

Technical Memorandum

Date: December 11, 2012

To: Mr. Dan Efseaff
City of Chico
Department of Parks and Natural Resources
965 Fir Street
Chico, CA 95928

From: Mr. Scott Gregory, Biologist
North State Resources, Inc.
500 Orient Street, Suite 150
Chico, CA 95928

Subject: 2012 Peregrine Point Disc Golf Course Oak Tree Assessment and Monitoring Report (NSR Project No. 51425)

I. INTRODUCTION

On behalf of the City of Chico (City) and Outdoor Recreation Advocacy, Inc. (ORAI), North State Resources, Inc. (NSR) conducted an arborist survey of the Peregrine Point Disc Golf Course, hereinafter referred to as the “study area”. This memorandum summarizes the findings of the 2012 arborist survey which is the second year of assessment and monitoring for three populations of native oak trees (*Quercus* spp.) in the study area.

II. PROJECT LOCATION

The study area is approximately 70 acres in size, and is located on the west side of State Highway 32 in Butte County, California. The study area is located in the eastern portion of Upper Bidwell Park on the south rim of the ridge overlooking Big Chico Creek at an elevation range of 1,050 to 1,300 feet above mean sea level.

III. PHYSICAL AND BIOLOGICAL SETTING

The study area is sited upon volcanic mudflow breccia that is part of the Tuscan Formation, with thin soils that are low in organic matter. The study area is frequently

used by disc golf enthusiasts, hikers, and cyclists. Footpaths and trails, eroded soils, trampled plants, and impacted trees are some examples of disturbances at the study area that reflect its current and historic use.

Vegetation within the study area is a mix of blue oak (*Quercus douglasii*) savannah with sparse, scattered tree cover and blue oak/foothill woodland with foothill pine (*Pinus sabiniana*) and interior live oak (*Quercus wislizenii*), interspersed with understory shrubs and vines, annual grasses and forbs, and exposed volcanic mudflow.

IV. SURVEY METHODOLOGY

Oak trees within the study area were surveyed on foot by Scott Gregory, International Society of Arboriculture (ISA) Certified Arborist WE-9041A on November 7, 2012.

Data Collection

Year 2 oak tree data were collected using a Trimble GeoXH GPS field computer using a data dictionary developed jointly by the City of Chico and Scott Gregory in 2011 prior to the Year 1 oak assessment field work. The boundaries of the study area and the location of the surveyed trees are illustrated on the map provided in Attachment A.

Each surveyed oak was measured and assessed for diameter at breast height (DBH), height class, tree condition class, proportion of the tree exhibiting impact marks, number of areas on the tree exhibiting deep wounding of the bark to the cork cambium depth, proportion of the canopy exhibiting dead wood, total number of broken branches in the canopy, tree species, growth form, and width of tree crown along the north-south bearing. Where surveyed oaks had multiple dominant stems originating below breast height, DBH was measured for each stem. All other attributes were assessed for the entire tree rather than stem-wise to maintain consistency with the 2011 project protocol.

Priority 1 Oaks

Oaks located in an area of influence of disc golf activity with a high potential for impacts by discs were identified by City of Chico Department of Parks and Natural Resources in 2011 as Priority 1 oaks. Priority 1 oaks were located in the field using existing Geographic Information Systems (GIS) coordinate data provided by the City of Chico. Identification number tags from Priority 1 oaks that fell off or were removed since initial tag installation during the initial oak assessment in 2011 were replaced near basal level where they would be less conspicuous.

Transect Oaks

Oak trees within each of the four interrupted belt transect quadrants (01-001, 1-002, 01-003, 01-004) established in 2011 between the course entrance and the Hole 5 tee box

were surveyed and assessed using the same parameters described above for Priority 1 oaks.

Reference Oaks

A random sample of oaks within outer bounds of the disc golf course, but outside the field of play of individual fairway boundaries, was designated by City of Chico Department of Parks and Natural Resources in 2011 as a reference population for monitoring and comparison to Priority 1 and Transect oak data. Reference oaks were surveyed and assessed using the same parameters described above for Priority 1 and Transect oaks.

V. RESULTS

Priority 1 Oaks

The population of Priority 1 oaks consists of 32 blue oaks and one interior live oak, with a total of 39 stems. These trees were re-visited and assessed during the 2012 monitoring survey. Summary 2012 Priority 1 oak data are presented in Tables 1–7 in Attachment B.

Transect Oaks

The population of Transect oaks consists of nine trees with a total of 10 stems. The first tree associated with each transect segment represents the starting point of that respective segment. Summary 2012 Transect oak data are presented in Tables 1–7 in Attachment B.

Reference Oaks

The population of Reference oaks consists of 35 trees, of which 32 are blue oaks and three are interior live oaks, with a total of 52 stems. Summary 2012 Reference oak data are presented in Tables 1–7 in Attachment B.

VI. DISCUSSION

This report presents results from the second annual assessment of 77 oak trees (101 stems) within the bounds of the study area. Three established populations of survey trees (Priority 1, Reference, and Transect oaks) will continue to be evaluated annually to monitor the possible effects of disc golf activities on oak trees in the study area.

Multiple dominant stems on a tree originating below breast height were treated as separate trees in calculating diameter (DBH) summary data. Summary data for all other attributes were assessed for the entire tree rather than stem-wise.

A calculation discrepancy was discovered in the 2011 data set, making direct comparison to 2012 data difficult. 2011 summary data appears to have been calculated based on an incorrect number of trees and/or stems. Despite the discrepancy, a rough comparison of

2011 and 2012 data indicates a direct increase in the number of impacted tree quadrants among Priority 1 trees. Re-calculation of 2011 data is required in order to make an accurate comparison to data collected in 2012.

Future surveys are required in order to gain a better long-term understanding of how recreational use of the Peregrine Point Disc Golf Course impacts the oak trees in the study area.

Thank you for providing NSR with the opportunity to assist the City of Chico with monitoring of its native oak trees in the Peregrine Point Disc Golf Course. If you have any questions or require additional information, please contact NSR Biologist Scott Gregory by telephone at (530) 345-4552 ext. 209, or by e-mail at gregory@nsrnet.com.

Sincerely,



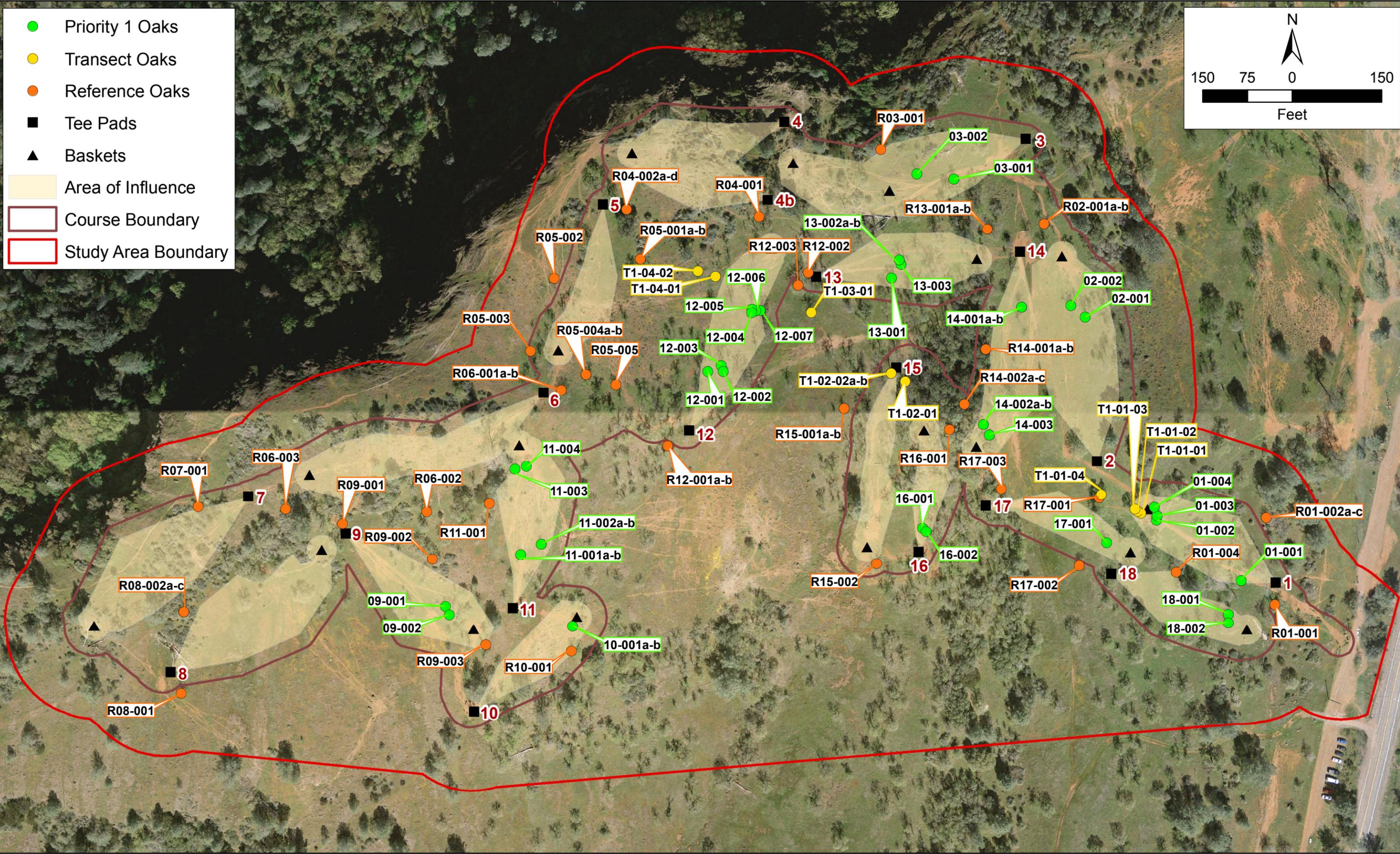
Scott Gregory, Biologist
Certified Arborist #WE-9041A, International Society of Arboriculture

Appendices: Attachment A: Tree Locations Map
 Attachment B: Summary Data

cc: Denice Britton, Urban Forest Manager, City of Chico
 Lise Smith-Peters, Park Services Coordinator, City of Chico

ATTACHMENT A

Locations of Surveyed Oak Trees Map



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ATTACHMENT B

Data Summary

Table 1 - Percent Composition of Diameter Classes

DBH (inches)	Percent of Priority 1 Population (%)	Percent of Reference Population (%)	Percent of Transect Population (%)
0-6	7.7	9.6	10.0
6-12	66.7	63.5	50.0
12-18	12.8	15.4	20.0
18-24	7.7	9.6	10.0
24-30	2.6	1.9	10.0
>30	2.6	0.0	0.0

Table 2 - Percent Composition of Height Classes

Height (feet)	Percent of Priority 1 Population (%)	Percent of Reference Population (%)	Percent of Transect Population (%)
0-5	0.0	0.0	0.0
6-10	0.0	2.9	0.0
11-15	15.2	25.7	11.1
>15	84.8	71.4	88.9

Table 3 - Percent Composition of Condition Classes

Condition	Percent of Priority 1 Population (%)	Percent of Reference Population (%)	Percent of Transect Population (%)
Excellent	0.0	0.0	0.0
Good	24.2	11.4	0.0
Fair	42.4	60.0	66.7
Poor	33.3	28.6	33.3
Dead	0.0	0.0	0.0

Table 4 - Percent Composition of Trunk Impacts Classes

Percent Trunk Impacted	Percent of Priority 1 Population (%)	Percent of Reference Population (%)	Percent of Transect Population (%)
0	0.0	62.9	66.7
1-25	18.2	22.9	33.3
26-50	30.3	11.4	0.0
51-75	36.4	2.9	0.0
>75	15.2	0.0	0.0

Table 5 - Percent Composition of Dead Canopy Classes

Percent Dead Canopy	Percent of Priority 1 Population (%)	Percent of Reference Population (%)	Percent of Transect Population (%)
0	0.0	2.9	0.0
1-25	90.9	77.1	77.8
26-50	6.1	17.1	11.1
51-75	0.0	2.9	11.1
>75	3.0	0.0	0.0

Table 6 - Percent Composition of Broken Branch Count

Number of Broken Branches	Percent of Priority 1 Population (%)	Percent of Reference Population (%)	Percent of Transect Population (%)
0	3.0	25.7	11.1
1	9.1	5.7	22.2
2	15.2	14.3	11.1
3	9.1	11.4	44.4
4	6.1	11.4	11.1
5	21.2	11.4	0.0
6	0.0	2.9	0.0
7	12.1	0.0	0.0
8	21.2	2.9	0.0
9	3.0	2.9	0.0
≥10	0.0	11.4	0.0

Table 7 - Percent Composition of Damaged Bark Patch Count

Number of Damaged Bark Patches	Percent of Priority 1 Population (%)	Percent of Reference Population (%)	Percent of Transect Population (%)
0	45.5	82.9	66.7
1	45.5	11.4	0.0
2	6.1	0.0	11.1
3	0.0	0.0	11.1
4	0.0	0.0	11.1
5	0.0	2.9	0.0
6	0.0	2.9	0.0
7	0.0	0.0	0.0
8	0.0	0.0	0.0
9	0.0	0.0	0.0
≥10	0.0	0.0	0.0