

Starr-Heredia Restoration Remediation and Restocking Plan

Humboldt County APN 216-271-13

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Introduction

This document provides the Restoration Remediation and Restocking Plan required as a condition of the Humboldt County grading permit pursued by Candace Starr for Humboldt County APN 216-271-013, in the town of Alderpoint. The Plan concerns remediating the effects of illegal native oak tree removal conducted on this parcel for the benefit of *Cannabis* cultivation sometime between 2014 and 2016.

Project Goals

This Plan will provide guidelines for the establishment of native oak trees over a total of 7,000 square feet on the parcel.

Project Schedule

This project will include four main steps:

1. Acorn Collection: late summer and early fall of 2020.
2. Acorn Planting: within 1 week of collection, fall 2020.
3. Initial Monitoring and Maintenance: winter/early spring 2020/2021.
4. 3-year Monitoring, Reporting and Maintenance period: fall of 2021- fall of 2024

Restoration Remediation and Restocking Plan

On June 13, 2018, NRM conducted a site visit to choose a suitable location for oak tree establishment and assess the feasibility of utilizing acorns collected from on-site. On-site acorn (seed) collection and propagation is the best way to protect the genetic resources of California's oak woodlands (McCreary 2009). Direct seeding these acorns is the best way to promote healthy root formation in young oak trees and prevent the transmission of soil borne pathogens via the importation of nursery stock (McCreary 2009). During the site visit, adequate acorn source trees were found, and suitable restocking sites were identified.

Restocking Sites

Oak tree establishment will occur on two adjacent sites in the north-central portion of the parcel. Both sites have suitable exposure, slopes and soils for oak establishment, as well as proximity to irrigation infrastructure. Figure 1 shows the location of each restocking site. See Site Photos section below, Photos 1-4

Site 1

The first site is located on an east-facing slope above a storage/processing facility and below a cultivation greenhouse. This site is approximately 25 feet by 75 feet creating a total of 1,875 square feet and has an approximately 15 percent slope. See Figure 1.

Site 2

The second site is on an east-facing slope between the two uppermost cultivation greenhouses on the property, stretching between the north property line and approximately 100 feet south along the slope between the greenhouses. This area is irregularly shaped, but is approximately 100 feet long, 50 feet wide at the southern end and 80 feet long at the north end creating a total of approximately 5,500 square feet. The slope is approximately 28 percent. See Figure 1.

Acorn Source Trees

Three oak species are abundant on the parcel, including two deciduous oaks, Oregon white oak (*Quercus garryana*) and California black oak (*Quercus kelloggii*), and one evergreen species, interior live oak (*Quercus wislizeni*). It is likely that an additional evergreen species, canyon live oak (*Quercus chrysolepis*) is also

present in the dense oak woodland on the eastern part of the property. All mature healthy individuals of these trees are appropriate sources for acorn collection.

Acorn Collection and Handling

Acorns will be gathered in the late summer to early fall when they break easily from their attachment point of the source tree. Acorns should be harvested directly from the tree if possible, or very soon after they have dropped to the ground. All acorns must be inspected for insect or other damage and then checked for viability via the float test. **Acorns must NOT be allowed to dry out once collected** and should be stored carefully in refrigeration or moist medium in the interim between collection and planting. Please refer to *Regenerating Rangeland Oaks in California* (McCreary 2009) for specific instructions on collecting, sorting and handling acorns.

Planting Site Preparation

Before planting begins, the site will be thoroughly weeded of all non-native vegetation. Emphasis shall be placed on removing perennial invasive species such as fennel (*Foeniculum vulgare*) and Himalayan blackberry (*Rubus armeniacus*). For each individual planting site, a micro-terrace approximately 3 feet in diameter should be constructed, creating a small level area referred to hereafter as a planting basin. The soil within this planting basin should be loosened to a depth of approximately 1 foot. **Do NOT fertilize the soil.**

Materials Preparation

Each planting basin will require two cylindrical cages, an inner and an outer. The inner cage must be made of “chicken wire” or similar material and be approximately two feet tall and 1.5 feet in diameter. The outer cage can be of any material of sufficient strength to deter deer, should be at least 3 feet in diameter and 3 feet tall, and should have strong stakes.

Acorn Planting Instructions

First, bury the inner cage to a depth of 1/2 foot in the center of each planting basin. Then irrigate the planting basin so that the soil is saturated to a depth of at least 2 feet. Five acorns should then be planted within the inner cage, at a depth of between 1 and 2 inches. The inner cage should then either be folded or wired shut at the top, to protect the acorns from being excavated and eaten by rodents or birds. Then install the outer cage and stake it in. A thin mulch of leaf duff collected on-site or weed free straw can be used around the inner cage. Please refer to *Regenerating Rangeland Oaks in California* (McCreary 2009) for specific instructions on planting acorns.

Initial Monitoring and Maintenance

The acorns should be monitored every other week after planting. If there are dry spells long enough to dry out the top several inches of soil, each planting basin should be irrigated. Once the acorns have begun to sprout and leaf out, the inner cage should be opened at the top to give the seedlings room to grow. By May of the spring following planting, the strongest, healthiest individual seedling growing within each planting basin should be identified, and the other individuals should be thinned by snipping off at ground level. Continue irrigating deeply once a month throughout the dry season of the first year. **Do not fertilize.** Hand weed around the plantings as necessary. Please refer to *Regenerating Rangeland Oaks in California* (McCreary 2009) for specific instructions on post-planting maintenance.

Planting Design

Site 1

A total of 10 planting basins will be constructed within site 1, requiring a total of 50 acorns. The basins should be evenly distributed throughout the area. Numbers of each species will vary according to what can be collected.

4 basins should be planted from white oak acorns (20 acorns).

3 basins should be planted with black oak acorns (15 acorns).

3 basins should be planted with live oak acorns (15 acorns).

Site 2

A total of 20 planting basins will be constructed throughout site 2, requiring a total of 100 acorns.

8 basins should be planted from white oak acorns (40 acorns).

8 basins should be planted with black oak acorns (40 acorns).

4 basins should be planted with live oak acorns (20 acorns).

Acorn production variability may influence the actual numbers available for each species, but total numbers should be maintained.

3-year Monitoring, Reporting and Maintenance period

A 3-year monitoring, reporting and maintenance period shall follow planting and the initial monitoring and maintenance. A final maintenance event will occur upon the completion of the 3rd monitoring year.

Maintenance

During each summer (May-August) for the 3 years following planting, each planting basin should be irrigated deeply once a month. This irrigation should be sufficient to wet soil within the basin down to a depth of two feet. Irrigation should **not occur** more frequently than recommended, as deep, infrequent watering encourages better root formation than frequent shallow watering. Weeds should be managed within the restocking sites regularly throughout this period. Caging must be inspected for effectiveness in preventing herbivory, and that it is not impeding tree growth or development. Adaptive management must be implemented to address additional caging needs. Maintenance may include re-planting if survivorship does not meet the Success Criteria in any of the three monitoring years.

Monitoring

In the fall (September-October) of the 3 years following planting, each of the 28 trees will be assessed for survival and growth. The number of surviving trees will be recorded, and this number will be used to assess percent survivorship of the plantings. Notes will be made about issues such as herbivory, disease, or any other factors influencing survivorship. Photos of the sites will be taken.

Reporting

An annual monitoring report will be submitted to Humboldt County by October 31 of each monitoring year. This report will include photos, planting survival status, a description of site conditions, discussion of any needed maintenance or other labor, and whether Success Criteria were met in that year. If survival is not high enough not meet the Success Criteria described below, arrangements will be made for re-planting. Adaptive management should be utilized to meet any unforeseen problems preventing the Success Criteria from being met by year 3

Success Criteria

By the fall of each monitoring year and by the end of monitoring year 3, there should be at least 70% survival of plantings, and less than 5% absolute cover of invasive plant species within the site. 70 percent survival at this site means 20 out of 28 trees are surviving.

Final Maintenance

At the end of monitoring year 3, the inner cages within each planting basin should be snipped open vertically down their length to soil level on four sides. Care must be taken **not to disturb the sapling roots** in the process. The cut lengths should be folded down away from the trunk. The basin should then be weeded, mulched, and the outer cages replaced and securely staked.

Site Photos



Photo 1. Site 1, looking south.



Photo 2. Site 2, looking south.



Photo 3. Site 2, Looking north



Photo 4. Site 2, looking west.



Figure 1. Restocking Site Location Map.

References

McCreary, Douglas D. 2009. Regenerating Rangeland oaks in California. University of California Agriculture and Natural Resources Publication 21601e. Oakland, CA.

(available online at http://ucanr.edu/sites/oak_range/files/59453.pdf)