to discuss the ecological values of the oak woodland habitat prior to tree removal, and to provide recommendations to restore habitat where it exists. Ultimately, the proposed restoration activities are meant to mitigate the loss of oak woodland habitat associated with a post-2016 tree removal related to cannabis cultivation.

The scope of the investigation included an analysis of a variety of aerial images, site reconnaissance, and the preparation of this report presenting observations and conclusions. The investigation was conducted in general conformance with the scope outlined in the Humboldt County Planning and Building Department, Cannabis Division's March, 2020 letter "RE: Permit Application No. 12468." As such, the study focused on determining the ecological values associated with the site, identifying areas to promote oak woodland habitat, evaluating management activities, and developing a restoration plan to mitigate the lost resources.

Timberland Resource Consultants visited the plan area on March 13, 2020. The investigation focused on identifying existing oak woodland and evaluating the potential to either augment existing habitat, or to restore encroached oak woodland where feasible at a 10:1 ratio of the cleared area. Prior to the site visit, a review of available imagery identified areas potentially occupied by true oak species. In the field, these areas and others were reviewed and further evaluated to determine appropriate management strategies to mitigate the effects of the tree removal activities.

Site Description

The property located at APN: 210-072-009 is 270 acres and found in portions of Section 25, Township 1 North, Range 4 East, Humboldt Base and Meridian of the U.S. Geological Survey Larabee Valley 7.5-minute quadrangle. The site spans a foothill ridge extending to the valley floor of Larabee Valley. The site is east of Larabee Buttes, approximately 1.5 miles upstream from the Little Van Duzen River.

The site has a mix of vegetation cover types including grasslands, California black oak and Oregon white oak woodlands with varying degrees of conifer encroachment, mixed hardwood/Douglas-fir stands, and young and mature timber stands dominated by Douglas-fir. The majority of the property supports Douglas-fir stands with varying degrees of hardwoods, mainly consisting of true oak species. Decadent oak trees were observed within the timber stands throughout the ownership, suggesting historically these areas were oak woodlands. A review of aerial imagery from 1947, 1968, 1972, and 1998 also indicates the presence of oak woodland in these areas. No logging activity is known to have occurred on the property. Available soil maps indicate these areas to be underlain by soils of the Pasturerock-Coyoterock-Maneze complex, and also by the Highyork-Elkcamp-Airstrip complex (USDA NRCS, 2019).

Ecological Setting

Oak woodlands have ecological, economic and cultural significance. They provide food and cover for a wide range of wildlife species, and provide important ecosystem services including air purification, water conservation, and soil retention functions. They also play an important role in maintaining livestock grazing habitat, and hold important cultural values among many tribes of the North Coast. Their significance is further emphasized by the growing spread of sudden oak death (SOD) in California and Oregon forests. In these regions, tanoak acorns are the primary food source for many forms of wildlife, however, as the spread of SOD effects tanoak stands the greatest, acorns from true oak species (Oregon white oak and California black oak) become increasingly more important as a substitute food source for sustaining wildlife populations (Green & Magnuson, 2011).

As described above, the subject property is located in eastern Humboldt County adjacent to Larabee Valley in the Van Duzen River drainage. This part of Humboldt County features broad grassy hillsides interspersed between true oak woodlands, surrounded by large blocks of conifer forests. Historically these vegetation types would have been maintained by the regular occurrence of fire, however since the adoption of an aggressive fire suppression policy, Douglas-fir has become a major competitor of many oak woodlands. A variety of aerial imagery indicates this successional change as oak woodlands transition into conifer stands here and in many parts of northern California. Encroachment is widely accepted to be the greatest threat to oak woodlands.

Considering the nature of ecological succession, it is inevitable that the vegetation types within and adjacent to the project area will be subject to change sometime in the future. Forest succession is gradual, and occurs in stages by which one plant community replaces another following disturbance or the lack thereof. Consequently, there is the potential that any management activities aimed at restoring the true oak component may only be successful at postponing this transition. However, it is the opinion of the RPF that the true oak woodlands within the subject property are currently healthy and stable enough that restoration activities to remove the conifers would yield successful results and should occur.

Forest Stand Conditions

Field observations during the site visit, in combination with reviewing available imagery, identified approximately 204 acres of timberland consisting of Douglas-fir intermixed with hardwoods; 17 acres of oak woodland with various stages of encroachment; and 49 acres of natural grasslands, rocky outcrops and cultivation areas.

Oak Woodlands

Within the true oak forest type, these areas vary in age and structure and range from 100-225ft² of basal area from true oaks per acre. These areas exhibit a mix of stand structural characteristics ranging between young dense, clustered multi-stemmed trees, and mature open-grown stand types. Oregon white oak occupies the majority of true oak stems per acre; however, California black oak is the principal oak species in areas where conifer encroachment is the most advanced. In general, oaks appear relatively healthy in the oak woodland stand type. While some mortality is certainly occurring, the majority of oaks display good form with full live crowns and minimal branch die-off. Douglas-fir is the principal competitor within these areas, accompanied by manzanita, ponderosa pine, and Pacific madrone in parts of the property. The understory consists mainly of annual and perennial grasses, and very dense regeneration of Douglas-fir ranging from 600-1,000 stems per acre.

As stated previously, the degree to which these areas are being encroached varies greatly. Whereas some of the property contain only minimal amounts of encroachment in the form of seedlings and sapling-sized conifers, others contain mature Douglas-fir trees in the dominant and codominant canopy positions. Of the 17 acres of oak woodland proposed for restoration, three management types were qualitatively stratified as follows: Encroachment Stages 1, 2, and 3.

Encroachment Stage 1

These areas consist of a dominant overstory of true oak species. The understory consists of a young cohort of very dense Douglas-fir regeneration, generally 5-25 feet tall. Little if any overtopping is occurring and most if not all of the Douglas-fir is sub-merchantable. If no action is taken, these stands will inevitably transition into conifer stands as soon as 20 years.

Encroachment Stage 2

These areas consist of an overstory made up of pre-dominant and dominant oak trees and younger sapling to pole sized Douglas-fir which currently range from co-dominant to dominant in the canopy layer. The understory is generally dense with young Douglas-fir regeneration. Oak trees within this type are beginning to show 'funnel' shaped crowns as Douglas-fir trees shade out the lower canopy.

Encroachment Stage 3

These areas consist of an overstory made up of pre-dominant oak trees and younger pole to small timber sized Douglas-fir trees in the dominant crown position. The average conifer diameter is approximately 15 inches at breast height, and basal area ranges from 75-250 ft² per acre. Sapling sized Douglas-fir trees occupy the intermediate crown positions, and the understory is generally sparse.

Conservation Practices

As described in the Timberland Conversion Evaluation, tree removal activities within APN: 210-072-009 occurred in two areas and in total summates to 1.82 acres. Timber harvesting that occurred in the Eastern Area consisted of the removal of 1.18 acres of an even-aged group of Douglas-fir trees with a minor component of oak trees. Mitigations for the Eastern Area shall follow the "Restocking Plan for APN 210-072-009" (Timberland Resource Consultants, 2020). Tree removal in the Western Area and around the pond site summates to 0.64 acres of oak woodland habitat loss.

The harvested oak trees are expected to resprout via coppicing, however, it is the opinion of the RPF that restoration efforts will protect the existing oak woodlands considerably. As such, after evaluating the current stand conditions, stand successional stages, and surrounding environmental characteristics, the enhancement of encroached oak woodland at a 10:1 ratio of the cleared acreage is recommended. This is chosen as it meets the objectives of mitigating tree removal and oak woodland habitat loss, and appears to be the most feasible option in doing so. As such, the target acreage for restored oak woodland shall be a minimum of 6.4 acres. See Project Maps.

As described in the stand conditions section, there are several stages of encroachment occurring. The following Conservation Practices will be used to meet the objectives of oak restoration in three phases. The operations presented herein were developed following the general practice requirements from the Deciduous Oak Woodland Restoration, Forest Stand Improvement plan (USDA NRCS, 2015). As mentioned previously, approximately 17 acres of restorable oak woodland exist within the property. It is the intent of the landowner to treat these areas as soon as environmentally and economically feasible, prioritizing first the minimum 6.4 acres.

Restoration Plan

Phase 1 - (Immediate)

- Remove Douglas-fir regeneration via hand crew (chain saws). Cut all Douglas-fir trees up to 12" DBH. Removal target is 80% or more of Douglas-fir stems. The cut needs to be made as low as possible on the stem, below the lowest live branch. Trees that are too difficult to fell safely can be girdled.
- Retain all living deciduous oaks and all snags greater than 10 inches in diameter. Avoid damage to retained trees; fall removed trees away from oaks to the extent feasible.
- Girdle (or cut) all Douglas-fir trees 12" DBH and greater. Girdles must completely go around the tree and should consist of two parallel horizontal bands through the bark and cambium several inches apart. After the grooves have been made, the bark and cambium should be peeled away. Merchantable trees may be left for future commercial harvests.
- Afterward, hand pile slash into manageable piles for burning. Piles must not be underneath the crowns, or directly adjacent to other trees.

Phase 2 - (2-10 years following Phase 1)

- Re-evaluate treated areas to determine if thinning oaks is appropriate. The goal of the thinning is to capture mortality and improve growing conditions. The target oak density will be site specific based on the crown size of individual trees. The objective is to not have interlocking crowns outside of multiple stem trees. This will lead to a spacing on average of 40-60 stems per acre. These stands should be marked by a forester prior to thinning.
- Remove remaining young encroaching Douglas-fir, and treat slash, following the criteria in Phase 1.

Phase 3 - (Indefinitely following Phase 2)

- Monitor treated stands periodically for further encroachment. Encroachment is anticipated to continue, however, following Phase 1 and 2 treatments it will be minimal and easily controlled.
- Identify the need for oak regeneration. California black oak and Oregon white oak are both capable of resprouting from dormant buds following disturbance, however the conditions to promote natural regeneration are not well understood. It may be desirable to artificially plant in some areas.
- Pursue alternative means of understory management including mowing, tilling, or prescribed fire.

It should be noted that prior to burning slash piles created from the restoration activities applicable burn permits must be obtained from the local CalFire or Air Quality Management District offices.

Pond

In 2019, Mother Earth Engineering advised the landowner a pond liner should be installed to ensure the stability of the pond. The installment required only minimal grading of the area immediately adjacent to the pond in order to secure the underlayment and pond liner. Additionally, five oak trees were felled that were overhanging the pond. Pursuant to the 14CCR § 1100 (g) this does not constitute timberland conversion. As of March 13, 2020 the felled trees had resprouted via coppicing. As such, no additional mitigations are recommended.

Conclusions

The intent of this investigation is to assess the proposal to restore oak woodland habitat within the subject property and, where appropriate, to provide management recommendations in order to mitigate any adverse ecological effects associated with conversion activities. This study focused on identifying restorable oak woodlands and evaluating options to achieve the objective of restoration and enhancement. Ultimately, the proposed restoration activities are meant to mitigate the loss of oak woodland habitat associated with a post-2016 conversion related to cannabis cultivation.

The activities described in this report were developed in general conformance with accepted oak restoration treatment practices and are prescribed to meet the specific conditions of the project area. After evaluating alternatives, the RPF supports oak woodland enhancement within APN: 210-072-009 and recommends treatment of no less than 6.4 acres of oak woodland with the potential to restore an additional 10.6 acres of habitat. Treatments are recommended to occur no later than March 19, 2021.

Certification

Following the completion of operations, no later than March 19, 2021, the RPF, or supervised designee, must examine the area to evaluate compliance with the practices outlined in this report. This inspection shall be used to certify no less than 6.4 acres were successfully treated. After the inspection, a letter including pictures of the project area shall be sent to the Humboldt County Planning Department Cannabis Division describing the results of the restoration activities and the project's status in conformance.

Appendix A

References

California Department of Forestry and Fire Protection. 2020. Forest Practice Rules.

Green, Shayne & Magnuson, Lindsay. 2011. Oak Woodlands of Humboldt County, A Report on Their Use, Distribution, Diversity, Ownership, and Conservation. Northcoast Regional Land Trust.

U.S. Department of Agriculture, Natural Resource Conservation Service, California. Practice Requirements, Forest Stand Improvement, Deciduous Oak Woodland Restoration. September 14, 2015.

U.S. Department of Agriculture, Natural Resource Conservation Service. Web Soil Survey, March, 2020. www.websoilsurvey.sc.egov.usda.gov

Appendix B

Maps and Photographs

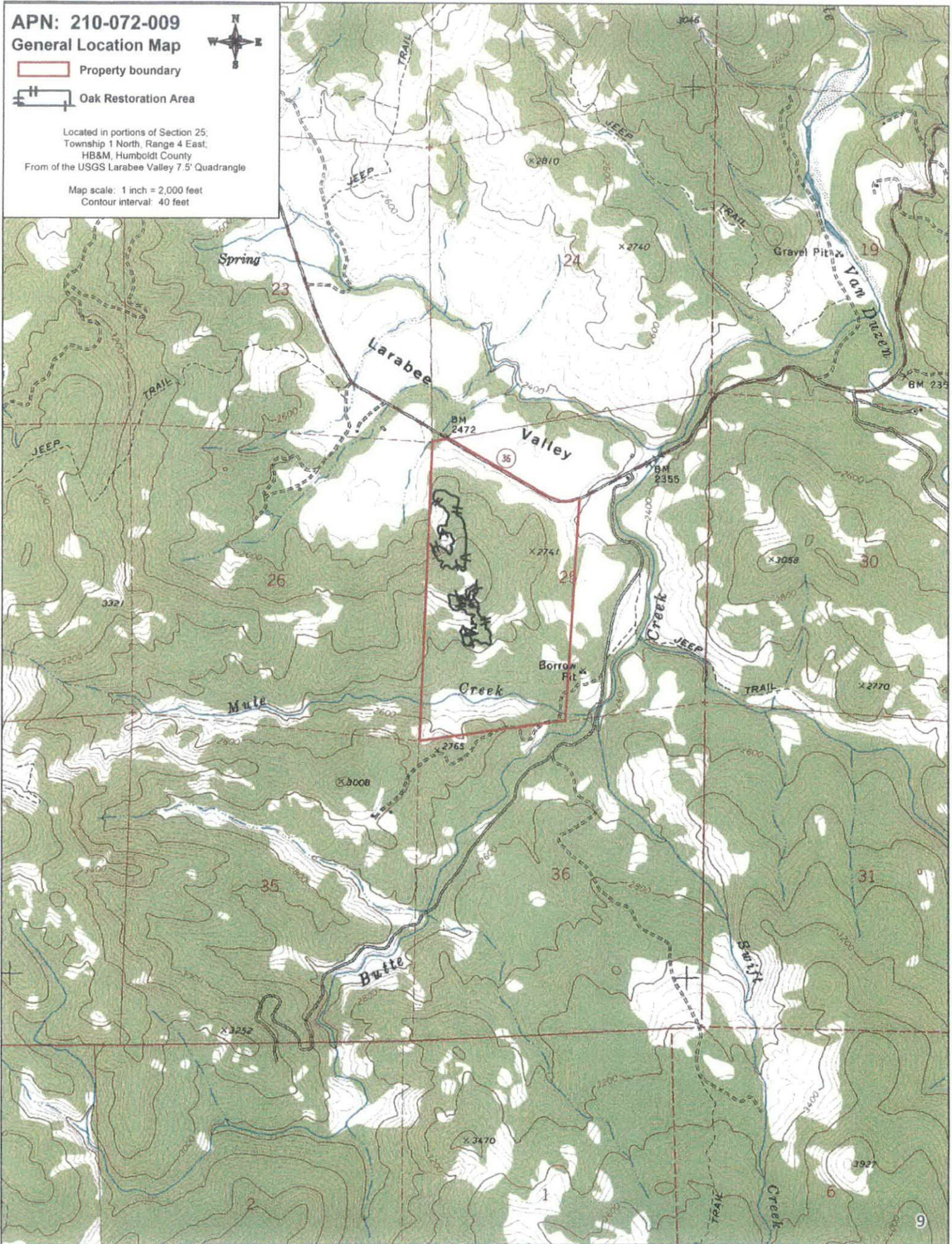
APN: 210-072-009
General Location Map



- Property boundary
- Oak Restoration Area

Located in portions of Section 25;
Township 1 North, Range 4 East,
HB&M, Humboldt County
From of the USGS Larabee Valley 7.5' Quadrangle

Map scale: 1 inch = 2,000 feet
Contour interval: 40 feet



APN: 210-072-009


Project Map



 Property boundary

 Oak Restoration Area [17 acres]

 Grasslands

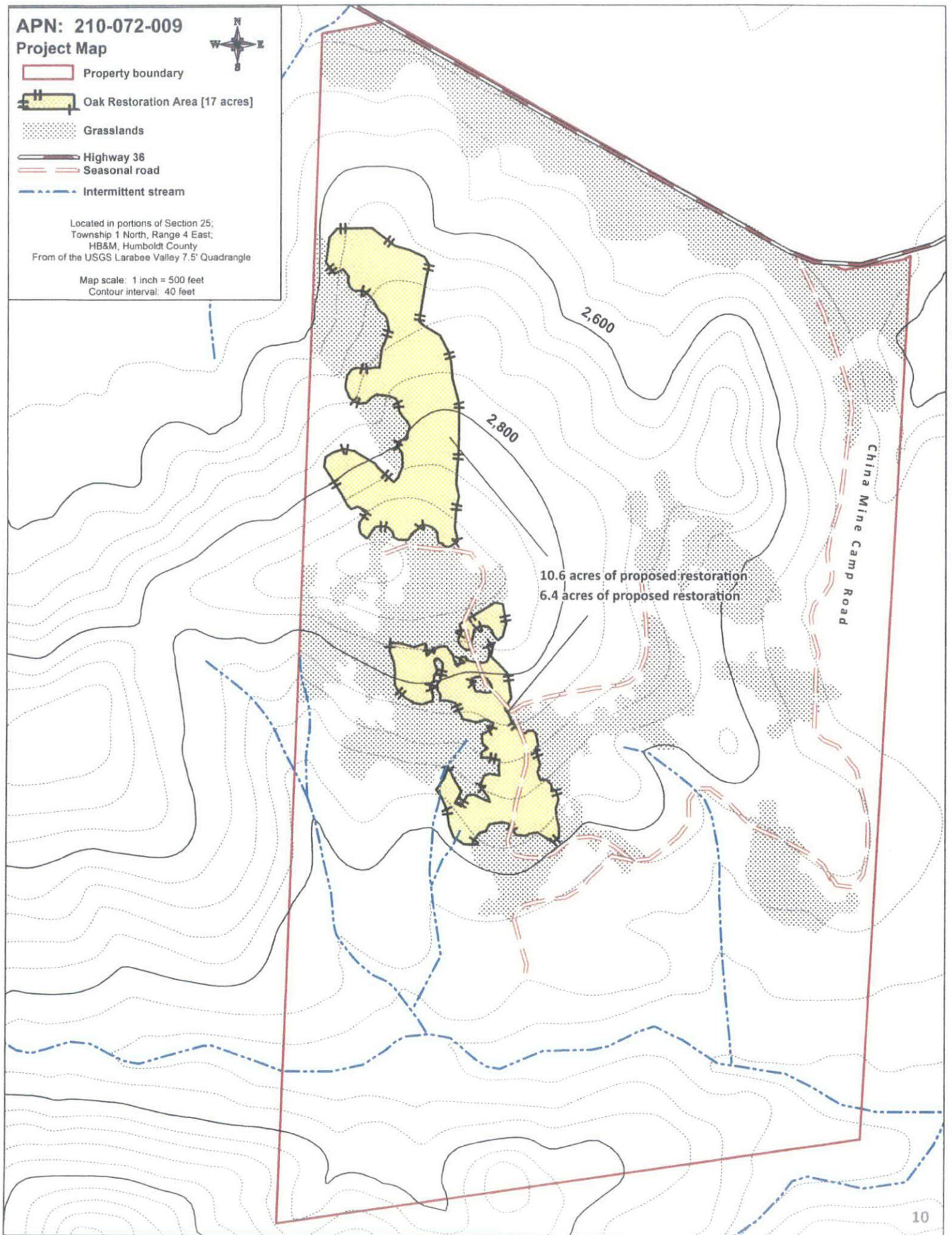
 Highway 36

 Seasonal road

 Intermittent stream

Located in portions of Section 25;
Township 1 North, Range 4 East;
HB&M, Humboldt County
From of the USGS Larabee Valley 7.5' Quadrangle

Map scale: 1 inch = 500 feet
Contour interval: 40 feet



10.6 acres of proposed restoration
6.4 acres of proposed restoration

APN: 210-072-009
Project Map DOQ

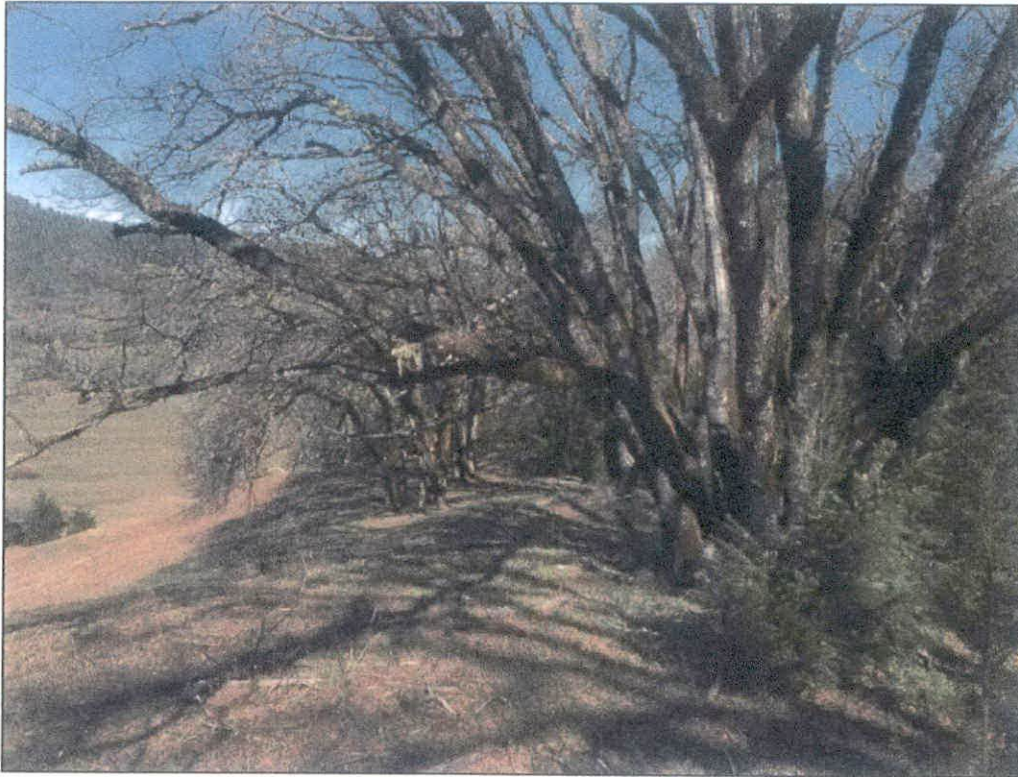


-  Property boundary
-  Oak Restoration Area [17 acres]
-  Grasslands
-  Highway 36
-  Seasonal road
-  Intermittent stream

Located in portions of Section 25,
Township 1 North, Range 4 East;
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From of the USGS Larabee Valley 7.5' Quadrangle

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Oregon white oak and California black oak woodland with encroaching Douglas-fir trees. Above & below





Above Example of oak woodland Encroachment Stage 1. Below Encroachment Stage 2.





Example of oak woodland Encroachment Stage 3. Above & below

