Native Tree and Biological GIS Mapping Inventory: Phases II & III

Prepared for

City of Atascadero
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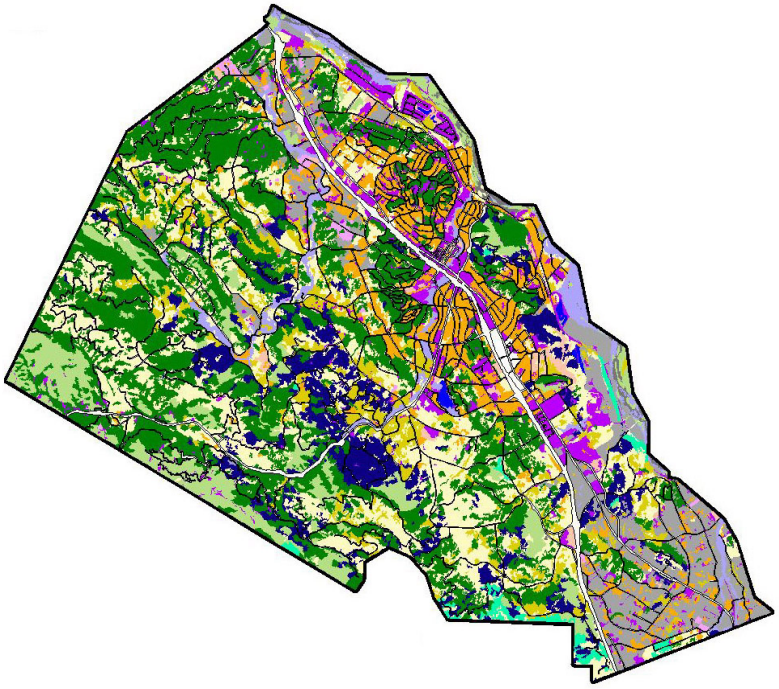

by:

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1. Introduction

In order to maintain the quality of life so valued in the community, planners need tools that will help them protect native woodland species, heritage trees, ecological diversity and high value habitat. At the same time the City of Atascadero must allow for growth, changes in land use, and legal construction on thousands of undeveloped parcels. Thoroughout the 3 phases of this project the goal has been to develop the technical methods and informational resources that would help to protecting to protect Atascadero's irreplaceable native forests and woodlands.

In late 2004, after more than 2 years of discussion, the City contracted with East-West Forestry Associates to proceed with a "Phase I" pilot project with goals to complete the vegetation and riparian corridor mapping on two square miles within the City of Atascadero, and to develop a forest and biological resources inventory methodology that would adequately describe the areas and composition of native landscapes[1].

Upon the completion of Phase I in late 2005, the City embarked upon Phase II. The plan of the Phase II project was to digitize and then to classify vegetation type polygons for the entire City and Colony using the same aerial image and the methodologies developed during Phase I. Polygons were created using Ecognition software and attributed using manual methods. A woodland and forest type map was prepared that is compatible with the City's GIS system. The final map, shown in thumbnail on the cover of this report, delineates and classifies 6959 polygons using the Wildlife Habitat Relations (WHR) used by the California Department of Fish and Game and compatible with the CALVEG vegetation classification system used by the US Forest Service. The GIS coverage was delivered to the City of Atascadero in April 2006. In order to assure quality the process included several days of ground surveys while polygons were being attributed, and an accuracy assessment described later in this report.

Phase III of the project was a tree inventory. One hundred twenty temporary cluster tree survey plots (163 fixed plots in all) were installed both by volunteers and by East-West Forestry staff during spring and autumn 2006. In addition to providing ground-based tree data to populate and describe the mapped polygons, the inventory was used for the accuracy assessment. Ground cover, understory vegetation data, and digital photography were collected to substantiate a biological resources inventory.

[1]. See the Phase I report (Gaman, 2005).

The summary inventory analyses of the WHR type groups are provided later in this report. They include acres by type, numbers of trees (per acre and overall) by species and by size classes by WHR group, assessment of tree condition and defect, and analyses of tree regeneration, understory vegetation and ground cover. The inventory summaries also include maps, graphics and some narrative. Photography of all plots is also being provided on a CD.

The final elements of the project are to identify key habitat, to compare Atascadero forest resources with surrounding woodland types, and to make recommendations for protection and management of critical habitat.

This document is a final report for the project. Its contents provide the basic approach for vegetation mapping and a forest/woodland inventory for the City and the Colony. By reference it includes the Phase I report (Gaman, 2005), a final PowerPoint show with maps, charts and graphics, the GIS vegetation shape files which were developed for the project, the inventory data for the sample plots, and the reference document describing the inventory methodology.

2. Methods

a. Vegetation mapping

Methods are fully described in the Phase I report. Therefore a summary discussion only is provided here.

An autumn 2002 aerial image and relevant GIS data were provided by the City of Atascadero. During December 2005 East-West Forestry used the image processing and artificial intelligence capabilities of the commercial software package “Ecognition” (Definiens 2004) to delineate vegetation types shown on the aerial image. East-West Forestry staff visited Atascadero in January 2006 to review a sample of the Ecognition vegetation type polygons. During the following 2 months Jeffrey Firman of our staff reviewed every one of the 6900 polygons and assigned to each appropriate WHR, stand density, and size class labels. Very often two (or more) WHR labels were suitable. In such cases two labels, “WHR1” and “WHR2” were assigned. These labels can be found embedded within the GIS map database provided as a part of this project.

Valid WHR codes FOR THIS PROJECT are as follows. Non WHR polygon definitions (but applicable to the urban setting of Atascadero) are marked with an asterisk(*).

BOP Blue Oak Pine
BOW Blue Oak Woodland

COW Coastal Oak Woodland
MHC Mixed Hardwood/Conifer
MHW Montane Hardwood
VOW Valley Oak Woodland
VRI Foothill Riparian

SHR Shrub (includes chaparral)
AGR* Agriculture
AGS Annual Grass
BAR Barren
CRP Crop
LAC Lake
LWN* Irrigated lawn

OVN Orchard or vineyard
PAS Pasture
PGS Perennial Grass
RD Road
TUR* Urban (mostly exotic) Tree Species
URB Urban hardscape

VALID SIZE CODES

Atascadero native forest and woodland vegetation polygons were, where applicable, classified by size class as indicated below:

Size Class	Description
1	Seedling
2	Sapling
3	Pole
4	Large Trees
5	Very Large Trees
6	2 or more size classes (not used)

VALID CANOPY DENSITY CODES

S Sparse 10-25% cover
P Poor 25-39% cover
M Medium 40-60% cover
D Dense > 60% cover.

b. Woodland Inventory.

Homeowners and landowners were for the most part very generous in allowing us access to the trees in their gardens, and back yards. Approximately 120

sample plot locations were selected in a variety of the vegetated WHR polygons. Tree and groundcover data were collected at 163 sample locations (some of the sample plot locations had more than a single inventory plot). The fact that there are dozens of permutations of the WHR type/size/density combinations made a comprehensive inventory untenable. Therefore we aggregated the diverse WHR types in Atascadero into 11 WHR Type Groups as shown in Table 1 below:

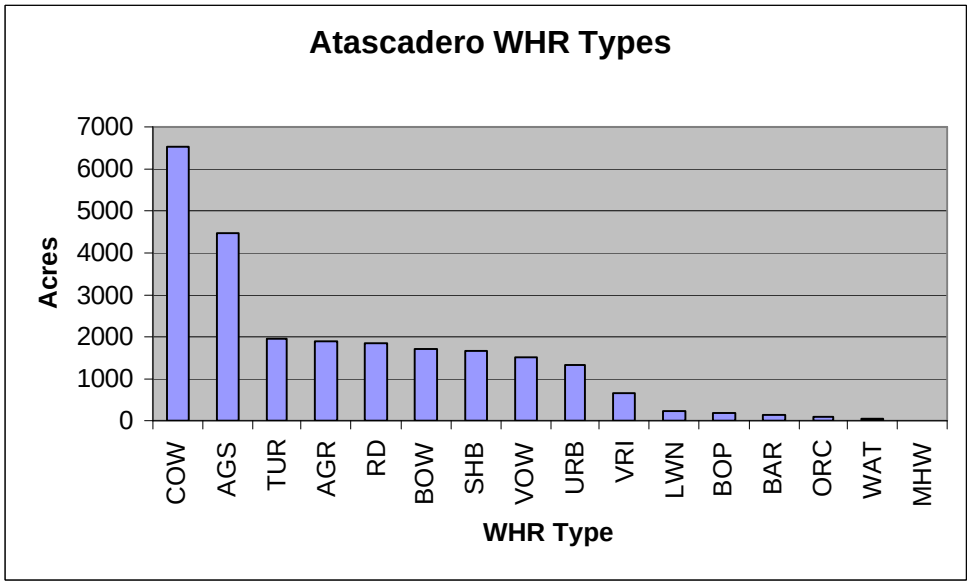
TABLE 1 WHR Type Groups and acreages as consolidated for Inventory Summaries*

Consolidated	Mapped WHR Type		Consolidated	Mapped WHR Type	
BOP34XX	BOP3M	Blue oak/ gray pine	**SHBXXXX**	SHBXX	Shrub types
213 ACRES	BOP3P		**1647 ACRES**		
	BOP4D				
			URBXXXX	AGRXX	Urban types
BOW34MD	BOW3D	Large Blue oak	**5207 ACRES**	TUR2P	
708 ACRES	BOW3M	High Density		TURXX	
	BOW4M			URBXX	
BOW34SP	BOW3P	Large Blue oak	**VOW45MX**	VOW5M	Large Valley Oak types
994 ACRES	BOW3S	lower density classes	**351 ACRES**	VOW4M	higher density
	BOW4P				
	BOW4S		**VOW45SP**	VOW4P	Large Valley Oak types
	BOW5P		**1165 ACRES**	VOW4S	lower density classes
				VOW5P	
COW23MD	COW2M	Coast live oak woodlands		VOW5S	
3276 ACRES	COW3D	smaller high density			
	COW3M		**VRIXXXX**	VRI2P	Riparian Types
			669 ACRES	VRI3P	Variable in size
COW45MD	COW4D	Coast live oak woodlands		VRI4D	and density
2144 ACRES	COW4M	larger high density			
	COW5M				
COWXXSP	COW2S	Coast live oak woodlands			
1126 ACRES	COW3P	lower density all sizes			
	COW3S				
	COW4P				
	COW5P				
	COW5S		***see ESRI shapefile coverage whrtypes_combined.shp***		

The Woodland Inventory Summaries are presented in section 4 of this report. The inventory methodology summary and plot form are in Appendix 1.

3.The WHR Type Map.

As noted above 6959 polygons were mapped and classified as primary WHR (WHR1) types as indicated on the bar chart below. Coast live oak woodland and annual grass types are the most common vegetation types in the project area (City and Colony). When one aggregates urban vegetation, road, urban hardscape, lawns, orchards, and agriculture, those together become the most common type (5207 acres) in the 24344 acre project area.

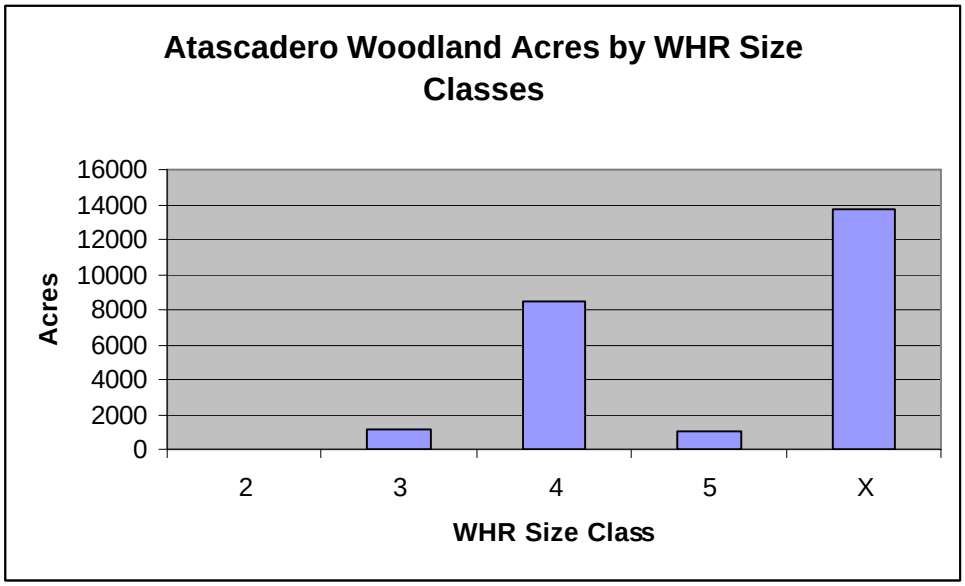


Aggregated acreages are shown below:

Atascadero Vegetation acreages by Generalized WHR Type

WHR Group	ACRES
Annual Grass	4475
Blue Oak/Pine	213
Blue Oak Types	1701
Coastal Oak Types	6544
Shrub Types	1648
Urban Types	5207
Valley Oak Types	1531
Riparian Types	670

Size Classes:



Summary of Size Classe Codes

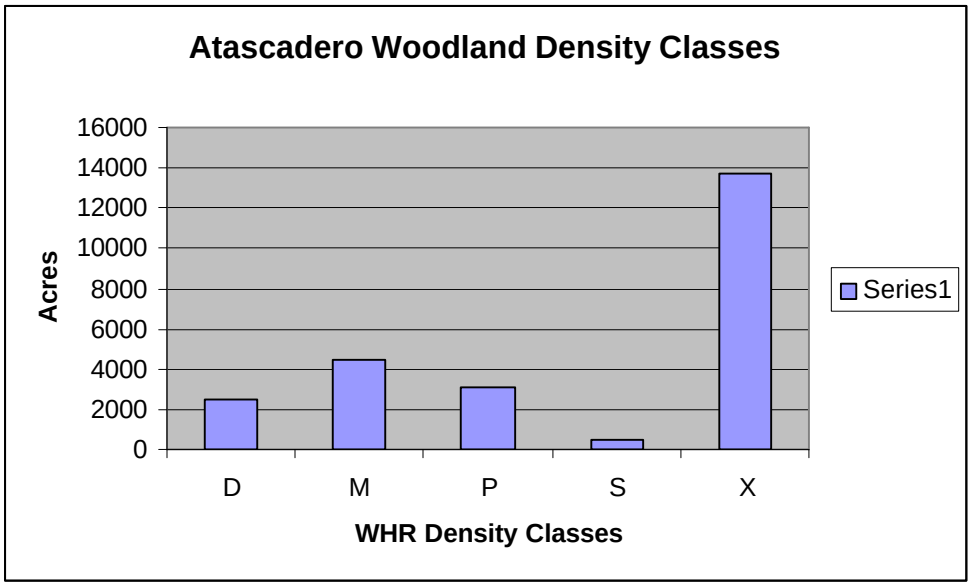
X size class not applicable (for shrub, grass and urban types)
1 Seedling tree <1.0" diameter at breast height (dbh)
2 Sapling tree crown <15.0' dbh 1.0" - 5.9"
3 Pole tree crown 15.0' - 29.9' 6.0" - 10.9" dbh
4 Medium tree crown30.0' - 44.9' 11.0" - 23.9" dbh
5 large tree crown >45.0' >24.0" dbh

From the graph above it appears that current Atascadero woodland cover originated mostly at the same time and is dominated by large trees.

Canopy Cover: Similarly, canopy dover density classes were categorized as follows:

Code Canopy Cover Description

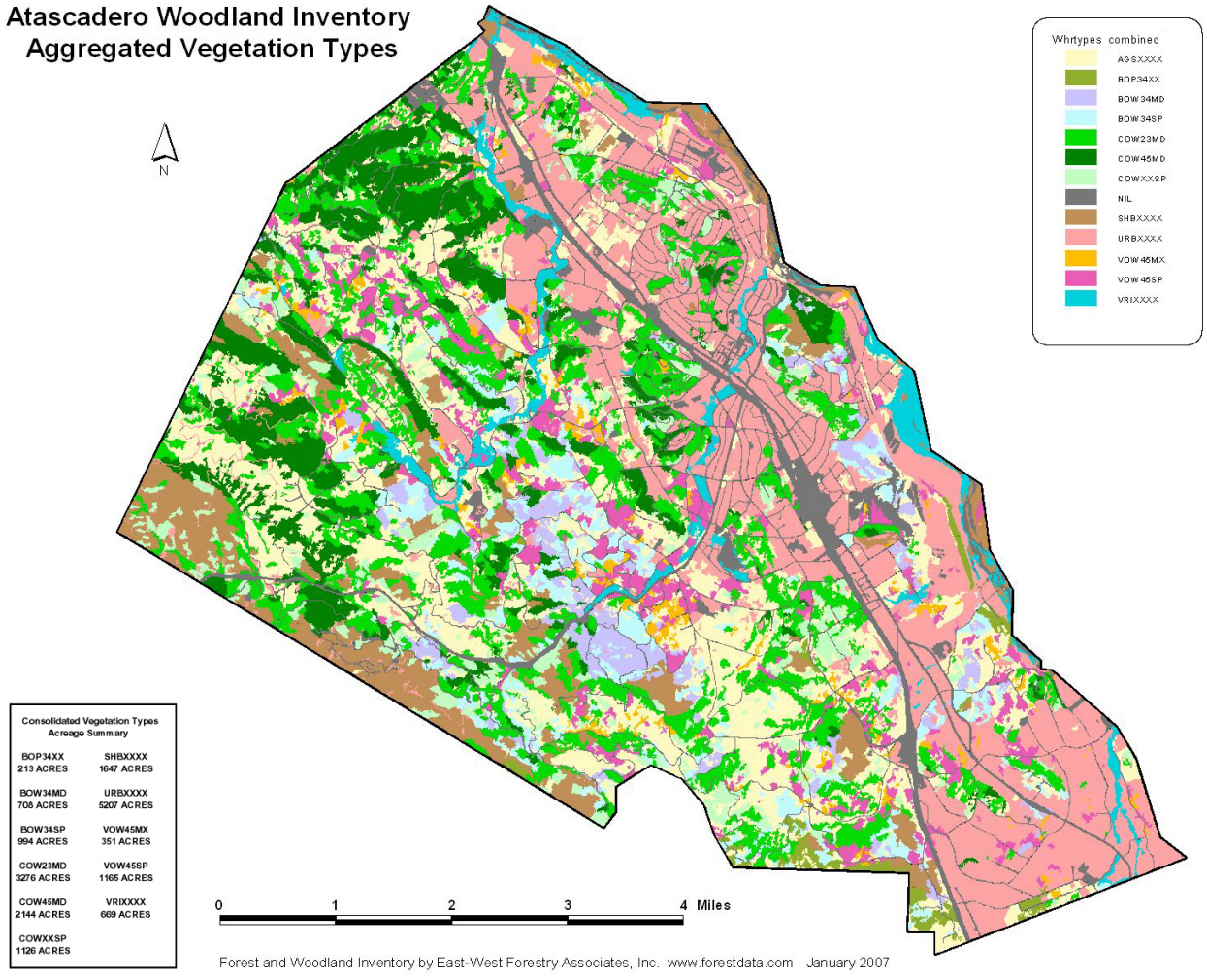
S Sparse: 10-25% density
P Poor: 25-40% density
M Medium 40-60% canopy density
D High 60%+ canopy density
X Not applicable (urban trees, urban, grassland, shrubland, etc.



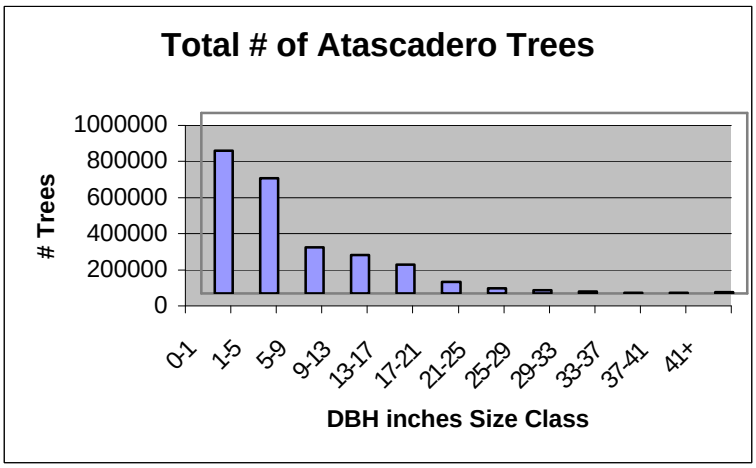
As shown above Atascadero woodlands are adequately distributed in a variety of Woodland Density Classes.

4. The Woodland Inventory Summary

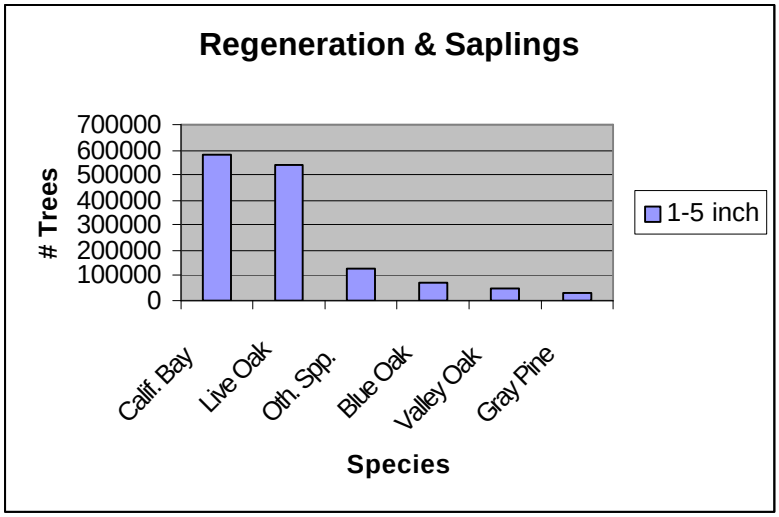
East-West Forestry Associates, working with volunteers from ANTA, installed 163 inventory plots at selected locations within the project area. The plot locations were obtained so as to achieve a representative distribution of WHR types. As shown in Table 1 above the mapped WHR types were aggregated into consolidated type groups for the purposes of reporting the forest inventory. Maps, analyses of the inventory data, selected charts, and summaries of each consolidated type are shown in this section.



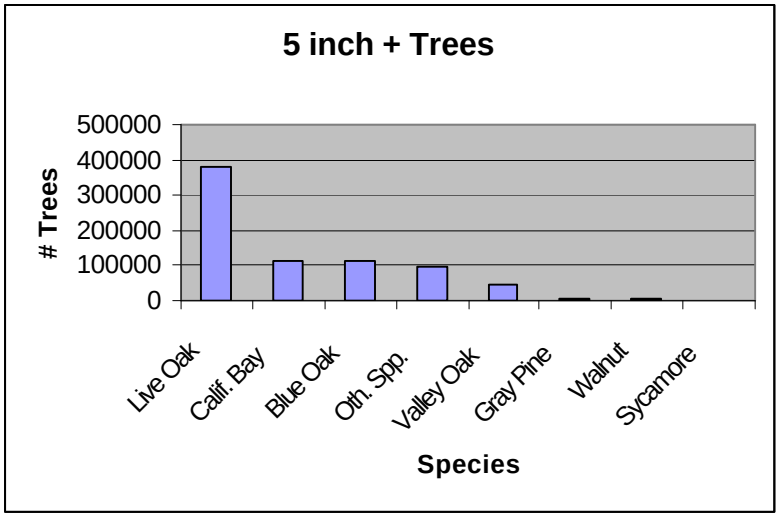
The summary below includes all WHR types in Atascadero. The cumulative inventory summary, multiplied by the acreage in each WHR type yields a total of 2.2 million trees in Atascadero, of which 65.5% are under 5" in dbh.



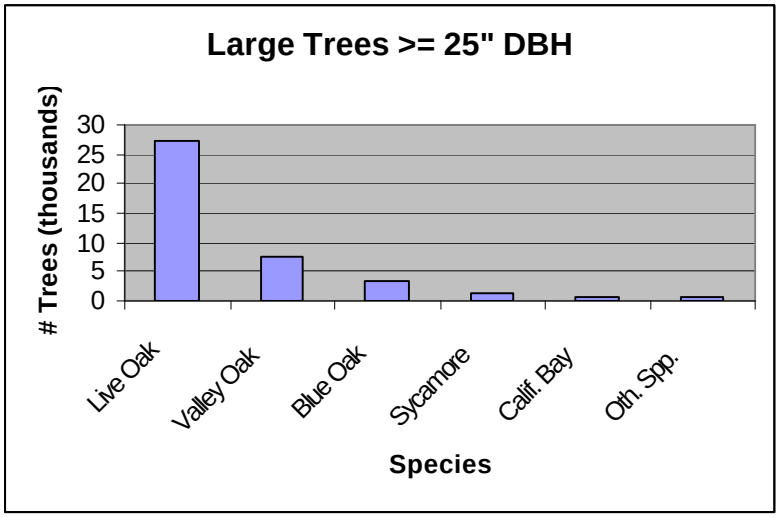
Of the Regeneration trees most (>1.1 million) are California bay and coast live oak. Overall there are about 75,000 blue oak seedlings and sapling trees and a larger population of 110,000 larger blue oak trees mostly in the smaller size classes. There are about 94,000 valley oaks in Atascadero in all size classes. They are evenly distributed: 47000 seeplings/saplings and 47000 larger trees. As in most California locations, blue oak and valley oak regeneration is almost absent throughout.



There are 760,000 trees over 5” inches in diameter in Atascadero. When only trees 21” and over are counted, there are 65000 such trees of which 47000 are coast live oak and another 11000 are valley oak. There are only 41000 trees over 25” in diameter in Atascadero, including about 1300 large sycamores in riparian areas.



Large trees are also mostly coast live oak and valley oak as shown below.



Comparison to other inventories: When these inventory numbers are compared to counterpart inventories in natural stands in this region of California (Gaman and Firman 2006) it is clear that Atascadero has a higher

number of trees in its woodlands than do natural stands. This makes sense for 4 reasons:

Exclusion of fire in and around urban areas
Large numbers of exotic trees
Higher precision mapping (1/4 acre minimum polygon size) enabled higher resolution sampling of locally dense stands
High variability in this small sample.

The charts and tables on the following pages provide inventory summaries for each of the consolidated mapped WHR types as shown above. The tables provide detail on number of trees by species, basal area (literally the square footage of area of tree trunk per acre), stand error analysis, summaries of canopy position (by number of trees) and percentage of the total number of trees which showed visible defect: rot, broken tops, fire scars, etc. A summary of groundcover and summary of species is provided. In most cases the sample was small and variability was high among the inventory plots. Though these factors resulted in high standard errors, the methods give an adequate sense of the components of Atascadero woodlands.

Blue Oak / Gray Pine Woodlands / Medium to Large Size Classes / all densities.

Bop34xx 213 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

	DIAMETER CLASSES (DBH INCHES RANGE) (DBH INCHES RANGE)											
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+ TOTAL
Gray Pine	60	80	14	2	6	3	1	0	0	0	0	0 166
Live Oak	160	0	6	8	2	3	3	0	0	0	0	0 182
Blue Oak	0	40	30	13	2	0	2	0	0	0	0	0 86
Oth. Hdwd.	100	0	0	0	0	0	0	0	0	0	0	0 100
Dead	0	0	2	0	0	0	0	0	0	0	0	0

Bop34xx.

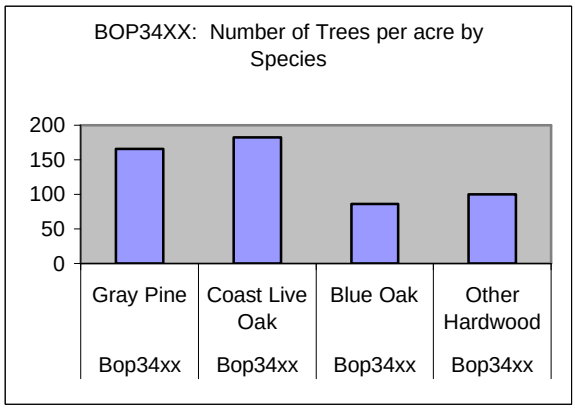
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

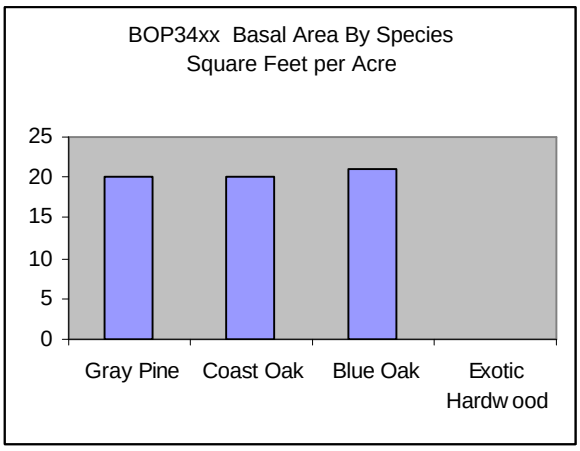
	DIAMETER CLASSES (DBH INCHES RANGE) (DBH INCHES RANGE)											
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+ TOTAL(GE5)
Gray Pine	0	3	4	1	8	6	3	0	0	0	0	0 20
Live Oak	0	0	1	4	2	5	8	0	0	0	0	0 20
Blue Oak	0	2	7	8	2	0	5	0	0	0	0	0 21
Oth. Hdwd.	0	0	0	0	0	0	0	0	0	0	0	0 0

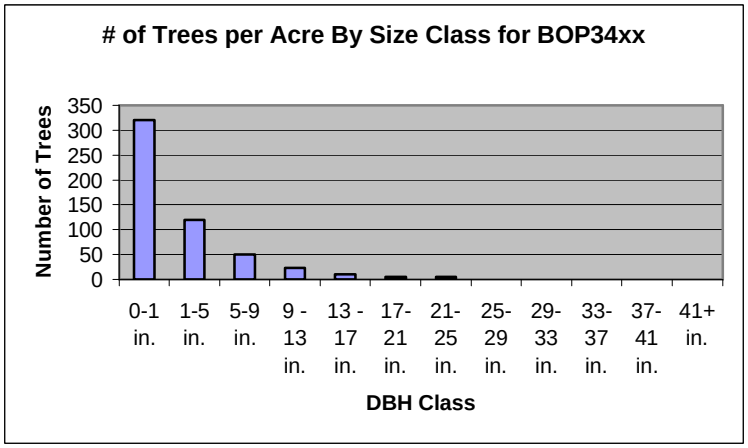
TREES/ACRE >= 5 INCHES DBH : 95
BASAL AREA LIVE TREES: 68
Percent of trees with defect: 5 %
Dominant (as % of all trees): 20 %
Codominant (as % of all trees): 38 %
Understory (as % of all trees): 42 %
Standard error of basal area : 33 sq. ft. ac.
Number of Sample Points: 5

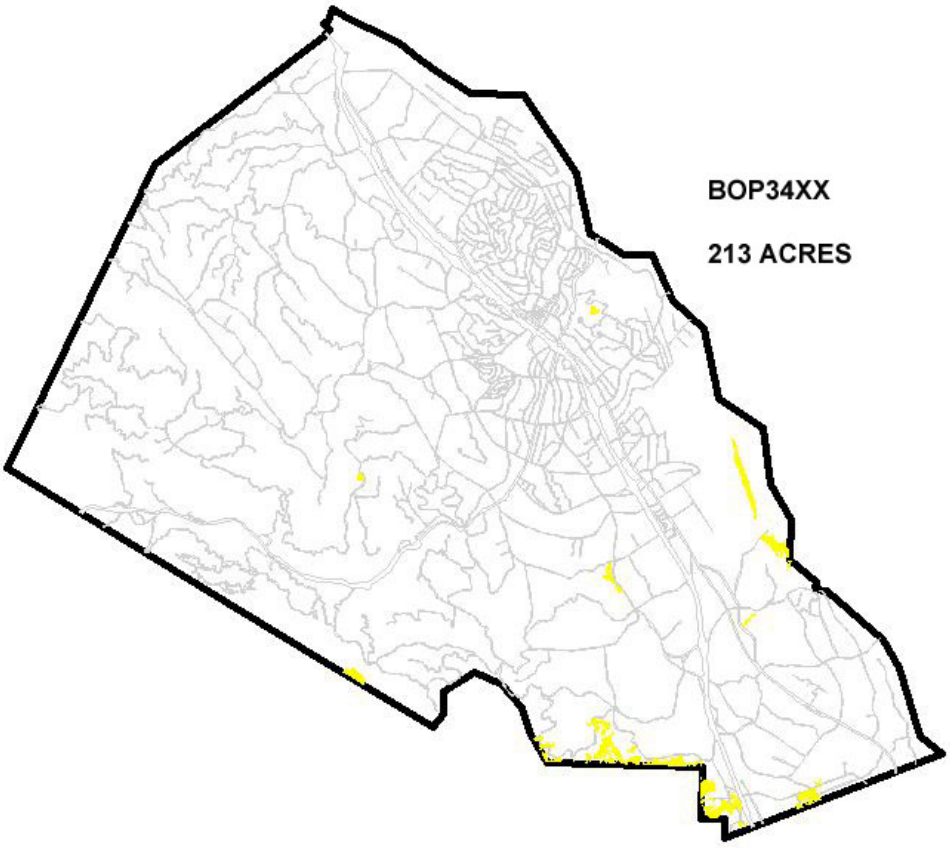
BRUSH COVER = 10 PERCENT
BRUSH SPECIES: POISON OAK, MTN. MAHOGANY, BIGLEAF MANZANITA, CHAMISE, SHRUB OAK, COYOTE BUSH, COFFEEBERRY, HOLLY LEAF REDBERRY
FORB COVER = 3 PERCENT
GRASS COVER = 59 PERCENT

Note that, although saplings are present, *no* blue oak regeneration was observed in this type.






# of Trees per Acre By Size Class for BOP34xx
Number of Trees
350
300
250
200
150
100
50
0
0-1 in.
1-5 in.
5-9 in.
9 - 13 in.
13 - 17 in.
17-21 in.
21-25 in.
25-29 in.
29-33 in.
33-37 in.
37-41 in.
41+ in.
DBH Class


BOP34XX
213 ACRES

Blue Oak Woodlands/ Medium to Large Size Classes
Medium to Dense (40% + canopy density)

Bow34md 708 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

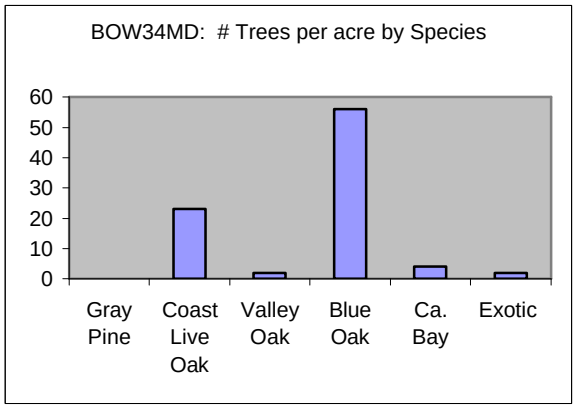
	DIAMETER CLASSES (DBH INCHES RANGE) (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Gray Pine	0	0	0	0	0	0	0	0	0	0	0	0	0
Live Oak	15	0	1	4	2	1	0	0	0	0	0	0	23
Valley Oak	0	0	0	1	1	0	0	0	0	0	0	0	2
Blue Oak	11	0	19	11	6	7	1	1	1	0	0	0	56
Calif. Bay	4	0	0	0	0	0	0	0	0	0	0	0	4
Exotic	0	0	2	0	0	0	0	0	0	0	0	0	2
Dead	0	0	1	0	1	0	0	0	0	0	0	0	

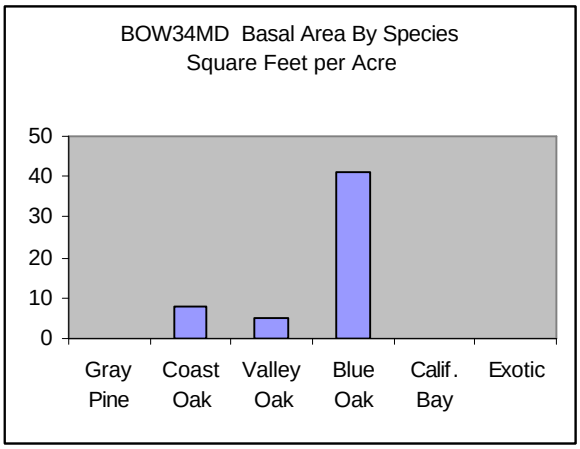
Bow34md.
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

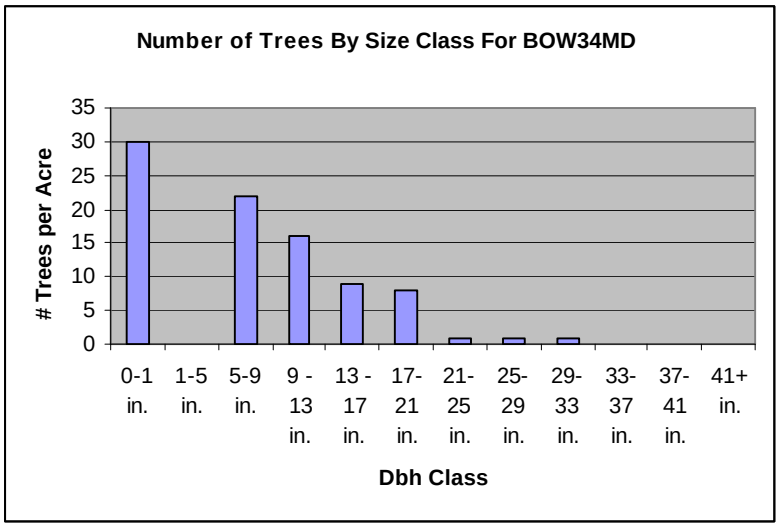
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Gray Pine	0	0	0	0	0	0	0	1	0	0	0	0	0
Live Oak	0	0	0	3	2	1	1	1	2	0	0	0	8
Valley Oak	0	0	0	0	1	1	1	2	1	0	0	0	5
Blue Oak	0	0	5	7	6	12	3	5	4	0	0	0	41
Calif. Bay	0	0	0	0	0	0	0	0	0	0	0	0	0
Exotic	0	0	1	0	0	0	0	0	0	0	0	0	0

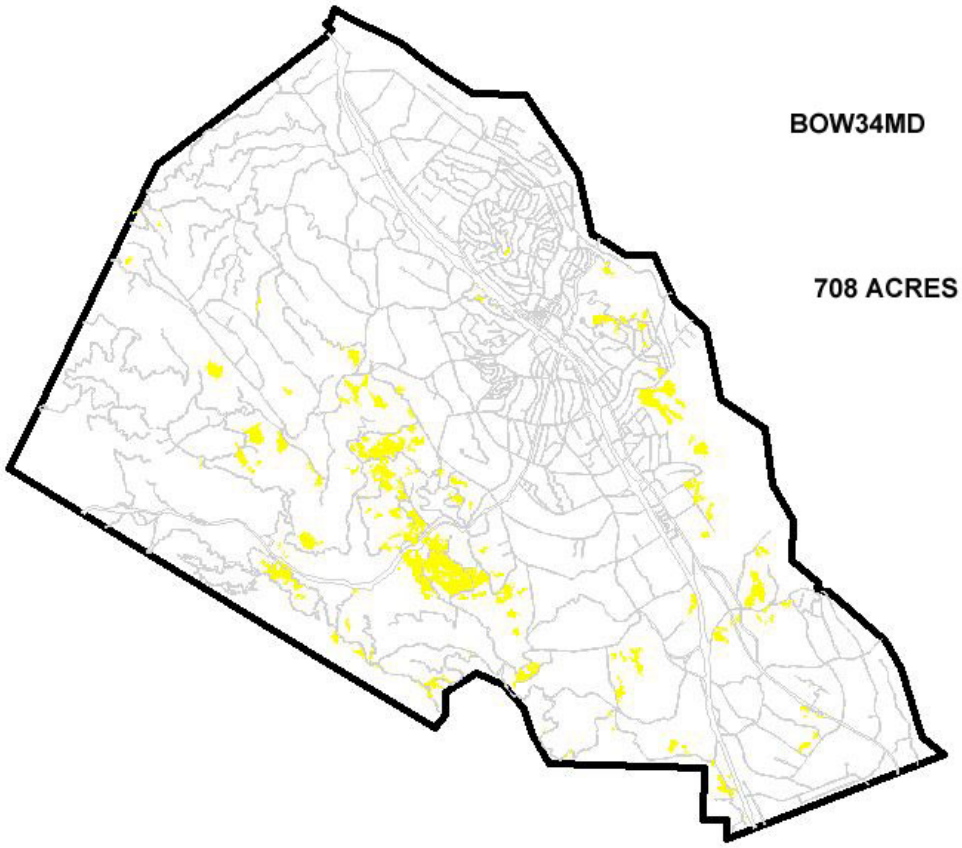
TREES/ACRE >= 5 INCHES DBH : 60
BASAL AREA LIVE TREES: 57
Percent of trees with defect: 17 %
Dominant (as % of all trees): 29 %
Codominant (as % of all trees): 40 %
Understory (as % of all trees): 25 %
Standard error of basal area : 32 sq. ft. ac.
Number of Sample Points: 27
BRUSH COVER = 5 PERCENT
BRUSH SPECIES: POISON OAK, MTN. MAHOGANY, RIBES, RUBUS, LONICERA, BITTER CHERRY, HOLLY LEAF REDBERRY, TOYON, SILKTASSEL, CEANOTHUS, EXOTICS, ARTEMESIA CALIFORNICA.
FORB COVER = 14 PERCENT
GRASS COVER = 69 PERCENT

Note that the blue oak regeneration, even without considering seedling mortality, is insufficient for stand replacement purposes.






Number of Trees By Size Class For BOW34MD
Trees per Acre
35
30
25
20
15
10
5
0
0-1 in.
1-5 in.
5-9 in.
9 - 13 in.
13 - 17 in.
17- 21 in.
21- 25 in.
25- 29 in.
29- 33 in.
33- 37 in.
37- 41 in.
41+ in.
Dbh Class


BOW34MD
708 ACRES

Blue Oak Woodlands/ Medium to Large Size Classes
Sparse to Poor Densities (10-40% canopy density)

Bow34sp 994 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

	DIAMETER CLASSES (DBH INCHES RANGE)											
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Live Oak	0	0	1	0	0	0	1	0	0	0	0	0	1
Valley Oak	0	0	0	1	1	0	1	0	0	0	0	0	2
Blue Oak	0	14	10	9	7	2	0	1	1	0	0	0	45
Oth. Hdwd.	0	0	0	0	0	1	0	0	0	0	0	0	1

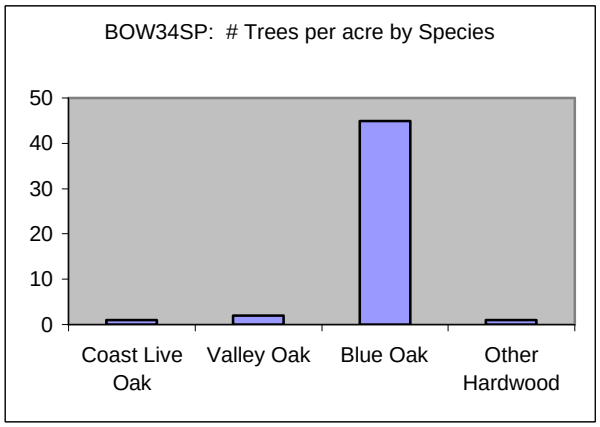
Bow34sp.

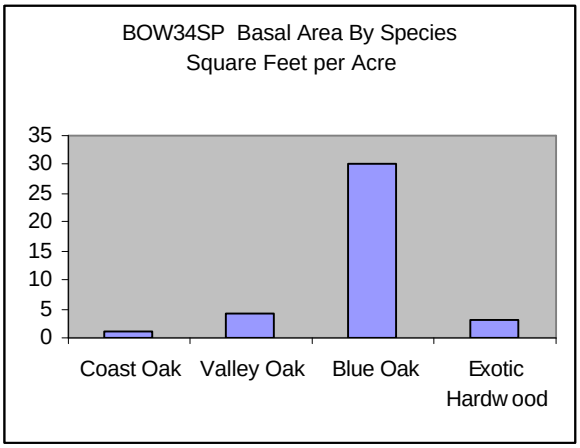
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

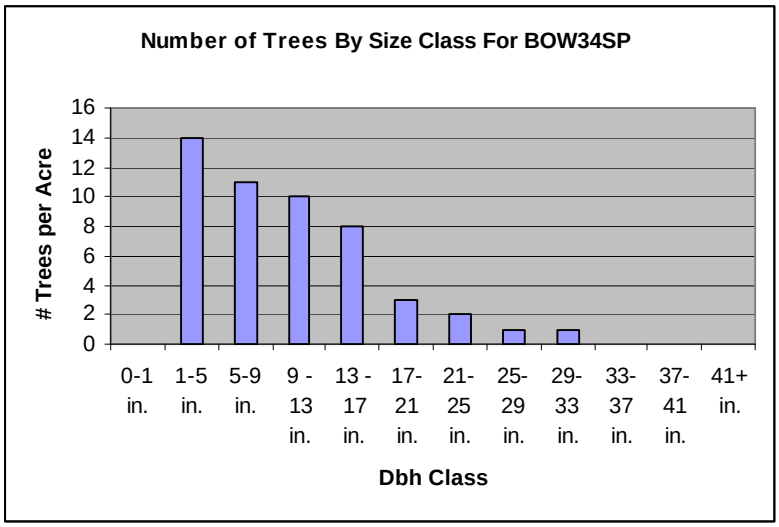
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Live Oak	0	0	0	0	0	0	1	0	0	0	0	0	1
Valley Oak	0	0	0	1	1	0	2	0	0	2	0	0	4
Blue Oak	0	1	2	6	8	5	0	4	4	2	0	0	30
Oth. Hdwd.	0	0	0	0	0	1	0	0	0	2	0	0	3

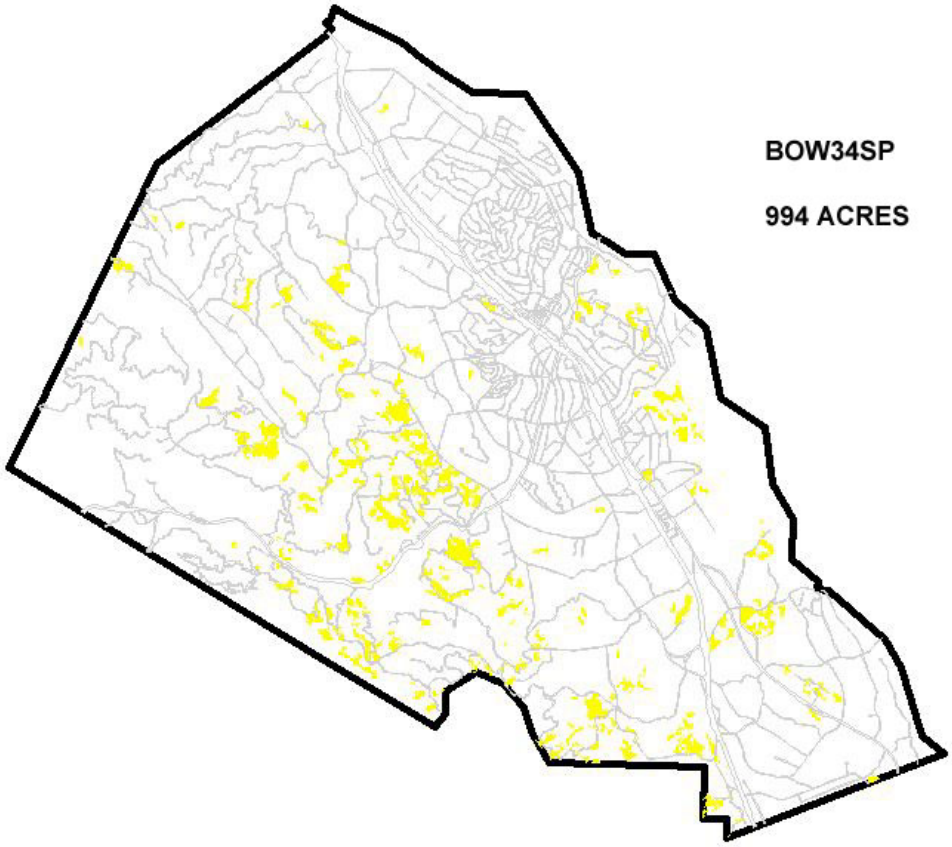
TREES/ACRE >= 5 INCHES DBH : 36
BASAL AREA LIVE TREES: 41
Percent of trees with defect: 5 %
Dominant (as % of all trees): 22 %
Codominant (as % of all trees): 39 %
Understory (as % of all trees): 40 %
Standard error of basal area : 28 sq. ft. ac.
Number of Sample Points: 14
BRUSH COVER = 2 PERCENT
BRUSH SPECIES: MTN. MAHOGANY, CEANOTHUS CUNEATUS, LONICERA
FORB COVER = 2 PERCENT
GRASS COVER = 85 PERCENT

Note that *no* regeneration of any species was observed in this type.






Number of Trees By Size Class For BOW34SP
Trees per Acre
16
14
12
10
8
6
4
2
0
0-1 in.
1-5 in.
5-9 in.
9 - 13 in.
13 - 17 in.
17- 21 in.
21- 25 in.
25- 29 in.
29- 33 in.
33- 37 in.
37- 41 in.
41+ in.
Dbh Class


BOW34SP
994 ACRES

Coastal Oak Woodlands / Sapling to Medium Size Classes
Medium to Dense (40%+) Canopy Cover
Cow23md 3276 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

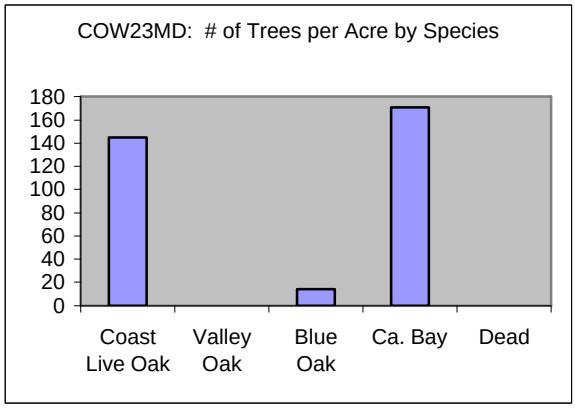
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Live Oak	43	36	14	21	23	5	2	1	1	0	0	0	145
Valley Oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Oak	0	7	3	2	1	0	0	0	0	0	0	0	14
Calif. Bay	57	86	21	7	1	0	0	0	0	0	0	0	171
Dead	0	0	5	1	0	0	0	0	0	0	0	0	

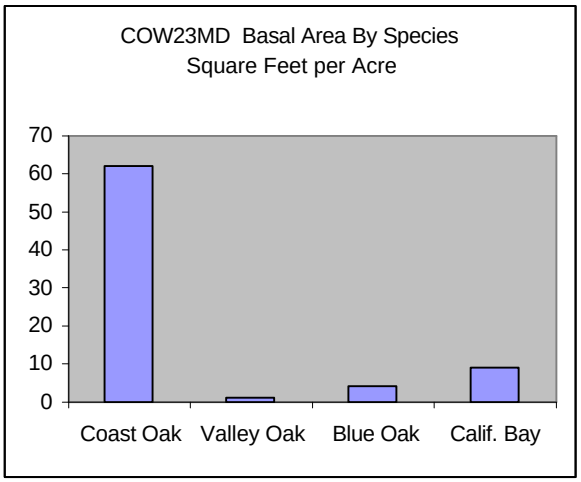
Cow23md.

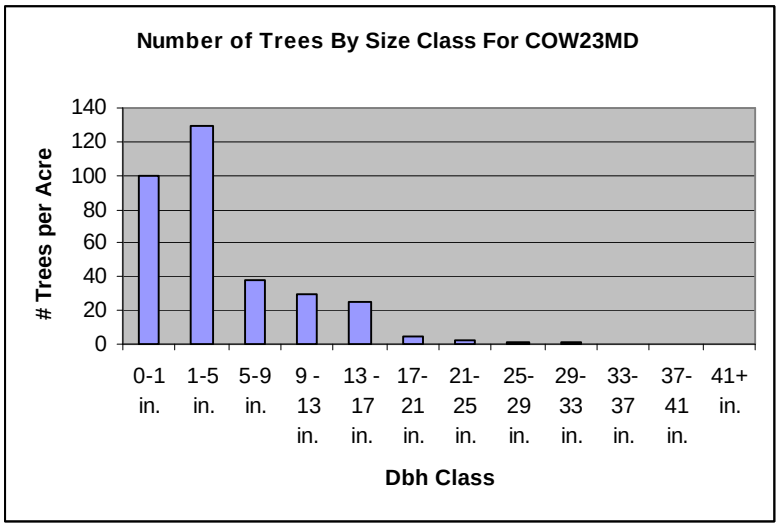
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

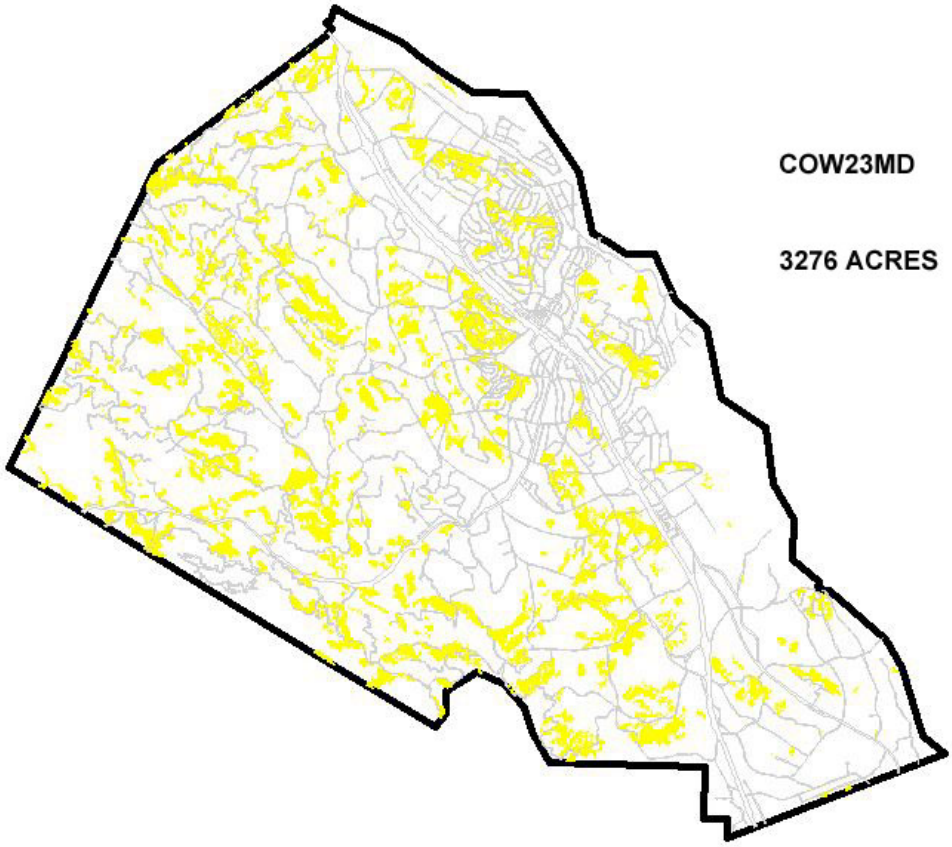
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Live Oak	0	2	3	13	27	9	5	3	3	0	0	0	62
Valley Oak	0	0	0	0	0	0	0	0	2	0	0	0	1
Blue Oak	0	0	1	1	1	0	0	1	0	0	0	0	4
Calif. Bay	0	2	5	4	1	0	0	0	0	0	0	0	9

TREES/ACRE >= 5 INCHES DBH : 103
BASAL AREA LIVE TREES: 82
Percent of trees with defect: 7 %
Dominant (as % of all trees): 10 %
Codominant (as % of all trees): 43 %
Understory (as % of all trees): 47 %
Standard error of basal area : 57 sq. ft. ac.
Number of Sample Points: 14
BRUSH COVER = 30 PERCENT
BRUSH SPECIES: TOYON, CEANOTHUS CUNEATUS, MIMULUS, LONICERA, POISON OAK, COFFEEBERRY, REDBERRY, CREAMBUSH, SNOWBERRY, CEANOTHUS OLIGANTHUS, SNOWBERRY, HOLLY LEAF CHERRY, SHRUB OAK
FORB COVER = 2 PERCENT
GRASS COVER = 10 PERCENT






Number of Trees By Size Class For COW23MD
Trees per Acre
140
120
100
80
60
40
20
0
0-1 in.
1-5 in.
5-9 in.
9 - 13 in.
13 - 17 in.
17-21 in.
21-25 in.
25-29 in.
29-33 in.
33-37 in.
37-41 in.
41+ in.
Dbh Class


COW23MD
3276 ACRES

Coastal Oak Woodlands / Large and Very Large Size Classes
Medium to Dense (40%+) Canopy Cover

Cow45md 2144 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS
DIAMETER CLASSES (DBH INCHES RANGE)

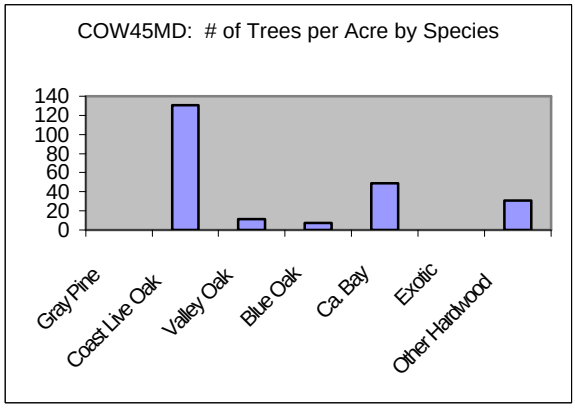
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Gray Pine	0	0	0	0	0	0	0	0	0	0	0	0	0
Live Oak	73	9	9	11	12	7	5	3	1	1	0	1	131
Valley Oak	6	0	1	2	1	0	0	0	0	0	0	0	11
Blue Oak	3	0	1	1	1	1	0	0	0	0	0	0	7
Calif. Bay	30	12	6	1	0	0	0	0	0	0	0	0	49
Exotic	0	0	0	0	0	0	0	0	0	0	0	0	0
Oth. Hdwd.	3	24	4	0	0	0	0	0	0	0	0	0	31
Dead	0	0	3	1	0	0	0	0	0	0	0	0	

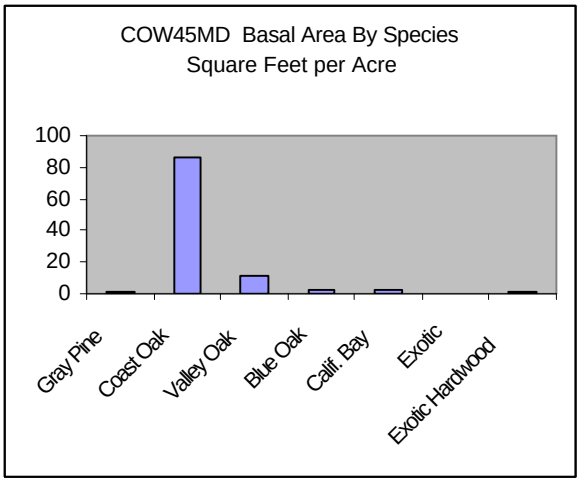
Cow45md.
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS
DIAMETER CLASSES (DBH INCHES RANGE)

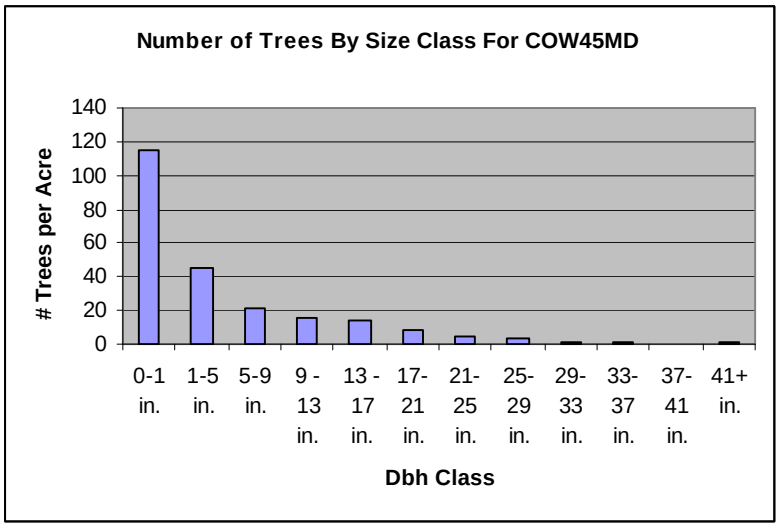
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Gray Pine	0	0	0	0	0	0	1	0	1	0	0	0	1
Live Oak	0	0	2	6	14	13	13	12	6	6	3	11	86
Valley Oak	0	0	0	1	1	0	1	1	1	0	1	6	11
Blue Oak	0	0	0	1	1	1	0	0	0	0	0	0	3
Calif. Bay	0	0	1	1	0	0	0	0	0	0	0	0	2
Exotic	0	0	0	0	0	0	0	0	0	0	0	0	0
Oth. Hdwd.	0	0	1	0	0	0	0	0	0	0	0	0	1

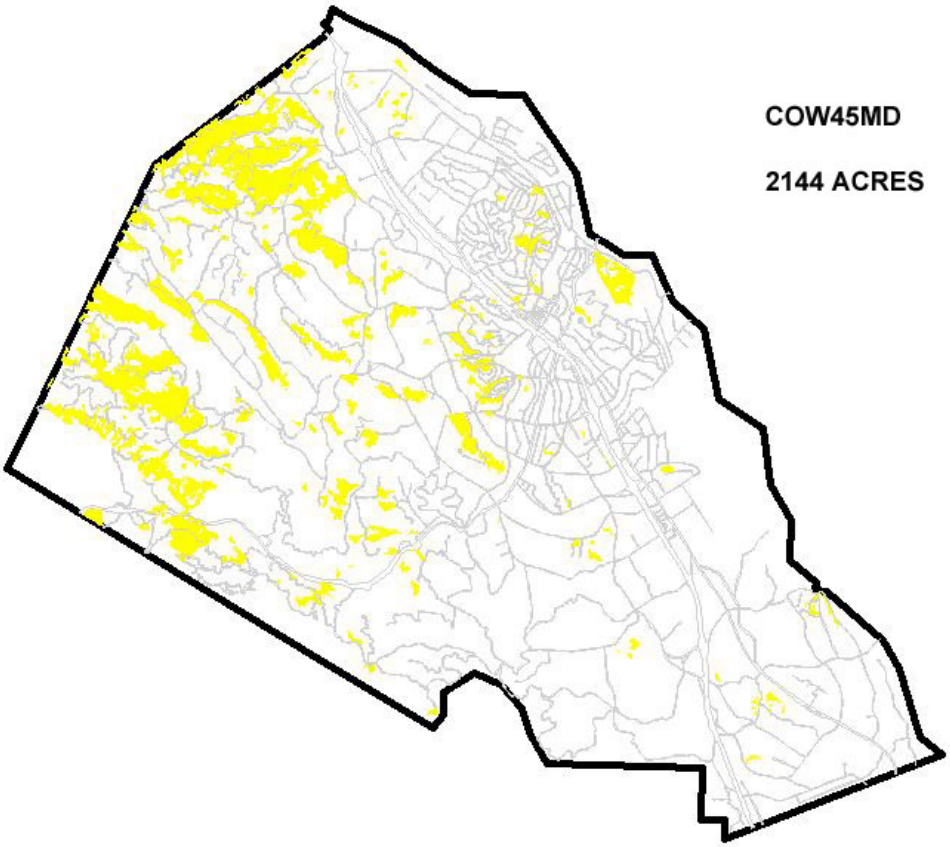
TREES/ACRE >= 5 INCHES DBH : 71
BASAL AREA LIVE TREES: 107
Percent of trees with defect: 10 %
Dominant (as % of all trees): 12 %
Codominant (as % of all trees): 32 %
Understory (as % of all trees): 56 %
Standard error of basal area : 55 sq. ft. ac.
Number of Sample Points: 33

BRUSH COVER = 16 PERCENT
BRUSH SPECIES: POISON OAK, COFFEEBERRY, REDBERRY, LONICERA, RIBES, CREAMBUSH, MIMULUS, CHAMISE, CEANOTHUS, EXOTICS, ASH, WILD RASPBERRY
FORB COVER = 5 PERCENT
GRASS COVER = 34 PERCENT






Number of Trees By Size Class For COW45MD
Trees per Acre
140
120
100
80
60
40
20
0
0-1 in.
1-5 in.
5-9 in.
9 - 13 in.
13 - 17 in.
17- 21 in.
21- 25 in.
25- 29 in.
29- 33 in.
33- 37 in.
37- 41 in.
41+ in.
Dbh Class


COW45MD
2144 ACRES

Coastal Oak Woodlands / All Size Classes
Sparse to Poor (10-40%) Canopy Cover

Cowxxsp 1126 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

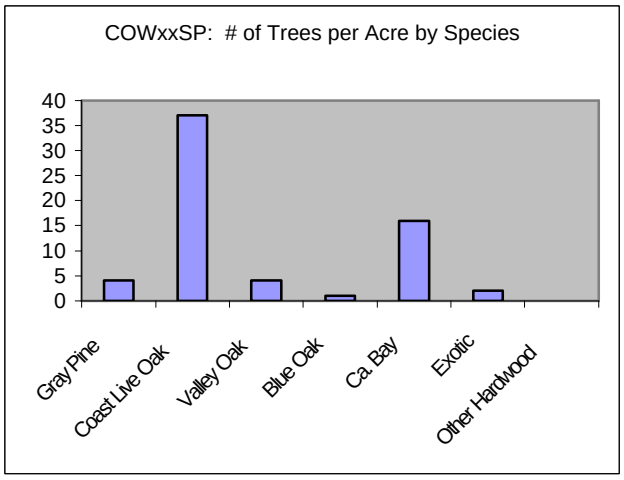
	DIAMETER CLASSES (DBH INCHES RANGE)											
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Gray Pine	5	0	0	0	0	0	0	0	0	0	0	0	4
Live Oak	23	0	1	2	2	2	1	1	1	1	1	2	37
Valley Oak	0	0	1	1	0	0	1	0	0	0	0	0	4
Blue Oak	0	0	0	0	0	0	1	0	0	0	0	0	1
Calif. Bay	0	14	1	1	0	0	0	0	0	0	0	0	16
Exotic	0	0	2	0	0	0	0	0	0	0	0	0	2
Oth. Hdwd.	0	0	0	0	0	0	0	0	0	0	0	0	0

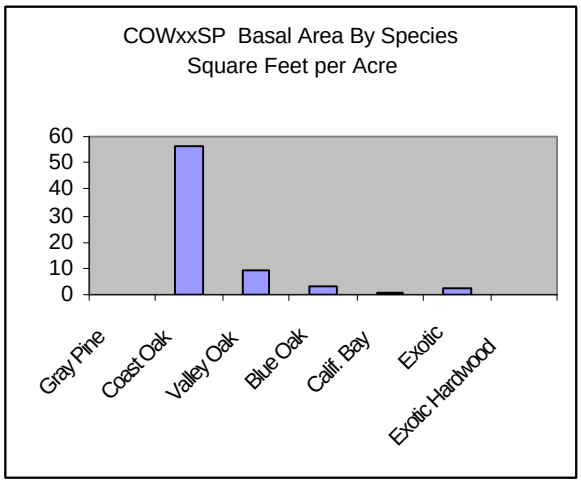
Cowxxsp.

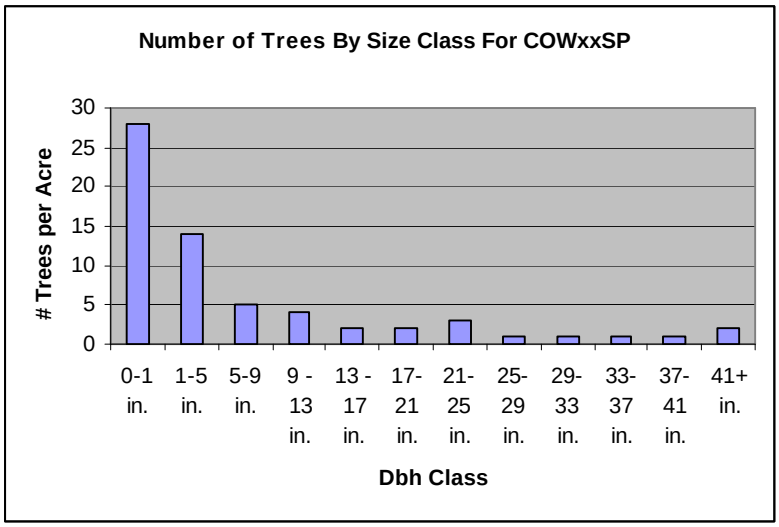
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

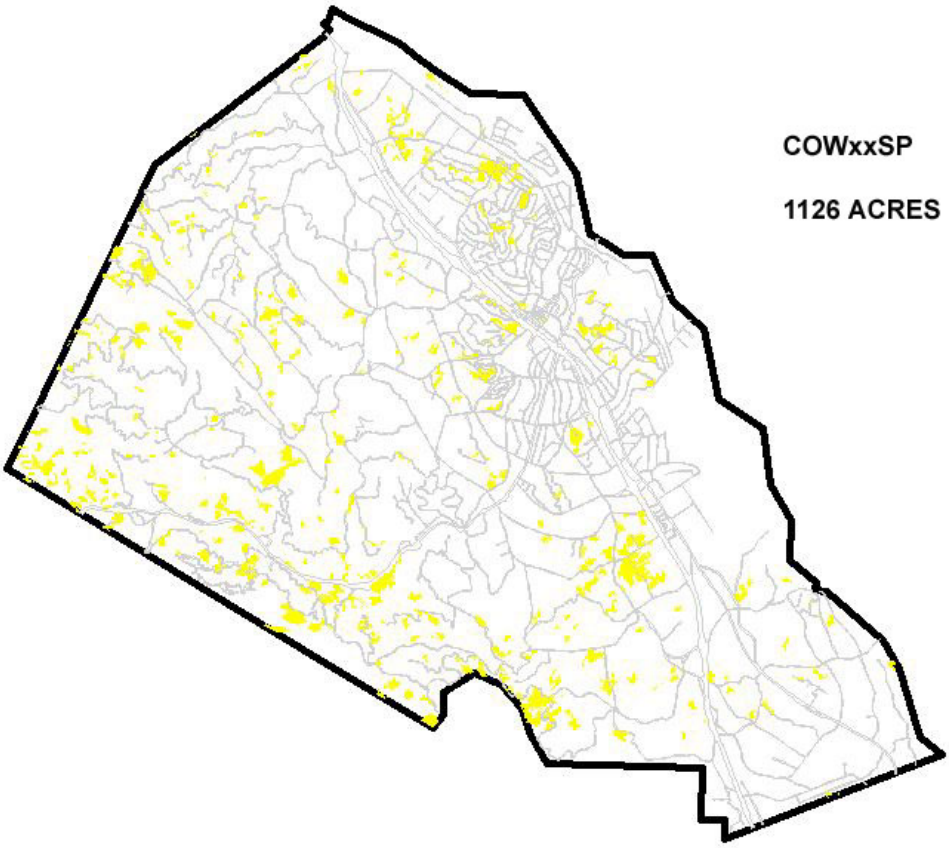
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Gray Pine	0	0	0	0	1	0	0	0	0	0	0	0	0
Live Oak	0	0	0	1	3	4	3	4	5	7	6	23	56
Valley Oak	0	0	0	0	0	1	3	1	0	0	1	3	9
Blue Oak	0	0	0	0	0	1	1	1	0	0	0	0	3
Calif. Bay	0	0	0	0	0	0	0	0	0	0	0	0	1
Exotic	0	0	0	0	0	0	2	0	0	0	0	0	2
Oth. Hdwd.	0	0	0	0	0	0	0	0	0	0	0	0	0

TREES/ACRE >= 5 INCHES DBH : 26
BASAL AREA LIVE TREES: 73
Percent of trees with defect: 8 %
Dominant (as % of all trees): 30 %
Codominant (as % of all trees): 55 %
Understory (as % of all trees): 15 %
Mean basal area: 71
Standard error of basal area : 45 sq. ft. ac.
Number of Sample Points: 22
BRUSH COVER = 12 PERCENT
BRUSH SPECIES: EXOTIC, MTN MAHOGANY, CHAMISE, CEANOTHUS CUNEATUS, POISON OAK, LOTUS, ERIOGONUM, COFFEEBERRY, REDBERRY
FORB COVER = 1 PERCENT
GRASS COVER = 38 PERCENT






Number of Trees By Size Class For COWxxSP
Trees per Acre
30
25
20
15
10
5
0
0-1 in.
1-5 in.
5-9 in.
9 - 13 in.
13 - 17 in.
17- 21 in.
21- 25 in.
25- 29 in.
29- 33 in.
33- 37 in.
37- 41 in.
41+ in.
Dbh Class


COWxxSP
1126 ACRES

Shbxxxx 1647 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

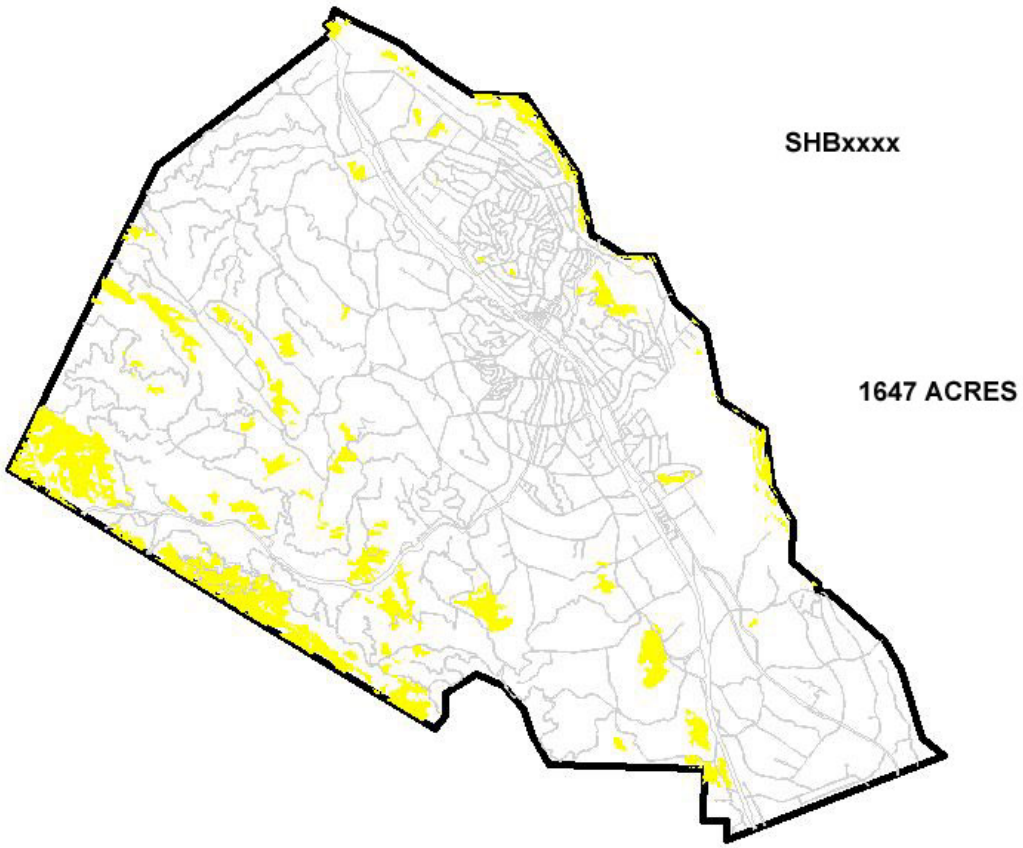
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Live Oak	0	0	0	1	0	0	0	0	0	0	0	0	1

Shbxxxx.

BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Live Oak	0	0	0	1	0	0	0	0	0	0	0	0	1

\# TREES/ACRE >= 5 INCHES DBH : 1
BASAL AREA LIVE TREES: 1
Percent of trees with defect: 100 %
Dominant (as % of all trees): 100 %
Codominant (as % of all trees): 0 %
Understory (as % of all trees): 0 %
Standard error of basal area : 3 sq. ft. ac.
Number of Sample Points: 6
BRUSH COVER = 78 PERCENT
BRUSH SPECIES: CHAMISE, BLACK SAGE, CEANOTHUS CUNEATUS, POISON OAK, MTN. MAHOGANY, TOYON, ARTEMESIA CALIFORNICA, MIMULUS, CEANOTHUS OLIGANTHUS, COYOTEBUSH
FORB COVER = 1 PERCENT
GRASS COVER = 11 PERCENT



Urban Types/ All size Classes / All density Classes

Urbxxxx 5207 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS
DIAMETER CLASSES (DBH INCHES RANGE)

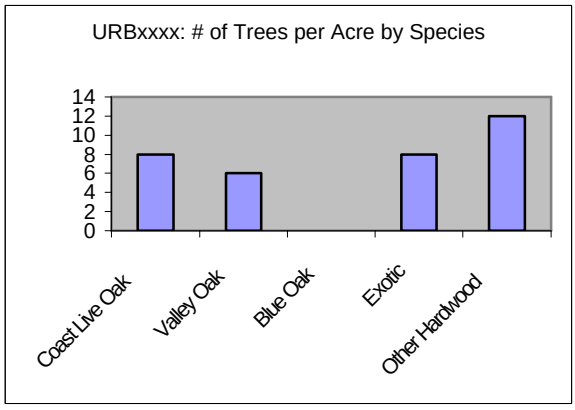
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Live Oak	6	0	1	1	0	0	0	0	0	0	0	0	8
Valley Oak	0	6	0	0	0	1	0	0	0	0	0	0	6
Blue Oak	0	0	0	0	1	0	0	0	0	0	0	0	0
Exotic	6	1	4	6	2	1	0	0	0	0	0	0	20

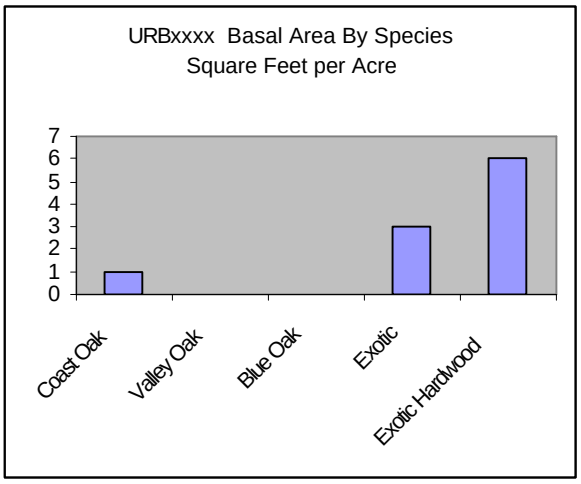
Urbxxxx.
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS
DIAMETER CLASSES (DBH INCHES RANGE)

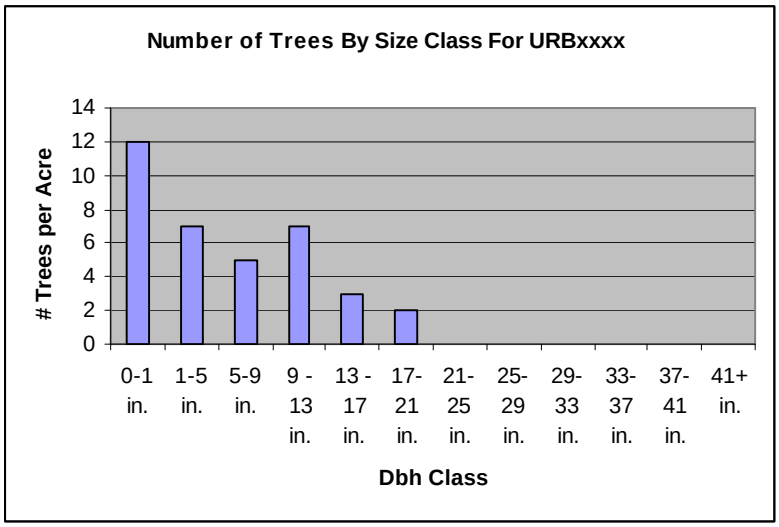
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Live Oak	0	0	0	1	0	0	0	1	0	0	0	0	1
Valley Oak	0	0	0	0	0	1	0	0	0	0	0	0	0
Blue Oak	0	0	0	0	1	0	0	0	0	0	0	0	0
Exotics	0	0	1	3	1	1	2	1	1	2	0	0	9

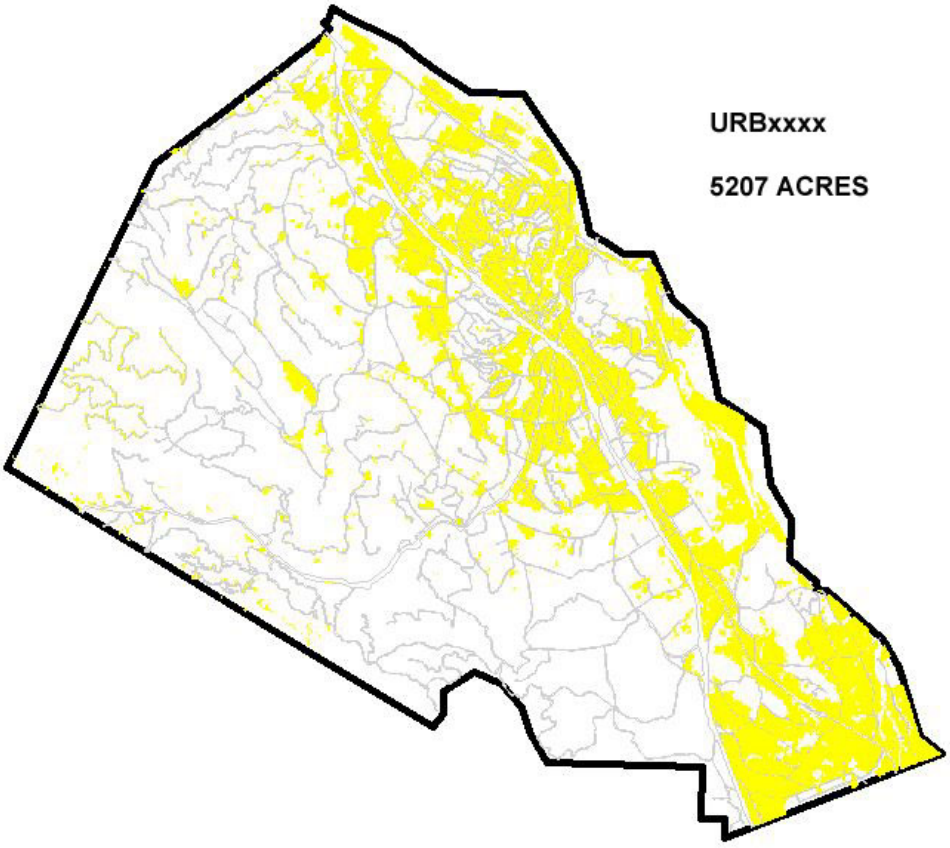
TREES/ACRE >= 5 INCHES DBH : 14
BASAL AREA LIVE TREES: 14
Percent of trees with defect: 0 %
Dominant (as % of all trees): 79 %
Codominant (as % of all trees): 14 %
Understory (as % of all trees): 7 %
Standard error of basal area : 12 sq. ft. ac.
Number of Sample Points: 16
BRUSH COVER = 5 PERCENT
BRUSH SPECIES: EXOTICS SALIX PRUNUS
FORB COVER = 2 PERCENT
GRASS COVER = 19 PERCENT

Note that this extensive urban type is occupied mostly by exotic tree species.






Number of Trees By Size Class For URBxxxx
Trees per Acre
14
12
10
8
6
4
2
0
0-1 in.
1-5 in.
5-9 in.
9 - 13 in.
13 - 17 in.
17- 21 in.
21- 25 in.
25- 29 in.
29- 33 in.
33- 37 in.
37- 41 in.
41+ in.
Dbh Class


URBxxxx
5207 ACRES

Valley Oak Woodland / Large and Very Large Size Classes / Medium Density Class
Vow45mx 351 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS
DIAMETER CLASSES (DBH INCHES RANGE)

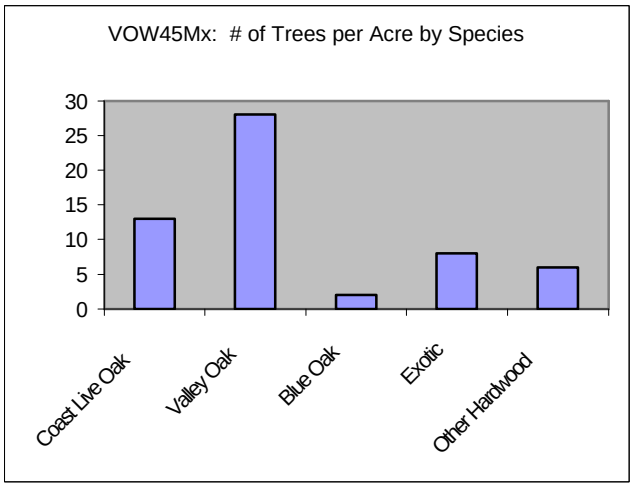
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Live Oak	5	0	1	2	3	2	0	0	0	0	0	0	13
Valley Oak	0	0	5	8	5	4	1	2	0	1	1	1	28
Blue Oak	0	0	0	1	1	0	0	0	0	0	0	0	2
Exotic	5	0	0	1	0	0	1	0	0	0	0	0	8
Oth. Hdwd.	0	5	2	0	0	0	0	0	0	0	0	0	6
Dead	0	0	1	0	0	0	0	0	0	0	0	0	

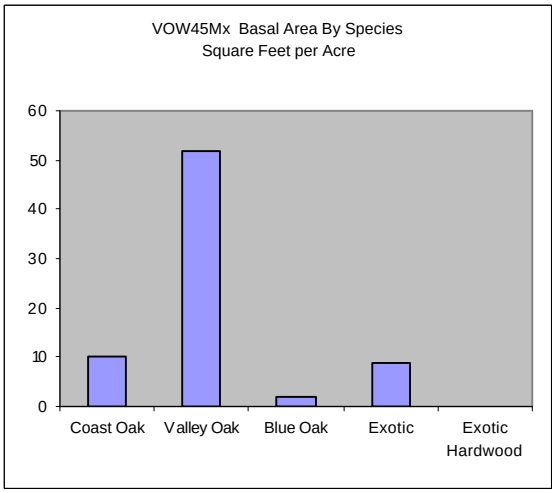
Vow45mx.
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS
DIAMETER CLASSES (DBH INCHES RANGE)

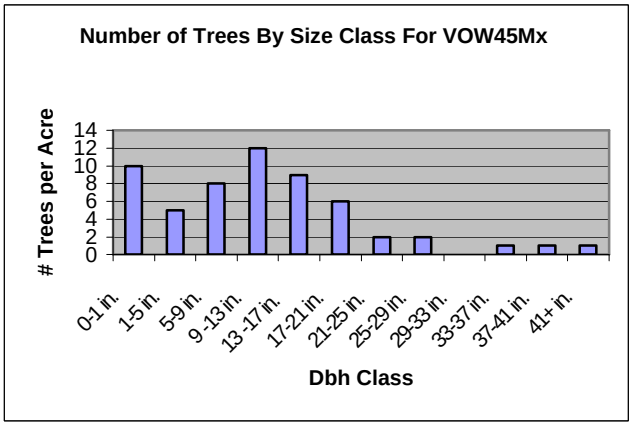
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Live Oak	0	0	0	1	3	3	1	1	1	0	0	0	10
Valley Oak	0	0	2	4	7	7	3	7	2	6	5	9	52
Blue Oak	0	0	0	1	1	0	1	0	0	0	0	0	2
Exotic	0	0	0	0	0	1	3	2	2	0	0	0	9
Oth. Hdwd.	0	0	0	0	0	0	0	0	0	0	0	0	0

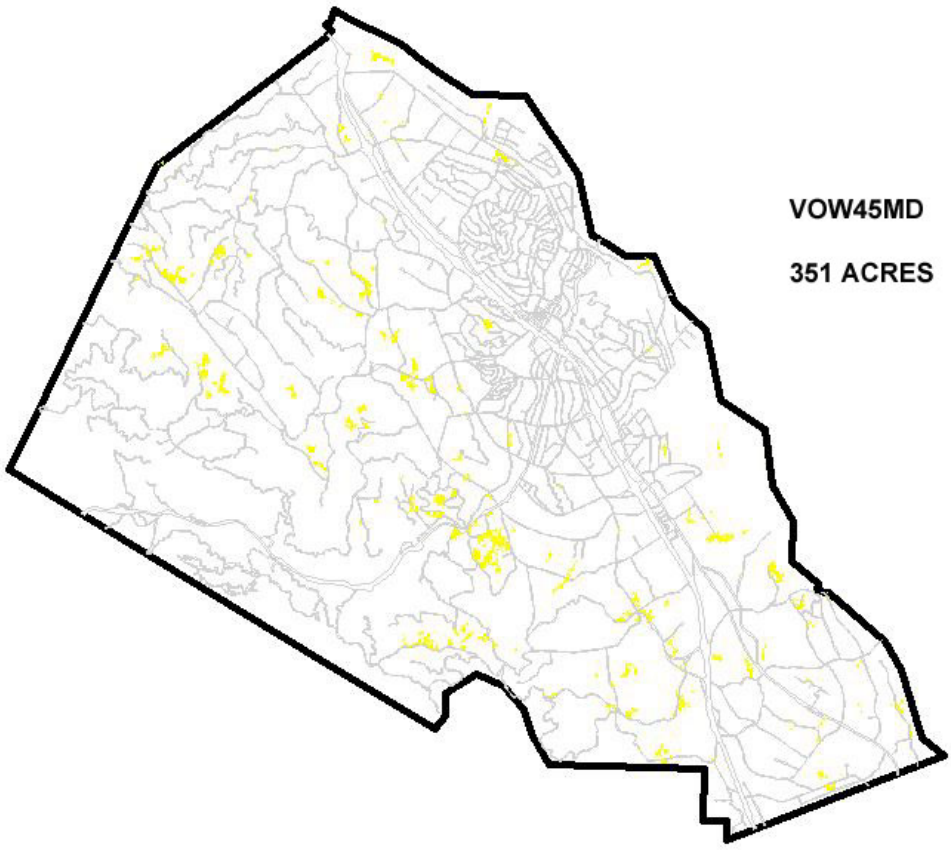
TREES/ACRE >= 5 INCHES DBH : 46
BASAL AREA LIVE TREES: 76
Percent of trees with defect: 16 %
Dominant (as % of all trees): 24 %
Codominant (as % of all trees): 44 %
Understory (as % of all trees): 32 %
Standard error of basal area : 47 sq. ft. ac.
Number of Sample Points: 19
BRUSH COVER = 7 PERCENT
BRUSH SPECIES: POISON OAK, RIBES, ROCKROSE, SNOWBERRY, RUBUS, COFFEEBERRY
FORB COVER = 11 PERCENT
GRASS COVER = 55 PERCENT

Note that no valley oak or blue oak regeneration or saplingswere observed on any of the 19 sample points in the WHR group.






Number of Trees By Size Class For VOW45Mx
Trees per Acre
14
12
10
8
6
4
2
0
0-1 in.
1-5 in.
5-9 in.
9-13 in.
13-17 in.
17-21 in.
21-25 in.
25-29 in.
29-33 in.
33-37 in.
37-41 in.
41+ in.
Dbh Class


VOW45MD
351 ACRES

Valley Oak Woodland / Large and Very Large Size Classes / Sparse and Poor (10-40%) Density Canopy Cover
Vow45sp 1165 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

	DIAMETER CLASSES (DBH INCHES RANGE)											
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Live Oak	0	0	0	0	1	1	0	1	0	0	0	0	3
Valley Oak	0	3	0	2	3	2	1	1	1	0	1	2	17
Blue Oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Exotic	0	0	0	0	0	0	0	0	0	0	0	0	1
Oth. Hdwd.	0	5	2	0	0	0	0	0	0	0	0	0	7
Dead	0	0	0	0	1	0	0	0	0	0	0	0	

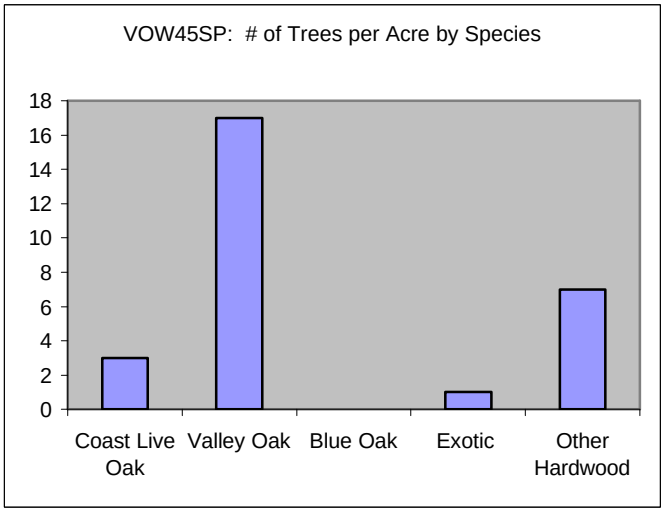
Vow45sp.

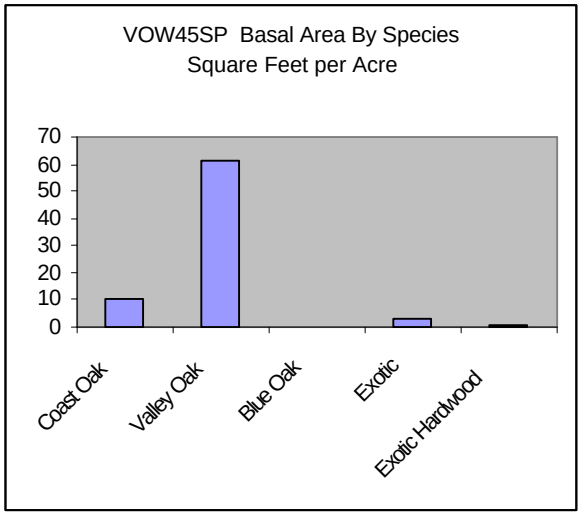
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

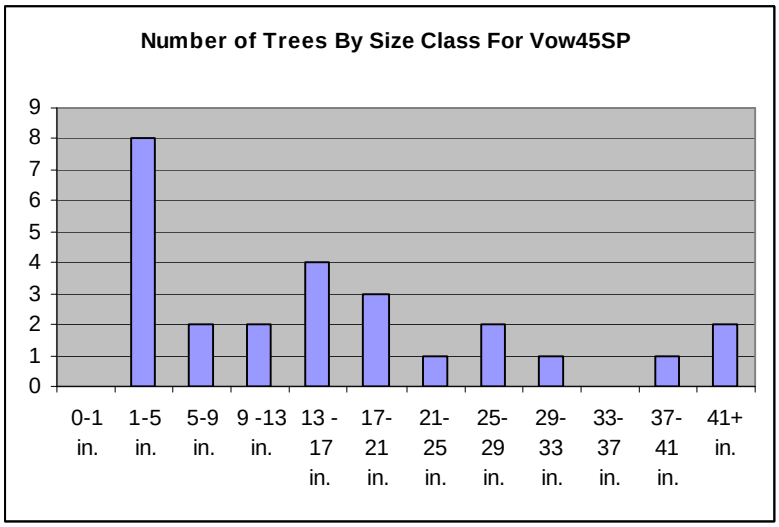
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Live Oak	0	0	0	0	1	1	0	6	0	0	2	0	10
Valley Oak	0	0	0	2	3	4	2	5	4	3	7	31	61
Blue Oak	0	0	0	0	0	1	0	0	0	0	0	0	0
Exotic	0	0	0	0	1	0	0	0	1	0	1	0	3
Oth. Hdwd.	0	0	0	0	0	1	0	0	0	0	0	0	1

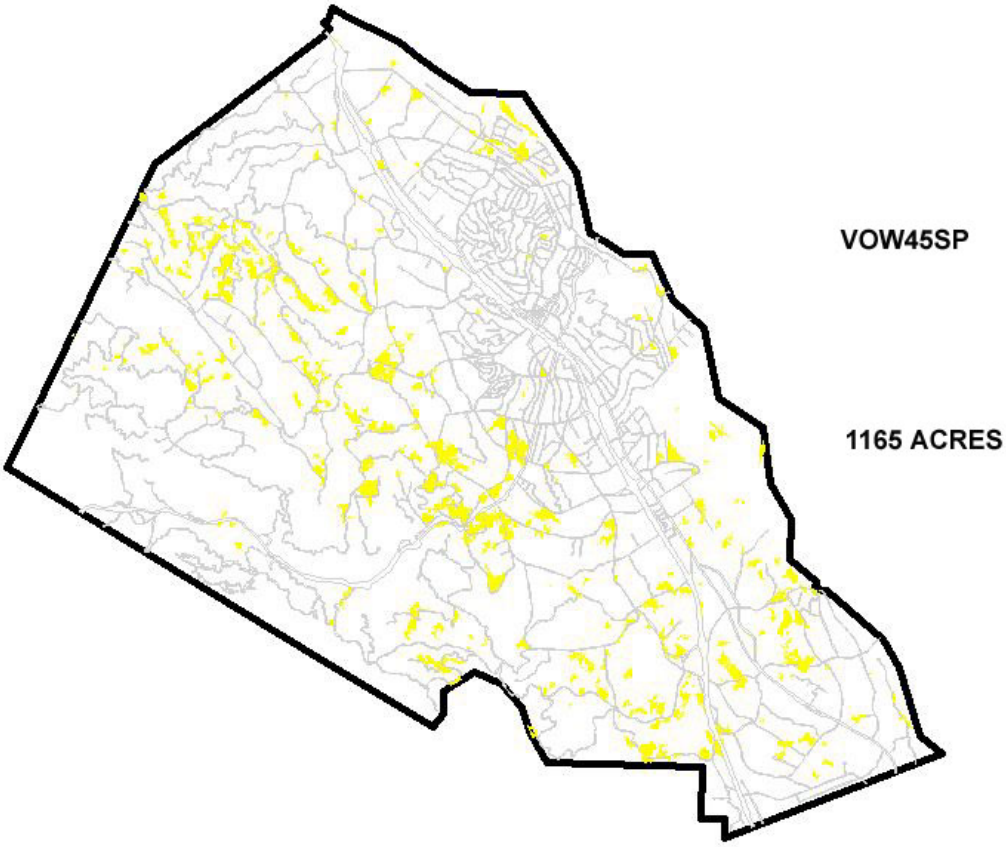
TREES/ACRE >= 5 INCHES DBH : 22
BASAL AREA LIVE TREES: 76
Percent of trees with defect: 7 %
Dominant (as % of all trees): 41 %
Codominant (as % of all trees): 34 %
Understory (as % of all trees): 25 %
Standard error of basal area : 80 sq. ft. ac.
Number of Sample Points: 20
BRUSH COVER = 2 PERCENT
BRUSH SPECIES: EXOTICS POISON OAK LOTUS SCOPARIS
FORB COVER = 0 PERCENT
GRASS COVER = 67 PERCENT

Note that blue oak regeneration or saplings wre observed on any of the 20 sample points in the WHR group. Nor were valley oak seedlings found.






Number of Trees By Size Class For Vow45SP
9
8
7
6
5
4
3
2
1
0
0-1 in.
1-5 in.
5-9 in.
9 -13 in.
13 - 17 in.
17- 21 in.
21- 25 in.
25- 29 in.
29- 33 in.
33- 37 in.
37- 41 in.
41+ in.


VOW45SP
1165 ACRES

Riparian Types / All Size and Density Classes
Vrixxxx 669 ACRES

NUMBER OF TREES PER ACRE BY SPECIES BY DBH CLASS

	DIAMETER CLASSES (DBH INCHES RANGE)											
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL
Sycamore	0	0	0	0	0	0	0	0	2	0	1	1	3
Live Oak	0	0	2	8	4	2	0	0	0	0	0	0	16
Valley Oak	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Oak	0	22	6	0	0	0	0	0	0	0	0	0	28
Calif. Bay	11	0	0	1	1	0	0	1	0	0	0	0	15
Walnut	0	0	1	3	2	1	1	0	0	0	0	0	7
Exotic	33	0	9	2	2	0	0	1	0	0	0	0	47
Oth. Hdwd.	0	0	0	0	0	1	0	0	0	0	0	0	1
Dead	0	0	0	0	0	1	0	0	0	0	0	0	

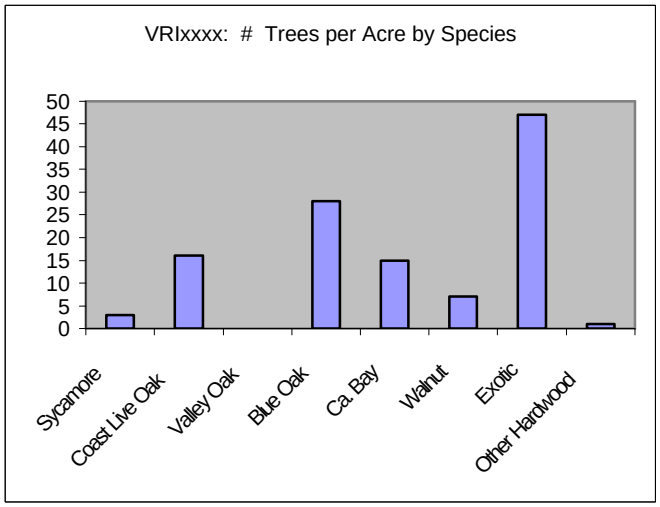
Vrixxxx.

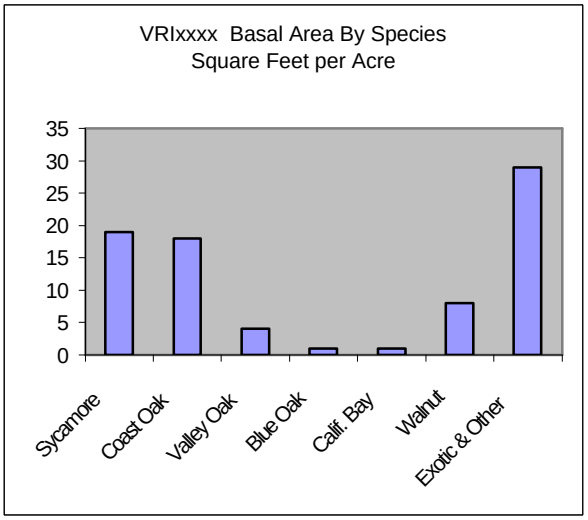
BASAL AREA SQ.FT.PER ACRE BY SPECIES BY DBH CLASS

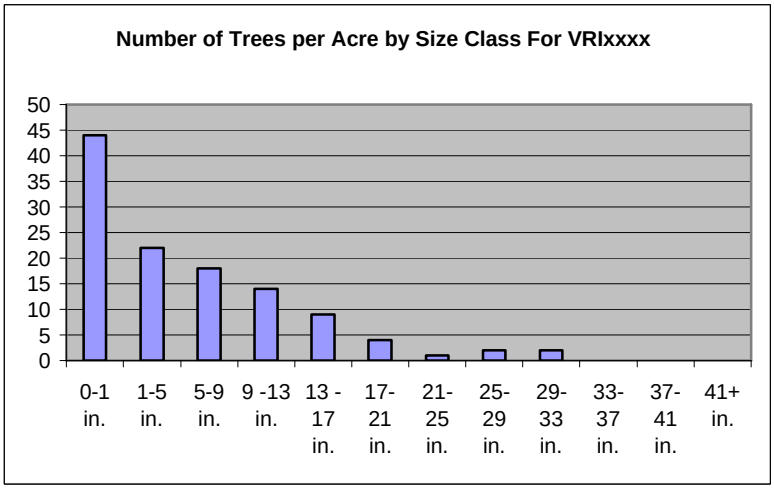
	DIAMETER CLASSES (DBH INCHES RANGE)												
SPECIES	0-1	1-5	5-9	9-13	13-17	17-21	21-25	25-29	29-33	33-37	37-41	41+	TOTAL(GE5)
Sycamore	0	0	0	0	0	0	0	2	10	0	4	5	19
Live Oak	0	0	0	6	6	3	0	2	2	0	0	0	18
Valley Oak	0	0	0	0	0	0	0	0	0	0	0	4	4
Blue Oak	0	0	2	0	0	0	0	0	0	0	0	0	1
Calif. Bay	0	0	0	0	1	0	0	0	0	0	0	0	1
Walnut	0	0	0	2	2	2	3	0	0	0	0	0	8
Exotic	0	0	2	1	2	0	3	3	2	0	8	6	26
Oth. Hdwd.	0	0	0	0	0	1	0	0	2	0	0	0	3

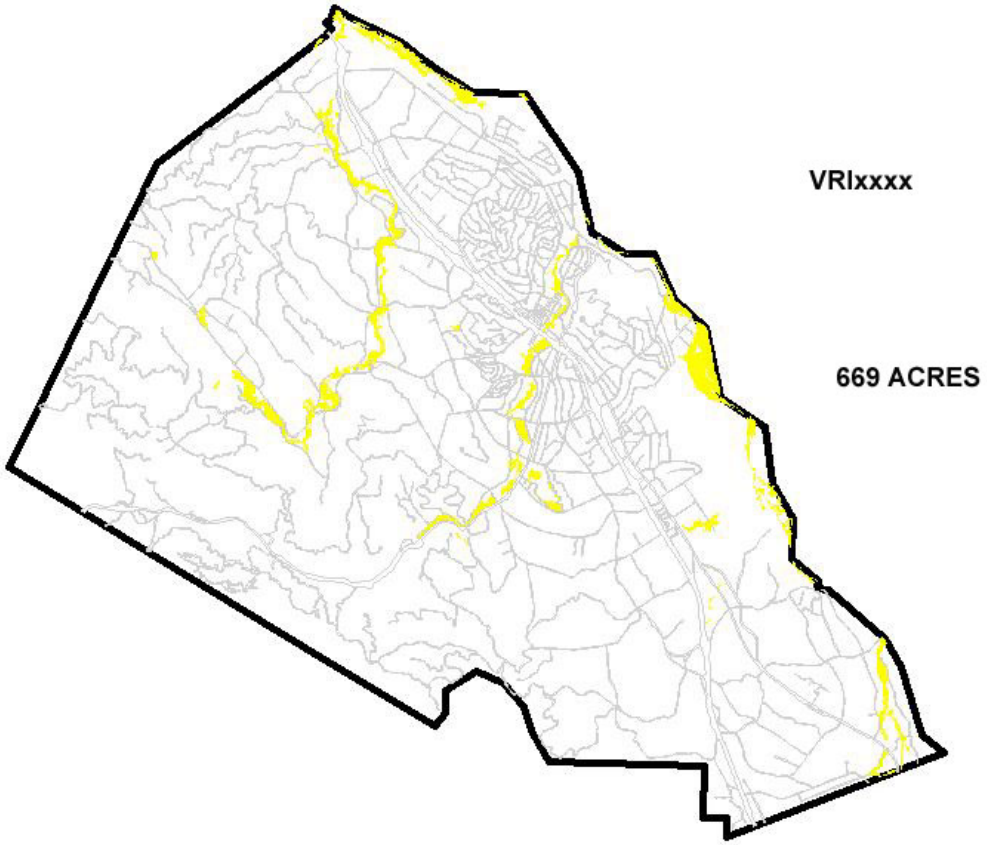
TREES/ACRE >= 5 INCHES DBH : 53
BASAL AREA LIVE TREES: 85
Percent of trees with defect: 24 %
Dominant (as % of all trees): 24 %
Codominant (as % of all trees): 36 %
Understory (as % of all trees): 41 %
Standard error of basal area : 72 sq. ft. ac.
Number of Sample Points: 9
BRUSH COVER = 19 PERCENT
BRUSH SPECIES: WILLOW, COFFEEBERRY, RUBUS WILD ROSE CHAMISE, POISON OAK, REDBERRY, COYOTE BUSH
FORB COVER = 12 PERCENT
GRASS COVER = 34 PERCENT

Riparian types were more diverse and included a number of large trees (which may not show above due to their small numbers by species). A large proportion of these trees have significant “defect”.


VRIxxxx: # Trees per Acre by Species
50
45
40
35
30
25
20
15
10
5
0
Sycamore
Coast Live Oak
Valley Oak
Blue Oak
Ca. Bay
Walnut
Exotic
Other Hardwood


VRIxxxx Basal Area By Species
Square Feet per Acre
35
30
25
20
15
10
5
0
Sycamore
Coast Oak
Valley Oak
Blue Oak
Calif. Bay
Walnut
Exotic & Other


Number of Trees per Acre by Size Class For VRIxxxx
50
45
40
35
30
25
20
15
10
5
0
0-1 in.
1-5 in.
5-9 in.
9 -13 in.
13 - 17 in.
17-21 in.
21-25 in.
25-29 in.
29-33 in.
33-37 in.
37-41 in.
41+ in.



As shown above we have mapped the Foothill Riparian WHR types and the riparian forests around Atascadero Lake. This mapping has been done in conjunction with the overall polygon creation and classification system described herewith. The riparian map is incorporated into the type maps and a data summary is provided. Water areas are not included in the 669 acres of riparian vegetation WHR types.

5. Accuracy Assessment:

We used 90 plots, across all WHR types, for accuracy assessment of the vegetation mapping. The WHR type map had been classified using the aerial image during winter/spring 2006. The WHR type polygons at the 90 plot sites were classified in the field during the inventory autumn 2006. We achieved agreement between the field crew and the image classification technician on WHR type, species and density 83.3% of the time.

The other 16.6% of the WHR classifications are not to be considered "errors". Many of these mapped types naturally blend into each other over a spatial gradient, so the polygon labeling and ground interpretive processes are both themselves subjective. Virtually all the species identification variations were associated with identification of the dominant species of oak in mixed stands at an individual sample location within a subject polygon. It is not completely reasonable to consider, in each case when a dominant species encountered on a plot is labeled as another WHR type, that the labeling is in error. Therefore most of these would be determined to be acceptable "fuzzy" errors[2].

A summary of the accuracy assessment is as follows:

Primary *or* secondary species, and size and density agreement: 75 of 90 = 83.3%
All items (primary species *and* size and density) agreement: 70 of 90 = 78%
Densities off by more than one class: 2 of 90 = 97.8% correct
Primary Species errors, all else correct: 9 of 90 = 90% agreement
Secondary species was primary species: 5 of 90 = 94.5% agreement
Density incorrect by 2 or more density classes: 2 of 90 = 97.8% agreement
Size class incorrect by 2 or more size classes: 2 of 90 = 97.8% agreement
Classification disagreement in 2 or more items: 0 of 90

Therefore the major "accuracy" problem in the analysis is that areas were classified as some combination of blue oak coast live oak and valley oak whereby a "better" oak WHR association label was applied the ground. The other species errors were a result of the area being classified was interpreted as "riparian" whereby to the field crew it appeared to be more properly classified as coast live oak, valley oak or blue oak.

6. Rare Plants

I looked into the presence of rare plants, identifying all rare plants which are locally known. These plants are listed below. I spoke with Dave Chipping of Calpoly, Jody of CNPS Atascadero, and Hazel Gordon, USFS vegetation ecologist. None knew of any rare plants in Atascadero proper, but all agreed that protection of rare plants in the area is, as in WHR, a matter of habitat

[2] Milliken and Beardsley (1998)

protection. We do know that rare and endangered plants and fauna have been found to occur on the Atascadero Quadrangle on dry serpentine and chaparral hillsides and, to a lesser extent, in riparian zones. The listing below identifies rare and endangered species in Atascadero and their habitat preferences. Field searches have not been conducted.

Natural Diversity Database Listing for Atascadero Quadrangle

SCINAME	ATASCADERO Habitat	FEDSTATUS	CALSTATUS	CDFG	CNPSLIST
Rana aurora draytonii	Wet ponds, bogs, water	Threatened	None	SC	
Antrozous pallidus	pallid bat/ variety of habitats	None	None	SC	
Emys (=Clemmys) marmorata pallida	southwestern pond turtle wetland habitats	None	None	SC	
Northern Interior Cypress Forest	Unknown in Atascadero	None	None		
Polyphylla nubila	Atascadero june beetle	None	None		
Cirsium fontinale var. obispoense	Seeps in woodland/chaparral endemic	Endangered	Endangered		1B
Arctostaphylos pilosula	Chaparral endemic	None	None		1B
Arctostaphylos wellsii	Chaparral endemic	None	None		1B
Astragalus didymocarpus var. milesianus	Chaparral endemic to 200' elev.	None	None		1B
Erodium macrophyllum	Grassland/woodland	None	None		2
Monardella palmeri	Chaparral, Foothill Woodland endemic	None	None		1B
Malacothamnus palmeri var. involucratus	Chaparral, Foothill Woodland shrub endemic	None	None		1B
Malacothamnus palmeri var. palmeri	Chaparral endemic	None	None		1B
Sidalcea hickmanii ssp. anomala	Closed cone pine (knobcone) forest endemic	None	Rare		1B
Chorizanthe breweri	Chaparral, Foothill Woodland, Coastal Sage Scrub, Closed-cone Pine Forest endemic	None	None		1B
Chorizanthe rectispina	Chaparral, Foothill Woodland, Northern Coastal Scrub, Coastal Sage Scrub (3 county endemic)	None	None		1B
Eriastrum luteum	Chaparral, Foothill Woodland	None	None		1B
Horkelia cuneata ssp. puberula	unknown	None	None		1B
Carex obispoensis	Coastal Prairie, Chaparral, Coastal Sage Scrub, Closed-cone Pine Forest, Valley Grassland (2 county endemic)	None	None		1B
Calochortus obispoensis	Chaparral, Valley Grassland, Coastal Sage Scrub only in SLO county	None	None		1B

7. Wildlife Corridors.

Core habitat for every wildlife species constitutes a mosaic of places where that species has competitive advantage in acquiring its requirements for food, water, protective shelter, reproductive opportunities and dispersal mechanisms. The home range requirement for each species is different.

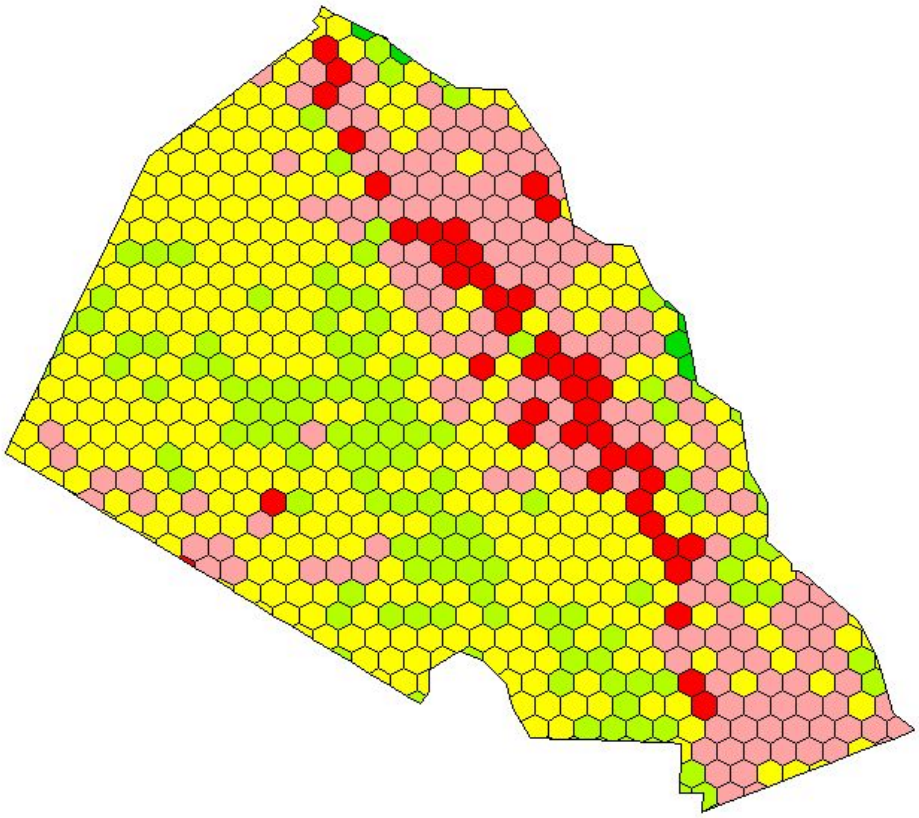
There are many approaches to assessment of habitat suitability. The GIS and inventory products of this project are compatible with WHR, which provides informational tools for habitat conservation. A common need for planning purposes is to use GIS tools to use indicators of biodiversity in order to evaluate relative habitat quality and viability. Cameron (2006) at the Nature Conservancy in San Francisco is working to identify priority areas for biological conservation throughout the region of California's private rangelands and woodlands, including Atascadero. His methodology is to attach highest conservation priorities to less-fragmented planning units with the highest concentrations of riparian forest and shrub, blue oak and annual grassland types. Any outlying areas harboring rare and endangered species are also added to the map. Once possible conservation areas are identified, the methodology assigns a conservation suitability varaiable value to those areas which are on or adjacent to conservation lands, are less fragmented by roads, or which are undeveloped and away from settlement areas. Although his project area is 28 million acres in size, Cameron has identified target areas in San Luis Obispo County.

Atascadero habitat evaluation needs are of a different scale, and have the additional advantage of the ground woodland inventory data so that assessments of far greater precision can be obtained. Therefore I used a combination of Cameron, the F&G (2002) Atlas methodology and the WHR data we developed to provide an initial estimate of generalized habitat suitability.

There are presently 59 wildlife habitats in the WHR system. We commonly have approximately 11 of these habitats in Atascadero. To preliminarily evaluate indicators of Atascadero habitat value I created a grid of 100-acre honeycomb-shaped hexes that overlays the Atascadero WHR map. I then assigned a relative value to each WHR habitat type. For each polygon I then multiplied the cumulative area of each WHR type in each hex polygon times the relative (and somewhat arbitrarily assigned) habitat value afforded by the type. I assigned a negative value to road and urban hardscape types. The attached map shows the derived habitat values for 100 acre blocks within Atascadero City and Colony. Note that the science behind the habitat values is subjective and can be further developed using WHR software which targets specific species.

HABITAT SUITABILITY INDEX

Red= no habitat
Pink=poor
Yellow=fair
Lt. Green=good
Dark green=very good



Wildlife corridors and habitat for specific species of interest can be identified using WHR 8.0 provided by Fish and Game. Having assigned WHR codes for all the areas in the City, wildlife habitat relations can be readily assessed using the science base of the WHR system. This will be very useful for specific planning efforts as individual permit applications are received.

7. Recommendations.

Valley Oaks. Large old Valley Oaks in Atascadero are exhibiting serious decline. While many areas of Atascadero are excellent growing sites for these large trees, many or most of the local population have serious rot and appear to be at the very end of their life cycle. This will lead to significant loss of heritage trees and habitat. I recommend protection of all large valley oaks and landowner incentives to plant and protect young valley oaks. A more intensive

(100%) inventory of large valley oaks would provide detailed information on this population that is only partially described via this current inventory project.

Blue Oaks. This is one of the very valuable habitat types, valuable to a large number of species. At the minimum we should assure for protection and regeneration of blue oaks and leave as much undeveloped blue oak habitat as possible.

Coastal Oak Woodlands. These types generally appear healthy, extensive in Atascadero. Encourage size and age class diversity.

Shrub lands. These lands are less diverse, heavily vegetated with shrub cover, and provide very sparse woodland cover. Chaparral shrublands are dominated by chamise (Adenostoma fasiculatum) on thinner soils. In some cases chaparral scrublands harbor R&E species and should be carefully surveyed.

Riparian corridors. These corridors, especially in perennially wet areas and seeps, are biodiverse, provide rare and endangered habitat and biodiversity. Protection buffers for streamside conservation areas should be maximized where possible.

Native Plant Education and Nursery Stock Availability. ANTA and the City should continue their community education projects, including neighborhood habitat protection and assuring the availability of native woodland species for landscaping purposes.

Tree Ordinance. The Atascadero Tree Ordinance, which I have not seen, should be reviewed to assure that it is effectively protecting Atascadero's significant vegetation and habitat types.

Fire. Consider the impacts of wildland fire when making policy and planning decisions. Fire hazard has not been addressed in this report.

More analysis of data. This inventory provides baseline GIS coverages and inventory data. These data are compatible with the WHR system as provided by the California Department of Fish and Game (CDFG 2002). Further analyses of this information base in cooperation with ANTA and planning staff is now necessary. Landscape analyses should consider the "outlying habitat" beyond the City and Colony boundaries.

Periodic Update. Many areas of Atascadero have changed even since the 2002 imagery. The GIS coverage and mapping should be regularly updated. The tree inventory should be updated every 10-20 years.

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Appendix 1. Inventory Methods and Specifications:

Atascadero Forest Inventory October 2006

Two ¼ acre(58.9′ radius) for trees > 24″ & 1/8th acre nested large tree plots (41.8' radius) for trees 5-23″ dbh, and 1/100th acre small tree plots (11.6' radius) for regeneration and 1-5" dbh trees within the subject polygon at each location as indicated on the imagery. The first fixed plot will be at the plot center as indicated on the map, and the second will be centered 100' away in a cardinal direction (N, E, S, W in that order of priority) that stays within the polygon. Record the direction you went to the second fixed plot in the comments secions 14-16. In field #2 Label each plot number per the printout appended with A and B for fixed plot A or fixed plot B, eg. 161A and 161B.

At each origin point:

Place a temporary stake in the ground. GPS location or mark on the map provided if possible. Take a photo which best characterizes the polygon you are sampling. If necessary take two photos. Record the plot number in field 2 and the photo jpg file # (in comments fields 14-16) or put a placard within the photo indicating the plot number.

Identify in the comments section and record a “field cover WHR type” (VOW, VRI, COW, BOW, BOP, SHB etc.) in fields 14-16.

At each of the 2 fixed plots:

Use one plot sheet per plot (e.g. plot 161 A & B) and one line per record/tree.

On the 1/8th acre plot start measuring all trees 5.0" and larger in diameter at breash height (4.5′ above ground level on the uphill side) clockwise from north. Use one line on the tally sheet for each tree. All live and dead trees within 41.6′ horizontal distance of each of the two plot centers are to be considered “in” and should be tallied and F records with Plot factor 125.

On the 1/100th acre plot all live and dead trees within the 11.8′ (horizontal distance) radius and from 1″ to 5″ dbh will be measured as F records with plot factor of 10.

All Seedlings 1′ tall to .99″ dbh will be tallied by species as S records with a plot factor of 10. A clump or seelings coming from a single root cluster is to be recorded as a single seedling.

For each tree that falls on the 1/8 and 1/100 acre plots as defined above record the following on the plot sheet provided:

For each record type F (fixed plot) tree:

Field 1: F
Field 2: Plot Number + A or B
Field 3: blank
Field 4: 10 (1/100th acre) for 1-4″ dbh trees or 125 (1/8th acre) for dbh >=5″
Field 5: Species Code (see tally sheet)
Field 6-7: Position and crown ration (see tally sheet)
Field 8: blank

Field 9: Death/Defect (see tally sheet for codes). A dead tree will have crown ratio of zero and a "D" in field 9.
Field 10: blank
Field 11: Diameter at breast height in inches
Field 11: Height in feet optional
Field 12: Age in years (optional)
Fields 14-16: Comments you think might help.

If a single live or dead tree has multiple stems at dbh please record each as a separate tree then link all the records together via a bracket in the left hand column of the plot sheet.

Should you encounter species not on the list record them as 98/99 and write the species name in the comments section (fields 14-16).

For Record type S(seedling):

Field 1: S
Field 2: Plot Number + A or B
Field 3: # of seedlings for that species
Field 4: 10 (1/100th acre)
Field 5: Species Code
Field 12: Average Height

Notes: Count the number of seedlings by species (1′ tall to 1″ dbh on the 1/100th acre plot and record that in Field #3. Record average seedling height in feet in Field #12.

Record B (shrub) record (up to 3 records per fixed plot):

Field 1: B
Shrubs

Field 1: B
Field 4: 125 (1/8th acre)
Field 5: Shrub Species (if known) or else "US" for all unknown shrubs.
Field 8: Estimate the % woody shrub cover on the 1/8th acre plot.
Field 12: Average estimated height in feet of the shrub cover for that species.
Comments. Please record any comments that you think are important.

For record types E (forbs) and G grasses (1 record per fixed plot):

Estimate the % forb cover on the 1/8th acre plot in field 8 and average height in feet of the shrub cover in field 12.
Field 1: E or G
Field 4: 125 (1/8th acre)
Field 5: Forb Species (if known) else "UF" for summation of all unknown shrubs.
Field 8: Estimate the % forb cover on the 1/8th acre plot.
Field 12: Average estimated height in feet of the forb/grass cover for that species/group.

Comments. Please record any comments that you think are important.

The Inventory Plot FIELD TALLY SHEET

Atascadero Inventory Tree Plot Record

Field 4: Plot Factor 10 = 1/100th acre 125 = 1/8th acre Field 11 DBH expressed in inches
Field 2: Point Number (see map). E.G. 31a is is origin of plot 31 and 31b is the 2nd (outbound point within the polygon)
Field 12: Optional Height expressed in total feet Field 13: optional age expressed in years

COMMENTS: SHEET ____ OF ____

Field 1, Record Type
- P Prism Tree Record
- M Measured Tree Record for prism plot
- N Measured Tree Record for fixed plot
- S Seedling Record for fixed area plot
- F Fixed Area Plot Tree Record
- D Down Log Record for fixed area plot
- X Non-stockable Plot

Field 6, Crown Position
- P Predominant
- D Dominant
- C Codominant
- I Intermediate
- S Suppressed

Field 7, Crown Ratio

1	0-10	6	51-60
2	11-20	7	61-70
3	21-30	8	71-80
4	31-40	9	81+

Field 9, Dead Trees
- D1 Dead 0-5 yrs, not salvable
- D2 Bark and sapwood mined
- D3 Sapwood decayed
- D4 Mound of wood around base
- D5 Decomposed wood

Species Codes:
70: buckeye
94: madrone
98: other conifer
99: other hardwood
81: black oak
82 coastlive oak
83: valley oak
85: interior live oak
86: blue oak
91: california bay
92: sycamore 23: gray pine

Field 9, Other Species
- 00 No visible defects
- 19 Multiple tops top 1/3
- 21 Rotten butt scar
- 22 Quinine/sulfur
- 23 Single other conk
- 24 Conks>10ft apart
- 25 Broken top
- 51 IC>140 years
- 91 Rotten cull
- 92 Rough cull
- 99 Noncom. species

TREE RECORD

1. RECORD TYPE X	2. POINT NO. XX	3. TREE/LOG NO. OR #/SEEDLINGS XXX	4. PLOT FACTOR XXXX	5. SPECIES XX	6. POSITION X	7. CROWN RATIO X	8. % shrub/forb cover X	9. DEATH-DEFECT DECAY XX	10 OPTIONAL X	11. TREE DBH OR LOG DIAMETER XXXX	12. OPT TREE HEIGHT OR LOG LENGTH XXX	13. OPT AGE YEARS XXX	14. COMMENTS XX	15. COMMENTS XXX	16. COMMENTS XX

PREVIOUS EDITION OBSOLETE