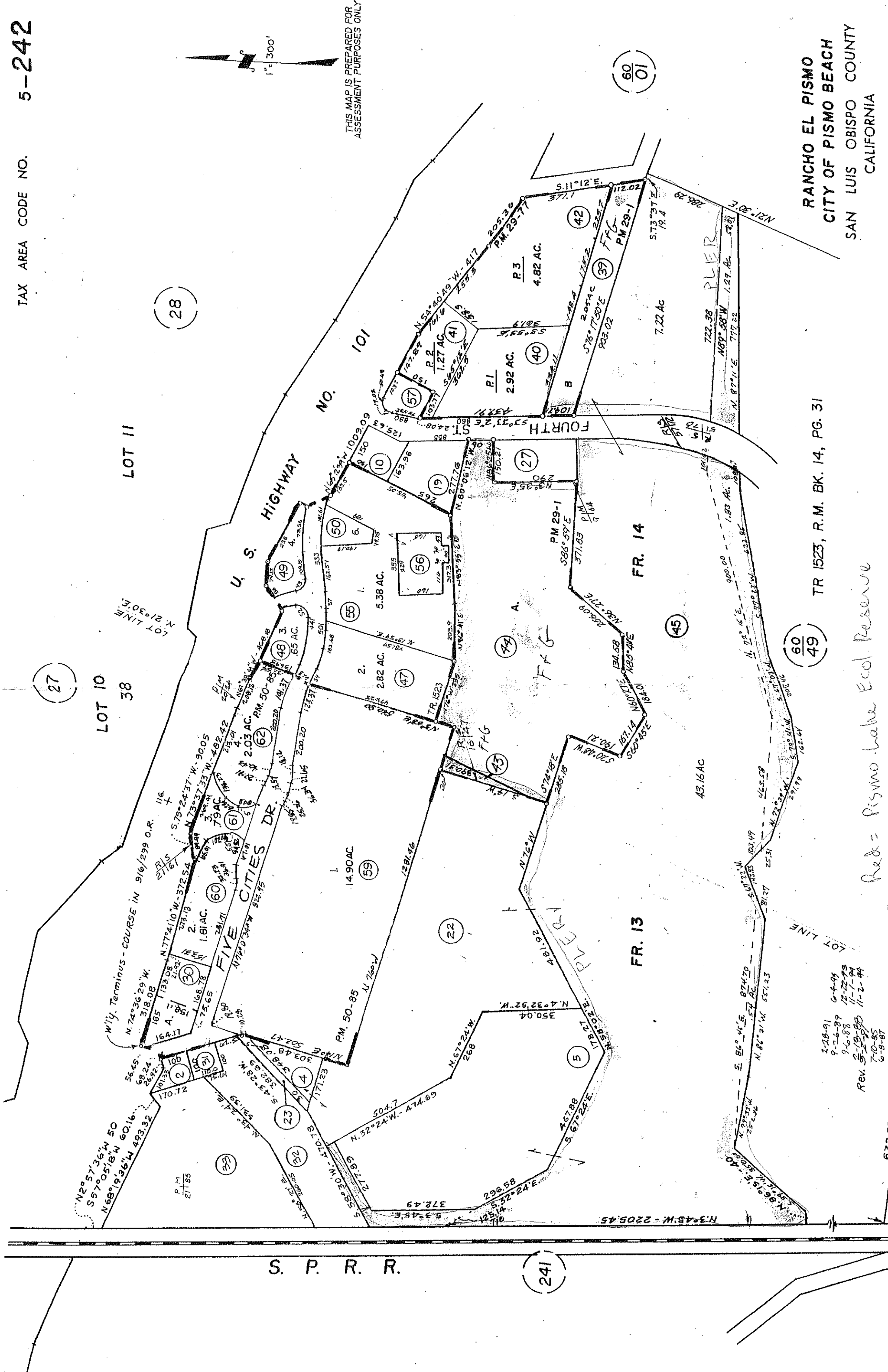


Appendix A  
Parcel Maps



THIS MAP IS PREPARED FOR ASSESSMENT PURPOSES ONLY



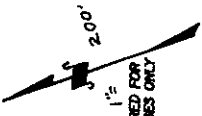
RANCHO EL PISMO  
CITY OF PISMO BEACH  
SAN LUIS OBISPO COUNTY  
CALIFORNIA

TR 1523, R.M. BK. 14, PG. 31

*Red = Pismo Lake Ecol. Reserve*

2-28-91  
9-2-89  
9-6-88  
REV. 2-18-88  
7-10-85  
6-8-85

632.83



THIS MAP IS PREPARED FOR ASSESSMENT PURPOSES ONLY

HIGHWAY NO. 101

(EL CAMINO)

PTN. LOT II

5C

R15  
R126

S. 10350'

RHO. EL PISMO

242

48  
10.02 AC.

49  
5.62 AC.

34.

012

492

TRACT 1080, R.M. 12-86

FRONTAGE ROAD

60



014

TOWN OF GROVER  
CITY OF GROVER BEACH  
SAN LUIS OBISPO COUNTY  
CALIFORNIA

REV. 4/10/72  
12/19/85  
4-14-86  
2-25-87

RANCHO EL PISMO

BK. 5

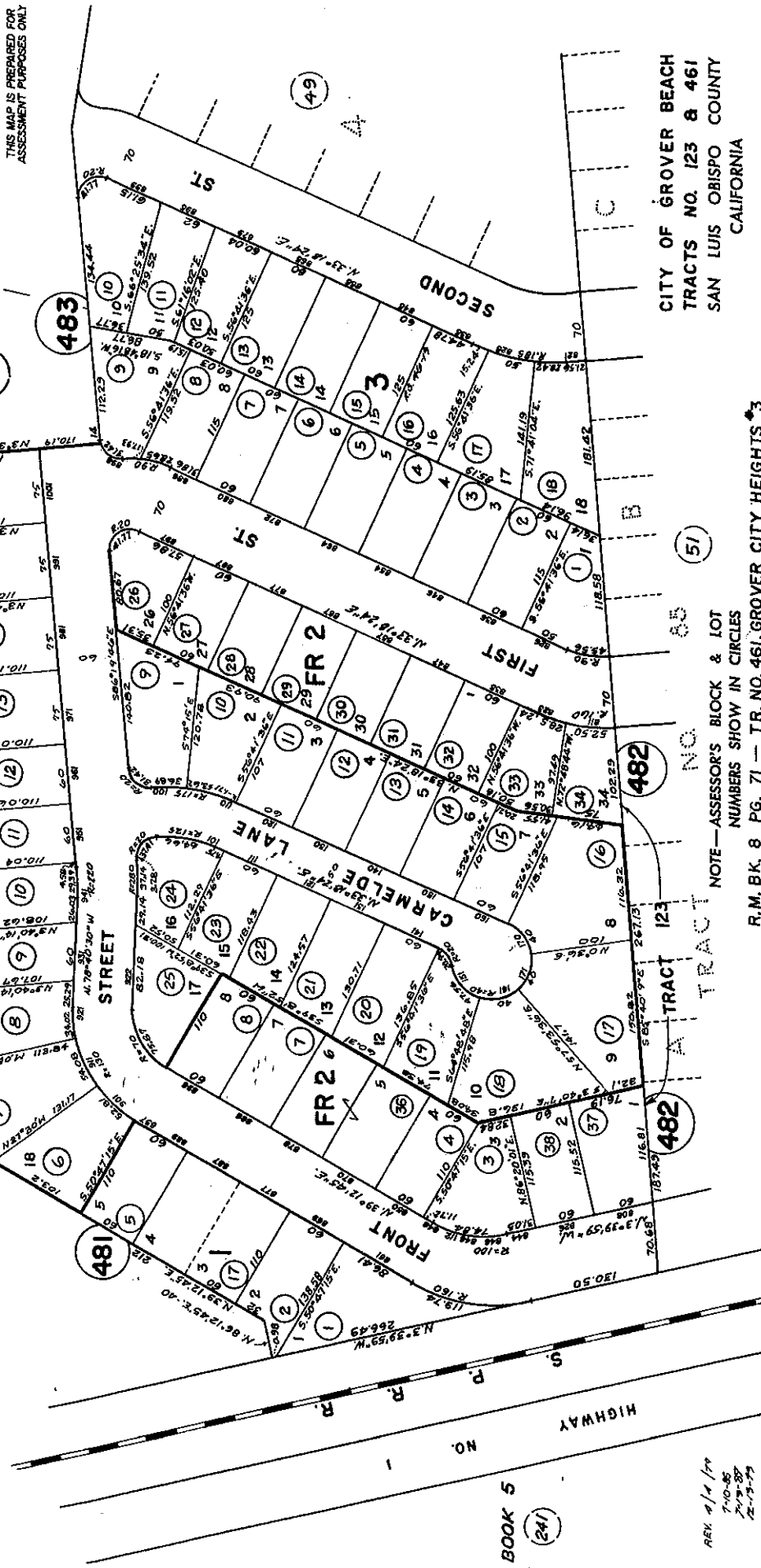
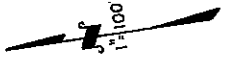
TRACT 461

481

483

49

THIS MAP IS PREPARED FOR ASSESSMENT PURPOSES ONLY



CITY OF GROVER BEACH  
TRACTS NO. 123 & 461  
SAN LUIS OBISPO COUNTY  
CALIFORNIA

NOTE—ASSESSOR'S BLOCK & LOT  
NUMBERS SHOW IN CIRCLES

R.M. BK. 8 PG. 71 — TR. NO. 461, GROVER CITY HEIGHTS #3

BOOK 5

(241)

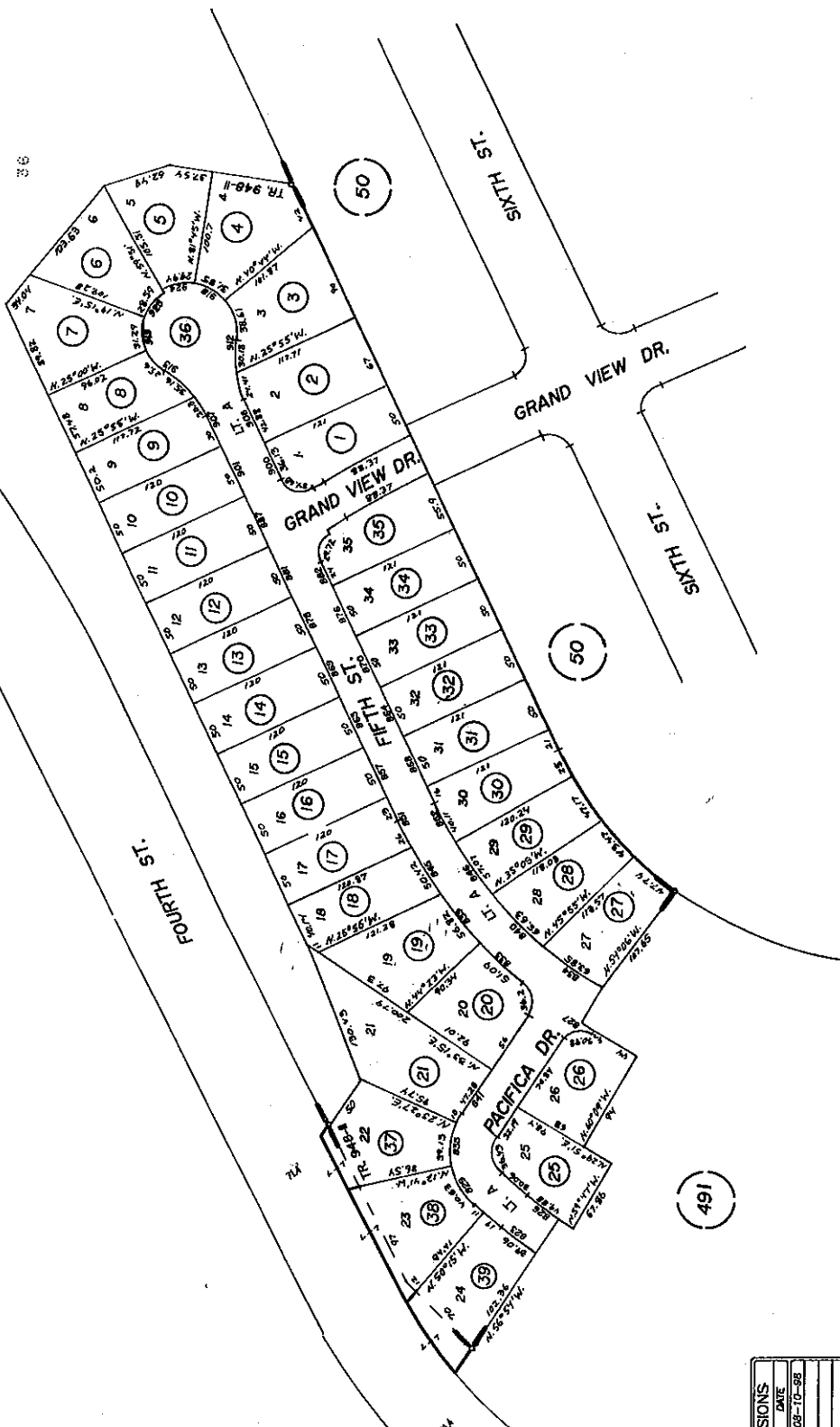
REV. 1/1/77  
7-10-85  
7-9-89  
2-17-93





492

491

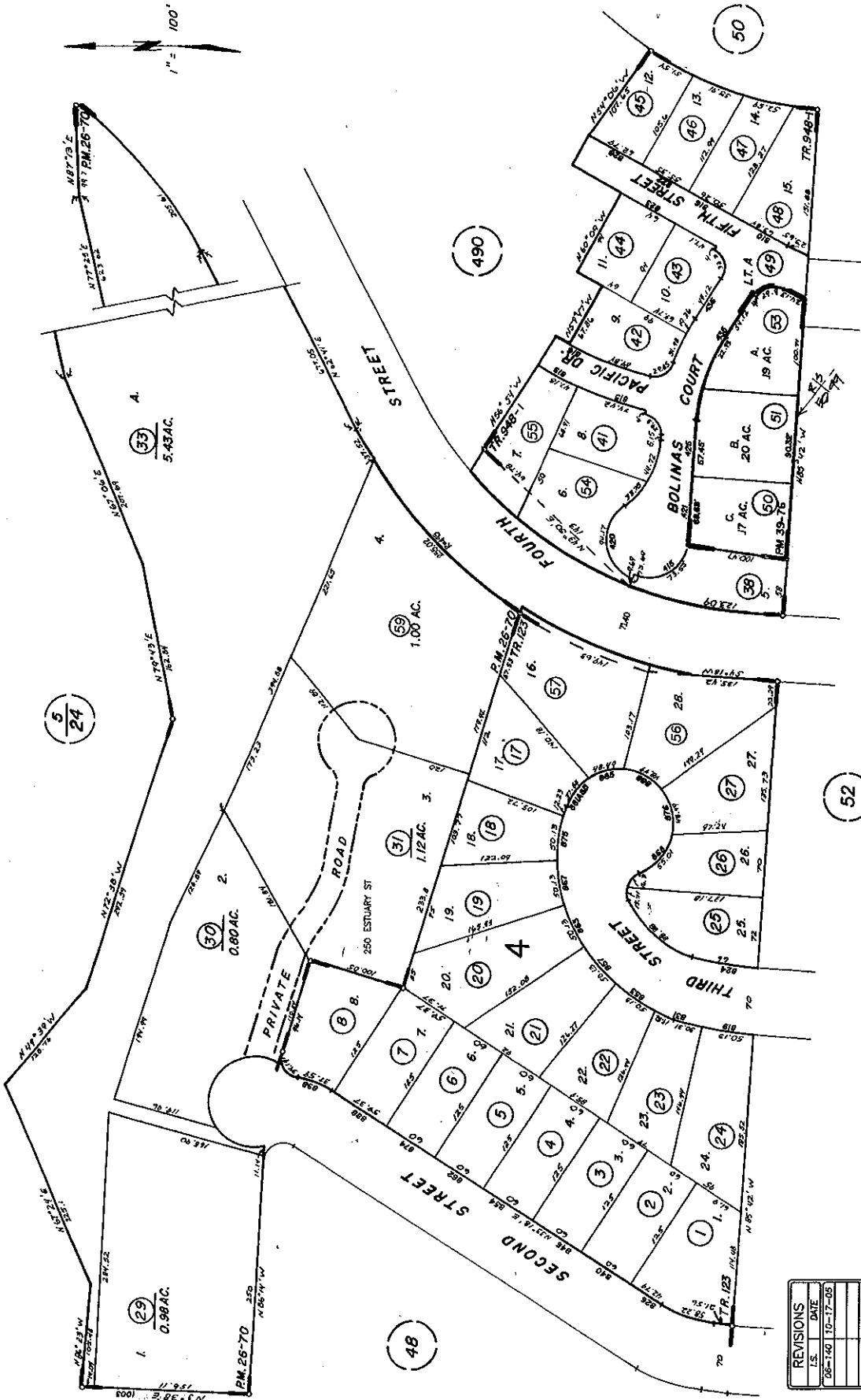


GM  
08-10-98  
THIS MAP IS PREPARED FOR  
ASSESSMENT PURPOSES ONLY.

REVISIONS	
TECH	DATE
GM	08-10-98

CITY OF GROVER BEACH  
ASSESSOR'S MAP COUNTY OF  
SAN LUIS OBISPO, CA  
BOOK 060 PAGE 490

TRACT 948, PHASE II, R.M. 13-100



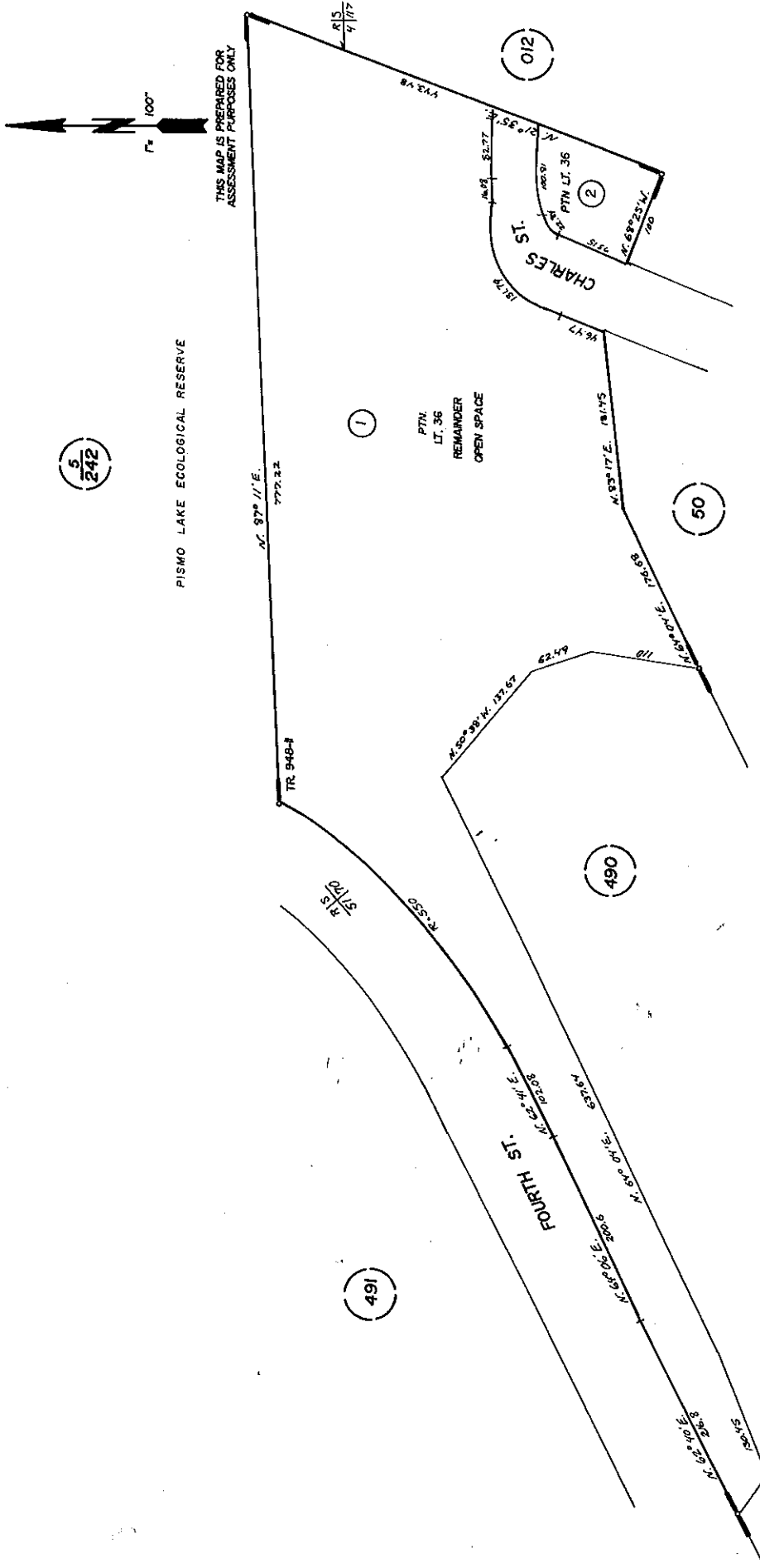
REVISIONS	DATE
06-140	10-17-05

50' 0 100' 200'

JAN  
09-10-98  
THIS MAP IS PREPARED FOR  
ASSESSMENT PURPOSES ONLY.

TRACT 123 ; R.M. Bk. 6 ; Pg. 1  
TRACT 948-1 ; R.M. Bk. 12, Pg. 32.

CITY OF GROVER BEACH  
ASSESSOR'S MAP, COUNTY OF  
SAN LUIS OBISPO, CA.  
BOOK 060 PAGE 491



CITY OF GROVER BEACH  
 Assessor's Map, County of  
 San Luis Obispo, Calif.

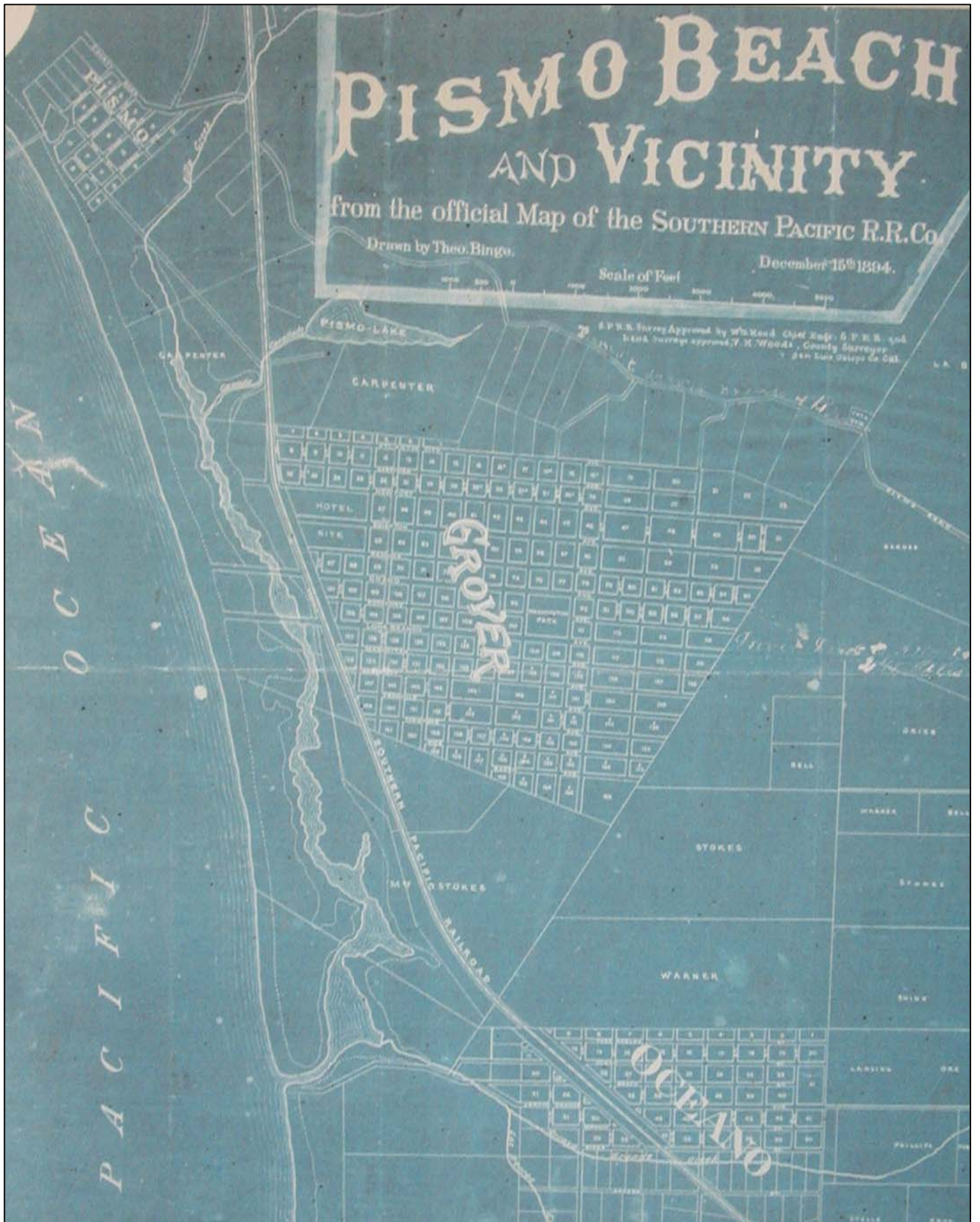
TRACT 948, PHASE II, R.M. 13-100

REV. 8-10-87  
 2-2-89

## Appendix B

Map of Pismo Lake Vicinity, 1894

Map of Pismo Lake Vicinity circa 1894



Appendix C  
Vegetation Map, 1976

# PISMO MARSH VEGETATION & HABITAT TYPES

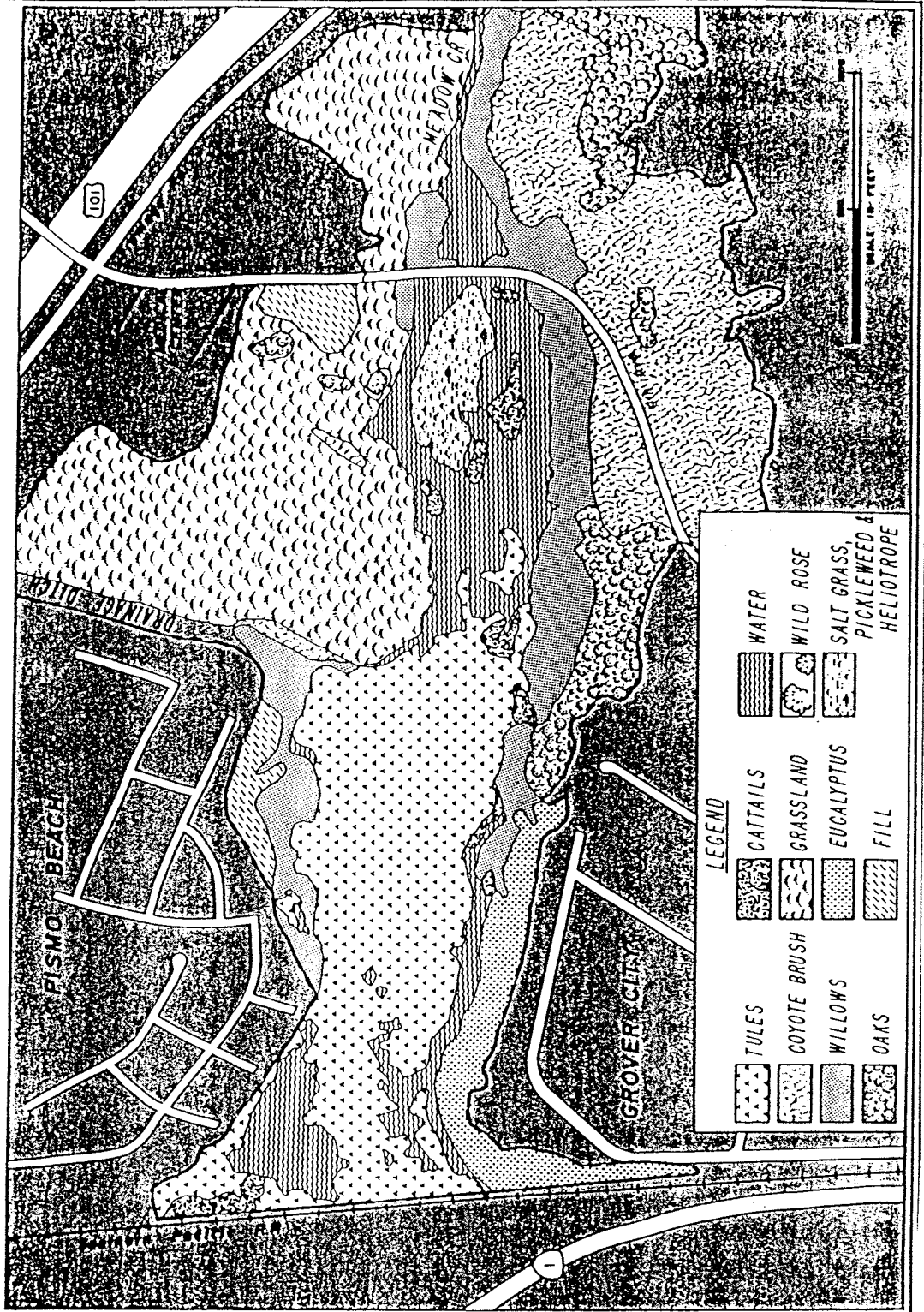


FIGURE II-4 Map of former vegetative distribution for Pismo Lake Cal. Dept. Fish and Game, 1976

## Appendix D

Pismo Lake Restoration Project As-Built Drawings, 1985



# PISMO LAKE

## WATER BASED WILDLIFE RESTORATION R C & D PROJECT MEASURE

SPONSORED BY:

CALIFORNIA DEPARTMENT OF FISH AND GAME

COASTAL SAN LUIS RESOURCE CONSERVATION DISTRICT

CENTRAL COASTAL RESOURCE CONSERVATION & DEVELOPMENT COUNCIL

**As Built**

PREPARED BY:

U. S. D. A. SOIL CONSERVATION SERVICE

SANTA MARIA FIELD OFFICE



CONTRACTOR -- H. D. PETTIONE INC

CONTRACT NO. 50-9104-6-4

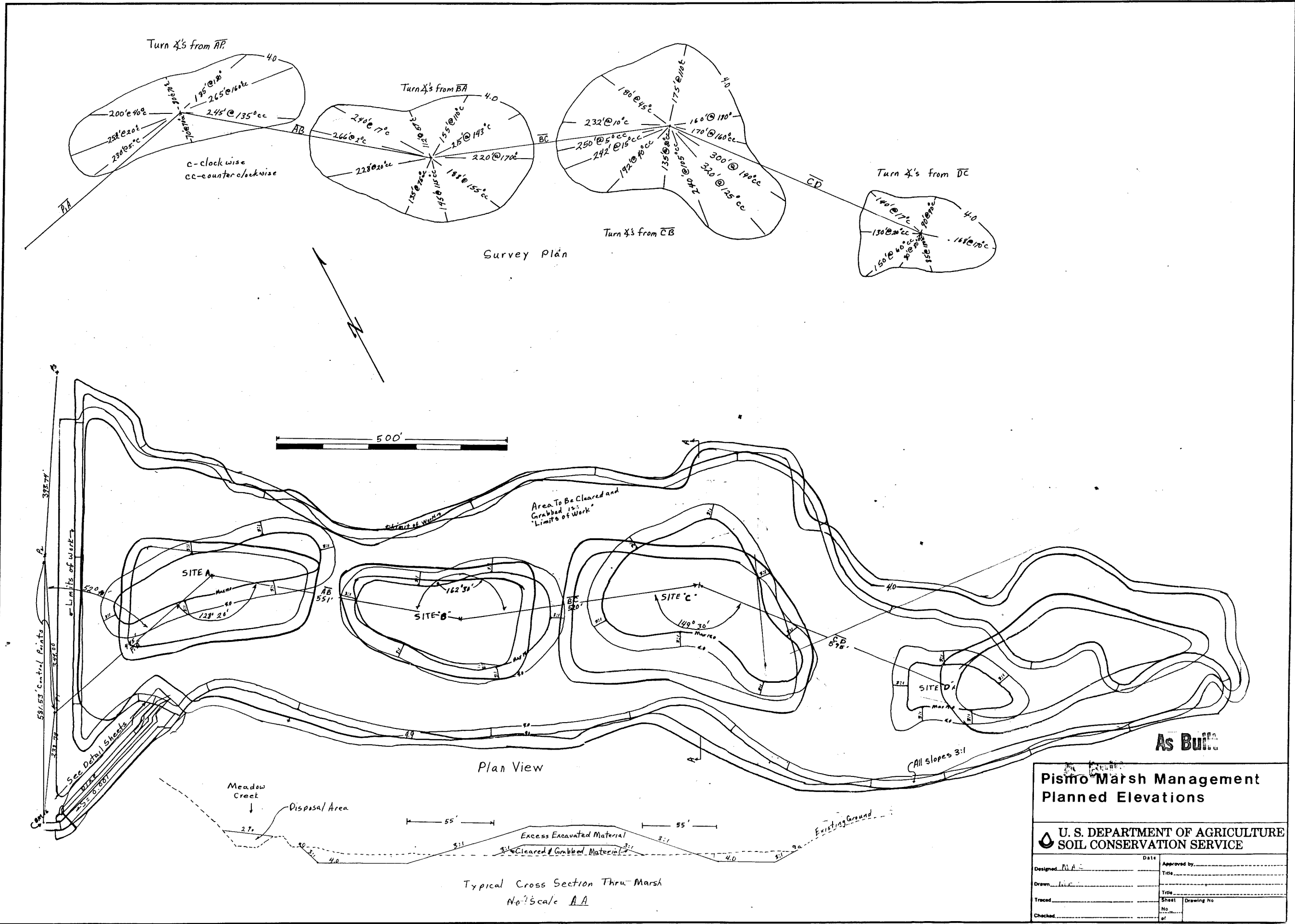
COMPLETION DATE: NOV. 4, 1986

GOVERNMENT REP. - MARK COCKE

INSPECTOR - TOM BURNHAM

APPROVED BY: *Charles Davis*

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designed .....	Date .....
Drawn .....	Approved by <i>H. D. Pettione</i>
Traced .....	Title SANTA MARIA FIELD OFFICE
Checked .....	Sheet No. 1 of 5
	Drawing No. 85-04

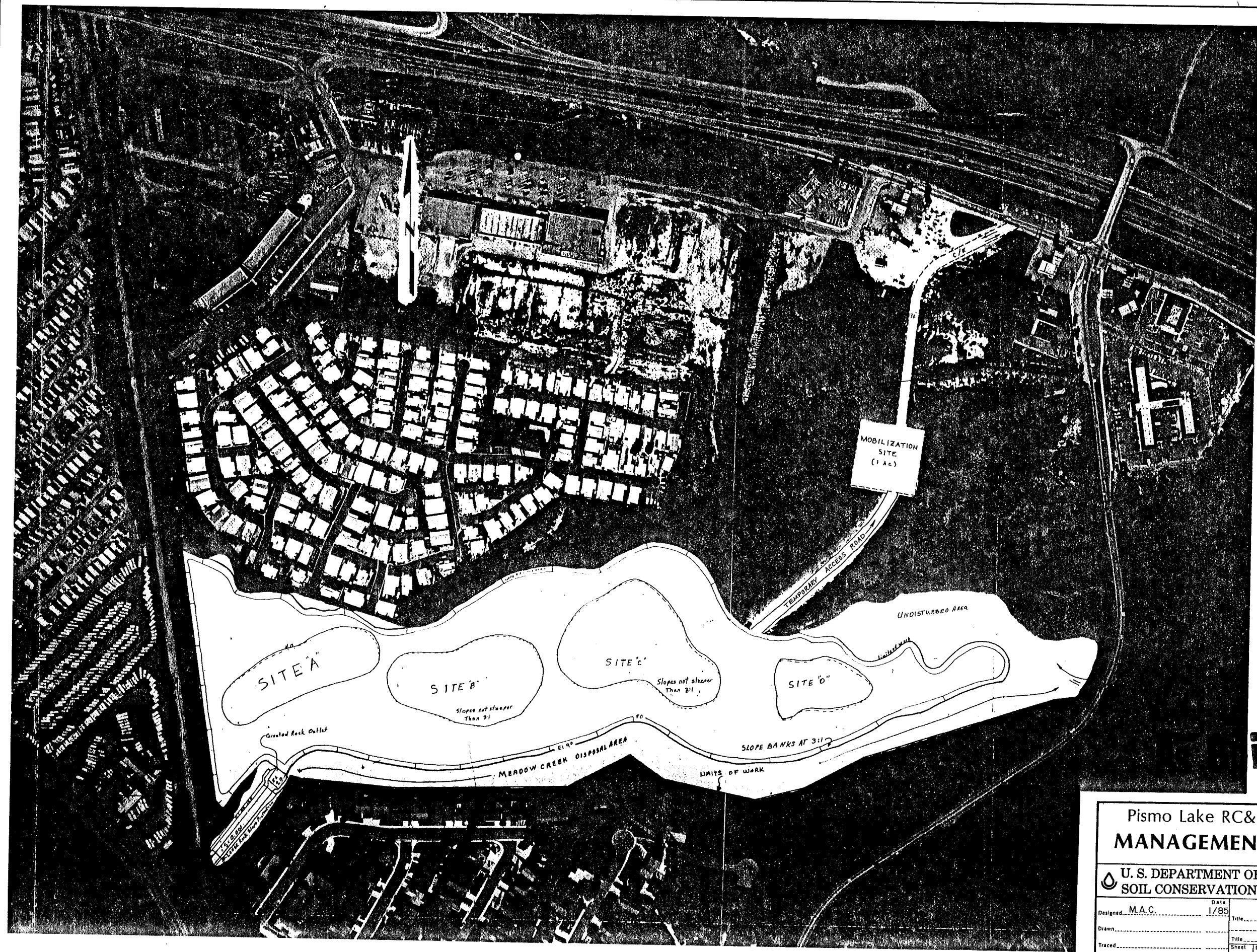


**Pismo Marsh Management  
Planned Elevations**

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Designed: N.A.C.	Date:	Approved by:
Drawn: L.V.C.		Title:
Traced:	Sheet No.:	Drawing No.:
Checked:	of:	

SCS-ENG-313C (REV. 1-61)

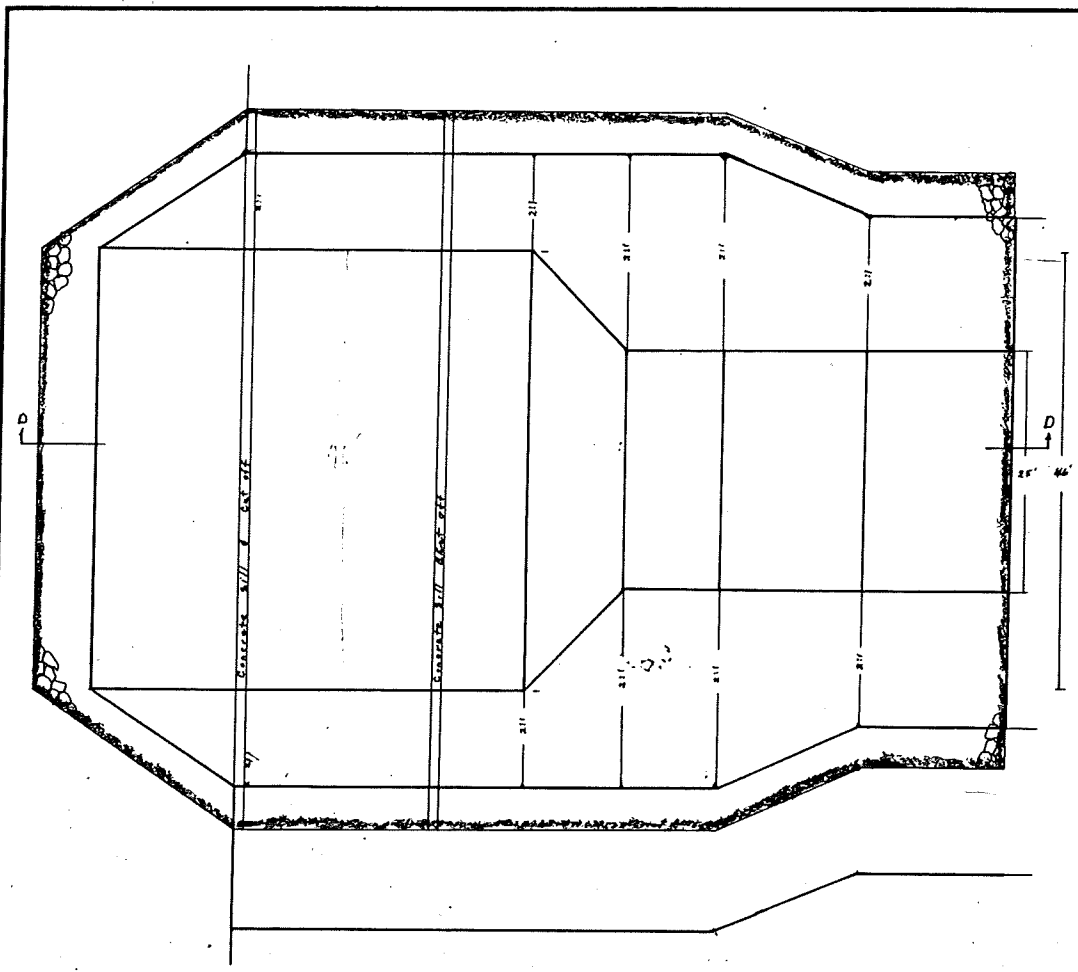


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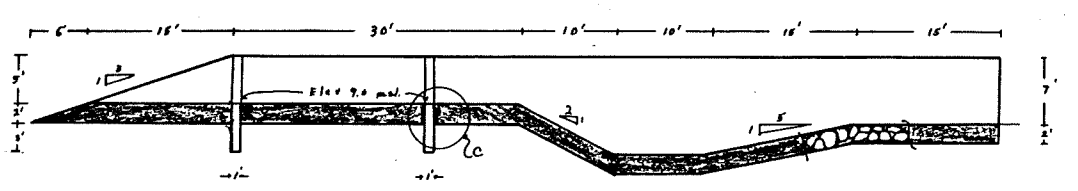
Pismo Lake RC&D Project  
**MANAGEMENT PLAN**

U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE

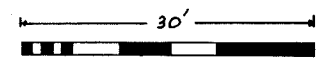
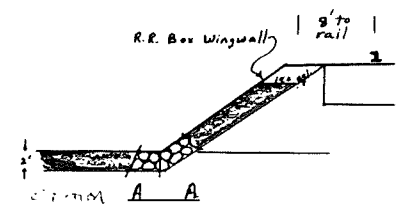
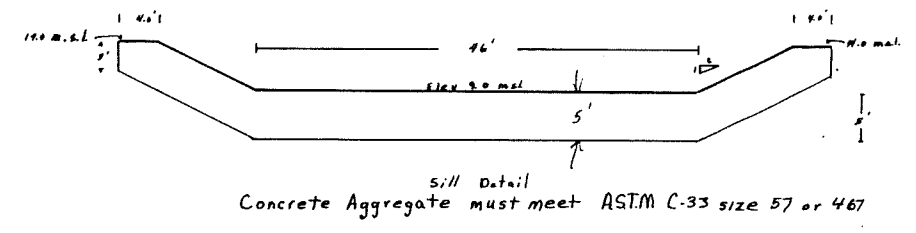
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Drawn.....		
Traced.....		
Checked.....		
	Sheet No. 2 of 5	Drawing No. 85 - 04



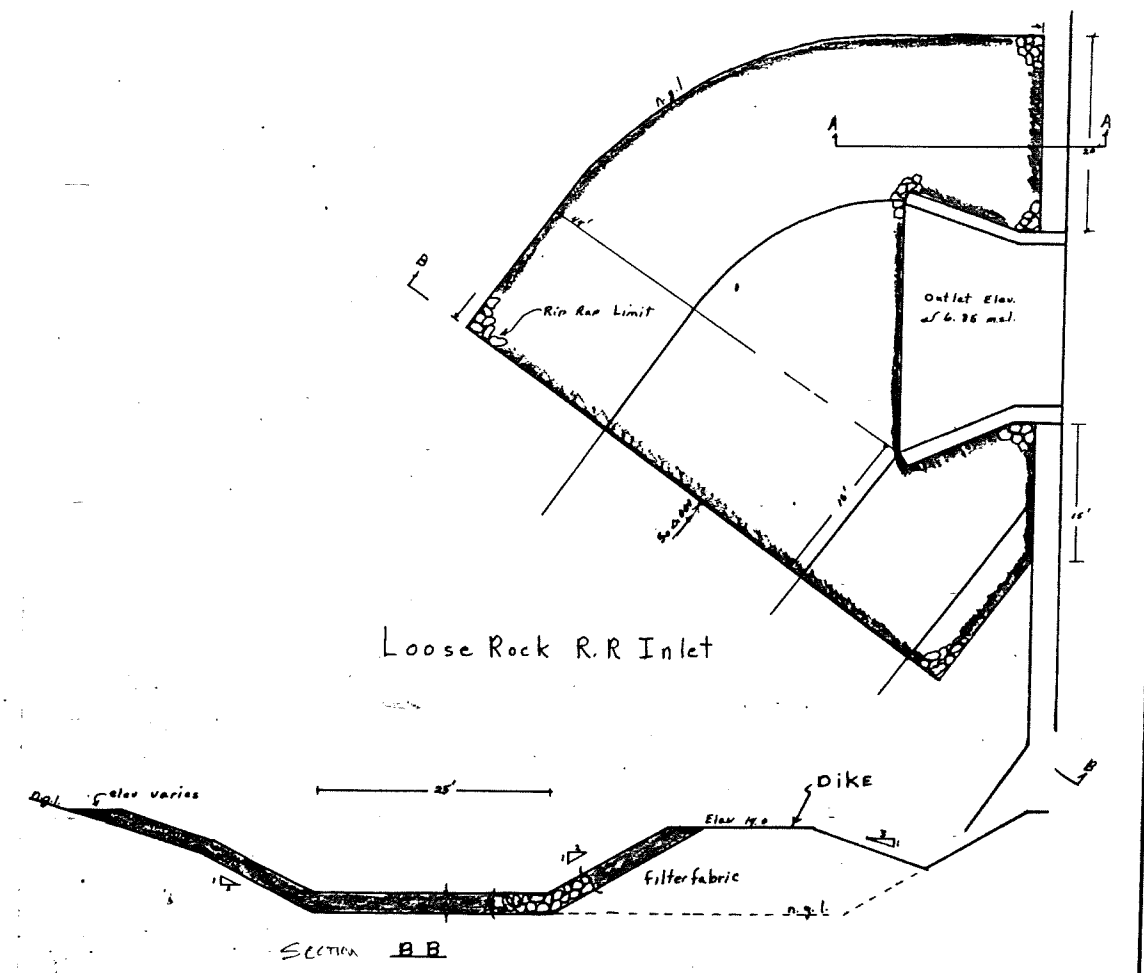
Grouted Rock Outlet



Section D-D



S<sub>h</sub> = 0.001 ft/H

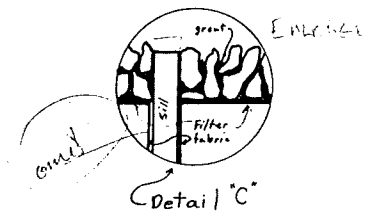


Loose Rock R.R. Inlet

Section B-B

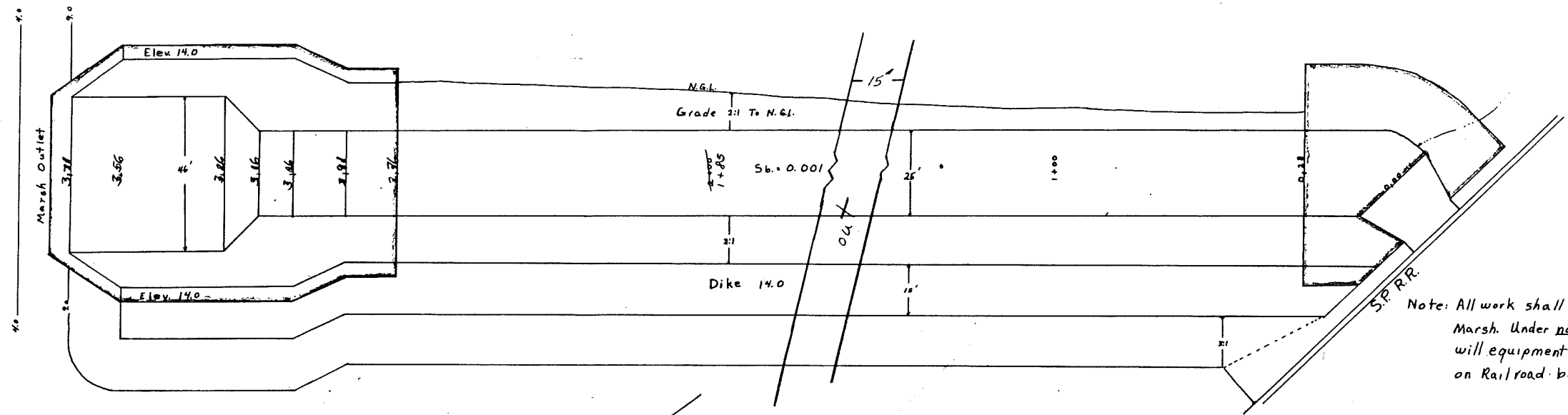
Scale 1" = 10'

Note: Filter Fabric will be placed under all rock and concrete



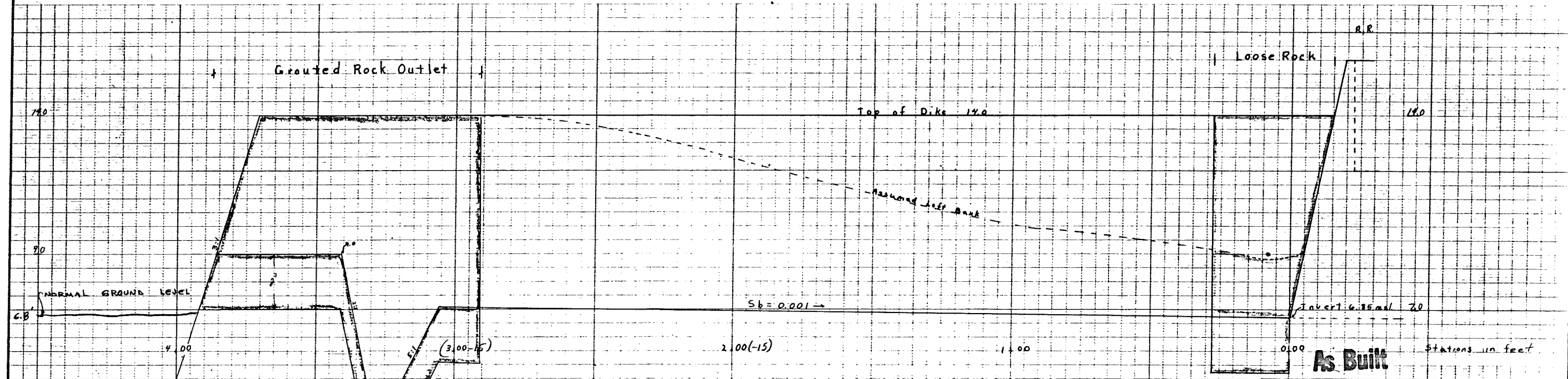
As Built

Pismo Marsh Rock Outlet Details As Built			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed <u>Mac</u>	Date <u>7-85</u>	Approved by _____	Title _____
Drawn <u>Mac</u>	Date <u>1-75</u>	Checked _____	Title _____
Traced _____	Sheet No. <u>5</u>	Drawing No. _____	_____
Checked _____	of _____	_____	_____



Note: All work shall be done from Marsh. Under no circumstances will equipment be allowed on Railroad bed.

50'



**Pismo Marsh Outlet Detail**  
As Built

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Designed.....	Date.....	Approved by.....
Drawn <i>MAC</i>		Title.....
Traced.....		Title.....
Checked.....		Sheet.....
		Drawing.....
		of.....

Appendix E  
Revegetation Plans, 1985 & 1995

Revegetation Plan 1985

<b>Site</b>	<b>Species</b>	<b>Material</b>	<b>Area</b>	<b>Amount</b>
Spillway	Saltgrass	Stolons	24,000 sq. ft.	48 bu
Submerged Aquatics	Sago pondweed	Tubers	10,500 linear ft/ row	21,000 each
	Three square bulrush	Roots	10,500 linear ft/ row	21,000 each
	Wapato duck potato	Tubers	10,500 linear ft/ row	21,000 each
Transition Aquatic	Nodding smartweed	Roots	11,000 linear ft	22,000 each
	Wild millet	Seeds	0.8 acres	24 lbs
Islands	Wild millet	Seeds	6.5 acres	195 lbs
	Wild blackberry	Roots	250,000 sq. ft	2,500 each
Riparian	Black cottonwood	Cuttings	2,350 linear ft.	330 each
	California sycamore	Cuttings	2,350 linear ft.	330 each
	Mulefat	Cuttings	2,350 linear ft.	330 each
	Wild blackberry	Roots	17,500 sq. ft	1,175 each
Upland	Annual ryegrass	Seeds	2 acres	8 lbs
	Blando brome	Seeds	2 acres	8 lbs
	Subterranean clover	Seeds	2 acres	10 lbs
	Woodlypod vetch	Seeds	2 acres	12 lbs
	Quailbush	Seeds	2 acres	8 lbs
	Four-wing saltbush	Seeds	2 acres	8 lbs
	California poppy	Seeds	2 acres	2 lbs

Revegetation List 1995

<b>Species</b>	<b>Totals</b>
Sycamore ( )	75
Box Elder ( <i>Acer negundo</i> )	20
Willow ( )	250
Cottonwood	250
Blackberry ( <i>Rubus ursinus</i> )	100
Dogwood ( <i>Cornus stolonifera</i> )	100
Elderberry ( <i>Sambucus mexicana</i> )	50
Coyote Bush	50
Maples	50
Oaks	30
Nettles	10
#7	30
#8 Hedge Nettle	5
Toyon	190
Bay	50



Appendix F  
Soils Map


Soil Map—San Luis Obispo County, California, Coastal Part  
(Pismo Lake Ecological Reserve)



Soil Map—San Luis Obispo County, California, Coastal Part  
(Pismo Lake Ecological Reserve)

## MAP LEGEND






















### Area of Interest (AOI)


 Area of Interest (AOI)


### Soils


 Soil Map Units

### Special Point Features




-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

 Very Stony Spot

 Wet Spot

 Other



### Special Line Features

-  Gully
-  Short Steep Slope
-  Other






### Political Features

 Cities

### Water Features

-  Oceans
-  Streams and Canals

### Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

## MAP INFORMATION

Map Scale: 1:4,180 if printed on B size (11" × 17") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Luis Obispo County, California, Coastal Part  
Survey Area Data: Version 4, Jan 2, 2008

Date(s) aerial images were photographed: 6/26/2005; 6/6/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

San Luis Obispo County, California, Coastal Part (CA664)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
169	Marimel sandy clay loam, occasionally flooded	13.0	5.5%
170	Marimel silty clay loam, drained	1.0	0.4%
184	Oceano sand, 0 to 9 percent slopes	32.5	13.8%
185	Oceano sand, 9 to 30 percent slopes	58.2	24.7%
189	Pismo loamy sand, 9 to 30 percent slopes	14.6	6.2%
191	Pismo-Tierra complex, 9 to 15 percent slopes	63.2	26.8%
193	Psamments and Fluvents, wet	44.7	19.0%
221	Xererts-Xerolls-Urban land complex, 0 to 15 percent slopes	8.6	3.7%
<b>Totals for Area of Interest</b>		<b>235.9</b>	<b>100.0%</b>

## Appendix G

### Plant Occurrence List and Special Status Plants

**Preliminary Plant Species Checklist**  
**Pismo Lake State Reserve<sup>1</sup>**  
**Pismo Beach, California**

By  
 Neil Havlik, PhD  
 Coastal San Luis Resource Conservation District  
 Kevin Merk  
 Rincon Consultants, Inc.

Scientific name <sup>2</sup>	Common name	Family <sup>3</sup>	Origin	Special Status
<b>TREES</b>				
<i>Alnus rhombifolia</i>	White Alder	Betulaceae	Native	
<i>Cupressus macrocarpa</i>	Monterey cypress	Cupressaceae	Introduced	
<i>Eucalyptus globulus</i>	Blue gum	Myrtaceae	Introduced	
<i>Myrica californica</i>	Wax-myrtle	Myricaceae	Native	
<i>Platanus racemosa</i>	Sycamore	Platanaceae	Native	
<i>Populus fremontii</i>	Cottonwood	Salicaceae	Native	
<i>Pinus radiata</i>	Monterey Pine	Pinaceae	Native	
<i>Quercus agrifolia</i>	Coast live oak	Fagaceae	Native	
<b>SHRUBS</b>				
<i>Artemisia californica</i>	California sagebrush	Asteraceae	Native	
<i>Baccharis douglasii</i>	Marsh baccharis	Asteraceae	Native	
<i>Baccharis pilularis</i>	Coyote bush	Asteraceae	Native	
<i>Brickellia californica</i>	California brickelbush	Asteraceae	Native	
<i>Eriogonum fasciculatum</i>	California buckwheat	Polygonaceae	Native	
<i>Galium porrigens</i>	Climbing bedstraw	Rubiaceae	Native	
<i>Hazardia squarrosa</i>	Saw-toothed goldenbush	Asteraceae	Native	
<i>Heteromeles arbutifolia</i>	Toyon	Rosaceae	Native	
<i>Isocoma menziesii</i>	Isocoma	Asteraceae	Native	
<i>Lotus scoparius</i>	Deerweed	Fabaceae	Native	
<i>Lupinus arboreus</i>	Bush lupine	Fabaceae	Introduced fm N. Ca.	
<i>Mimulus aurantiacus</i>	Bush monkeyflower	Phrymaceae [Scrophulariaceae]	Native	
<i>Nicotiana glauca</i>	Tree tobacco	Solanaceae	Introduced	
<i>Ribes speciosum</i>	Fuschia-flowered gooseberry	Saxifragaceae	Native (but planted)	
<i>Rhamnus californica</i>	Coffee-berry	Rhamnaceae	Native	
<i>Rosa spithamea</i>	Rose	Rosaceae	Native	

<sup>1</sup> This list is unvouchered and is based upon field observations made during the spring and summer 2010.

<sup>2</sup> Nomenclature in THE JEPSON MANUAL that have been superceded are listed in brackets.

<sup>3</sup> Family assignments are in accord with the limits used in the upcoming second edition of THE JEPSON MANUAL. Family names from the first edition are in brackets.

Scientific name <sup>2</sup>	Common name	Family <sup>3</sup>	Origin	Special Status
<i>Rubus vitifolius</i>	California blackberry	Rosaceae	Native	
<i>Salix lasiolepis</i>	Arroyo willow	Salicaceae	Native	
<i>Solanum douglasii</i>	Black nightshade	Solanaceae	Native	
<i>Sambucus mexicana</i>	Elderberry	Adoxaceae	Native	
		[Caprifoliaceae]		
<i>Symphoricarpos mollis</i>	Snowberry	Caprifoliaceae	Native	
<i>Toxicodendron diversilobum</i>	Poison-oak	Anacardiaceae	Native	
<b>HERBS</b>				
<i>Achillea millefolium</i>	Yarrow	Asteraceae	Native	
<i>Ambrosia psilostachya</i>	Western ragweed	Asteraceae	Native	
<i>Amsinckia menziesii</i> subsp. <i>menziesii</i>	Fiddleneck	Boraginaceae	Native	
<i>Anagallis arvensis</i>	Scarlet pimpernel	Myrsinaceae	Introduced	
		[Primulaceae]		
<i>Anthemis cotula</i>	Mayweed	Asteraceae	Introduced	
<i>Artemisia douglasiana</i>	Mugwort	Asteraceae	Native	
<i>Asclepias fascicularis</i>	Milkweed	Apocynaceae	Native	
		[Asclepiadaceae]		
<i>Astragalus gambelianus</i>	Annual milk-vetch	Fabaceae	Native	
<i>Avena barbata</i>	Slender wild oats	Poaceae	Introduced	
<i>Avena fatua</i>	Common wild oats	Poaceae	Introduced	
<i>Brachypodium distachyon</i>	False brome grass	Poaceae	Introduced	
<i>Brassica nigra</i>	Black mustard	Brassicaceae	Introduced	
<i>Brassica rapa</i>	Field mustard	Brassicaceae	Introduced	
<i>Bromus carinatus</i>	Brome grass	Poaceae	Native	
<i>Bromus diandrus</i>	Ripgut brome	Poaceae	Introduced	
<i>Bromus hordeaceus</i>	Soft chess brome grass	Poaceae	Introduced	
<i>Bromus rubens</i> [ <i>B. madritensis</i> subsp. <i>rubens</i> ]	Red brome	Poaceae		
<i>Calandrinia ciliata</i>	Red maids	Montiaceae	Native	
		[Portulacaceae]		
<i>Calystegia macrostegia</i>	Wild morning glory	Convolvulaceae	Native	
<i>Capsella bursa-pastoris</i>	Shepherd's purse	Brassicaceae	Introduced	
<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae	Introduced	
<i>Carex sp.</i>	Sedge	Cyperaceae	Native	
<i>Caulanthus lasiophyllus</i> [ <i>Guillenia lasiophylla</i> ]	California mustard	Brassicaceae	Native	
<i>Centaurea melitensis</i>	Tocolote	Asteraceae	Introduced	
<i>Chenopodium album</i>	Goosefoot	Chenopodiaceae	introduced	
<i>Chlorogalum pomeridianum</i> subsp. <i>pomeridianum</i>	Soap plant	Agavaceae	Native	
		[Liliaceae]		
<i>Chrysanthemum segetum</i>	Corn chrysanthemum	Asteraceae	Introduced	
<i>Cirsium vulgare</i>	Bull thistle	Asteraceae	Introduced	
<i>Claytonia perfoliata</i>	Miner's lettuce	Montiaceae	Native	
		[Portulacaceae]		
<i>Conium maculatum</i>	Poison hemlock	Apiaceae	Introduced	
<i>Cortaderia selloana</i>	Pampas grass	Poaceae	Introduced	

Scientific name <sup>2</sup>	Common name	Family <sup>3</sup>	Origin	Special Status
<i>Cotula coronopifolia</i>	Brass buttons	Asteraceae	Introduced	
<i>Crassula connata</i>	Pygmy weed	Crassulaceae	Native	=Tellaea?
<i>Croton setigera</i> [ <i>Eremocarpus setigerus</i> ]	Turkey-mullein	Euphorbiaceae	Native	
<i>Cynodon dactylon</i>	Bermuda grass	Poaceae	Introduced	
<i>Cyperus eragrostis</i>	Umbrella sedge	Cyperaceae	Native	
<i>Cyperus involucratus</i>	Umbrella sedge	Cyperaceae	Introduced	
<i>Danthonia californica</i>	California oat grass	Poaceae	native	
<i>Dichelostemma capitatum</i>	Blue dicks	Amaryllidaceae	Native	
<i>Deinandra fasciculata</i> [ <i>Hemizonia fasciculata</i> ]	Tarweed	Asteraceae	Native	
<i>Dipsacus sativus</i>	Teasel	Dipsacaceae	Introduced	
<i>Distichlis spicata</i>	Saltgrass	Poaceae	Native	
<i>Ehrharta calycina</i>	Veldt grass	Poaceae	Introduced	
<i>Eleocharis macrostachya</i>	Spike-rush	Cyperaceae	Native	
<i>Elymus glaucus</i>	Blue wild rye	Poaceae	Native	
<i>Elymus multisetus</i>	Big squirrel tail grass	Poaceae	Native	
<i>Erodium botrys</i>	Filaree/storksbill	Geraniaceae	introduced	
<i>Erodium cicutarium</i>	Redstem filaree	Geraniaceae	Introduced	
<i>Erodium moschatum</i>	Green-stem filaree	Geraniaceae	Introduced	
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	Native	
<i>Euthamia occidentalis</i>	Western goldenrod	Asteraceae	Native	
<i>Foeniculum vulgare</i>	Fennel	Apiaceae	Introduced	
<i>Frankenia salina</i>	Frankenia	Frankeniaceae	Native	
<i>Galium aparine</i>	Common bedstraw	Rubiaceae	Introduced	
<i>Geranium dissectum</i>	Annual geranium	Geraniaceae	Introduced	
<i>Helenium puberulum</i>	Sneezeweed	Asteraceae	Native	
<i>Helminthotheca echioides</i> [ <i>Picris echioides</i> ]	Bristly ox-tongue	Asteraceae	Introduced	
<i>Hemizonia corymbosa</i>	coast tarweed	Asteraceae	Native	
<i>Hesperevax sparsiflora</i>	Hesperevax	Asteraceae	Native	
<i>Hirschfeldia incana</i>	Perennial mustard	Brassicaceae	Introduced	
<i>Holcus lanatus</i>	Velvet Grass	Poaceae	Introduced	
<i>Hordeum brachyantherum</i>	Meadow barley	Poaceae	native	
<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	Mediterranean barley	Poaceae	Introduced	
<i>Hordeum murinum</i>	Foxtail barley	Poaceae	Introduced	
<i>Hypochaeris glabra</i>	Smooth cat's ear	Asteraceae	Introduced	
<i>Jaumea carnosa</i>	Jaumea	Asteraceae	Native	
<i>Juncus bufonius</i>	Toad rush	Juncaceae	Native	
<i>Juncus patens</i>	Spreading rush	Juncaceae	Native	
<i>Juncus phaeocephalus</i>	Brown-headed rush	Juncaceae	Native	
<i>Lactuca serriola</i>	Prickly lettuce	Asteraceae	Introduced	
<i>Lamarckia aurea</i>	Goldentop grass	Poaceae	Introduced	
<i>Lathyrus vestitus</i> var. <i>vestitus</i>	Sweet pea	Fabaceae	Native	
<i>Lemna gibba</i>	Duckweed	Lemnaceae	Native	
<i>Lepidium nitidum</i>	Peppergrass	Brassicaceae	Native	
<i>Lepidium strictum</i>	Peppergrass	Brassicaceae	Native	



Scientific name <sup>2</sup>	Common name	Family <sup>3</sup>	Origin	Special Status
<i>Leymus condensatus</i>	Giant wild-rye	Poaceae	Native	
<i>Leymus triticoides</i>	Alkali wild-rye	Poaceae	Native	
<i>Logfia gallica</i> [ <i>Filago gallica</i> ]	Herba impia	Asteraceae	Introduced	
<i>Lolium multiflorum</i>	Ryegrass	Poaceae	Introduced	
<i>Lomatium utriculatum</i>	Biscuit root	Apiaceae	Native	
<i>Lotus humistratus</i>	Deervetch	Fabaceae	Native	
<i>Lupinus bicolor</i>	Miniature lupine	Fabaceae	Native	
<i>Lupinus microcarpus</i>	Chick lupine	Fabaceae	Native	
<i>Lupinus succulentus</i>	Succulent lupine	Fabaceae	Native	
<i>Lythrum hyssopifolium</i>	Loosestrife	Lythraceae	Introduced	
<i>Madia sativa</i>	Coast tarweed	Asteraceae	Native	
<i>Malva nicaeensis</i>	Mallow	Malvaceae	Introduced	
<i>Marah fabaceus</i>	Wild cucumber vine	Cucurbitaceae	Native	
<i>Matricaria discoidea</i> [ <i>Chamomilla suaveolens</i> ]	Pineapple weed	Asteraceae	Introduced	
<i>Medicago polymorpha</i>	Bur-clover	Fabaceae	Introduced	
<i>Melica imperfecta</i>	Melic grass	Poaceae	Native	
<i>Melilotus albus</i>	White sweet-clover	Fabaceae	Introduced	
<i>Melilotus indicus</i>	Yellow sweet clover	Fabaceae	Introduced	
<i>Micropus californicus</i>	Cottonweed	Asteraceae	Native	
<i>Mimulus guttatus</i>	Common monkeyflower	Phrymaceae [Scrophulariaceae]	Native	
<i>Mimulus pilosus</i>	Pilose monkeyflower	Phrymaceae [Scrophulariaceae]	Native	
<i>Muhlenbergia microsperma</i>	Little-seed muhly	Poaceae	Native	
<i>Nassella lepida</i>	Slender needlegrass	Poaceae	Native	
<i>Nassella pulchra</i>	Purple needlegrass	Poaceae	Native	
<i>Oxalis pescaprae</i>	Bermuda-buttercup	Oxalidaceae	Introduced	
<i>Paeonia californica</i>	California peony	Paeoniaceae	Native	
<i>Pellaea andromedifolia</i>	Coffee fern	Pteridaceae	Native	
<i>Pentagramma triangularis</i>	Goldback fern	Pteridaceae	Native	
<i>Phacelia distans</i>	Phacelia	Boraginaceae	native	
<i>Phacelia imbricata</i>	Phacelia	Boraginaceae [Hydrophyllaceae]	Native	
<i>Phalaris aquatica</i>	Harding grass	Poaceae	Introduced	
<i>Pholistoma auritum</i>	Fiesta flower	Hydrophyllaceae	Native	
<i>Plagiobothrys nothofulvus</i>	Popcorn flower	Boraginaceae	Native	
<i>Plantago erecta</i>	Plantain	Plantaginaceae	Native	
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Introduced	
<i>Plantago major</i>	Common plantain	Plantaginaceae	Introduced	
<i>Platystemon californicus</i>	Cream cups	Papaveraceae	Native	
<i>Poa annua</i>	Annual bluegrass	Poaceae	Introduced	
<i>Polypodium californicum</i>	Polypody fern	Polypodiaceae	Native	
<i>Polypogon interruptus</i>	Ditch beard grass	Poaceae	Introduced	
<i>Polypogon monspeliensis</i>	Rabbitfoot grass	Poaceae	Introduced	
<i>Pseudognaphalium biolettii</i> [ <i>Gnaphalium bicolor</i> ]	Everlasting	Asteraceae	Native	

Scientific name <sup>2</sup>	Common name	Family <sup>3</sup>	Origin	Special Status
<i>Pseudognaphalium luteoalbum</i> [ <i>Gnaphalium luteoalbum</i> ]	Cudweed	Asteraceae	Introduced	
<i>Ranunculus californicus</i>	California buttercup	Ranunculaceae	Native	
<i>Raphanus sativus</i>	Wild radish	Brassicaceae	Introduced	
<i>Rubus vitifolius</i>	California blackberry	Rosaceae	Native	
<i>Rumex conglomeratus</i>	Knotted dock	Polygonaceae	Introduced	
<i>Rumex crispus</i>	Curly dock	Polygonaceae	Introduced	
<i>Rumex kernerii</i>	Kerner's dock	Polygonaceae	Introduced	
<i>Rumex pulcher</i>	Fiddle dock	Polygonaceae	Native	
<i>Salvia spathacea</i>	Hummingbird sage	Lamiaceae	Native	
<i>Sanicula crassicaulis</i>	Sanicle	Apiaceae	Native	
<i>Scirpus acutus</i>	Tule	Cyperaceae	Native	
<b><i>Scrophularia atrata</i></b>	<b>Black-flowered figwort</b>	<b>Scrophulariaceae</b>	<b>Native</b>	<b>CNPS List 1B</b>
<i>Scrophularia californica</i> subsp. <i>californica</i>	California figwort	Scrophulariaceae	Native	
<i>Sidalcea malviflora</i>	Checker mallow	Malvaceae	Native	
<i>Silene gallica</i>	Windmill pink	Caryophyllaceae	Introduced	
<i>Silybum marianum</i>	Milk-thistle	Asteraceae	Introduced	
<i>Sisymbrium officinale</i>	Hedge mustard	Brassicaceae	Introduced	
<i>Sisyrinchium bellum</i>	Blue-eyed-grass	Iridaceae	Native	
<i>Solidago velutina</i> subsp. <i>californica</i> [ <i>S. californica</i> ]	Goldenrod	Asteraceae	Native	
<i>Soliva sessilis</i>	Soliva	Asteraceae	Introduced	
<i>Sonchus asper</i>	Prickly sow-thistle	Asteraceae	Introduced	
<i>Sonchus oleraceus</i>	Common sow-thistle	Asteraceae	Introduced	
<i>Spergularia rubra</i>	Sand-spurry	Caryophyllaceae	native/ introduced	
<i>Stachys bullata</i>	Hedge-nettle	Lamiaceae	Native	
<i>Stellaria media</i>	Chickweed	Caryophyllaceae	Introduced	
<i>Stellaria nitens</i>	Shining chickweed	Caryophyllaceae	Native	
<i>Stephanomeria cichoriacea</i>	Silver rock-lettuce	Asteraceae	Native	
<i>Taraxacum officinale</i>	Dandelion	Asteraceae	Introduced	
<i>Thysanocarpus laciniatus</i>	Fringe pod	Brassicaceae	Native	
<i>Torilis nodosus</i>	Knotted hedge-parsley	Apiaceae	Introduced	
<i>Typha domingensis</i>	Cattail	Typhaceae	Native	
<i>Urtica holosericea</i>	Nettle	Urticaceae	Native	
<i>Verbena lasiostachys</i>	Vervain	Verbenaceae	Native	
<i>Vicia sativa</i>	Vetch	Fabaceae	Introduced	
<i>Vicia villosa</i>	Vetch	Fabaceae	Introduced	
<i>Viola pedunculata</i>	Johnny jump-up	Violaceae	Native	
<i>Vulpia bromoides</i>	Annual fescue	Poaceae	Introduced	
<i>Vulpia microstachys</i>	Annual fescue	Poaceae	Native	
<i>Vulpia myuros</i>	Rattail fescue	Poaceae	Introduced	

**Special-Status Plants Known from the Vicinity of the Site**

Species	Status* Fed/CA/CNPS	Habitat Requirements	Site Suitability/Observations
<b>PLANTS</b>			
Adobe sanicle <i>Sanicula maritima</i>	--/R/1B.1	Perennial herb; blooms February through March; ranges from 30 to 240 meters; Occurs on clay and serpentine soils in chaparral, coastal prairie, meadows, seeps, and valley and foothill grassland.	<b>Not expected to occur.</b> No suitable clay serpentine derived soils present on-site. Not observed during plant surveys.
Beach spectaclepod <i>Dithyrea maritima</i>	--/T/1B.1	Rhizomatous, perennial herb; blooms March through May; found in sandy soils, usually near shore, in coastal dunes and coastal scrub habitats; ranges from 3 to 50 meters in elevation.	<b>Not expected to occur.</b> Site is too far from the coast for this species. Only known to occur on dunes immediately along the coast. Not observed during surveys.
Betty's dudleya <i>Dudleya abramsii</i> ssp. <i>bettinae</i>	--/--/1B.2	Perennial herb; blooms May through July and is endemic to San Luis Obispo County; found in chaparral, coastal scrub, and valley and foothill grasslands, usually on serpentine outcrops or shallow rocky soils; ranges in elevation from 20 to 180 meters.	<b>Not expected to occur.</b> No suitable serpentine soils and rock outcrops present on-site. Not observed during surveys.
Black-flowered figwort <i>Scrophularia atrata</i>	--/--/1B.2	Perennial herb; blooms April through July; ranges from 10 to 500 meters in elevation; occurs in closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub, and riparian scrub habitats, typically on sandy or diatomaceous shale soils.	<b>Present.</b> Suitable habitat and soils observed in coastal scrub and margins of willow thickets on-site. Observed in coastal scrub habitat on slope below the overlook off Fourth Street. Additional occurrences found to the south and west outside the Reserve boundaries. One occurrence on slope downslope of Fourth Street in and adjacent to blackberry thickets. Another occurrence located in scrub habitat in small opening in oak woodlands to the southeast of Fourth Street.
Blochman's dudleya <i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	--/--/1B.1	Perennial herb; blooms April through June; found on rocky, often clay or serpentine soils in coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grassland; ranges from 5 to 450 meters in elevation.	<b>Not expected to occur.</b> Marginal habitat present on-site consisting of sandstone outcroppings and thin soils around Fourth Street overlook. Not observed during surveys.
Blochman's leafy daisy <i>Erigeron blochmaniae</i>	--/--/1B.2	Rhizomatous perennial herb; blooms July through August; ranges from 3 to 45 meters in elevation and occurs in coastal dunes and coastal scrub.	<b>Not expected to occur.</b> This species is restricted to coastal dunes typically along the immediate coastline. Not observed during surveys.



**Special-Status Plants Known from the Vicinity of the Site**

<b>Species</b>	<b>Status* Fed/CA/CNPS</b>	<b>Habitat Requirements</b>	<b>Site Suitability/Observations</b>
Brewer's spineflower <i>Chorizanthe breweri</i>	--/--/1B.3	Occurs in closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub habitats on serpentine derived soils and rock outcrops, mostly in rocky and gravelly areas; ranges in elevation from 45 to 800 meters; annual herb; blooms May through August.	<b>Not expected to occur.</b> No serpentine based soils and rock outcrops present onsite. Not observed during surveys.
California saw-grass <i>Cladium californicum</i>	--/--/2.2	Rhizomatous, perennial herb; blooms June through September; ranges in elevation from 60 to 600 meters and occurs in freshwater marshes, alkali marshes and seeps.	<b>Not expected to occur.</b> Marginal habitat present in wetland habitats along margin of lake and open ponded areas of Meadow Creek. Not observed during surveys.
California seablite <i>Suaeda californica</i>	--/--/1B.1	Evergreen shrub; blooms July through October; found in coastal salt marshes and swamps from 0 to 5 meters.	<b>Potential to occur.</b> Limited extent of salt marsh habitat present onsite consisting of alkali heath and various associates growing on eastern-most island. Searched for this species during surveys of the islands and along lake margins, and it was not located. Still has potential to occur based on presence of suitable habitat.
California spineflower <i>Mucronea californica</i>	--/--/4.2	Annual herb; blooms March through August; ranges from 0 to 1400 meters in elevation and occurs on sandy soils in chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland.	<b>Not expected to occur.</b> Suitable habitat consisting of loose sandy soils in coastal scrub or chaparral habitat not observed during plant surveys.
Cambria morning-glory <i>Calystegia subcaulis</i> ssp. <i>episcopalis</i>	--/--/1B.2	Rhizomatous, perennial herb; blooms from April to May; occurs in chaparral, cismontane woodland, and sparse to dense grassland covering sloped or flat areas in clay-rich soils; ranges from 60-500 meters; restricted to outer South Coast ranges in SLO and Santa Barbara Counties.	<b>Not expected to occur.</b> Suitable habitat present in onsite annual and purple Needlegrass grasslands. Searched for and not observed during plant surveys.
Caper-fruited tropidocarpum <i>Tropidocarpum capparideum</i>	--/--/1B.1	Annual herb; blooms March through April; ranges from 1 to 455 meters and is found on alkaline clay soils in valley and foothill grassland.	<b>Not expected to occur.</b> No suitable alkaline clay soils present onsite. Not observed during surveys.



**Special-Status Plants Known from the Vicinity of the Site**

<b>Species</b>	<b>Status* Fed/CA/CNPS</b>	<b>Habitat Requirements</b>	<b>Site Suitability/Observations</b>
Congdon's tarplant <i>Centromadia parryi</i> <i>ssp. congdonii</i>	--/--/1B.2	Annual herb; blooms from June to November; occurs in moist alkaline conditions in marshes, swamps, vernal pools, and valley and foothill grassland habitats; ranges from 1 to 230 meters in elevation.	<b>Not expected to occur.</b> No vernal pool habitat present. Marginally suitable habitat identified in herbaceous wetlands, however the site lacks suitable seasonal hydrology, clay soils and alkaline conditions. Not observed during rare plant surveys.
Coulter's goldfields <i>Lasthenia glabrata</i> <i>ssp. coulteri</i>	--/--/1B.1	Annual herb; blooms February through June; ranges from 1 to 1220 meters in elevation and occurs in playas, vernal pools, and coastal salt marshes and swamps.	<b>Not expected to occur.</b> No suitable vernal pool habitat, but elements of salt marsh habitat present. Searched for, but not observed during surveys of site.
Coulter's saltbush <i>Atriplex coulteri</i>	--/--/1B.2	Perennial herb; blooms March to October; ranges from 3 to 460 meters in elevation and occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland; usually occurs in alkaline clay soils where open sites within habitat are found.	<b>Not expected to occur.</b> Potentially suitable habitat present in onsite scrub habitat, however alkaline soils are not present. Not observed during surveys.
Crisp monardella <i>Monardella crispera</i>	--/--/1B.2	Rhizomatous, perennial herb; blooms April through August; ranges from 10 to 120 meters in elevation and occurs on sandy soils in coastal dunes and coastal scrub.	<b>Not expected to occur.</b> Species typically occurs in coastal dunes in close proximity to the Pacific Ocean, and the site is therefore outside the species range. Not observed during rare plant surveys.
Cuesta Pass checkerbloom <i>Sidalcea hickmanii</i> <i>ssp. anomala</i>	--/R/1B.2	Perennial herb; blooms May through June; ranges from 600 to 800 meters and is found on serpentine soils in closed-cone coniferous forest; known from only three occurrences on Cuesta Ridge in San Luis Obispo County.	<b>Not expected to occur.</b> Project site is outside the known range for this species. No suitable serpentine soils onsite. Not observed during rare plant surveys.
Dune larkspur <i>Delphinium parryi</i> <i>ssp. blochmaniae</i>	--/--/1B.2	Perennial herb; blooms April through May; occurs in maritime chaparral and coastal dune habitats at elevations ranging from 0 to 200 meters, typically on volcanic soils and/or rocky slopes.	<b>Not expected to occur.</b> Marginal habitat present in coastal scrub. Not observed during rare plant surveys.
Dwarf soaproot <i>Chlorogalum pomeridianum</i> var. <i>minus</i>	--/--/1B.2	Bulbiferous, perennial herb; blooms May to August; occurs on serpentine soils in chaparral and valley and foothill grassland habitats, ranging from 305 to 1000 meters in elevation.	<b>Not expected to occur.</b> No suitable serpentine-based soils present. Not observed during rare plant surveys.



**Special-Status Plants Known from the Vicinity of the Site**

Species	Status* Fed/CA/CNPS	Habitat Requirements	Site Suitability/Observations
Gambel's water cress <i>Rorripa gambelii</i>	E/T/1B.1	Rhizomatous, perennial herb; blooms April through September; ranges from 5 to 330 meters in elevation and is found in freshwater or brackish marshes and swamps, as well as the margins of lakes and streams.	<b>Potential to occur.</b> Suitable habitat present along lake and island margins as well as in the Meadow Creek corridor to the southeast of Fourth Street. Not observed during surveys, but still could potentially occur onsite in areas of freshwater marsh habitat.
Firm cup lichen <i>Cladonia firma</i>	--/--/--	Grows on soil and detritus on stabilized sand dunes.	<b>Not expected to occur.</b> No suitable coastal dune habitat present onsite. No cup lichens observed during surveys.
Hoover's bent grass <i>Agrostis hooveri</i>	--/--/1B.2	Stoloniferous, perennial herb; blooms April to July; occurs between 60 and 600 meters on sandy soils in chaparral, cismontane woodland, and valley and foothill grassland habitats.	<b>Not expected to occur.</b> Suitable habitat identified in annual grassland and coast live oak woodland habitat on-site. This species was searched for at a time when it would have been identifiable. Not observed during surveys.
Hoover's button-celery <i>Eryngium aristulatum</i> var. <i>hooveri</i>	--/--/1B.1	An herb that can occur as either an annual or a perennial; blooms in July and occurs at elevations ranging from 3 to 45 meters; found in vernal pools, seasonally wet grasslands, and often in roadside ditches.	<b>Not expected to occur.</b> Marginal habitat present along margins of wetlands on-site. Not observed during rare plant surveys.
Indian Knob mountainbalm <i>Eriodictyon altissimum</i>	E/E/1B.1	Evergreen shrub; blooms March through June; ranges in elevation from 80 to 270 meters and occurs in maritime chaparral, cismontane woodland, and coastal scrub, usually on sandstone; often found in open disturbed areas.	<b>Not expected to occur.</b> Marginal habitat identified in oak woodland and coastal scrub on-site. Not observed during rare plant surveys.
Jones' layia <i>Layia jonesii</i>	--/--/1B.2	Annual herb; blooms March through May; occurs on clay soils and serpentine outcrops in chaparral and valley and foothill grassland; ranges in elevation from 5 to 400 meters.	<b>Not expected to occur.</b> No suitable serpentine soils present. Not observed during rare plant surveys.
Kellogg's horkelia <i>Horkelia cuneata</i> ssp. <i>sericea</i>	--/--/1B.1	Sandy soils in coastal scrub and chaparral communities along Central Coast from 0 to 200 meters elevation.	<b>Not expected to occur.</b> Suitable habitat was identified in coastal scrub on-site. Not observed during rare plant surveys.
La Graciosa thistle <i>Cirsium loncholepis</i>	E/T/1B.2	Perennial herb; blooms May to August; occurs in mesic conditions in coastal dunes, coastal scrub, and brackish marshes and swamps; ranges in elevation from 4 to 220 meters.	<b>Not expected to occur.</b> Marginal habitat identified in coastal scrub and adjacent wetlands on-site. Not observed during rare plant surveys.



**Special-Status Plants Known from the Vicinity of the Site**

Species	Status* Fed/CA/CNPS	Habitat Requirements	Site Suitability/Observations
La Panza mariposa-lily <i>Calochortus obispoensis</i>	--/--/1B.2	Bulbiferous, perennial herb; blooms May to July; ranges from 75 to 730 meters on sandstone, serpentine and/or sandy soils in chaparral, coastal scrub and valley and foothill grassland; endemic to San Luis Obispo County and is known from localized occurrences in the San Luis Obispo and Arroyo Grande region.	<b>Not expected to occur.</b> Suitable habitat identified in sandstone rock outcrops in coastal scrub, oak woodland and grassland on-site. Not observed during rare plant surveys.
Leafy tarplant <i>Deinandra increscens</i> ssp. <i>foliosa</i>	--/--/1B.2	Annual herb; blooms June through September; typically found in sandy soils in valley and foothill grassland, and ranges from 300 to 500 meters in elevation.	<b>Not expected to occur.</b> Potentially suitable habitat present in grassland on-site. Site is outside known elevation range for this species. Not observed during rare plant surveys.
Marsh sandwort <i>Arenaria paludicola</i>	E/--/1B.1	Stoloniferous, perennial herb; blooms May to August; occurs in freshwater marshes and swamps, bogs and fens, and some coastal scrub, ranging from 3 to 170 meters in elevation; common associates include Typha, Juncus, and Scirpus.	<b>Potential to occur.</b> Marginal habitat identified along lake margins adjacent to and within wetland and riparian habitat. Not observed during rare plant surveys, but could have been missed due to its small occurrence size.
Mesa horkelia <i>Horkelia cuneata</i> ssp. <i>puberula</i>	--/--/1B.1	Sandy or gravelly sites in chaparral, coastal scrub and cismontane woodland; 70 to 700 meter elevation range.	<b>Potential to occur.</b> Suitable habitat identified in coastal scrub and oak woodland habitats on-site. Not observed onsite during rare plant surveys, but several patches located south of Fourth Street outside the Reserve boundary were located when surveying in this area.
Miles' milk-vetch <i>Astragalus didymocarpus</i> var. <i>milesianus</i>	--/--/1B.2	Annual herb; blooms March to June; found in coastal scrub habitats, typically occurring on clay soils; ranges in elevation 20 to 90 meters.	<b>Not expected to occur.</b> Marginal habitat identified in coastal scrub on-site. Suitable clay soils absent, species was included on target list. Not observed during rare plant surveys.
Morro manzanita <i>Arctostaphylos morroensis</i>	T/--/1B.1	Evergreen shrub; blooms December through March; ranges in elevation from 5 to 205 meters; typically found on sandy-loam or baywood sands in chaparral, woodlands, coastal dunes and coastal scrub.	<b>Not expected to occur.</b> Project site is outside the known range for this species. Not observed during rare plant surveys.
Most beautiful jewel-flower <i>Streptanthus albidus</i> ssp. <i>peramoenus</i>	--/--/1B.2	Annual herb; blooms April through June; occurs on serpentine soils in chaparral, valley and foothill grassland, and cismontane woodland, ranging from 120 to 1000 meters in elevation.	<b>Not expected to occur.</b> No suitable serpentine soils present. Not observed during rare plant surveys.



**Special-Status Plants Known from the Vicinity of the Site**

Species	Status* Fed/CA/CNPS	Habitat Requirements	Site Suitability/Observations
Mouse-gray dudleya <i>Dudleya abramsii</i> <i>ssp. murina</i>	--/--/1B.3	Succulent shrub; blooms May through June; occurs in chaparral and cismontane woodland, usually on serpentine outcrops, at elevations ranging from 90 to 300 meters.	<b>Not expected to occur.</b> Site lacks suitable serpentine outcrops. Not observed during rare plant surveys.
Nipomo Mesa lupine <i>Lupinus nipomensis</i>	E/E/1B.1	Annual herb; blooms March through May; occurs on dry sand flats in coastal dunes ranging from 10 to 50 meters in elevation.	<b>Not expected to occur.</b> No suitable habitat present. Not observed during rare plant surveys.
Ojai fritillary <i>Fritillaria ojaiensis</i>	--/--/1B.2	Bulbiferous, perennial herb; blooms March through May; ranges from 300 to 670 meters in elevation; found in barren river basins, chaparral, broadleaved upland forest and lower montane coniferous forest; commonly found on moist shale and/or rocky slopes.	<b>Not expected to occur.</b> No suitable habitat present. Site is outside known elevation range for this species. Not observed during rare plant surveys.
Palmer's monardella <i>Monardella palmeri</i>	--/--/1B.2	Rhizomatous, perennial herb; blooms June through August; occurs on serpentine soils in chaparral and cismontane woodland habitats at elevations ranging from 200 to 800 meters.	<b>Not expected to occur.</b> No suitable serpentine soils present. Not observed during rare plant surveys.
Palmer's monardella <i>Monardella palmeri</i>	--/--/1B.2	Rhizomatous, perennial herb; blooms June through August; occurs on serpentine soils in chaparral and cismontane woodland habitats at elevations ranging from 200 to 800 meters.	<b>Not expected to occur.</b> No suitable serpentine soils present. Not observed during surveys.
Pecho manzanita <i>Arctostaphylos pechoensis</i>	--/--/1B.2	Perennial shrub; blooms November to March; occurs on siliceous shale in closed-cone coniferous forest, chaparral, and coastal scrub habitats, ranging from 170 to 1100 meters in elevation.	<b>Not expected to occur.</b> No suitable habitat present. Not observed during rare plant surveys.
Pismo clarkia <i>Clarkia speciosa</i> ssp. <i>immaculata</i>	E/R/1B.1	Annual herb; blooms May through July; ranges from 25 to 185 meters in elevation and occurs in sandy soils in chaparral (margins, openings), cismontane woodland, and valley and foothill grassland.	<b>Not expected to occur.</b> No suitable soils present to support this species. Not observed during surveys.
Rayless ragwort <i>Senecio aphanactis</i>	--/--/2.2	Annual herb; blooms January through April; ranges from 15 to 800 meters in elevation; typically found on drying alkaline flats, serpentine soils and barren gravelly or sandy slopes in chaparral, cismontane woodland, and coastal scrub habitats.	<b>Not expected to occur.</b> Potentially suitable habitat present in open areas within oak woodland and coastal sage scrub onsite, however site lacks suitable serpentine soils. Not observed during surveys.





**Special-Status Plants Known from the Vicinity of the Site**

<b>Species</b>	<b>Status* Fed/CA/CNPS</b>	<b>Habitat Requirements</b>	<b>Site Suitability/Observations</b>
Round-leaved filaree California macrophylla	--/--/1B.1	Annual herb; blooms March to May; commonly found on clay soils in cismontane woodland and valley and foothill grassland at elevations ranging from 15 to 1200 meters.	<b>Not expected to occur.</b> Potentially suitable habitat present in margins of oak woodland and grassland habitat onsite. Not observed during surveys.
Saline clover <i>Trifolium depauperatum</i> var. <i>hydrophilum</i>	--/--/1B.2	Annual herb; blooms April through June; ranges from 0 to 300 meters in elevation and occurs in mesic and alkaline conditions in marshes and swamps, valley and foothill grasslands, and vernal pools.	<b>Not expected to occur.</b> Marginal habitat identified in grassland-wetland ecotone. Not observed during rare plant surveys.
Salt marsh bird's-beak <i>Cordylanthus maritimus</i> ssp. <i>maritimus</i>	--/--/1B.2	Hemiparasitic, annual herb; blooms May through October; occurs in coastal dunes, coastal salt marshes and swamp at elevations ranging from 0 to 30 meters.	<b>Not expected to occur.</b> No suitable coastal dune/hind dune swales present, however, elements of salt marsh habitat present. Akali heath and Salicornia patches were searched during surveys, and it was not observed.
San Benito fritillary <i>Fritillaria viridea</i>	--/--/1B.2	Bulbiferous, perennial herb; blooms March to May; ranges from 200 to 1525 meters in elevation and occurs in chaparral on serpentine soils.	<b>Not expected to occur.</b> No suitable habitat or soils present. Not observed during rare plant surveys.
San Bernardino aster <i>Symphyotrichum defoliatum</i>	--/--/1B.2	Perennial herb; blooms July to November; occurs in meadows, seeps, marshes and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest and grassland from 2 to 2040 meters in elevation.	<b>Not expected to occur.</b> Marginal habitat identified in on-site wetlands and adjacent coastal scrub. Not observed during rare plant surveys.
San Luis Obispo County lupine <i>Lupinus ludovicianus</i>	--/--/1B.2	Perennial herb; blooms April through July; commonly found on sandstone or sandy soils in chaparral and cismontane woodland, ranging in elevation from 50 to 525 meters.	<b>Not expected to occur.</b> Suitable habitat identified in oak woodlands on-site. Not observed during rare plant surveys.
San Luis Obispo fountain thistle <i>Cirsium fontinale</i> var. <i>obispoense</i>	E/E/1B.2	Perennial herb; blooms February to July; ranges from 35 to 365 meters in elevation; occurs in chaparral and cismontane woodland habitats, often in serpentine seeps.	<b>Not expected to occur.</b> No suitable habitat present on-site, as site lacks suitable serpentine soils. Not observed during rare plant surveys.
San Luis Obispo mariposa-lily <i>Calochortus simulans</i>	--/--/1B.3	Bulbiferous, perennial herb; blooms April to May; occurs in sandy, often granitic, sometimes serpentine soils in chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland; ranges from 395 to 1100 meters in elevation.	<b>Not expected to occur.</b> Marginal habitat identified in oak woodland and undisturbed grasslands on-site. Not observed during rare plant surveys.



**Special-Status Plants Known from the Vicinity of the Site**

Species	Status* Fed/CA/CNPS	Habitat Requirements	Site Suitability/Observations
San Luis Obispo monardella <i>Monardella frutescens</i>	--/--/1B.2	Rhizomatous, perennial herb; blooms May through September; ranges from 10 to 200 meters and occurs on sandy soils in coastal dunes and coastal scrub.	<b>Not expected to occur.</b> Species is known to occur in dunes along Pacific Ocean. No suitable habitat present. Not observed during rare plant surveys.
San Luis Obispo owl's clover <i>Castilleja densiflora</i> <i>ssp. obispoensis</i>	--/--/1B.2	Annual herb; blooms in April; ranges from 10 to 400 meters in elevation and occurs in meadows, seeps, and valley and foothill grassland.	<b>Not expected to occur.</b> Suitable habitat present in undisturbed grasslands on-site. Not observed during rare plant surveys. Nearby reference population visited during surveys to confirm species was in flower and identifiable.
San Luis Obispo sedge <i>Carex obispoensis</i>	--/--/1B.2	Rhizomatous, perennial herb; blooms April to June; ranges from 10 to 790 meters; occurs in closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland (usually near seeps and springs); Usually occurs in transition zone on sand, clay or serpentine.	<b>Not expected to occur.</b> No suitable soils or habitat present on-site. Not observed during rare plant surveys.
Sand mesa manzanita <i>Arctostaphylos rudis</i>	--/--/1B.2	Perennial shrub; blooms November to February; occurs in maritime chaparral and coastal scrub habitats on sandy soils from 25 to 230 meters in elevation.	<b>Not expected to occur.</b> Perennial shrub would have been identifiable during field surveys. Not observed during rare plant surveys.
Santa Lucia manzanita <i>Arctostaphylos luciana</i>	--/--/1B.2	Perennial shrub; blooms February to March; occurs on shale outcrops in chaparral and cismontane woodland habitats; ranges from 350 to 850 meters in elevation.	<b>Not expected to occur.</b> Site lacks shale outcrops and is well outside known elevation range for this species. Perennial shrub would have been identifiable during field surveys. Not observed during rare plant surveys.
Santa Margarita manzanita <i>Arctostaphylos pilosula</i>	--/--/1B.2	Perennial shrub; blooms December to March; occurs in Closed cone coniferous forests, cismontane woodland, and chaparral, typically on shale outcrops/soils in San Luis Obispo and Monterey counties; ranges from 170 to 1100 meters in elevation.	<b>Not expected to occur.</b> Perennial shrub would have been identifiable during field surveys. Not observed during rare plant surveys.
Short-lobed broomrape <i>Orobanche parishii</i> <i>ssp. brachyloba</i>	--/--/4.2	Parasitic, perennial herb; blooms April through October; ranges from 3 to 305 meters in elevation and occurs in sandy soils in coastal bluff scrub, coastal dunes, and coastal scrub.	<b>Not expected to occur.</b> Marginal habitat identified in coastal scrub habitat. Not observed during rare plant surveys.



**Special-Status Plants Known from the Vicinity of the Site**

Species	Status* Fed/CA/CNPS	Habitat Requirements	Site Suitability/Observations
Straight-awned spineflower <i>Chorizanthe rectispina</i>	--/--/1B.3	Annual herb; blooms May through July; occurs in chaparral, cismontane woodland, and coastal scrub habitats, ranging in elevation from 200 to 1035 meters; has even been found in vineyards and other frequently disturbed areas. Found in granite sand or disintegrating shale.	<b>Not expected to occur.</b> Marginal habitat present in coastal scrub and oak woodland habitat on-site. Not observed during plant surveys.
Surf thistle <i>Cirsium rhotophilum</i>	--/T/1B.2	Perennial herb; blooms April through June; ranges in elevation from 3 to 60 meters; occurs in coastal dune and coastal bluff scrub communities.	<b>Not expected to occur.</b> No suitable habitat present. Not observed during plant surveys.
Wells' manzanita <i>Arctostaphylos wellsii</i>	--/--/1B.1	Evergreen shrub; blooms December to April; occurs in chaparral and closed-cone coniferous forests on sandstone outcrops; ranges in elevation from 30 to 400 meters and is only known to occur in San Luis Obispo County.	<b>Not expected to occur.</b> Perennial shrub would have been identifiable if encountered during surveys. Not observed onsite.
Umbrella larkspur <i>Delphinium umbracolorum</i>	--/--/1B.3	Perennial herb; blooms April through June; ranges from 400 to 1600 meters in elevation and occurs in moist cismontane woodland habitat. Most common in loose soils derived from disintegrating shale.	<b>Not expected to occur.</b> Marginal habitat present in oak woodlands on-site. Site lacks shale soils and the project is outside the known elevation range for this species. Not observed during plant surveys.
Yellow-flowered eriastrum <i>Eriastrum luteum</i>	--/--/1B.2	Annual herb; blooms May to June; ranges from 290 to 1000 meters in elevation and occurs in broadleaved upland forest, chaparral, and cismontane woodland, usually on sandy or gravelly soils.	<b>Not expected to occur.</b> Marginal habitat present in oak woodland on-site. Project site is outside known elevation range for this species. Not observed during plant surveys.

\*E = Endangered; T = Threatened; R = Rare CE = Candidate for Endangered Status; ‘—’ = no status; List 1B – Rare, threatened, or endangered in California and elsewhere; List 2 – Rare, threatened or endangered in California, but more common elsewhere; List 4 – Limited distribution (Watch List). Source: California Natural Diversity Database (California Department of Fish and Game 20010); California Native Plant Society Online Inventory of Rare Plants, 2010 (online at www.cnps.org); Special Vascular Plants, Bryophytes, and Lichens List (California Department of Fish and Game 2010).



Appendix H  
Bird Occurrence List & Species Accounts

<u>Pismo Lake</u>	<u>February 2010</u>								<u>June 2010</u>								<u>Behavior</u>	<u>Comments</u>
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
Point Count #																		
<b>DUCKS, GEESE AND SWANS</b>																		
Gadwall											2					1	SW	
Mallard*		9					2			2				4		1	SW	
Ruddy Duck*		5	3								2						SW	
Northern Pintail*																	F	
<b>GREBES</b>																		
Pied-billed Grebe*										2						1	SW	
<b>PELICANS AND CORMORANTS</b>																		
Double-crested Cormorant*				1			1				1			1		4	E, F, P, SW	used downed tree branches in the lake to roost on
<b>BITTERNS, HERONS AND EGRETS</b>																		
Black-crowned Night-Heron*										2							F, P	several seen (during June herp surveys) exhibiting nesting behavior
Green Heron									1								F, P	several seen (during June herp surveys) exhibiting nesting behavior
Great Egret*																	F, P	seen on 2 surveys days in 1992
Snowy Egret*																	P	seen on 2 surveys days in 1992
Great Blue Heron*																	H, P	seen on 3 surveys days in 1992
<b>VULTURES</b>																		
Turkey Vulture*														3		1	F	
<b>OSPREYS, KITES, EAGLES AND HAWKS</b>																		
Cooper's Hawk													1				H, P	Hunting in oak woodland
Red-tailed Hawk*			1									1					H, P, N, F	Nesting in eucalyptus trees between point 7 and 8
<b>RAILS</b>																		
American Coot*		1	1				2				1				2	4	S	
<b>PLOVERS</b>																		
Killdeer*																		seen on one survey day in 1992
<b>GULLS AND TERNS</b>																		
Western Gull*							2										F	
Least Tern																	F, H	Federally endangered. seen foraging on several occasions during June, July
Caspian Tern*																	F	seen on 3 surveys days in 1992
Ring-billed Gull*																	F	seen on 4 survey days in 1992
<b>DOVES</b>																		
Rock Pigeon*										6		8					F	
Eurasian Collared-Dove	1						6		1		2			1		1	F	
Mourning Dove*									1							2	F, P	
<b>OWLS</b>																		
Great Horned Owl																	P	seen on 8/21/10 near point 7 while doing a herp survey
<b>HUMMINGBIRDS</b>																		

<u>Pismo Lake</u>	<u>February 2010</u>								<u>June 2010</u>								<u>Behavior</u>	<u>Comments</u>
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
Point Count #																		
Anna's Hummingbird*	1		1			1	2									F, P		
Allen's Hummingbird													1			F, P	Audubon watchlist.	
<b>KINGFISHERS</b>																		
Belted Kingfisher*									1		1					H		
<b>WOODPECKERS</b>																		
Nuttall's Woodpecker								1			1					V, P	Audubon watchlist.	
Downy Woodpecker*															1	V, P		
Northern Flicker		3														V, F		
<b>FLYCATCHERS</b>																		
Pacific-slope Flycatcher													1			S, F		
Black Phoebe*															2	F		
<i>Western Wood-Pewee*</i>																F	seen on one survey day in 1992	
<b>VIREOS</b>																		
Warbling Vireo											1					F		
<i>Solitary Vireo*</i>																F	seen on one survey day in 1992	
<b>JAYS, MAGPIES AND CROWS</b>																		
Western Scrub-Jay*	1	3		1	1	2					2			1	1	V, F, P		
American Crow*		2		3	1	1		1							1	V, F, P		
<b>SWALLOWS</b>																		
Tree Swallow*									2	12						F		
Violet-green Swallow														4		F		
Northern Rough-winged Swallow											1	5				F		
Cliff Swallow*								4	20	12				4	4	15	F	800 cliff swallows seen in 1992
Barn Swallow*								2								4	F	
<b>CHICKADEES AND TITMICE</b>																		
Chestnut-backed Chickadee*		4														4	S, P	
Oak Titmouse															1		F, P	Audubon watchlist.
<b>BUSHTITS</b>																		
Bushtit*		2					2										E, F	
<b>WRENS</b>																		
Bewick's Wren*					1	1											V	
Marsh Wren*	2		1					3	2	1						5	F, S	nests seen in reeds near point 1, 3, 8
<b>KINGLETS, BLUEBIRDS AND THRUSHES</b>																		
Ruby-crowned Kinglet				1			2										E, F, V	
Hermit Thrush				1	1		1										V	
<b>BABLERS</b>																		
Wrentit*											2			1	1		S	Audubon watchlist.
<b>MOCKINGBIRDS AND THRASHERS</b>																		

<u>Pismo Lake</u>	<u>February 2010</u>								<u>June 2010</u>								<u>Behavior</u>	<u>Comments</u>
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8		
Point Count #																		
Northern Mockingbird*									1								F, P, S	
<b>STARLINGS AND MYNAS</b>																		
<i>European Starling*</i>																	F	
<b>WARBLERS</b>																		
Yellow-rumped Warbler																		
Common Yellowthroat	1								1	1						1	S, P, F	
Wilson's Warbler*													1				P	
<b>TOWHEES AND SPARROWS</b>																		
Spotted Towhee*		1			1							4	1		1		S, P	
California Towhee*					2							1					S, P	
Fox Sparrow							1										F, P	
Song Sparrow*		2	2	1	4	1	2		1	1	2	1	3	2	2	5	S, P	
Dark-eyed Junco															4		P	
<b>GROSBEAKS AND BUNTINGS</b>																		
Black-headed Grosbeak*									1			1					S	
<b>BLACKBIRDS, MEADOWLARKS AND ORIOLES</b>																		
Red-winged Blackbird*	4									1	2					1	S	
Brewer's Blackbird*									8								P	male and female seen together
Brown-headed Cowbird*									1					1			S, F	
Hooded Oriole*															1	1	F, P	
<b>FINCHES</b>																		
Purple Finch												1	3				S	
House Finch*	3				2		2		10	5	3				3	12	P, S, F	
American Goldfinch*													2				S	
<i>Lesser Goldfinch*</i>																	F	seen on 2 survey days in 1992

\*- birds seen during 1992 bird count

<u>Behavior</u>	
E- eat	P- perch
F- fly	S- sing
H- hunt	SW- swim
N- nest	V- vocalize

## Bird Species Accounts

The following are descriptions of bird species identified at the Reserve.

### DUCKS, GEESE, SWANS (Anatidae)

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#### **Gadwall: *Anas strepera***

Occurrence: Seasonally uncommon

Active Months: September-April

Description: A very drab colored bird, mostly gray with a white patch on the wings known as the speculums. The female of this species is mostly brown when compared to the male.

Information: This bird is uncommon to this area. When these birds are foraging they tip almost upside down with their rump sticking up in the air to reach the plants on the bottom. They tend to inhabit marshy or shallow ponds.

#### **Mallard: *Anas platyrhynchos***

Occurrence: Common, nesting

Active Months: Resident

Description: A familiar species to most people: the male has a dark green head, with a brown chest and a pale body. The rump feathers are black and when the wings are spread out a blue speculum with white borders is seen. The female is all brown and very drab, with an orange bill that has a black spot on the center.

Information: This well known species is a common winter migrant to the area. Numerous breeding populations have been recorded in the county. These birds can be found in any wetland habitat in which they feed on vegetation. Nests are lined with leaf litter, grasses, and down feathers. Nestlings are precocial and downy, taking to water soon after hatching and tended to by the female. Fledglings leave after 6-7 weeks.

#### **Ruddy Duck: *Oxyura jamaicensis***

Occurrence: Common

Active Months: Resident

Description: Seen typically in the non-breeding season when distinctive colorations are not apparent. Males are a mottled gray, with white cheeks and a gray bill and black cap. During the breeding season the body turns a deep red color and the bill becomes a distinctive blue.



Females are a brown and orange color with dark lines across the cheeks. The tail is long and often is raised up in the air.

Information: Has the ability to sink and disappear from sight under water. Unable to walk upright on land, and typically flee from danger by diving underwater rather than flying away. Most commonly feed on plant material, insect larvae, and mollusks, usually on ponds, lakes, and bay inlets.

### **Northern Pintail: *Anas acuta***

Occurrence: Seasonally uncommon

Active Months: August- April

Description: A slender and elegant bird that has a long neck and long slender wings. The female of this species is a plain colored brown with a dark gray bill. The males have a gray body and white neck that leads to an all brown body. The tail is long and the males have a green speculum with white borders on the outer wings.

Information: These birds are common on freshwater ponds in smaller flocks. They nest on the ground in sparse grassy vegetation. 90% of their diet consists of vegetation (i.e. seeds, aquatic vegetation, sedge grain), while occasionally feeding on tadpoles, minnows, and aquatic invertebrates.

### **GREBES (*Podicipedidae*)**

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#### **Pied-billed Grebe: *Podilymbus podiceps***

Occurrence: Common; Uncommonly seen year-round.

Active Months: September-April

Description: A pigeon-sized bird with a brown body with a gray back. The bill is rather thick and turns white with a black ring when in the breeding season; the chin also turns black. The eye is dark with a slight ring surrounding it.

Information: These birds are winter residents and can also be seen breeding on the central coast. They typically nest in open bodies of water where they lay their eggs on a floating mass of vegetation that is anchored to surrounding emergent vegetation. The Pied-billed Grebe eats small fish, crustaceans, and aquatic insects but is especially fond of crayfish, which it crushes easily with its stout bill. When alarmed, this grebe often sinks slowly into the water, resurfacing out of sight among the reeds.

## **CORMORANTS (*Phalacrocoracidae*)**

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### **Double-crested Cormorant: *Phalacrocorax auritus***

Occurrence: Common

Active Months: Resident

Federal Status: None

State/Audubon Status: California State List 2

Description: A large black bird with orange throat pouch and long neck. Breeding birds have white plumes on the sides of the head.

Information: These birds nest in colonies, usually in trees or rocky cliffs, with nests made from seaweed and other coastal debris.

## **BITTERNS, HERONS, AND EGRETS (*Ardeidae*)**

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### **Great Blue Heron: *Ardea herodias***

Occurrence: Common

Active Months: Resident

Description: A large blue-gray bird with a long, slightly crooked, neck. Black plumes extend from the forehead and appear as long “eyebrows.” In flight, the wings are two-toned with the outer portion being black and the inner portion gray like the rest of the body. The bill is long with a greenish to yellow hue.

Information: The Great Blue Heron is one of the most common herons in North America. They feed on a wide variety of food, such as fish, mice, various invertebrates, and small birds, which enables them to inhabit varying habitats. Commonly forage alone, standing tall and stationary. Birds typically roost in colonies in large trees, in nests made from debris and often go undetected. When the leaves of trees begin to fall, large nests become apparent.

### **Great Egret: *Ardea alba***

Occurrence: Common

Active Months: Resident

Description: A large all white bird with long black legs and feet and a bright yellow bill. These birds have a long neck and in flight the neck becomes quite bowed. Similar to the Snowy Egret, but has long plumes on the rump.

Information: Majestic and quite striking, the Great Egret is at risk due to the destruction of wetlands. Urbanization has led to a shift of the breeding range north, which could lead to their absence here on the Central Coast. This bird has already recovered from impacts caused from sport-hunting. Like the Great Blue Heron, this bird feeds on a wide variety of organisms, such as fish, mice, and reptiles. They inhabit tidal flats, estuaries, and shallow lakes and usually forage by standing tall and walking slowly. Nests are large and platform-like and made of sticks which are often re-used (Heron Rookery). Nestlings are semi-altricial and downy and tended by both parents. Young can fly with adults by 6-8 weeks.

### **Snowy Egret: *Egretta thula***

Occurrence: Common

Active Months: Resident

Description: An all white bird, much smaller than the Great Egret, with yellow feet and a darker bill. Has a slight feathery projection on the lower neck; also has a yellow patch on the side of the face. The plumes on the rear are “lacy” which is quite different from the Great Egret.

Information: Commonly feed on small fish which they catch by running, distinguishing them from the Great Egret.

### **Green Heron: *Butorides virescens***

Occurrence: Uncommon

Active Months: Resident

Description: Smaller than the Snowy Egret, this stocky bird is very strikingly colored.

The neck is a deep red that blends into a teal colored back and wing. The top of the head is black that blends into a long sharply pointed dark bill.

Information: Very secretive and solitary and can be found foraging in wooded water masses. Foraging strategy is quite unique; the herons obtain “bait” as diverse as live insects, berries, twigs, and discarded crackers, and cast them out onto the water. They then crouch and wait for fish to appear. They are also able to fish without bait; however, employing the “fishing” method increases their feeding efficiency. Nest platforms are smaller than those of Great Egrets (inside diameter is about 4-5 inches). Semi-altricial and downy young are tended by both parents and independent in about 30-35 days.

### **Black-crowned Night Heron: *Nycticorax nycticorax***

Occurrence: Common, nesting

Active Months: Resident

Description: Very different from the other heron-type birds, this bird is quite stocky and has a large head on top a short neck. Head and back are all black, with a grayish white coloration on the wings and underbelly. Bill is dark colored and very thick. The red eye is makes this bird quite distinguishable.

Information: While they can be seen foraging along the surf's edge, they most commonly feed at night, unlike other heron-type birds, in which they stand still at long lengths of time waiting for food to pass by. Prey on a large variety of organisms, such as frogs, reptiles, other bird chicks, and small rodents. These birds are quite noisy, and their call can be described as a bark, like a small dog. Roost in trees or in reeds in estuarine or marshy areas.

## **VULTURES (*Cathartidae*)**

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**Turkey Vulture: *Cathartes aura***

Occurrence: Common

Active Months: Resident

Description: A large dark bird with a wing span of about 6 meters (18 feet). Adults have a bald reddish colored head while juveniles have grayish-brown heads. The underside of their primary and secondary feathers is white as is the underside of their tail feathers.

Information: Commonly seen feeding on carcasses that wash up on the beach. They fly high overhead as they forage, often in a dihedral pattern with wings over head forming a "V," and rocking or tilting from side-to-side. Nests and roosts in caves, trees or in hollow stumps. Young are semialtricial.

## **HAWKS, KITES, EAGLES, AND ALLIES (*Accipitridae*)**

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**Cooper's Hawk: *Accipter cooperii***

Occurrence: Uncommon

Active Months: September-May

Description: A medium sized accipter with an elongated tail. Similar to the Sharp-shinned Hawk, it is slightly larger with a rather long head and neck.

Information: Solitary. Feeds on small birds and mammals captured in surprise attack.

**Red-tailed Hawk: *Buteo jamaicensis***

Occurrence: Common, nesting

Active Months: Resident

Description: Large hawk. Plumage is variable; dark brown above, most typically light below with a dark belly band. Signature red tail has a narrow dark band and light tip. Finely streaked grayish tail of immature is often light at base.

Information: Solitary and hunts mainly from a perch, choosing the same sentinel perch day after day; also hunts from the air by soaring at high altitudes and snatching up prey from the ground in large talons. Nests made of sticks and twigs and are usually placed in the crotch of a tree between 15-70 feet from the ground. Clutches consist of 2-3 bluish-white eggs speckled with brown. Nestlings are born semialtricial and leave the nest within 45 days.

## **RAILS AND COOTS (*Rallidae*)**

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**American Coot: *Fulica americana***

Occurrence: Seasonally uncommon

Active Months: Year round

Description: A distinctive black duck-like bird with a large white bill and a stubby tail. The male and female features are essentially the same.

Information: These birds are common to ponds and lakes. They graze on grass or they dive for aquatic vegetation for food.

## **PLOVERS (*Charadriidae*)**

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**Killdeer: *Charadrius vociferus***

Occurrence: Common

Active Months: Resident

Description: Largest of the “ringed” plovers, has two distinctive 2 black breast bands, with brown back and white underbelly and a longer tail and legs.

Information: These birds inhabit open areas and are found mostly more inland. Their call is a distinctive “Killdeer!” They nest in shallow depressions in the ground lined with grass, pebbles and seaweeds. Usually 4 speckled eggs per clutch and 1-3 clutches per year. Nestlings are precocial and downy and much camouflaged.

## **GULL AND TERNS (*Laridae*)**

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**Ring-billed Gull: *Larus delawarensis***

Occurrence: Common, uncommonly seen in breeding season

Active Months: September-May

Description: Similar to Herring Gull but smaller, with greenish-yellow feet and narrow black ring around bill.

Information: These birds often breed in this county. Commonly follow tractors after plowing or after a rainstorm to feed on worms.

### **Western Gull: *Larus occidentalis***

Occurrence: Common

Active Months: Resident

Description: Snow white, dark slate-colored back and wings. Yellow eye and bill; breeding adults have a red dot near tip of lower mandible. Pinkish or flesh colored feet.

Information: Found here year round. These birds nest in colonies on offshore islands, jetties, and private structures. They build seaweed or grass nests to protect the nest during the season. Nest may be re-used.

### **California Least Tern: *Sterna antillarum***

Occurrence: Occasional, nests at ODSVRA

Active Months: May-August

Federal Status: Endangered

State/Audubon Status: Endangered/ Red

Description: Small tern. During breeding, black cap ending at white forehead. Short white eyestripe. Bill yellow with black tip. Back light gray. Underside white. Black leading edge to wing. In nonbreeding plumage has black eyestripe extending to back of head, white top of head, and black bill.

Information: The smallest of American Terns, the Least Tern is found nesting on sandy beaches along the southern coasts of the United States and up the major river systems far into the interior of the continent.

Information: Plunges into water from flight; may hover briefly before plunging. Can be seen in at Pismo Lake foraging for fish.

### **Caspian Tern: *Sterna caspia***

Occurrence: Common

Active Months: April-October

Federal Status: Birds of Conservation Concern

State/Audubon Status: None/None

Description: The largest Tern, it is largely white with a black cap, slight crest, and a pale gray back and wings. Bill is a bright red and under wing is dusky, which is more pronounced on the wing tips.

Information: Nest in solitary locations. Nests typically a well made cup in a patch of dead grass. Terns can be quite predatory, consuming small birds and the eggs of other nesting terns.

## **PIGEONS AND DOVES (*Columbidae*)**

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### **Rock Pigeon: *Columba livia***

Occurrence: Common

Active Months: Resident

Description: Larger and plumper than a Mourning Dove, Rock Pigeons are tubby birds with small heads and short legs. Their wings are broad but pointed wings and the tail is wide and rounded. Pigeons often gather in flocks, walking or running on the ground and pecking for food. When alarmed, the flock may suddenly fly into the air and circle several times before coming down again.

Information: Introduced to North America from Europe in the early 1600s, city pigeons nest on buildings and window ledges. Pigeons eat seeds and fruits but rarely invertebrates.

### **Eurasian Collared-Dove: *Streptopelia decaocto***

Occurrence: Common

Active Months: Resident

Description: Medium-sized bird; large dove. Sandy gray body and head with black half-collar on back of neck. Medium-long square tail.

Information: Introduced into the Bahamas in the mid-1970s, the Eurasian Collared-Dove is now established throughout the southeastern United States and has been seen across the continent. Its spread across North America is still an evolving story, and the extent of its final range and the impact it will have on other bird species remains to be seen.

### **Mourning Dove: *Zenaida macroura***

Occurrence: Common, nesting

Active Months: Resident

Description: A robust bodied bird with a slender neck and head. They are typically all light brown with an iridescent patch on the neck and black spots on the lower back. In flight they reveal a long tapered tail with white tips.

Information: A common bird found near anthropogenic areas, this bird inhabits almost any area. They primarily feed on seeds produced by weeds and crops, and they typically roost in trees, hedgerows, and brush. After nesting, these birds tend to roost in large numbers. Mourning doves build flat platform nests of stick lined with softer materials. These sites are located at a large variety of heights, ranging from the ground to 25 feet. Two eggs per clutch. Nestlings are altricial and tended by both parents for about 27 days.

## **OWLS (*Strigidae*)**

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### **Great Horned Owl: *Bubo virginianus***

Occurrence: Common, nesting

Active Months: Resident

Description: These birds are easily identified by their broad ear tufts on each side of the head. They also have a large head and dark striping patterns over the entire body.

Information: They typically nest in natural tree cavities or earthen caves. Usually 2-3 eggs per clutch. Young are altricial and tended by both parents. The breeding season begins in late November to January. Their diet consists of medium-sized mammals, such as rabbits and skunks, which they hunt solo during the night. They roost during the day in trees or sheltered cliff ledges.

## **HUMMINGBIRDS (*Trochilidae*)**

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### **Anna's Hummingbird: *Calypte anna***

Occurrence: Common

Active Months: Resident

Description: A small long-billed bird; male Anna's have a distinctive magenta colored gorget on the neck on an otherwise all green body. Females are a dingy green color with a small red central patch on the neck.

Information: One of the most common hummingbirds found in the county. Like most hummingbirds, these birds hover while they forage on the nectar of flowering plants. They extend their long tongue and probe the nectary spurs taking several licks every second. Male breeding behavior is a good identification indicator: male makes a call, fly up in the air, then



dives down making a “J” shape and repeats this act. Anna’s and most other species of hummingbirds do not form pair bonds, and the males only mate with the females that feed in their area. Males spend most of the time warding off intruders by flashing their bright gorget. The nests of this species consist of a well-made cup constructed from sticks and spider webs lined with lichen and feathers. These nests can be placed in a wide variety of arboreal sites capable of supporting the nest. Nestlings are altricial and leave nest after 26 days.

**Allen’s Humingbird: *Selasphorus sasin***

Occurrence: Common

Active Months: December-August

Federal Status: Birds of Conservation Concern (BCC), Federal Species of Concern (FSC)

State/Audubon Status: Audubon List Yellow

Description: Similar in size and shape to the Anna’s; has orange color on the belly and tail. The outer tail feathers are rather narrow, and the male of this species has a red gorget. The female is similar to the Anna’s but has more orange on the belly and back.

Information: Breeding displays is similar to the Anna’s, however, the end “J” pattern becomes a series of back and forth motions before returning.

**KINGFISHERS (*Alcedinidae*)**

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**Belted Kingfisher: *Ceryle alcyon***

Occurrence: Uncommon, nesting

Active Months: Resident

Description: A pigeon-sized bird, it is blue-gray above with white below, with a bushy crest and a distinctive dagger-like bill. Males have a blue-gray breast band; the female is similar but has a chestnut belly band.

Information: Their nesting behavior consists of tunneling in the sides of cliffs and banks and depositing their eggs unprotected on the tunnel floor. 6-8 white eggs per clutch. Nestlings are altricial and naked and tended by both parents for 30-35 days after hatching. These birds can also be seen foraging in lakes and rivers as well. They take to flight in circling route to catch fish then return to their perch.

**WOODPECKERS (*Picidae*)**

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**Nuttall’s Woodpecker: *Picoides nuttallii***

Occurrence: Common

Active Months: Residents

State/ Audubon Status: Audubon List Yellow

Description: A white breasted woodpecker with a black back that has white bars. The bars on the back do not extend up the entire back. There is a white moustache stripe right above the bill. The male has a red hind crown.

Information: Mostly found in oak woodlands. Has been known to hybridize with Downy and Ladder-Backed woodpeckers. Breeds in live oaks and mixed tree growth forests near water courses.

### **Downy Woodpecker: *Picoides pubescens***

Occurrence: Common

Active Months: Residents

Description: A small black and white woodpecker with a white back. The wings have white bars on them and the tail has light edges with two dark bands. They have large thick white supercilium and malar stripes. They have a very short bill for a woodpecker. The males have a small red hind crown.

Information: Found near or in woods and forages along small twigs or weed stalks. Usually nests in cavities in dead wood.

### **Northern Flicker: *Colaptes auratus***

Occurrence: Common

Active Months: Residents

Description: A large brown woodpecker with black bars along the back and wings and black spots on the breast and belly. Throat has a large black spot. Rump is white that changes to black and white bars on the tail. Head is grey with a brown crown and a brown malar stripe in females and a red malar stripe in males. The underneath of the wings is a reddish color.

Information: These are large distinctive woodpeckers often seen on the ground feeding on ants. Their cryptic coloring makes them very hard to see until they take off and expose the bright coloring on the undersides of the wings. Breeds in areas with scattered trees, usually with the cavity in a living tree.

## **TYRANT FLYCATCHERS (*Tyrannidae*)**

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### **Western Wood-Pewee: *Contopus sordidulus***

Occurrence: Common

Active Months: April to September

Description: A medium-sized, drab flycatcher. Grayish olive above, pale below, with darker wash on breast and sides. Whitish wingbars, no eye ring or only a faint one.

Information: The Western Wood-Pewee is a common breeder in open forests and riparian zones across the West. The Western Wood-Pewee makes a clapping noise with its bill while chasing and attacking intruders in nest defense. Feeds on flying insects, especially flies, ants, bees, wasps, beetles, moths, and bugs.

### **Pacific-slope Flycatcher: *Epidonax difficilis***

Occurrence: Seasonally uncommon

Active Months: March-December

Description: A green-brown bird with a paler belly and white eye ring. Wings are darker brown-black with two white bands. Lower mandible is yellow and head has a slight crest.

Information: Most *Epidonax* flycatchers are difficult to tell apart from each other. The male makes a *psee-weet* noise, like hailing a taxi. They are often found in shaded forest areas along streams.

### **Black Phoebe: *Sayornis nigricans***

Occurrence: Common

Active Months: Resident

Description: All black with white belly and retrices edges; head has a slight crest.

Information: When perched this bird will wag its tail up and down, flicking it rapidly, exposing the white edges. Found most commonly in open areas near water. They generally choose low conspicuous perches. Females make a nest of mud pellets, dried grass, and hair in a cup shape that is lined with feather, wool, and hair. Breeding begins mid March and 4 to 5 eggs are laid. Incubation lasts 15 to 18 days and young leave the nest at 21 days. Males may feed the fledged young while the female re-nests.

## **VIREOS (*Vireonidae*)**

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### **Warbling Vireo: *Vireo gilvus***

Occurrence: Seasonally uncommon

Active Months: March-October

Description: A small stocky vireo that is mostly grey in color with a yellow to white belly. Large pale lores contrast with a darker crown.

Information: The pale lores give this bird a blank faced look. They are found mainly in broad leaf trees, especially near water. It is usually a solitary bird. Similar to the Philadelphia vireo, but with pale lores.

### **Cassins Vireo: *Vireo cassinii***

Occurrence: occasional

Active Months: Spring, Summer

Description: Small songbird, medium-sized vireo with brownish-gray head with white spectacles, two whitish wingbars, white belly and yellow flanks.

Information: The Cassin's Vireo is a fearless defender of its nest. Both the male and female will vigorously scold a predator and dive at it. The female often will not leave her nest and sometimes can be picked up off of it by a human observer. Feeds on arthropods.

## **JAYS AND CROWS (*Corvidae*)**

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### **Western Scrub-Jay: *Aphelocoma californica***

Occurrence: Common, nesting

Active Months: Resident

Description: A slender long tailed jay with blue wings and tail. The adults have a blue head with a distinct blue breastband and a white supercilium.

Information: This jay usually forages along on the ground in dense brushy areas among oaks or other trees. These birds are generally bold and conspicuous. Nests in trees or shrubs beginning in early April. Nest consists of twigs mixed with moss, weed stems and grasses. Usually 2 to 3 eggs are laid and incubation last 15 to 17 days. Young are tended by both parents and leave the nest at about 18 days.

### **American Crow: *Corvus brachyrhyncos***

Occurrence: Common

Active Months: Resident

Description: A solid black large bird with broad wings and short tail. Some individuals have irregular white markings on wings. Juveniles may have a brownish hue on the wings.

Information: Recent publications have reported that corvids, especially the crow, are as smart as primates. More common farther inland, these birds are often seen in small groups foraging on the ground. They adjust well to human habitation and are found in most urban areas. Breeding season begins in late January. The nest is a large cup of sticks and coarse stems lined with grasses, fur, hair, and moss.

## **SWALLOWS (*Hirundinidae*)**

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### **Tree Swallow: *Tachycineta thalassina***

Occurrence: Seasonally uncommon

Active Months: March-August

Description: Metallic blue-black above; underparts are white. Juveniles are gray-brown above, sometimes with indistinct dusky partial breast band. This swallow is relatively broad-winged, with a notched tail.

Information: Often seen in large flocks, perching on wires, or in bushes and reeds. Forages over fields or water for berries and insects.

### **Violet-green Swallow: *Tachycineta thalassina***

Occurrence: Seasonally uncommon

Active Months: March-August

Description: Dark metallic bronze-green upperparts, iridescent violet rump and tail, the latter slightly forked; white underparts. White cheeks extending above eye, and white on the sides above rump distinguish it from the Tree Swallow.

Information: This swallow lives in small colonies and forages over open areas, usually near water.

### **Northern Rough-winged Swallow: *Stelgidopteryx serripennis***

Occurrence: Common

Active Months: Spring, Summer

Description: Small, long-winged stocky songbird with small bill, long and pointed wings and dull brown head and upperparts.

Information: Breeds in a wide variety of open habitats, with openings in various vertical surfaces, including banks, gorges, and human structures. Catches insects in flight, often close to ground or water surface.

**Cliff Swallow: *Petrochelidon pyrrhonota***

Occurrence: Common

Active Months: March-September

Description: Colorful bird with light forehead, blue-black crown and a white-striped back. Rust-colored rump, dark wings and tail, chestnut throat and cheek, buffy collar, and whitish belly. Tail is slightly notched, not forked, and often appears squarish.

Information: Forages over fields and ponds. The Cliff Swallow nests mostly on man-made structures such as under bridges or house eaves; also under overhanging ledges on rocky cliffs. The nest is a gourd-shaped mud cone with small entrance hole; built in tightly packed clusters in large colonies. Clutches consist of 2-5 whitish eggs spotted with brown. Nestlings are altricial; born naked with eyes closed and they fledge within 21-24 days.

**Barn Swallow: *Hirundo rustica***

Occurrence: Uncommon, nesting

Active Months: March-September

Description: Blue-black above, light cinnamon-rust below, with richer chestnut-red throat and forehead. Adults have a long, deeply forked tail with white spots underneath. Juveniles have rust-colored throat and buffy under parts, shorter tail, and less graceful flight.

Information: Forages in air for insects; will occasionally eat berries. Nest is a partial bowl of mud and is constructed on human-made structures. Form colonial nests located on cliff ledges.

**CHICKADEES AND TITMICE (*Paridae*)**

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**Chestnut-backed Chickadee: *Poecile rufescens***

Occurrence: Common

Active Months: Resident

Description: A small drab bird with strong legs and a short, strong bill. Dusky black-capped bird with a black-bib and chestnut flanks and back.

Information: Found in small flocks and are fairly social and inquisitive. They glean invertebrates and/or fruit from foliage and occasionally from branches.

**Oak Titmouse: *Baeolophus inornatus***

Occurrence: Common

Active Months: Resident

Federal Status: Federal Species of Concern

State/Audubon Status: None/Audubon's List Yellow

Description: A small and plainly colored gray bird, with a slight crest. The bill is very short, as is the head. A very distinct bird overall due to its small stature and commonly being found in an oak forest.

Information: Most commonly seen here in the west in open or closed oak woodlands feeding on seeds and insects. The sighting of this species could be just be coincidental passage through the property due to the lack of preferred habitat in the form of dense canopy.

**BUSHTITS (*Aegithalidae*)**

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**Bushtit: *Psaltriparus minimus***

Occurrence: Common

Active Months: Resident

Description: Tiny distinctive gray bird with light underparts, a brown crown, pale ear patches, a small bill, and relatively long tail.

Information: Flock in small bands (except when breeding) and flit nervously through trees and bushes while gleaning for insects, seeds, and fruit. Nests are gourd-shaped hanging pockets made of moss, leaves, grass and lichens woven around twigs and secured by spider webs. Seen foraging in small aggregates at Pismo Lake on *Lupinus chamissonis* (silver bush lupine) and Willow sp.

**WRENS (*Troglodytidae*)**

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**Bewick's Wren: *Thryomanes bewickii***

Occurrence: Common

Active Months: Resident

Federal Status: Bird of Conservation Concern

State Audubon Status: None/None

Description: Plain and lacking distinct patterning; they are brown above, white or grayish-white below, with a distinct white eyebrow stripe. When the tail is fanned, the white outer tips of the tail feathers are conspicuous.

Information: Uses its long, narrow, slightly downcurved bill for scavenging on the ground and picking in crevices for insects and spiders.

### **Marsh Wren: *Cistothorus palustris***

Occurrence: Common, nesting

Active Months: Resident

Description: Small brown bird with thin bill, dark cap, and white eyeline. Tail often held upright.

Information: A common and noisy inhabitant of cattail marshes, the Marsh Wren sings all day and throughout the night. Nests in variety of marshes, especially with dense reeds. Feeds on insects and spiders.

## **KINGLETS (*Regulidae*)**

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### **Ruby-crowned Kinglet: *Regulus calendula***

Occurrence: Common

Active Months: Oct- March

Description: Tiny bird with dull, olive-green plumage. Has wingbars, eyering, and short tail. In constant motion, continually flicking its wings. Male has red crown which is usually hidden.

Information: Nests in forests. Gleans food from tips of branches and bark.

## **THRUSHES (*Turdidae*)**

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### **Hermit Thrush: *Catharus guttatus***

Occurrence: Seasonally uncommon

Active Months: Resident

Description: Olive-brown above with contrasting rufous tail, white streaked throat, blackish-brown spots on breast, complete white eye ring and whitish underparts.

Information: This is the only thrush normally seen in North America in winter. These thrushes spend most of their time in dense cover, foraging on the ground and in vegetation for insects and/or fruit. Its habit of flipping its wings helps differentiate it from other thrushes.



## **BABLERS (*Timaliidae*)**

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**Wrentit:** *Chamaea fasciata*

Occurrence: Common

Active Months: Resident

Federal Status: None

State/Audubon Status: None/Audubon List Yellow

Description: Sparrow-sized bird with uniformly streaked breast and conspicuous white eyes. Its name is apt, for its head, beak, and eyes resemble those of a tit, whereas the long, cocked tail and secretive habits remind one of a wren.

Information: Spends all its adult life within the territory chosen its first year. Call of the male, a “bouncing ping pong ball” song, is heard much more often than the bird is seen. Diet consists of insects gleaned off foliage and bark.

## **MOCKINGBIRDS AND THRASHERS (*Mimidae*)**

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**Northern Mockingbird:** *Mimus polyglottos*

Occurrence: Common

Active Months: Resident

Description: A robin-sized bird. Gray above, white below, with white wing bars and a nervous motion of the tail. In flight, tail is black with striking white borders and white wing flashes.

Information: This common and conspicuous bird feeds on insects and fruit and often defends fruiting trees and shrubs from other birds. “Wing-flashing,” the sudden opening and closing of wings, is performed perhaps to stir up insects and to distract predators.

## **STARLINGS (*Sturnidae*)**

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**European Starling:** *Sturnus vulgaris*

Occurrence: Common

Active Months: Resident

Description: A chunky bird with a short tail. This bird is black with iridescent green-purple gloss and yellow bill in spring. In winter, it is duller and heavily speckled with light spots and a dark bill.

Information: Introduced from Europe to New York in the late 1800's and is now found throughout North America. Considered a nest parasite, competes with native cavity-nesters such as, woodpeckers, and will forcibly remove residents from their nests.

## **WOOD WARBLERS (*Parulidae*)**

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### **Yellow-rumped Warbler: *Dendroica coronata***

Occurrence: Seasonally common

Active Months: September-May

Description: A grey bird with a yellow rump, throat, and side patches under the wings. The wings and tail are grey with extended white coverts. Male has a yellow crown and distinct black breast. The entire body has streaky black markings except for head and belly.

Information: Found in open woods and bushy areas. This species often perches upright on prominent twigs with its yellow rump exposed. It will flit out to catch insects and then return to the same roost.

### **Common Yellowthroat: *Geothlypis trichas***

Occurrence: Common, nesting

Active Months: Resident

Federal Status: Birds of Conservation Concern (BCC)

State/Audubon Status: None

Description: A small brown bird with a bright yellow throat, breast, and undertail coverts. Male has a black face mask with a white line behind the mask. Female has no black or white on the head. Juveniles may lack yellow throat and breast.

Information: An inconspicuous resident of marshy areas that breeds in low undergrowth by the waters edge. Breeding begins in late April and usually four eggs are laid. Incubation is by the female and lasts 12 days. Young leave the nest at 9 to 10 days.

### **Wilson's Warbler: *Wilsonia pusilla***

Occurrence: Seasonally uncommon

Active Months: February-October

Description: A small yellow bellied bird with a green grey back and plain dark wings and tail. Male has a black crown. Very small and small billed with a large distinctive dark eye.

Information: A small active species usually found in dense brushy vegetation. Frequently found near water, especially in willow thickets. Its size and bright yellow plumage with drab wings and tail are very distinctive.

## **TOWHEES AND SPARROWS (*Emberizidae*)**

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### **Spotted Towhee: *Pipilo maculatus***

Occurrence: Uncommon, nesting

Active Months: Resident

Description: The Spotted Towhee is a stocky, long-tailed bird with a dark head that appears slightly crested and a red eye. It has distinct rufous flanks. The male of this species has an overall dark appearance with very limited white markings on the wing bars, and the flanks are dark. The female is dark brown with limited white spotting on the wing bars.

### **California Towhee: *Pipilo crissalis***

Occurrence: Common, nesting

Active Months: Resident

Description: A rather sluggish and stocky bird with drab coloration. Gray-brown overall with cinnamon lore and faint cinnamon streaks on breast. Belly is dusky.

Information: Found, usually solitary or in pairs, in relatively open areas near patches of brush. Scratches with a backward kick on the ground in search of food. Feeds on seeds, fruit, and insects.

### **Fox Sparrow: *Passerella iliaca***

Occurrence: Common

Active Months: Winter, non-breeding

Description: Large sparrow, small songbird with heavily streaked chest, rusty tail, and messy spot in center of chest.

Information: It vigorously "double-scratching," kicking backward in ground litter with both feet to uncover food. Feeds on insects.

### **Song Sparrow: *Melospiza melodia***

Occurrence: Common, nesting

Active Months: Resident

Description: This is a fairly long-tailed bird with a round head and stout, gray bill. The front of the body is coarsely streaked with a bold brown lateral throat stripe and central breast spot. Overall, this bird is dark and contrasting.

Information: Found, usually solitary, in brushy areas near water. Nests on the ground or in shrubs and trees, usually in a twig fork. Nest is cup-shaped and made of weeds, grasses, bark stripes and lined with finer materials. 3-5 finely speckled eggs per clutch. Young are altricial and tended by both parents. Young leave the nest after ten days.

### **Dark-eyed Junco: *Junco hyemalis***

Occurrence: Common

Active Months: Residents

Description: The sparrow-shaped Dark-eyed Junco is the smallest junco. It has a dark, dull-gray hood that contrasts sharply with brown and back flanks. It has a short, conical and pointed bill. However, the female of this species is less showy with a dark ashy gray hood and a reddish back and pinkish-brown flanks.

Information: Found in patches of open ground and brush near woodlands. Winter in small flocks in patchy wooded areas. Forage on open ground, flying into brush or trees when alarmed.

## **GROSBEAKS AND BUNTINGS (*Cardinalidae*)**

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### **Blue Grosbeak: *Guriaca caerulea***

Occurrence: Seasonally uncommon

Active Months: April-August

Description: Relatively large-headed with a heavy bill, long, rounded tail and rufous wing bars. The male of this species is bright blue overall with rufous wing bars. The female has a uniform reddish brown color with rufous wing bars.

Information: Found in open weedy fields with brushy patches. Often found in small groups of two to five. Forages low for seeds and insects.

## **BLACKBIRDS, MEADOWLARKS AND ORIOLES (*Icteridae*)**

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### **Red-winged Blackbird: *Agelaius phoeniceus***

Occurrence: Common, nesting

Active Months: Resident

Description: A rather stocky bird with a short tail, bill is moderately thick. The males are all black with an orange to red lesser coverts and pale yellowish median coverts. The females have obvious red streaks overall, the bill is thicker, and the throat is often washed with pinkish white.

Information: Nests and roosts in wet, marshy or brushy habitats. Nests are a deep cup-like structure made of tightly woven leaves and stems in shrubs. Nestlings are altricial and downy and tended by both parents. Fledglings typically leave the nest after 28 days. Forage for seeds and invertebrates in open fields, often in a large flock.

### **Brewer's Blackbird: *Euphagus cyanocephalus***

Occurrence: Common, nesting

Active Months: Resident

Description: A slender long-tailed bird. The bill is short, straight and pointed. The males are dark black overall with a pale eye. When in breeding season, males have more of an iridescent look to their black feathers and have a glossy appearance. Females are a drab gray-brown and unmarked overall with a dark eye.

Information: Found in large flocks foraging for seeds and insects on open ground. They nest in a variety of habitats. Nests made of fine twigs, grasses, mud, and dung lined with fine materials. 5-6 pale eggs per clutch.

### **Brown-headed Cowbird: *Molothrus ater***

Occurrence: Common, nesting

Active Months: Resident

Description: This bird has a stout bill, short tail and pointed wings. The male of this species has a black body with an appearance of slight glossy green. Its head is dark brown. The female of this species has a more drab coloration. It has a scaly back and all the feathers are fringed in a pale brown. Its breast has fine, distinct streaks.

Information: Found in woods, edges, and open fields. Usually found in small flocks and often with blackbirds. Forages for seeds and invertebrates on open ground. A brood parasite, the females can lay up to 30 eggs in a breeding season, in other birds' nests. Young are altricial but develop very quickly, out competing other young in the host nest. Young leave nest at ten days.

### **Hooded Oriole: *Icterus cucullatus***

Occurrence: Common

Active Months: Summer, breeding

Description: Medium-sized oriole with slender body, long tail and long, slightly decurved bill. Males are bright orange with black bib and females are drab yellow.

Information: Breeds in areas with scattered trees and along streams. Searches for insects among leaves; may hang upside down. Often perches near ground. Feeds also on spiders, nectar, and fruit.

## **FINCHES (*Fringillidae*)**

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### **Purple Finch: *Carpodacus purpureus***

Occurrence: Common, nesting

Active Months: Resident

Description: The Purple Finch is a stocky bird with a short tail, medium-length wings and stout bill. The male of this species has a reddish head and breast. Outlining the red breast is a brown coloration. The female of this species is very streaky in appearance. The head and back of the female is brown, and the breast is blurry streaks. Both sexes of this bird have a grayish bill and legs.

Information: Typically breeds in open coniferous-deciduous forest, forest edge, and open woodland. 3-6 pale blue and speckled eggs per clutch. Nestlings are altricial, tended by both parents and independent by 14 days.

### **House Finch: *Carpodacus mexicanus***

Occurrence: Common, nesting

Active Months: Resident

Description: A smaller bodied bird with a long, notched tail. The wings are short and round and has a round head and short bill. Males have an orange to red coloration from the forehead to the malar. There is pale grayish auriculars and brownish indistinct streaks on the primary coverts. There are brownish white streaks on the flank. The females are a drab, blurry version of the male; gray to brown overall with indistinct streaks and the head is very plain and has blurry, grayish streaks on its flanks.

Information: Found in patchy, brushy and wooded areas. Usually in small flocks, flying above treetops and swooping down to land on the tops of bushes or weeds. A regular visitor to bird feeders and often nests on or near buildings; feeds on seeds, fruit and some insects. Nests built by the females in two days and are made of fine grasses, leaves, string, feathers, and twigs.

### **Lesser Goldfinch: *Carduelis psaltria***

Occurrence: Common, nesting

Active Months: Resident

Description: Smallest of all goldfinches. Stocky and short-tailed with short, rounded wings, and large stout dark grey bill. Males are generally yellow in appearance with black cap and black wings. In flight, the under wing is black with an obvious white patch. The tail also has large white patches present. Females are not as yellow as males, and in flight, the females are all dark on the upper side and has little to no white on tail.

Information: Open habitats with scattered trees or brush, and fields. Typically nest in solitary pairs, albeit sometimes nest in small colonies. Nests are compactly woven using plant fibers, grass stems, bark, and moss; 3-6 pale greenish-blue eggs per clutch.

### **American Goldfinch: *Carduelis tristis***

Occurrence: Common, nesting

Active Months: Resident

Description: The largest finch in the United States; however, it is still a small bird. The Males are yellow with black forehead and tail. Most of this bird's wings are black with yellow lesser coverts. Under wing coverts and rump are white. The bill is conic, stout, and pink in color. Female are similar to the male except for being drab in coloration.

Information: Breeding occurs over a variety of habitats with openings and where trees and shrubs are present. Nests have been found in trees, shrubs or in tall weeds. Nests constructed as cups from plant fibers and placed on twigs or in a fork in trees or shrubs.

## **OLD WORLD SPARROWS (*Passeridae*)**

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### **House Sparrow: *Passer domesticus***

Occurrence: Common

Active Months: Resident

Description: Males have a red back, white cheeks, and a black breast. During the breeding season the bill of the male turns black. Females are plainly colored off-brown.

Information: This introduced species is common to urban settings. A common bird found in the City of Pismo Beach, this bird is seen foraging around Pismo Lake.

Appendix I  
Fish Species Accounts



## Fish Species Accounts

The following are descriptions of species identified during the 2010 fish survey. The use of scientific and common names follows Moyle and Davis (2000), Scharpf (2005), and California Department of Fish and Game species lists (2004). Information contained in the species accounts was largely based upon Page and Burr (1991), McGinnis (1984), and Kimsey and Fisk (1969).

### **SUNFISH AND BASS (*Centrarchidae*)**

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#### ***Bluegill: Lepomis macrochinus***

Distribution: Native to the Quebec, St. Lawrence, and Great lakes areas south to the Atlantic and Gulf Slope drainages in Florida and southern Texas. Now introduced throughout the United States and Northern Mexico. They are commonly stocked in ponds as food for larger fish.

Habitat: Most often in the shallow waters of warm, clear vegetated ponds, lakes, reservoirs, rivers, and pools of creeks.

Life History: Bluegill typically build nests in large groups, called nest spawning, sometime between May and August. Males often select an area in 1 to 4 feet of water and sweep out rounded, plate-like depression with their tails for the nest. Females will then lay between 10,000 to 60,000 eggs in the nest which will be guarded by the male. The eggs hatch in approximately five days. Young bluegill most commonly forage on zooplankton while the adult diet is largely comprised of aquatic insects. Bluegill greatly vary in size (3-10 inches) but may get up to 10 inches in length where there is no overcrowding.

Identification: A deep and compressed fish with a small mouth and a long pectoral fin. Colors vary, but they most commonly have an olive back and side with clear to dusky colored fins. The ear flap is black, and they have a black spot near the back of the dorsal fin and a dusky colored spot on the anal fin. They have a small mouth and a complete lateral line.

#### ***Largemouth bass: Micropterus salmoides***

Distribution: Native to the Mississippi River basin, the Great Lakes region, and the southeastern U.S. Have been introduced throughout California in most warm freshwater habitats.

Habitat: Prefer impoundments, but can also be found in stream pools, rivers, and marshes. Associated with aquatic vegetation.

Life History: Juveniles eat zooplankton and adults are piscivores. Adults feed from the vegetated margins of aquatic habitats.

Identification: Members of the Centrarchid family have a forked tails and two dorsal fin segments, consisting of anterior spines and posterior soft rays, which may or may not be

separated. This species can be distinguished from other centrarchids found locally by having an elongate body and a jaw that extends past the posterior edge of the eye. They have a continuous black lateral stripe, and the dorsal fins are nearly separate. Adults are usually 30–40 cm total length, and maximum length is 74 cm.

### ***White crappie: Pomoxis annularis***

Distribution: The native range of white crappie includes the area west of the Appalachian Mountains north to southern Ontario and south to the Gulf of Mexico. The range extends west to Minnesota and South Dakota in the north, and to northeastern Mexico in the south. Today the range extends west to include California and portions of Nevada, Arizona, New Mexico, Montana, Colorado, Utah, and North Dakota.

Habitat: Prefer impoundments, but can also be found in stream pools, rivers, and marshes. Associated with aquatic vegetation.

Life History: Like other members of the sunfish family, white crappie are nest builders. They are similar to bluegills in that they tend to nest in relatively large "beds" and they have very high reproductive potential. White crappie nest in the spring, generally when water temperatures reach 65°F to 70°F. They feed predominantly on smaller species, including the young of their own predators (which include the northern pike, muskellunge, and walleye).

Identification: White crappie have dark bands (vertical bars) around the body. They are deep-bodied and silvery in color, ranging from silvery-white on the belly to a silvery-green or even dark green on the back. dorsal fin has a maximum of six spines. Males may develop dark coloration in the throat region during the spring spawning season.

### ***Black crappie: Pomoxis nigromaculatus***

Distribution: The native range of the species is very similar to that of the white crappie, except that it extends slightly further north into Canada and east to the coastal plain south of Virginia. Currently, populations of black crappie can be found in each of the 48 contiguous United States.

Habitat: The black crappie tends to prefer clearer water than the white crappie does.

Life History: Like other members of the sunfish family, black crappie are nest builders. They nest in the spring, generally when water temperatures reach 60°F. The biology of black crappie is very similar to that of white crappie. Growth in terms of weight is very similar between the two species. White crappie tend to have higher growth rates in terms of length, but black crappie are more robust in body construction. Black crappie adults feed on fewer fish, and more insects and crustaceans, than do white crappie.

Identification: Very similar to black crappie size, shape, and habits, except that it is darker, with a pattern of black spots. It is most accurately identified by the seven or eight spines on its dorsal

fin. The oldest recorded age of a specimen is fifteen years, although seven years is a more typical life span for the species.

## **MINNOWS (*Cyprinidae*)**

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### **Common carp: *Cyprinus carpio***

Distribution: Native to Eurasia and has been introduced throughout the U.S.

Habitat: Occurs in lakes, ponds, and rivers. Associated with muddy water, organic detritus, and low current speeds. Usually found in moderately shallow water in littoral zones.

Life History: May hybridize with goldfish (*Carassius auratus*), and a strain of this species is the domesticated Koi. They forage on bottom-dwelling invertebrates, gulping up substrate and spitting out sand and silt, which increases water turbidity. They also consume vascular plants, and often remove entire stands while feeding. They have high fecundity and one female can lay up to two million eggs each season.

Identification: A deep-bodied fish with very large scales that may have dark outlines. Some individuals may lack scales or have only a few extremely large scales. They have two short barbels on each side of the upper jaw (to 75 cm total length). Adults may have reddish-orange caudal and anal fins.

### **Golden shiner: *Notemigonus crysoleucas***

Distribution: Found throughout the eastern half of North America, north to the St Lawrence River, Great Lakes, and Lake Winnipeg, and west to the Dakotas and Texas. Because of its use as bait, it has also been introduced in many places outside this native range.

Habitat: Prefer quiet waters and are therefore found in lakes, ponds, sloughs, and ditches. They are sometimes found in the quietest parts of rivers. They do better in clear water with dense mats of vegetation, but can deal with pollution, turbidity, and low oxygen content. They can tolerate temperatures as high as 40 degrees Celsius (104 degrees Fahrenheit) which is unusually high for a North American minnow.

Life History: Golden shiners are omnivorous. They eat zooplankton, plants, and algae. They can feed at the surface, in mid-water, or at the bottom. They lay sticky eggs amid vegetation. There is no parental care. Occasionally, like a few other minnows, golden shiners can deposit their eggs in the occupied nests of pumpkinseed, largemouth bass, or bowfin (the latter two, ironically, can be predators of shiners).

Identification: A deep-bodied fish usually between 7.5 and 12.5 cm long. The back is dark green or olive, and the belly is a silvery white. The sides are silver in smaller individuals, but golden in larger ones. There can be a faint dusky stripe along the sides. The anal fin is large and has 8-19

rays, while the dorsal fin comprises almost always 8 rays. Scales are relatively large and easily lost when the fish is handled. The mouth is small and upturned. Two characteristics can distinguish the golden shiner from all other minnows: (1) the lateral line has a pronounced downward curve, with its lowest point just above the pelvic fins; and (2) there is a fleshy keel lacking scales on the belly between the pelvic fins and the base of the anal fin.

## **CATFISH (*Ictaluridae*)**

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### ***Brown bullhead: Ameiurus nebulosus***

Distribution: The 40+ species in this family are native to the eastern United States, and seven species have been introduced to California.

Habitat: *Ameiurus spp.* have the highest tolerance to low dissolved oxygen levels of any group of fish. They are bottom feeders that occur in warm eutrophic water, especially backwater areas and ponds.

Life History: *Ameiurus spp.* have barbels that are used to detect food along the bottom in shallow areas, and they usually feed at night. Prey include tadpoles, small fish, and detritus, and sand and mud may also be ingested. They breed in May and June. The females excavate nests in the substrate in aquatic vegetation, under roots, and in the sides of banks. Eggs are attended by both parents who fan the nest with their tails. The adults guard the fry up to 2 weeks after hatching and may carry them in their mouths. The sharp spines in their dorsal and pectoral fins can easily pierce your skin and contain poisonous substances.

Identification: This catfish lacks scales and has very slimy skin (total length to 53 cm). There are barbels that protrude around the snout. This species can be distinguished from other bullhead in California by having chin barbels that are light near the chin and dark along the rest of the length.

Appendix J  
Mammal Species Accounts

## Mammal Species Accounts

Life history information represents sightings and trap data as well as animals thought to occur that were never caught. The use of scientific and common names follows Burt and Grossenheider (1980), Kays and Wilson (2002), and California Department of Fish and Game species lists (2004). Information contained in the species accounts was largely based upon Burt and Grossenheider (1980), Kays and Wilson (2002), Jameson and Peters (2004), and Ingles (1965). The species accounts are arranged according to taxonomic families.

### Key to Mammal Guide

Genus species: Names written in red are non-native species.

Location: General habitat where animal can be found.

Status:

**Common**: Easy to find and common in most areas.

**Fairly Common**: Not easy to find but common, usually in habitat restricted areas

**Uncommon**: Generally not found in most areas, not threatened, endangered,

**Federal Species of Concern** or **Species of Special Concern**

**Threatened**: Uncommon and threatened (jurisdiction cited).

**Rare**: Hard to find in the area but common elsewhere.

Description: General description of animal with key features in italics.

Information: Time of day when most active, breeding habits and habitats, interesting behavior, and evidence of presence.

## **DIDELPHIDAE**

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**Opossum: *Didelphis virginianus***

Location: All areas; prefers woodlands near meadows or arable lands.

Status: Common.

Description: Body fur is gray with long white and gray guard hairs, giving a scruffy appearance. Has a white head with a long pink-tipped snout, and a long, scaly, prehensile tail.

Information: Mostly nocturnal. Breeds at any time, but most mating occurs from January to July. Gestation lasts only 12 days, but young remain in the pouch for two more months. Usually two

litters a year of four to ten young. Normally shy; may “play possum,” feigning death, going limp with eyes closed.

## **LEPORIDAE**

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### **Brush Rabbit: *Sylvilagus bachmani***

Location: Found in chaparral habitats; prefers dense brush.

Occurrence: Common

Description: Small rabbit with short legs and tail. Ears are slightly pointed and sparsely haired inside. Dark gray on back and sides; pale gray on belly and underside of tail. Whiskers are all black.

Information: Crepuscular. Breeding is limited to the first six months of the year. The gestation period is about 27 days. There are three to six young in a litter, and three or four litters per season. Thumps ground with hind foot when frightened; may climb low branches to escape.

## **CASTORIDAE**

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### **American Beaver: *Castor canadensis***

Location: Beavers live in streams, rivers, marshes, ponds, and shorelines of large lakes throughout North America, parts of Europe, and Asia.

Occurrence: Common.

Description: Largest rodent in North America and the third largest rodent in the world. Adults usually weigh 33–77 lbs. The beaver's fur consists of long, coarse outer hairs and short, fine inner hairs. The fur has a range of colors but usually is dark brown. It has a large flat paddle-shaped tail and large, webbed hind feet. The unwebbed front paws are smaller, with claws. The eyes are covered by a nictitating membrane which allows the beaver to see underwater.

Information: Beavers are semi-aquatic. Beavers are mainly active at night. They are excellent swimmers but are more vulnerable on land and tend to remain in the water as much as possible. They are able to remain submerged for up to 15 minutes. The flat, scaly tail is used to signal danger and also serves as a source of fat storage.

## **MURIDAE**

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### **Deer Mouse: *Peromyscus maniculatus***

Location: In all types of habitat, including forests, brush, grassland, and chaparral.

Occurrence: Common.

Description: One of the smallest deer mice. Brown (adult) or gray (juvenile) above, white below. Ears round, medium-size. Feet white. Tail distinctly bicolored and shorter than body (less than 50 percent of its total length). In most habitats, out-numbers all other rodents combined.

Information: Primarily nocturnal. Breeding takes place from April through November or even December; the breeding season is variable, usually during the period that provides the best environment and food for raising young. Several litters per year of two to eight young each; gestation 21–24 days. Agile climber. Feeds on seeds, insects, fungi.

### **Western Harvest Mouse: *Reithrodontomys megalotis***

Location: Found in grasslands and open oak woodlands. May be found in cultivated areas if grass and weeds are present; avoids forests.

Occurrence: Common.

Description: A small, delicate mouse that's generally brownish above and white below. Similar to a House Mouse, but with a longer tail (about 50 percent of its total length), and grooved upper incisors.

Information: Tend to be more active on moonlit nights. Breeds early spring to late autumn, with reduced activity in midsummer. Gestation 23 to 24 days; three to five young (sometimes up to nine) per litter. They build nests on or above ground level, from grasses shredded bark and other fibers. These mice frequently use the runways of meadow voles.

### **California Vole: *Microtus californicus***

Location: Found in upland meadows and grassland habitats, from sea level to mountains. Active day and night, year-round.

Status: Common.

Description: Gray to brownish with long grizzled fur and small hidden ears. Faintly bicolored tail more than twice the length of the hind foot.

Information: Diurnal and nocturnal. May breed throughout the year if fresh green food is abundant; otherwise breeds when grasses and forbs are sprouting. Several litters per year, each of three to eight young; gestation 21 days. Populations are cyclic, building up and crashing at regular intervals, depending on food availability. Females become sexually mature between three and four weeks of age. Makes runways and tunnels along roots and stems. Constructs nests of grasses or shredded bark, usually below or at ground level, often under logs and rocks.



### **Dusky-footed Woodrat: *Neotoma fuscipes***

Location: Found in hardwood forests and brushlands, from sea level to mountains. Active day and night, year-round.

Occurrence: Common.

Description: A large wood rat with a grayish brown dorsum and a pale or white venter. The feet are brown at the base with the distal half white and it has a faintly bi-colored and scantily haired tail.

Information: This species consumes many different leaves, flowers, nuts, and berries. It favors *Rhamnus californica* and *Toxicodendron diversilobum*. It breeds only in the winter and spring, though during exceptionally wet years it may breed nearly year-round.

It typically has more than one and up to five litters per year with one to three young, usually two per litter. They build large houses of twigs, leaves and other debris on the ground or rarely in trees. It is known to rattle its tail during times of duress. The rattle lasts three to four seconds and can be heard by humans from 15 meters.

### **Norway Rat: *Rattus norvegicus***

Location: Thought to have originated China, this [rodent](#) has now spread to all continents, except Antarctica, and is the dominant rat in Europe and much of North America

Occurrence: Very Common.

Description: Brown or grey rodent with a body up to 25 cm (10 in) long, and a similar tail length; the male weighs on average 350 g (12 oz) and the female 250 g (9 oz). The fur is coarse and usually brown or dark grey, while the underparts are lighter grey or brown. The length can be up to 25 cm (10 in), with the tail a further 25 cm (10 in), the same length as the body.

Information: The brown rat is usually active at night and is a good swimmer, both on the surface and underwater, but unlike the related Black Rat (*Rattus rattus*) they are poor climbers. Brown rats dig well, and often excavate extensive burrow systems.

### **Muskrat: *Ondatra zibethicus***

Location: The muskrat generally inhabits wetlands with an abundant supply of aquatic vegetation such as swamps, coastal and freshwater marshes, lakes, ponds, and slow-moving streams.

Occurrence: Common.

Description: 2-4 pounds. Length: 18-25 inches; tail: 8-11 inches. The muskrat is a large, stout, semi-aquatic rodent. Its head is broad and blunt with short ears barely visible beyond the fur.

The muskrat's coat is practically waterproof and is soft, dense, and grayish brown in color. The underfur is covered by long, brown guard hairs which serve to protect the soft underhair from wear. Its tail is scaled, nearly hairless, and somewhat flattened on the sides. The muskrat is further adapted for its semi-aquatic life with lips that act as valves, closing behind the front incisors so it can actually gnaw underwater.

Information: Primarily aquatic plants including cattails, arrowheads, and duckweeds. Occasionally eats crayfish, snails, mussels, frogs, insects, and slow-moving fish. Muskrats have a high reproductive rate, producing up to four litters per year each with six to seven young.

## **CANIDAE**

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### **Coyote: *Canis latrans***

Location: Found in all habitat types, most often found in open plains and scrubby areas. One of the most widespread mammals in North America.

Status: Common.

Description: Gray, sandy, or brown, with a bushy dark-tipped tail held low when running.

Information: Diurnal. Mating takes place in February; five to ten pups are born about two months later. Eats carrion, insects, rodents, rabbits, turtles, gophers, and frogs; will sometimes hunt in small groups to catch larger prey such as deer.

### **Red Fox: *Vulpes vulpes nescator***

Location: Normally found in alpine areas of the high mountains of the Sierra Nevada, but also found at lower elevations including farmlands and scrubby hillsides.

Occurrence: Very common.

Description: Small and dog-like, generally reddish brown above with white underparts, and a long white-tipped bushy tail. The feet and the back of the ears are blackish.

Information: A litter of five to ten kits is born in early spring. Has a diet of small mammals, birds, fruit, and insects, often storing food in caches. The male helps the female provide food for the young.

## **PROCYONIDAE**

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### **Raccoon: *Procyon lotor***

Location: Found all over; chiefly along streams, marshes, and ponds. Often in suburbs.

Status: Common.

Description: Generally dark grayish or grayish brown above, paler below. Easily identified by striped tail and black face mask.

Information: Nocturnal and crepuscular. Mates in late winter; a litter of three to six young is born in late spring in a hollow log or tree. Swims and climbs well. Omnivorous. Raccoons are sociable, and family groups may remain in a unit throughout the winter.

## **MUSTELIDAE**

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### **Striped Skunk: *Mephitis mephitis***

Location: Found in many habitat types (woodlands, fields, agricultural areas, and neighborhoods), generally near streams.

Occurrence: Common.

Description: A large black skunk with broad white stripes from the back of the head to the rump.

Information: Nocturnal. Mating takes place in late winter or spring; gestation lasts for 60 to 77 days. Four to seven (or more) young are born in May or June in a hollow log or underground chamber. Omnivorous, feeding mostly on insects and their grubs. One of the most common carriers of rabies.

## **SCIURIDAE**

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### **California Ground Squirrel: *Spermophilus beecheyi***

Location: Mainly found in fields, along roadsides, on grazed pastures, and in open oak woodlands.

Status: Common.

Description: A large squirrel, gray-brown and mottled with light flecks. Usually has a dark mantle that is rarely adjoined by faint light lateral stripes. Its tail is long and bushy.

Information: Diurnal. A single litter of three to ten young is born annually; season of birth varies with locality. These animals prefer an open area that gives them a clear view of their surroundings. Where the grass has become tall, it is frequently seen on fence posts or wire fencing. Adult males enter hibernation in late summer and adult females enter later, while young remain active until the fall. Hibernation lasts until early spring.

### **Western Gray Squirrel: *Sciurus griseus***

Location: Commonly found in oak and conifer woodlands.

Status: Common.

Description: Has a long gray tail with a white streak on the edge. Overall, it is gray, but its underbelly is all white.

Information: Typically feeds on acorns or conifer seeds. Mostly arboreal, yet can be found foraging on the ground. Northern populations in California are threatened due to increased human activity.

## **FELIDAE**

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### **Domestic Cat: *Felis familiaris***

Location: Anthropogenic communities.

Occurrence: Common.

Description: They vary in size, shape, and color.

Information: These cats may be feral or house cats, often preying on birds and mice. Long term presence could impact fauna found at Pismo Lake.

## **VESPERTILIONIDAE**

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### **Big Brown Bat: *Eptesicus fuscus***

Location: Found virtually in every North American habitat. Roosts in buildings, trees, caves, and bridges.

Status: Common

Description: Common large brownish bat with rather glossy fur. Ears and wing membranes darkly pigmented; broad muzzle, rounded ears, and blunt tragus.

Information: Nocturnal. Mating occurs in August to September; fertilization takes place in April; and a single young is born in June. Females form maternity colonies of 20 to 300. Usually begins flying long before the sky is dark. Feeds on a variety of insects but primarily beetles and caddis flies.

### **Yuma Myotis: *Myotis yumanensis***

Location: Widespread throughout California in a variety of habitats but never far from water sources. Roosts in buildings, mines, caves, crevices, and bridges.

Status: Federal Species of Special Concern.

Description: Very similar to Little Brown Myotis, but Yuma Myotis is slightly smaller. Dorsal fur is buffy and belly is whitish, not shiny or burnished; membranes and ears pale brown.

Information: Nocturnal. Mating occurs in the fall. A single young is born from late May to early July. Prior to birth of the young, females segregate into nursery colonies of up to 2,000 individuals. Feeds on a wide variety of small flying insects.

## **MOLOSSIDAE**

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### **Brazilian Free-tailed Bat: *Tadarida brasiliensis***

Location: Occurs in a wide range of habitats. Roosts in buildings, caves, and mines along the Coast, primarily roosts in buildings.

Status: Common

Description: Common dark brown or grayish above. Ears separated at the base, and the tail is not connected to a membrane along its entire length. The wings are narrow and the flight fast and straight.

Information: Nocturnal. Breeding occurs in late winter, and gestation takes about 100 days. A single young is born from late June to early July. Nursery colonies may number tens of thousands. Out flight often occurs in huge numbers, looking like a plume of smoke leaving a cave. Feeds primarily on small moths but will consume a variety of aerial insects.

Appendix K  
Reptile and Amphibian Occurrence List &  
Species Accounts

## Reptile and Amphibian Occurrences

The following list summarized in Table 1 below is intended to include all amphibian and reptile species that may occur at the Pismo Lake Ecological Reserve, and is based on species distribution data reviewed during the literature search as well as results of the present surveys. If a species has been confirmed to be present, the most recent year it was observed at the site is given under “Occurrence”. In cases where the observation was offsite, but within the local area, the location of the observation is given with the year in parentheses. If suitable habitat exists within the reserve boundaries and the site is within the species’ local distribution, but the species has not been observed onsite, occurrence is listed as “Expected”. For species that have not been detected onsite and only marginally-suitable or unsuitable habitats are present onsite, but in which individuals are known to occur within the region, occurrence is listed as “Unlikely”. It is possible that individuals of these species may occur onsite at some point in time, but they have not yet been found and their occupancy of the site may be extremely limited. Further information on the occurrence of each species at the reserve is given under “Distribution” in the Species Accounts below.

Regulatory “Status” follows California Department of Fish and Game (2009). Native species that are not listed as protected are broken into “Common” and “Uncommon” categories based upon a qualitative assessment of local abundance using personal observations, museum records, and Stebbins (2003). Categories are abbreviated as follows:

Table 1. Amphibian and Reptile Species Occurring or Potentially Occurring at Pismo Lake Ecological Reserve

Scientific Name	Common Name	Occurrence	Status
<b>Amphibians</b>			
<i>Anaxyrus boreas halophilus</i>	Southern California toad	1973	U
<i>Aneides lugubris</i>	Arboreal salamander	Unlikely	U
<i>Batrachoseps nigriventris</i>	Black-bellied slender salamander	2010	C
<i>Ensatina eschscholtzii eschscholtzii</i>	Monterey ensatina	Unlikely	U
<i>Lithobates catesbeianus</i>	American Bullfrog	2010	I
<i>Pseudacris regilla</i>	Northern Pacific treefrog	2010	C
<b>Reptiles</b>			
<i>Actinemys marmorata</i>	Western pond turtle	2010	SC
<i>Anniella pulchra</i>	California legless lizard	(Pismo Beach, 1933)	SC
<i>Phrynosoma blainvillii</i>	Blainville’s horned lizard	(Oak Park, 1959)	SC
<i>Plestiodon skiltonianus skiltonianus</i>	Skilton’s skink	Unlikely	U

<i>Sceloporus occidentalis bocourtii</i>	Coast Range fence lizard	2010	C
<i>Uta stansburiana elegans</i>	Western side-blotched lizard	Unlikely	U
<i>Elgaria multicarinata multicarinata</i>	California alligator lizard	2010	C
<i>Diadophis punctatus vandenburghii</i>	Monterey ring-necked snake	Expected	C
<i>Lampropeltis getula californiae</i>	California kingsnake	2010	C
<i>Pituophis catenifer annectans</i>	San Diego gopher snake	1973	C
<i>Thamnophis elegans terrestris</i>	Coast gartersnake	Expected	U
<i>Thamnophis hammondi</i>	Two-striped gartersnake	Expected	SC
<i>Thamnophis sirtalis fitchi</i>	Valley gartersnake	1973	U
<i>Crotalus oreganus helleri</i>	Southern Pacific rattlesnake	Unlikely	U

FE: Federally listed endangered species

FT: Federally listed threatened species

SE: State listed endangered species

ST: State listed threatened species

SC: State species of special concern

C: Common, native species

U: Uncommon native species not listed as a sensitive species by regulatory agencies; generally uncommon in isolated habitats surrounded by urban areas

I: Introduced species



## Reptile and Amphibian Species Accounts

The following species were observed at the Reserve during the 2010 surveys and/or earlier surveys. Species observed in the 2010 survey are identified with an “\*”.

### TRUE TOADS (*Bufo*idae)

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#### **Southern California Toad: *Anaxyrus boreas halophilus* (Baird and Girard, 1853)**

Taxonomy: The southern California toad is a member of the true toad family Bufonidae. This genus of exclusively North American toads was removed from *Bufo*. Other common names previously used include California toad and western toad.

Distribution: Ranges throughout California except for interior deserts and elevations above 11,800 feet in the Sierra Nevada Mountains. *A. b. halophilus* intergrades with *A. b. boreas* in a region near Mendocino, Tehama, Shasta and Lassen Counties, with *A. b. boreas* occurring to the north and *A. b. halophilus* to the south. Although formerly common, this subspecies appears to be declining in many regions of California. It is rare in coastal areas of northern San Luis Obispo County, and this may be due to historical distribution patterns. It was recorded at Pismo Lake in 1973 by the Department of Fish and Game (Nakata and Pintler, date unknown) but was not found during the 2010 surveys.

Habitat: These are terrestrial anurans that breed in aquatic habitats. They occur in a wide range of habitats including grasslands, woodlands, coastal streams, rivers, mountain meadows, desert springs and streams. They breed in slow-moving or still water that is shallow and sparsely vegetated. On the coast, breeding habitats include stream mouths, lagoons, vernal pools, stock ponds, lakes, and dune ponds. They shelter in crevasses, rodent burrows, depressions at the base of vegetation, under garden container, and they may dig in loose soil.

Life History: Active January through October. In our area adults are almost entirely nocturnal but sometimes are found breeding during the day. They often sit on roads at night, especially unpaved roads and trails, and suffer high mortality from vehicle traffic. They can be very abundant on roads during rainstorms and but also use roads during dry periods until late-summer. They tend to walk rather than hop, and can be found by listening for them fleeing in leaf litter. Toxins secreted from the bumps on their skin can kill a dog or other predators, but will not give you warts. Breeding occurs in the late part of the rainy season in quiet, shallow water. Larvae can often be found in large aggregations in extremely shallow water. Recently-metamorphosed toadlets can be very abundant in mid- to late-summer during the day or at night along sand bars, sparsely-vegetated shorelines and dirt roads. Adults eat ants, beetles, worms, spiders, moths and other insects. They absorb water through the thin skin of their groin. When picked up they may release this water as an escape mechanism. Since this water is stored for use when traveling over dry land, individuals that have “peed” should be relocated near shallow water.

Identification: *Adults and juveniles:* *Anaxyrus* are stocky, short-legged and covered with bumps that resemble large warts (body length 100 – 190 mm). They have parotoid glands that are large bumps behind the bulging eyes. *A. b. halophilus* have a thin, usually continuous white stripe down their backs. Their backs are dusky, gray or greenish with dark or rusty-colored blotches on the warts. The ventral surface is pale with dark blotches. Juveniles have bright yellow on the undersides of their feet, rusty-colored warts and a dorsal stripe that may be indistinct. Males have dark nuptial pads on their thumbs and inner fingers. *Larvae:* All anuran larvae in our area hatch out black and remain dark until around 15 mm total length. *A. b. halophilus* remain jet or smoky black above and below until the hind legs begin to emerge, when they begin to lighten to a blotchy gray. When viewed from above their eyes are within the outline of their head and oriented outward, and the snout is pointed. When viewed from the side they are trim without an enlarged belly. They often form large, dense aggregations in shallow water. *Eggs:* Each female can lay up to 16,500 small eggs that are contained in strings of jelly that are wound around sparse vegetation in the margins of aquatic habitats. If a string is pulled, the eggs will line up in a straight line. Individual eggs are black above and white below. *Voice:* Males and females will emit a peeping noise like a chick when picked up, which is a release call to prevent amplexus. Some literature reports that aggregations of males make this call during the breeding season, but instead of being an advertisement call, they are thought to be aggressive calls against other males to maintain spacing. Males do not use an advertisement call to attract females, and they wait silently in the water.

## **LUNGLESS SALAMANDERS (*Plethodontidae*)**

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### **Arboreal Salamander: *Aneides lugubris* (Hallowell 1849)**

Taxonomy: The arboreal slender salamander is a member of the lungless salamander family Plethodontidae. Populations in the Sierra Nevada foothills are genetically distinct from coastal and island populations.

Distribution: Occurs in coastal ranges and valleys from Humboldt County to northwestern Baja California, and the foothills of the Sierra Nevada from El Dorado County to Madera County. Also occurs on South Farallon, Catalina, Año Nuevo, and Los Coronados islands. It is present from sea level to approximately 5000 feet elevation. The arboreal salamander is widespread throughout San Luis Obispo County, except the northeastern portion. They have not been recorded from Pismo Lake, but records exist from Price Canyon.

Habitat: Inhabits coast live oak woodland, and can occur in pine forests in the Sierra Nevada foothills. They can climb trees and may be found in tree cavities. They are usually found under cover objects such as logs, boards, rocks, or bark. They lay their eggs in tree cavities or under logs.

Life History: This species is active above or near the surface of the ground November through May, and is nocturnal. They eat various small invertebrates such as millipedes, worms, snails, ants, termites, sowbugs, moths, and centipedes. They are also known to eat slender salamanders (*Batrachoseps* sp.). They breathe mainly through their skin, instead of through their lungs. Males use the mental gland to stroke a female's back during courtship, while scratching her skin with his teeth to deliver the mental gland pheromones to the female. In late spring and early summer, females lay from 5 - 24 eggs in moist places, most commonly in decaying cavities of live oak trees, sometimes high off the ground, and also under rocks and logs. Females, and sometimes males, usually remain with the eggs until they hatch. Groups of salamanders may lay eggs communally. Young develop completely in the egg and hatch fully formed in August and September. They may stay with the male and female after hatching. The arboreal salamander may vocalize (like a squeak) when picked up, and they can bite hard enough to draw blood. Males and females are highly territorial.

Identification: *Adults:* Dorsal coloration is blackish-brown with yellow flecks (62 to 100 mm body length). The ventral surface is whitish to grey. The toes are square-tipped and slightly enlarged for climbing. They have very large jaw muscles, especially in the males. The males also have an enlarged heart-shaped mental gland on their chins. They have conspicuous costal gooves (15) along the ribs down their sides. If their front and hind limbs were pressed against the body, they would overlap or be separated by 1 costal fold. *Juveniles:* Dorsal pattern is mottled with grey, brown or rust color. The bases of the limbs and tail are yellow.

**\*Black-bellied Slender Salamander: *Batrachoseps nigriventris* (Cope, 1869)**

Taxonomy: The black-bellied slender salamander is a member of the lungless salamander family Plethodontidae. *B. nigriventris* consists of three distinct lineages: those found from Monterey County south to the Tehachapi Mountains; those found south of the Tehachapi Mountains from Ventura and Los Angeles south to the Santa Ana Mountains and east to Cajon Pass; and, those found on Santa Cruz Island. Individuals from the western slope of the central and southern Sierra Nevada mountains previously identified as *B. nigriventris* were re-described as *B. gregarius* in 1998.

Distribution: Occurs in the coastal mountains from Monterey County south to the Santa Ana Mountain Ranges, and the Tehachapi, Santa Monica and San Gabriel Mountains east to Cajon Pass. Also found on Santa Cruz Island. It is present from sea level to 8200 feet in elevation. In 2010, this species was found throughout the oak woodland habitats of the Reserve, and was relatively abundant.

Habitat: Mainly inhabits oak woodlands, and it also occurs in grasslands, riparian areas, eucalyptus woodland, chaparral, and oak-pine forests. They also can be found in urban yards and associated with buildings. In southern California, they can be found in riparian habitats dominated by sycamores. Salamanders can be found under and within rotting logs, discarded

lumber, rocks, leaf litter and bark. Populations are often patchily distributed but locally abundant, and often several individuals can be found under the same log. The salamander requires moisture and during dry conditions individuals probably retreat under ground in small crevasses and burrows. Apparently it can tolerate salt spray from the ocean as it can be found on bluffs above beaches.

Life History: Active under cover objects during the wet season, and they are adapted to utilize earthworm burrows, root channels and crevasses. Females lay eggs in the winter underground, under damp bark and rotting logs. Eggs are laid underground or rotting logs in winter, and several females may make a communal nest. Eggs hatch in early spring. When exposed, the salamanders may coil up, flip around violently, or remain motionless partially embedded in the soil and rotting wood. Their tails may break off when disturbed and can be regenerated. They eat small arthropods and mollusks. They breathe mainly through their skin instead of using their lungs.

Identification: *Adults and juveniles:* Delicate, elongated salamanders with tiny limbs and protruding eyes (body length 31-47 mm; total length including tail to 140 mm). The tail may be twice as long as the body. They have four toes on front and back feet, whereas other western North American salamanders have four toes on the front and five toes on their back feet. They have vertical (costal and caudal) grooves down their sides that give them a segmented earthworm-like appearance; they are dark-colored, often with a broad reddish or tan stripe down their backs. Ventral surfaces are sprinkled with white specks. Other *Batrachoseps* sp. in the central coast closely resemble *B. nigriventris* in appearance, and may be distinguished most readily by local geographic ranges (see Jockusch et al. 2001). *Larvae:* There is no free-living aquatic larval stage. Terrestrially-laid eggs hatch into juveniles. *Eggs:* The eggs are whitish, about the size of BB shot, and strung together by jelly.

### **Monterey Ensatina: *Ensatina eschscholtzii eschscholtzii* (Gray, 1850)**

Taxonomy: The Monterey ensatina is a member of the lungless salamander family Plethodontidae. There is only one species within the genus. There are 7 morphologically distinct subspecies within *E. eschscholtzii* that are an example of a rassenkreis (“ring species”) – the subspecies are distributed up the coast, across the northern Central Valley, and south through the Sierras. The coastal and Sierran subspecies meet in the mountains of southern California, and they behave as separate species. *E. e. eschscholtzii* hybridizes with *E. e. croceator* and *E. e. klauberi*.

Distribution: Occurs on the coast, from the beaches inland to the edge of the Central Valley, from San Luis Obispo County to northern Baja California. It is also found in the San Bernadino and San Gabriel mountains. They are found throughout the western 2/3 of San Luis Obispo County. It has been recorded from Price Canyon, Arroyo Grande, and the hills above Avila Beach, but was not found at the Reserve during the surveys.

Habitat: Relatively uncommon locally, but they can occur in a wide range of habitats including coastal sand dunes, chaparral, oak woodlands and pine forests. They are entirely terrestrial but require moisture, and are found under rotting logs, bark, lumber, firewood piles and rocks. During dry periods they use the interior of rotting logs and woodrat nests, and they may travel down rodent burrows and rotting root tunnels.

Life History: Active December through April. Mating occurs in February and March. Eggs are laid under bark, in mammal burrows and crevasses under logs. The female attends the clutch throughout the summer, and she may coil around it protecting the eggs and keeping them moist. Young hatch at the beginning of the rainy season. They eat various invertebrates, including spiders, beetles, crickets, sowbugs, centipedes, millipedes, worms, snails, and termites. Predator defenses include a constriction at the base of their tails where the tails break off and sticky white toxins secreted from the skin. If tapped on the back, they will elicit a defense posture by arching their back. Adults have been observed marking and defending territories outside of the breeding season.

Identification: *Adults and juveniles:* Relatively stout-bodied (body length 62 – 81 mm; up to 155 mm including tail). Dorsal surfaces are reddish-brown, salmon or light pink, and the venter is a lighter shade to white. Eyes are prominent and black. There is a distinct constriction at the base of the tail, costal grooves vertically down their sides, and nasolabial grooves between the nostrils and upper lip. Juveniles have a short body and large head. Males have broader heads and longer tails than females. *Eggs:* The eggs are rarely found, and are whitish and laid in a grape-like cluster of 3-25 eggs. They hatch into miniature adults.

## **TRUE FROGS (*Ranidae*)**

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### **\*American Bullfrog: *Lithobates catesbeianus* (Shaw, 1802)**

Taxonomy: The American bullfrog is a member of the true frog family Ranidae. This species formerly was known as *Rana catesbeiana*.

Distribution: This species is native east of the Rocky Mountains, and has been widely introduced throughout the western United States as well as many places in the world. They occur at elevations from near sea level to 9000 feet. They occur throughout San Luis Obispo County, and were observed in Pismo Lake in 2010 in low numbers. They were also observed in Pismo Lake in 1973 (Nakata and Pintler, date unknown).

Habitat: Occurs mainly in permanent bodies of water, but individuals are occasionally found in temporary water sources following overland migration during late-spring rains. It is usually present in or near water, but they can make long-distance overland movements in search of water even in the driest time of year when aquatic sites they occupied dry up. This species inhabits ponds, lakes, reservoirs, streams, drainage ditches, rivers, lagoons and marshes. It

favors areas with open, warm water, and anthropogenic sites such as golf course ponds and stock ponds. This species is facilitated by the presence of introduced fish species, which prey on the invertebrate predators of bullfrog larvae. Populations are probably also enhanced by the presence of introduced crayfish (especially *Procambarus clarkii*), which is preferred prey of the bullfrog, and can attain high densities despite the presence of predators. American bullfrogs occur in areas with dense shoreline vegetation or along banks devoid of vegetation. Often they can be found sitting atop submergent vegetation out in the water.

Life History: Active during the day and at night. Breeding may begin as early as February and extend into October, but on the coast most breeding activity occurs in May to late August. Males emit a breeding call to attract females, during the day and at night, and they defend their territories against other males. Tadpoles may complete metamorphosis in the fall, or overwinter and transform the following spring. Adults feed on frogs, toads, tadpoles, garter snakes, hatchling turtles, birds, fish, rodents, crayfish, and aquatic and terrestrial invertebrates. They are generally sit-and-wait predators, eating practically anything that comes by, but they may also pursue amphibians that are vocalizing. American bullfrogs and their larvae are unpalatable to many predators. Bullfrog tadpoles may compete with native tadpoles. American bullfrogs have been implicated as a cause of population declines of native aquatic herpetofauna due to predation and competition.

Identification: *Adults and juveniles:* Adults are the largest of any frog in our area and may exceed 250 mm snout-urostyle length. The dorsal surface is olive, dark gray or dark brown and may or may not have dark mottling. The ventral surface is whitish to light yellow with a gray, marbled pattern. The legs usually have dark bands. All size classes lack dorsolateral folds and the skin appears especially slimy. There is a ridge around the eardrum that is inconspicuous in very large individuals. The toes of the hind feet are fully webbed. Juveniles have a green upper lip, and this is the only local ranid with this coloration. Recently-metamorphosed American bullfrogs (~50 mm snout-urostyle length) are bright green to light olive-gray with tiny black dots on the dorsal surface. Males have an eardrum larger than the eye, a yellow throat and dark nuptial pads on the thumbs. *Larvae:* Eyes are within the outline of the head and mostly upward-oriented, resembling the larvae of the California red-legged frog. American bullfrog larvae < 20 mm have a more rounded, broad snout than those of the California red-legged frog. Small tadpoles resemble California toad larvae, but the latter has eyes that are outward-oriented. American bullfrog larvae >20 mm have tiny distinctly-round inky black dots, whereas California red-legged frog larvae have dark spots that are larger and irregularly shaped. American bullfrog larvae lack the rows of pores seen on California red-legged frog larvae. Overwintered tadpoles can reach >150 mm total length. *Eggs:* Egg masses are seldom seen because they quickly break up and drift around the surface of the water, and they hatch within a few days. Freshly laid egg masses resemble a layer of mucus (~1 m diameter) floating on the surface of the water with up to 20,000 small black dots (the ova). Egg masses are not a cohesive cluster or contained in strings like those of our other frogs and toads.

*Voice:* The call of males is a deep, resonating “harr-umm” that is repeated in succession. The call is both territorial and for attracting females. Juveniles often “eep” while jumping into the water.

## **TREEFROGS (*Hylidae*)**

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### **\*Northern Pacific Treefrog: *Pseudacris regilla* (Baird and Girard, 1852)**

Taxonomy: The northern Pacific treefrog is a member of the treefrog family Hylidae. In recent decades, the accepted names for this species have alternated between *Hyla regilla* and Pacific chorus frog.

Distribution: Occurs throughout California except for interior desert regions. It is also widespread in Baja California, Nevada, Oregon, Washington, Vancouver Island, western Idaho and Montana, and southern British Columbia. It is the only frog native to the Channel Islands. It is present from sea level to 11,600 feet in elevation. It is widespread and abundant in coastal San Luis Obispo County. It was found in Pismo Lake during the 2010 and 1973 surveys. However, it was relatively uncommon at the site and the only aquatic habitats in which it (adults and larvae) was observed was the ditch in the northeastern corner of the property and the willow wetland that the ditch flows into. Individuals were heard calling from the portion of Meadow Creek upstream of Pismo Lake. Introduced predatory fish present in the lake likely prevent this species from inhabiting the lake itself.

Habitat: Occurs in most habitats, including urban and agricultural areas. They can be found far from water due to skin glands that produce a waxy coating. Breeding can occur in large or very small bodies of water including stock water troughs, but they are usually absent from moving water.

Life History: Usually found on the ground but they may climb vegetation over or near water. During dry periods, they climb down into cracks in the mud, use burrows or other crevasses, or find domestic water sources such as pet bowls and ornamental ponds. They can jump many times their body length and land sticking to smooth vertical surfaces. Breeding occurs November through July and females can lay more than one clutch per season. Males are territorial during the breeding season, and defend their territories using an encounter call or by physically butting and wrestling with an encroaching male. Satellite male breeding behavior has also been observed (i.e., a silent male will intercept and mate with females that are attracted to the calling of other territorial males). Larvae transform in about two to three months, and disperse into upland habitats usually near a source of moisture.

Identification: *Adults and juveniles:* Northern Pacific treefrogs are small frogs (body length 19 – 50 mm) with enlarged sticky toe tips used for climbing. Color is quite variable (green, gray, tan, brown, gold, and copper), and individuals may or may not have dark oblong markings on the

back. Color types do not appear to be based upon environmental factors; however, individuals can change quickly between light and dark shades. All individuals have a dark stripe from the snout, through the eye to the shoulder. They often have a Y-shaped dark marking between their eyes on the top of their head. Males have a dusky wrinkled throat, and females have a white throat that matches their ventral surface. Recently-metamorphosed individuals can be extremely tiny and brightly colored (10 mm). *Larvae*: This is the only species found locally that has larvae with eyes at the outline of the head when viewed from above. Eyes are oriented outward, and the snout is square. All sizes of larvae have this characteristic, and hatchlings may require a hand lens for identification. Larvae > 15 mm total length have a bulbous belly when viewed from the side, and the skin covering coiled intestines has pinkish or gold iridescence. Larvae are almost black as hatchlings and usually lighten with age with darkened blotches across the tail when viewed from above. However, they may remain dark with gold/tan flecks if substrate color is dark. Tadpole length at metamorphosis can be quite variable between sites, resulting in high variation of metamorph size. *Eggs*: Eggs are in a soft oblong or round cluster about 4 cm long, and clusters are attached to submerged vegetation or laid on the bottom in shallow water. Clusters are comprised of 9 – 80 eggs (usually around 20-25). Individual eggs are dark above and white below, and enclosed in jelly envelopes about 1 cm in diameter. Jelly is clear or bluish within 1 day of oviposition, and then becomes covered with algae and silt. *Voice*: The advertisement call of males is loud despite their small size and travels far. The call “kreck – et” is repeated about once per second in a sequence. The throat greatly enlarges balloon-like while calling. Large singing choruses are usually at night but occasionally occur during the afternoon, ceasing suddenly when disturbed. While in upland areas (often during the daytime) or when not in full chorus, they have another call that is an infrequent “krr-r-r-eck”. Their calls are often used as background noise in many movies, including those supposedly set in other regions of the country where this species does not occur.

## **BOX AND WATER TURTLES (*Emydidae*)**

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### **\*Western Pond Turtle: *Actinemys marmorata* (Baird and Girard, 1852)**



Taxonomy: The western pond turtle is a member of the box and water turtle family Emydidae. This species was formerly known under the generic names *Clemmys* and *Emys*. The subspecies designations formerly used for *Clemmys marmorata pallida* and *C. m. marmorata* are not supported by molecular evidence, and there might actually be four separate species.



Distribution: Distributed in most drainages west of the Sierra Nevada and Cascades crest from British Columbia to northern Baja California, Mexico. There are isolated populations in the foothills of the Sierra Nevada and in Nevada. They were formerly abundant in the San Joaquin Valley but are essentially extinct there now. They are present from sea level to 5900 feet elevation. They are present throughout San Luis Obispo County where there is suitable habitat. A few individuals were found in Pismo Lake in 2010.

Habitat: Inhabit ponds, lagoons, marshes, rivers, streams and ditches that have aquatic vegetation and slow-moving water. Substrate can be mud, cobble, rock or boulders. Surrounding vegetation is often woodland and grassland. They bask in the sun on exposed banks, floating logs, mats of submergent vegetation and knocked-down patches of emergent vegetation. Although called an aquatic turtle, females leave the water to lay eggs, and both sexes may use upland areas during winter. Nests are excavated in clay or silt substrate with low moisture, and usually are on unshaded slopes. Most nest sites are within 200 m of water, but can be as far as 400 m.

Life History: In the central coast, may be active year-round or individuals may aestivate in winter in upland or riparian areas up to 400 m from water. They forage in the water for plants, detritus, carrion, invertebrates and fish. They are active out of the water only during the day and can be seen swimming or floating with their head above water at night. Hatchlings and juveniles eat zooplankton. Mating probably occurs in April and May in the water, and eggs are laid May through August in upland areas. Most hatchlings overwinter in the nest and migrate to aquatic sites the following spring, but some may migrate in the fall following hatching. Individuals can be exceptionally long-lived (>50 years) and they lose the appearance of individual scute rings as they age. They can climb extremely steep slippery slopes.

Identification: *Adults:* Carapaces are not highly domed and are drab olive or brown (120 – 210 mm carapace length). The plastron can be light or dark. Carapaces and plastrons often have dark marks radiating from the center of each shield. Males have a concave plastron, longer tails and a light unmottled throat, whereas in females the plastron is flat and the throat mottled. They can be distinguished from introduced *Trachemys scripta elegans* by lacking red, orange or yellow coloration on the head.

*Hatchlings:* Carapaces are around 25 mm long and the tail is almost as long as the shell. Head, limbs and tail may have dusky yellow markings.

## **LEGLESS LIZARDS (*Anniellidae*)**

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### **California Legless Lizard: *Anniella pulchra* (Gray, 1852)**

Taxonomy: The California legless lizard is a member of the alligator and legless lizard family Anniellidae. Formerly, melanistic forms found in Monterey Bay and Morro Bay were thought to

be a separate subspecies, but subspecies are no longer recognized as the melanistic forms are do not represent separate lineages.

Distribution: Occurs south of San Francisco Bay along the coast to Baja California and east to the Central Valley, with populations occurring in the Tehachapi, Piute and Scodie Mountains and scattered desert slope drainages. It is present from sea level to 5100 feet in elevation. This species is rarely seen but is widespread throughout San Luis Obispo County, occurring in both inland areas and on the coast. A 1933 museum record lists the locality as “Pismo Beach”.

Habitat: Occurs in a variety of habitats including sand dunes, chaparral, pine and oak woodlands, desert scrub and riparian. It occupies areas with sparse vegetation and uncompacted substrate as it burrows into loose soil and forages in leaf litter. It has been associated with bush lupines (*Lupinus arboreus*), mock heather (*Ericameria ericoides*) and coastal buckwheat (*Eriogonum parvifolium*). They can be found under boards, logs and in woodrat (*Neotoma spp.*) nests. It requires moisture but also prefers sandy substrates. This species appears to be absent from areas that are cultivated or otherwise have high levels of anthropogenic disturbance. Introduced plants species such as European beach grass (*Ammophila arenaria*), veldt grass (*Ehrharta calycina*) and eucalyptus (*Eucalyptus spp.*) are thought to exclude the lizard by altering soil characteristics and prey composition. However, individuals have been found in high densities under living and dead (after being sprayed by herbicides) ice plant (*Carpobrotus edulis*) at Oceano Dunes State Park.

Life History: Specialized for its fossorial existence, and because they are usually underground, they can be very abundant in an area but seldom are seen. They are most active in the morning and evening just under the ground surface in sunny areas. Individuals are infrequently found on the surface during warm nights. On the coast they may be active almost year-round. They ambush their prey, and food items include microlepidopterans, beetles, termites and spiders. Breeding occurs in spring and summer, and females bear live young (1 to 4) from July to November.

Identification: *Adults:* A worm-like lizard lacking legs with small, smooth, shiny scales, and a wedge-shaped head with reduced eyes. Snout vent length is 90 – 170 and total length including tail is to 250 mm. Usually silver or beige dorsally, but some individuals in Morro Bay and Monterey Bay are black or dark brown. In lighter individuals, thin lengthwise lines can be seen down the body and the back. Ventral surface is yellow or whitish-yellow. *Juveniles:* Generally lighter in color than the adults – cream or silver dorsally and light gray or pale yellow ventrally.

## LIZARDS (*Phrynosomatidae*)

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**Blainville’s Horned Lizard: *Phrynosoma blainvillii* (Gray, 1839)**

Taxonomy: The California horned lizard is a member of the family Phrynosomatidae. Horned lizards in our area were formerly called coast (or California) horned lizards, *P. coronatum frontale*. Those formerly known as *P. coronatum* are currently known as four separate species, and only *P. blainvillii* occurs in the United States. This species belongs to the subclade Anota.

Distribution: Historically found along the Pacific coast from the Bay Area to Baja California, west of the deserts and as far north as Shasta Reservoir. Ranges onto the Kern Plateau east of the crest of the Sierra Nevada. Their current range is more fragmented. This species is found throughout San Luis Obispo County, including inland and coastal areas, but has not been recorded from the northwestern corner of the county. A museum record from "Oak Park" exists from 1959.

Habitat: Occurs in scrubland, chamise chaparral, sand dunes, grassland, coniferous forests and riparian woodlands. It requires loose soil (sand, sandy-loam, alkali flats or gravel) for burrowing and open areas where it can bask in the sun. They may also use small mammal burrows.

Life History: They are active April through October, and often remain motionless blending in with their background. They feed almost exclusively on native species of ants, and the presence of Argentine ants, which outcompete native ants have been proposed to be responsible for *P. coronatum* declines. Domestic cats can eliminate *Phrynosoma* spp. from large areas through predation. Eggs are laid April through June, and hatchlings can be found in the early fall.

Identification: *Adults and juveniles:* *Phrynosoma* spp. have flattened oval-shaped bodies, horns around the head and pointed scales along the edge of the body. *P. blainvillii* has 2 rows of pointed scales on each edge of the body (65 – 105 mm snout vent length) and 2-3 rows on each side of the throat. There are two long spines at the back of the head. Dorsal color is sandy, reddish-brown, gray or tan and they usually resemble the background soil color. There are darker horizontal bars and a lighter dorsal stripe. Ventral surface is yellow to white with distinct dark spots.

**\*Coast Range Fence Lizard: *Sceloporus occidentalis bocourtii* (Boulenger, 1885)**

Taxonomy: The Coast Range fence lizard is a member of the family Phrynosomatidae. Some evidence exists that true subspecies may not be present as currently recognized. Individuals in our area previously were known as *S. O. occidentalis*.

Distribution: This subspecies occurs along the coast from north of the San Francisco Bay Area south to Ventura County.. This species is very common and widespread throughout San Luis Obispo County. It was found in most areas throughout Pismo Lake Ecological Reserve.

Habitat: Occurs in most habitats including urban and agricultural areas, except for interior deserts. It is usually found on the ground, among lumber piles, on rocks or small shrubs, the sides of buildings and wooden fences.

Life History: Diurnal and basks in the sun, and uses burrows or takes cover under logs and lumber when inactive. They prey on spiders, beetles, flies, wasps, termites and ants. Females can produce up to 3 clutches per year that are laid April through July. Hatchlings can be found in early summer through fall. The tail can break off when captured and be regenerated. Males have a territorial display that involves “doing pushups” on a prominent perch.

Identification: *Adults:* Gray or brown dorsally with darker blotches and scales that are markedly keeled and pointed (56 – 87 mm body length). Ventral surface has blue patches on the sides of belly and yellow or orange on the limbs. Males have a blue patch on the throat and occasionally blue speckles on the dorsal surface, which distinguishes them from the females (which can have faint blue on the sides of the belly).

*Hatchlings:* Blue belly and yellow on the limbs is faint or absent (25 mm body length).

### **Western Side-blotched Lizard: *Uta stansburiana elegans* (Yarrow, 1882)**

Taxonomy: The California side-blotched lizard is a member of the family Phrynosomatidae. The taxonomy of this widespread and variable species has been disputed, and it is sometimes considered to have three subspecies in California. Some experts do not recognize any subspecies pending further studies.

Distribution: It is one of the most common lizards in arid and semi-arid areas of the western states. Common and widespread throughout California south of the San Francisco Bay area and the San Joaquin and Owens Valleys. It occurs from below sea level in desert sinks to 9000 feet. In San Luis Obispo County, it is found along the immediate coast and is especially abundant in inland areas. The nearest record to Pismo Lake is Nipomo Mesa.

Habitat: Occurs in a variety of habitats that have sand, rock, loam or hardpan substrates among scattered trees, shrubs and grasses.

Life History: Usually found on the ground near shrubs or rocks. They prey on insects, scorpions, spiders, mites, ticks and sowbugs. Females lay up to 7 clutches of eggs per year from March through August and hatchlings can be found in late summer.

Identification: *Adults:* The characteristic that distinguishes this species is a bluish black blotch behind the forelimbs, but this is sometimes faint or absent. Scales are smooth, small and not pointed unlike *Sceloporus occidentalis bocourtii*. Dorsal coloration is tan to gray with lighter and darker blotches. Often there is a double row of dark spots or wedges on the back, edged with white on the rear. The underside is whitish to gray and mostly unmarked. Some males may have blue or blue-green speckles dorsally, yellow or orange speckles on the sides, and a dark

throat with yellow, orange or reddish-orange speckles. Males have slightly enlarged postanal scales posterior to the vent. Females are blotched on top with brown and white, often with stripes, and have a faint blotch on the sides. They have no blue speckling, and no color on the throat. *Hatchlings*: May lack the side blotch, or if present it is usually faint.

## **SKINKS (Scincidae)**

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### **Skilton's skink: *Plestiodon skiltonianus skiltonianus* (Baird and Girard, 1852)**

Taxonomy: The Skilton's skink is a member of the skink family Scincidae. This species was formerly under the genus *Eumeces*. The taxa currently recognized as subspecies within *Plestiodon skiltonianus* may actually be separate species.

Distribution: Occurs throughout all of northern California and extends down the coast to San Diego County, and east to the edges of the Central Valley and southern deserts. There are isolated populations in the White Mountains, Kern Plateau, the east slope of the Sierra Nevada, and other eastern California mountain ranges. It also occurs throughout much of Oregon, eastern Washington, northern Idaho, western Montana and southern British Columbia. It is present from sea level to 8300 feet in elevation. This species is widespread in the western 2/3 of San Luis Obispo County, and records exist from Oceano Dunes.

Habitat: Inhabits grassland, chaparral, pinyon, juniper, riparian, oak and pine woodlands. It is found in open and densely vegetated habitats, near rocky areas, by streams and in dry areas away from water. They construct burrows in moist soil under stones and logs for aestivating and nesting.

Life History: Diurnal and feeds on insects, spiders and sowbugs. They are active from the early spring to the early fall, are most active in the early morning and late afternoon. Eggs are laid June through July and are attended by the female. Eggs hatch in late summer. The brightly colored tails of the juveniles, which can be dropped, have been suggested to be for attracting predators away from their bodies and to enable adults to recognize juveniles.

Identification: *Adults*: *Eumeces* spp. have slim bodies with thick necks and small shiny scales. They have a forked tongue. There are longitudinal stripes down their back ranging in color from black to tan to reddish-brown (body length 53 – 81 mm). Tail is bluish on younger individuals and fades to gray. *Juveniles*: Tail bright blue and stripes have more contrasting colors and extend onto tail.

## **ALLIGATOR LIZARDS (Anguidae)**

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### **\*California Alligator Lizard: *Elgaria multicarinata multicarinata* (Blainville, 1835)**

Taxonomy: The California alligator lizard is a member of the alligator and legless lizard family Anguidae. It was formerly known as *Gerrhonotus multicarinatus multicarinatus*.

Distribution: Occur from Mendocino County south to Ventura County (including the Channel Islands), along the coast and west to the crest of the Cascade Mountains and the San Joaquin Valley. This subspecies is widespread in San Luis Obispo County, and it was observed at Pismo Lake Ecological Reserve during the surveys.

Habitat: Inhabits grassland, chaparral, oak woodland, riparian woodland and pine forest. It is often associated with canyons and dense vegetation. Individuals are often found on the ground or under wood, but it can climb trees and shrubs in search of prey. They are also fossorial and use burrows.

Life History: Prey on slugs, insects, centipedes, scorpions, spiders, lizards, eggs, young birds and small mammals. They are diurnal and nocturnal, especially during warm periods. They will often attempt to bite when caught, and may smear feces and drop their tail while writhing about. Mating occurs in May to June and the females lay eggs in July and August in small mammal burrows. Eggs hatch in September, but hatchlings may be found in May after overwintering in the nest.

Identification: *Adults:* Elgaria sp. have relatively short limbs, a large head and a long slender body (71 – 175 mm long) and tail (total length to ~475 mm). They can be distinguished by a fold of skin on each side of the body that allows them to expand their girth. The scales on the back are square. Dorsal background coloration is brown, olive or tan, with dark or red crosswise bands, and white and black spots on the sides. Ventral surface is light colored with dark lengthwise stripes down the middle of the scale rows. *Males:* Head is more triangular and broader than in the females. *Hatchlings:* Instead of having the barred or speckled appearance of the adult, the back is grayish-tan or beige and the sides barred. They are especially long and thin.

## **SNAKES (Colubridae)**

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### **Monterey Ring-necked Snake: *Diadophis punctatus vandenburghii* (Blanchard, 1923)**

Taxonomy: The Monterey ring-necked snake is a member of the family Colubridae. Twelve subspecies are currently recognized; however, the seven currently recognized in California may not represent unique evolutionary lineages. California subspecies appear to belong to four distinct lineages.

Distribution: Occurs in the Coast Range Mountains from southern Monterey County south to Ventura County. This species is relatively widespread in San Luis Obispo County, and it was recorded in Price Canyon in 1960.

Habitat: Inhabits moist areas in woodlands (especially riparian areas), grasslands, chaparral and gardens. It is usually associated with streams, bark, rotting logs, rocks and boards.

Life History: Has rear fangs that carry venom, but they cannot effectively bite humans due to the position of the fangs and they are usually not aggressive. They prey on salamanders (including *Batrachoseps* spp.), small *Pseudacris regilla*, lizards (including *Anniella pulchra*), small snakes, slugs and worms. When disturbed they may coil up their tails showing the red underside, and writhe around spreading the odiferous contents of their cloacal glands. They are active mid-January to mid-April. Females lay 1 or 2 clutches in June and July, and they are often in a communal nest with other females. Eggs hatch in the fall.

Identification: *Adults and juveniles:* A small, thin, and delicate snake. Bluish-gray, olive or black dorsally with a red-orange neck band and black or dark gray head (20 – 75 cm long). The ventral surface is red-orange with black dots. The scales are smooth and shiny. Melanistic individuals lack the neck band and have alternating light and dark crossbands ventrally.

**\*California Kingsnake: *Lampropeltis getula californiae* (Blainville, 1835)**

Taxonomy: The California kingsnake is a member of the family Colubridae. The species was formerly known as *L. getulus*.

Distribution: Occurs throughout California, except the extreme northeastern tip, the northwestern coast, and high elevations in the Sierras, the Trinity Alps, and the Cascades. It is also present in Baja California, southwestern Oregon, southern Nevada, southwestern Utah and Arizona. They occur from sea level to 7000 feet in elevation. They occur throughout San Luis Obispo County, and were observed at Pismo Lake Ecological Reserve in 2010.

Habitat: Inhabits coniferous forest, marshes, riparian woodland, grassland, chaparral, desert, farmland, and suburban areas. It is associated with rocky outcrops and damp areas.

Life History: Active in the morning and late afternoon, and may be nocturnal during hot weather. Individuals are usually found on the ground and under rocks and logs, but they can also climb. Prey is killed by constriction, and includes snakes (including *Crotalus* spp.), lizards, small turtles, reptile eggs, frogs, birds, bird eggs, and small mammals. They are immune to *Crotalus* spp. venom. When cornered they may vibrate their tail in dry leaves to produce a sound similar to a rattle, hiss, coil into a ball, evert the vent smearing foul-smelling anal gland contents, and strike. Eggs are laid in moist soil from May through August, and hatch about two months later.

Identification: *Adults and juveniles:* *Lampropeltis* spp. have smooth, shiny scales and a head that is a little wider than the neck. In our area, the dorsal surface has alternating bands of pale brown to black and white or pale yellow. In other portions of this subspecies' range, there can be color variants ranging from those that lack bands and have stripes and some that have wider/narrower dark and light bands. Large adults (to 122 cm total length) and coastal populations may be paler in color. The bands generally are offset on the ventral surface and are paler.

*Hatchlings:* Usually black and white alternating bands (25 cm long).

### **San Diego Gopher Snake: *Pituophis catenifer annectans* (Blainville, 1835)**

**Taxonomy:** The Pacific gopher snake is a member of the family Colubridae. This taxon was formerly known as *Pituophis melanoleucus annectans*. Eight subspecies of *Pituophis catenifer* are recognized, and the two that occur in Baja California may be new species. Five of the subspecies occur in California. Gophersnakes are related to ratsnakes and kingsnakes, and they have been known to interbreed with these species.

**Distribution:** Ranges from northern San Luis Obispo County south to Baja California. Also occurs on Catalina Island. Sympatric with *P. c. affinis* in a narrow range, but no intergrades have been found. Apparently intergrades with *P. c. catenifer* and *P. c. deserticola*. This species is common and widespread throughout San Luis Obispo County. It was found at Pismo Lake Ecological Reserve in 1973, but was not observed during the current surveys. Shed snake skin was found that could have been from this species, or *Lampropeltis getula californiae*.

**Habitat:** Occurs in chaparral, grassland, pine and oak woodlands, desert, and agricultural areas.

**Life History:** Diurnal except during very hot weather. They are often seen on the ground, but they also climb, use burrows and can swim. They are often seen on roads and trails. They prey on mice, gophers, rabbits, birds, bird eggs, lizards and insects that they kill by constriction. Females lay 1 or 2 clutches of eggs June through August. When approached they may display aggressive behavior mimicking a rattlesnake – vibrating the tail in dry leaves producing a rattling sound, flattening the head which makes it appear broader at the base, coiling up and hissing.

**Identification:** *Adults and juveniles:* A large snake with heavily keeled scales, a head that is slightly wider than the neck, and a protruding rostral scale on the tip of the snout. Dorsal coloration has a background color of cream, tan or yellowish with brown, reddish-brown or black blotches. There are large squarish blotches down the back and smaller blotches or streaks on the sides. There is a dark stripe through or slightly in front of the eye that is nearly vertical. The shape of a pair of brown neck blotches with black borders is used to distinguish between western subspecies. The ventral surface is white to yellow and may have black or gray spots. There are color variants including those lacking blotches and having side stripes, and a cream/orange form. This snake can get quite large (body length 122 to 213 cm) and have a diameter similar to that of *Crotalus* spp. Coloration and pattern are similar to *Crotalus oreganus*, but they lack rattles and have an elongated (not triangular) head. *Hatchlings:* Resemble the adults and are 38 cm long.

### **Coast Gartersnake: *Thamnophis elegans terrestris* (Fox, 1951)**

**Taxonomy:** The coast gartersnake is a member of the family Colubridae. There is some disagreement over whether *terrestris* is a valid subspecies.



Distribution: Occurs along the California coast from the Oregon border south to the Santa Barbara/Ventura County line. It has been recorded from coastal San Luis Obispo County. There are records from 1960 of this species from Price Canyon and upper Arroyo Grande Creek.

Habitat: Considered to be more terrestrial than the other gartersnakes in our area, but it is also found near water. It inhabits grassland, scrub, woodlands and forests.

Life History: Feeds mainly on slugs, snails, and worms, and they also eat leeches, fish, salamanders, frogs, tadpoles, lizards, snakes, small mammals, birds and carrion. Some populations have enlarged rear teeth and venom glands that are poisonous to their prey. The females bear live young in July through September. When captured, they usually writhe around spreading feces and musk from their anal glands. Diurnal.

Identification: *Adults and juveniles:* A medium-sized slender snake with a head barely wider than the neck and keeled dorsal scales. Dorsal coloration is black to dark olive, with a yellow to greenish-yellow dorsal stripe and yellow to reddish side stripes (body length 45 – 107 cm). The background color is often flecked with dark and light spots in a checkerboard pattern, and some individuals may have red or orange flecks on the sides creating a checkerboard pattern. Individuals south of Santa Cruz County generally are dark between the side and dorsal stripes, lacking the red flecks that are more common in northern populations. The side stripes may contact the ventral coloration, but the stripes are more reddish and the ventral surface is gray, bluish or brownish and flecked with red or salmon. There are usually 8 upper labials, and the 6<sup>th</sup> and 7<sup>th</sup> are higher than wide with the top edge above a horizontal line through the lower edge of the pupil. Similar to *Thamnophis sirtalis infernalis*, but generally has 8 upper labial scales instead of 7, larger eyes, and the side stripes are usually distinct from the ventral coloration.

### **Two-striped Gartersnake: *Thamnophis hammondi* (Kennicott, 1860)**

Taxonomy: The two-striped gartersnake is a member of the family Colubridae. No subspecies are currently recognized. This taxon was formerly contained within the *T. couchii* complex.

Distribution: Occurs in coastal drainages from the city of Salinas south to Baja California. They occur west of the San Joaquin Valley and their range extends eastward at Mount Pinos and Mount San Jacinto. They occur from sea level to 7000 feet in elevation. They have been recorded from coastal areas of San Luis Obispo County.

Habitat: Inhabits aquatic sites including streams, coastal lagoons, sloughs, and ponds, and it appears to prefer areas with dense riparian vegetation. In summer they occupy stream and streamside areas, and in winter they occur in coastal sage scrub and grasslands where they overwinter in small mammal burrows.

Life History: Diurnal and nocturnal. They become active in the spring, but may also be active during warm winter days. They feed while perched on vegetation or under the water on

tadpoles, fish (including *Gasterosteus aculeatus*, *Eucyclogobius newberryi*, and *Cottus* spp.), fish eggs, newts, earthworms and small frogs. They have enlarged rear teeth and venom glands. They mate in the spring and bear live young in the fall, and neonates have been observed from late-August through November. When captured, they usually writhe around spreading feces and musk from their anal glands. *Rana catesbeiana* and feral pigs prey on all life stages.

Identification: *Adults:* The dorsal background color is dark olive to brownish gray with yellow, yellow-orange or tan stripes down each side of the body (body length 60-90 cm, total length 60 – 101 cm). Ventral surface is dull yellow, orange-red or salmon and may have dusky marks. The throat is pale. Melanistic individuals lacking side stripes are present in our area.

### **Valley Gartersnake: *Thamnophis sirtalis fitchi* (Fox, 1951)**

Taxonomy: The valley gartersnake is a member of the family Colubridae.

Distribution: Ranges throughout northern California, including the coast in Humboldt and Del Norte counties, south and mostly east of the Coast Ranges until just south of the Monterey Bay when it extends to the coast until roughly Santa Barbara County. West of the Sierras to the southern San Joaquin Valley, and east of the Sierras into the Owens Valley. This subspecies ranges north to extreme southern Alaska, and east into western Nevada, Idaho, western Montana, western Wyoming, and northcentral Utah. This subspecies is widespread in San Luis Obispo County. It was recorded at Pismo Lake Ecological Reserve in 1973.

Habitat: Inhabits grasslands, woodland, scrub, chaparral, forest, vacant lots and agricultural land. It is semi-aquatic and prefers damp grasslands, such as the edges of streams, marshes, ponds, roadside ditches and sloughs.

Life History: They prey on earthworms, tadpoles, salamanders, newts, slugs, leeches, frogs, toads and small mammals. Females bear live young from May through October. When captured, they may bite and writhe around spreading feces and musk from their anal glands.

Identification: *Adults:* A medium-sized snake with a head barely wider than the neck and keeled dorsal scales. Dorsal background color is nearly black or dark olive, and they have three greenish-yellow stripes (body length 46 – 140 cm). The side stripes may be indistinct from the ventral coloration, which is bluish-gray or greenish and darker toward the tail. Red patches on the sides are usually confined to the area just above the lateral stripes, in a single row, alternating with dark markings. There are usually 7 upper labial scales and the 6th is higher than wide as in *T. elegans terrestris*.

### **VIPERS (Viperidae)**

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**Southern Pacific Rattlesnake: *Crotalus oreganus helleri* (Meek, 1905)**

Taxonomy: The southern Pacific rattlesnake is a member of the viper family Viperidae. It was formerly known as *Crotalus viridis helleri*. The taxonomy of western rattlesnakes is controversial and still being studied. This taxon is being considered for full species status, *Crotalus helleri*.

Distribution: Found in California from southern San Luis Obispo County, where it intergrades with *C. o. oreganus*, east to the central valley and the desert slopes of the transverse and peninsular ranges, south into the middle of the Baja California peninsula. Also found on Santa Cruz and Santa Catalina Islands. It is common throughout San Luis Obispo County, inhabiting both dry inland areas and the coast.

Habitat: Inhabits coastal dunes, chaparral, woodlands, grasslands and mountain forests. It is associated with rock outcrops, tallus slopes, rocky streams and ledges. They may overwinter communally in dens using mammal burrows, crevasses in rocks and caves. They can swim and are sometimes found near water.

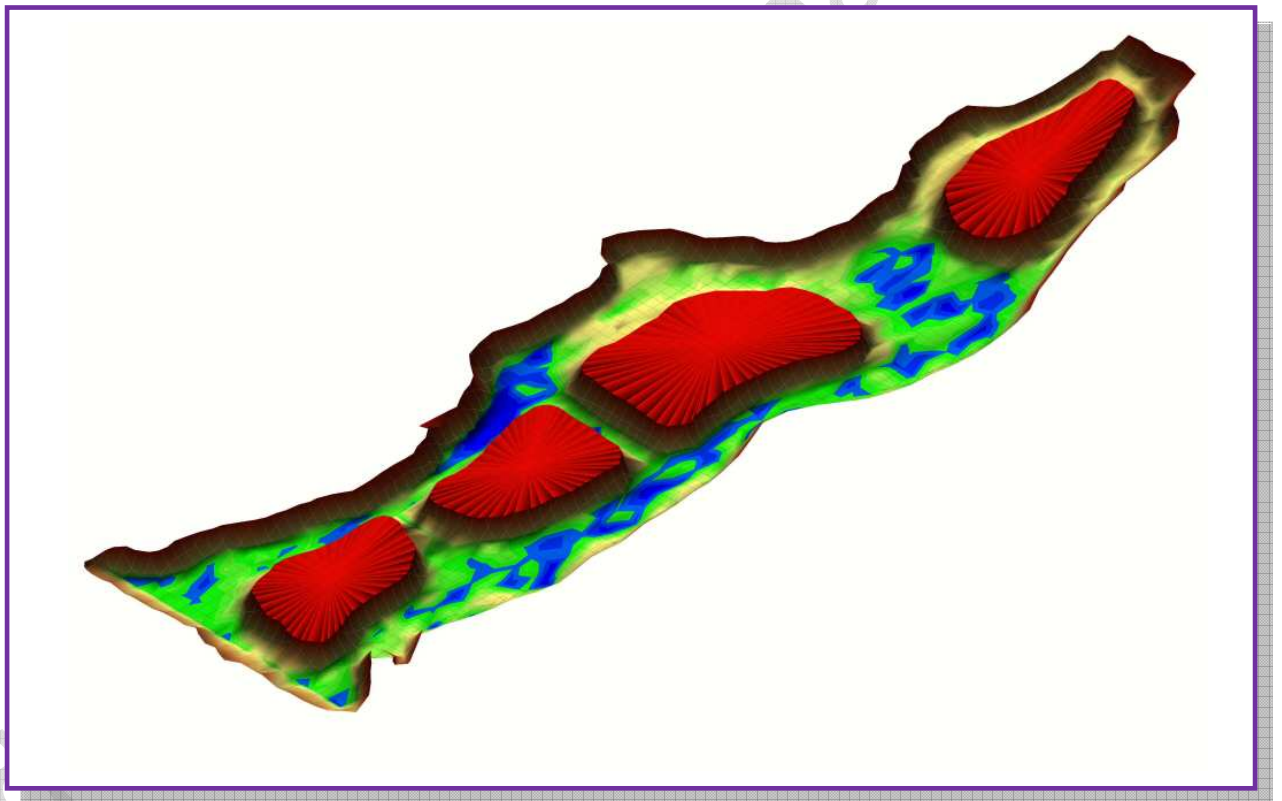
Life History: Venomous and may not rattle (may sound like a loud buzzing noise) before you step on them. The type of venom changes as the snake ages – the venom of juveniles contains nerve-blocking agents and adults contains mostly proteases that destroy tissue. The venom is used to kill prey that might otherwise be too large to subdue. They detect prey through temperature-sensitive pits on the sides of their nose, and they eat mice, ground squirrels, woodrats, rabbits, nestling birds, lizards, snakes and amphibians. They bear live young August through October. They are inactive in winter and come out of aestivation when temperatures reach 21°C.

Identification: *Adults:* *Crotalus* spp. are heavy-bodied snakes with a wide triangular head and a tail rattle. They have keeled scales and vertically elliptical pupils. The dorsal background color usually matches the soil color and can be cream, yellow, gray, pinkish, greenish, brown or black (body length 37 – 162 cm). There are large blotches down the back that are brown and black with rings of darker and lighter borders. There is a dark brown stripe below the eye that angles back to the end of the jaw. *C. o. oreganus* can be distinguished from *C. o. helleri* by having alternating dark and light tail rings of uniform width. Individuals tend to be darker near the coast and lighter in eastern parts of the county. *Hatchlings:* The rattle is a blunt button, and segments are added each time the snake sheds. The tail is bright yellow and they are 25 cm long.

Appendix L  
Bathymetric Survey

**SURVEY REPORT**

BATHYMETRIC SURVEY  
PISMO LAKE, CITY OF PISMO BEACH  
SAN LUIS OBISPO COUNTY, CA



prepared at the request of:  
San Luis Coastal Resource Conservation District  
Morro Bay, California

August, 2009

**DIGITAL COPY – ORIGINAL STAMPED & SIGNED**

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## 1. PROJECT OVERVIEW

**1.1. Project, client** - This survey report is prepared for the Bathymetric Survey at Pismo Lake in the City of Pismo Beach, San Luis Obispo County, California, (PROJECT), at the request of San Luis Coastal Resource Conservation District (SLCRCD - client).

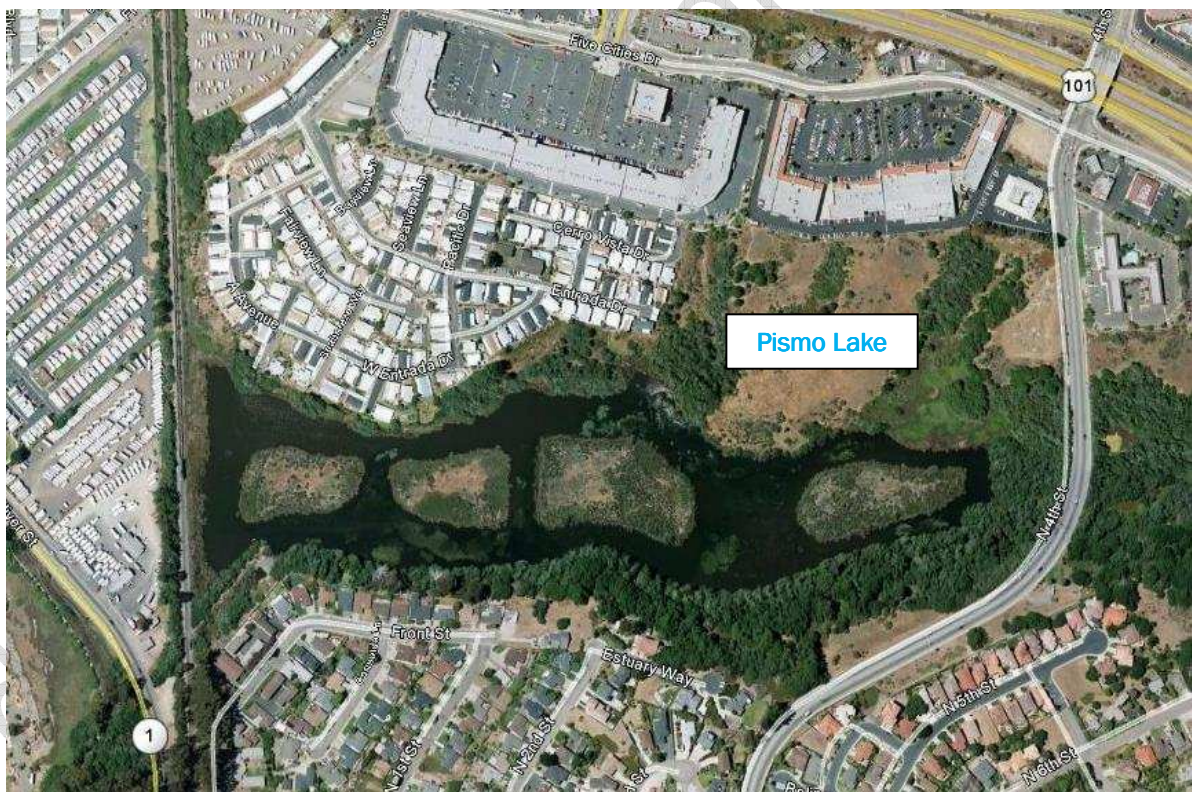
The REESE Water & Land Surveying Services (RWLSS) project number is 0911.

### 1.2. Point of contact

Mark Barnett, RE  
San Luis Coastal Resource Conservation District  
545 Main Street, Suite B1  
Morro Bay CA 93442  
805.772.4391

**1.3. Project location** - The PROJECT is located at the Pismo Lake, easterly of and adjacent to the Southern Pacific Railroad, westerly of 4<sup>th</sup> Street and south of Highway 101, in the city of Pismo Beach, San Luis Obispo County, California, at 35° 07' 57"N, 120° 37' 40"W. Residential development borders on the north and south sides.

Pismo Lake covers approximately 29 acres with a net water surface of about 21 acres. The four islands arrayed in an east-west orientation occupy 8 acres total. Inflow on the east comes from culverts under 4<sup>th</sup> street; outflow occurs at the southwest corner through a spillway leading to a box culvert under the railroad and is ultimately channeled into the lagoons at Oceano, CA.



**1.4. Purpose** - The project was performed to:

1. provide a general contour map of the benthic surface for the entire Pismo Lake, where accessible by survey boat, and;
2. provide cross section data as a baseline for future sedimentation monitoring programs.



**1.5. Standards, specifications, references** – Sounding data were collected using a sounding pole and RTK GPS along planned lines and around the perimeter of the lake and islands. Equipment and methods employed were intended to provide sufficient resolution to accurately portray current configuration of the lake's benthic surface.

The survey depths and boat position were measured with equipment having a precision of  $\pm 0.1'$ . Considering the boat drift, wind effects and sounding rod plumb, the horizontal error for sounding position is estimated at  $\pm 0.4'$  and the vertical error for depth measurements is estimated at  $\pm 0.2'$ .

There were no formal standards or specifications provided regarding positioning, but the methods used are expected to provide accurate repeatability.

The sounding rod used conformed to US Army Corps of Engineers (USACE) EM 1110-2-1003 (1 Jan 2002) Hydrographic Survey Manual Section 8-3 *Sounding Pole*.

## **2. UNITS, DATUMS, PROJECTIONS**

**2.1. Units** – The measurement unit for this PROJECT is the US survey foot.

**2.2. Horizontal datum & grid projection** – The horizontal datum for this PROJECT is NAD83 (2002 epoch). The horizontal projection for surveyed points is California Zone V (five) State Plane Grid.

**2.3. Vertical datum** – The vertical datum for this PROJECT is NAVD88. Orthometric elevations are propagated from the elevation at primary vertical control point 102 (shown on mapping).

## **3. PROJECT CONTROL**

**3.1. General** – Two permanent survey markers were set on site for horizontal and vertical survey control.

Eight permanent markers were set on site with one inter-visible pair set on each island, and some are visible from point 101 or 102. Refer to the map included with this report for location and coordinate information.

**3.2. Primary control** – The primary onsite control points are numbered 101 and 102 at which were set 5/8" x 24" rebar and plastic cap with center tack marked "CONTROL POINT". In processing the static GPS survey work, point 101 was fixed as horizontal control, point 102 was fixed as vertical control. The two permanent markers set at points 101 & 102 are inter-visible for future use with conventional survey equipment.

The horizontal position for point 101 was derived from two hours of static GPS observations and processed with ties to CORS stations at PID DG8359, DE6612 and DK7589 using the NGS OPUS utility. The reported rms for the computed position at 101 is 0.05' latitude, 0.08' longitude, 0.25' ellipsoidal height. The orthometric height for point 101 was derived using the GPS determined ellipsoid height and a high resolution geoid model (Geoid03) combined with the 3D vector from point 102.

The horizontal position for point 102 was derived from static GPS observations and processed with ties to point 101. The orthometric height for point 102 was derived from differential leveling from benchmark P 532, NGS PID FV0701, located about 375 feet southwesterly of the spillway at the southwesterly corner of Pismo Lake, on the culvert wingwall under the railroad tracks.

See section 4.4. for information regarding point 103.

**3.2. Secondary control** – The secondary onsite control points are numbered 11, 12, 21, 22, 31, 32, 41 & 42 at which were set 5/8" x 24" rebar and plastic cap with center tack marked "CONTROL POINT". These were set in inter-visible pairs on the islands for future use with



conventional survey equipment and to mark the cross sections for future monitoring programs. Positions for these points were derived from RTK GPS survey, using an averaged position from 120 one-second observations. The 3D rms for those positions generally was at the 0.03' or better level and checked well on subsequent visits for control check.

Also, RTK positions were used for boat location when soundings were taken. The 3D rms for those positions were generally at the 0.05' to 0.10' level with full satellite geometry.

#### 4. FIELD WORK – BATHYMETRY & CROSS SECTIONS

**4.1. Equipment, personnel** – Ashtech ZXtreme L1/L2 GPS receivers were used for static GPS and for RTK GPS work. For primary control and/or to establish secondary control points by RTK, the base receiver was set at point 101. For sounding positions, the base receiver was set at points 101 or 11 (on the most westerly island) and the rover was installed on the boat. Positions determined by RTK GPS for secondary control or soundings were stored in a data collector for download.

Elevations were measured with a sounding pole as prescribed in the US Army Corps of Engineers (USACE) EM 1110-2-1003 (1 Jan 2002) Hydrographic Survey Manual Section 8-3 *Sounding Pole*. A GPS antenna was mounted on the top and thus provided location and elevation at each RTK position. The pole is a collapsible fiberglass pole with markings in feet, 1/10 and 1/100 with a 6 inch diameter aluminum disk mounted on the bottom, with an overall weight of 8.0 pounds. See figures below. Note the rebar on the back used for weight.



All GPS control and boat survey work was conducted by Robert J. Reese, LS, in July, 2009. A survey assistant was used for boat survey work.

A 12-foot fiberglass boat propelled by oars was used for survey work, with an electric motor used occasionally to get to survey areas. The shallow conditions and the aquatic flora that blooms in these lakes precluded using propeller motors and acoustic equipment for the survey as they would clog a propeller and obstruct soundings. So rowing was resorted to and directly observed elevations with a rod were used for the survey.

As well, the bottom characteristics would have made a discrete bottom difficult to determine from sonar, as sonar will penetrate soft, mucky bottom to varying depths.

**4.2. Survey – bottom contours** – Elevations and position fixes were made concurrently. Data points were collected along planned survey lines out in the lake and on a perimeter line around the edge of the lake and islands. The planned survey lines were oriented to north/south on the grid and spaced approximately 50' apart. Points along those lines were spaced approximately 25 feet apart. In smaller areas, the planned lines and point spacing were made closer together. The perimeter lines were run on an *estimated* offset to the edge of the tules, to the edge of the willows or to the water edge and noted for mapping. See section 5.2.

The position and elevation of the data points were made using RTK GPS, and the elevations were made by vertical offset from the GPS antenna to the bottom of the rod. The rod was set a predetermined height.

**4.3. Survey – cross sections** – Elevations and position fixes were made on specific alignments defined by the prolongation of the lines between the pairs of markers on the islands (11 & 12, 21 & 22, etc). Attention was paid to staying as close as possible to the alignment and stationing along the alignment so that any future data acquisition could be repeated at the same location.

The station, offset from the line and elevation of those cross section points are tabulated on the mapping as "ISLAND (n) CROSS SECTION DATA". The markers defining the lines were placed as near to the north/south axis of the island as inter-visibility would allow, in order to place the section across the channels between the islands and the lake edge.

**4.4. Water surface elevation & monitoring –**

A 5/8" x 24" rebar and plastic cap with center tack marked "CONTROL POINT" was set at the water surface as a benchmark at point 103 for establishing a water surface "zero" from which depths can be derived.

The elevation of the water surface at 1030 hrs on 07.29.09 was 10.67'.

The elevation at point 103 was derived from differential levels from control point 101.

The horizontal position for point 103 was derived from RTK GPS survey, using an averaged position from 120 one-second observations. The 3D rms for this point was at the 0.02' level and checked within 0.02' on subsequent visits for control check.

The water surface at Pismo Lake was monitored by use of a gauge board. The observed water surface level at the site fell steadily, to a total drawdown of 0.17' over the course of the survey.

## **5. PROCESSING AND RESULTS**

**5.1. Data processing** – No post-survey data processing for the lake elevations was performed, as the RTK GPS provided positions and elevations directly.

**5.2. Water line and other features –**

Perimeter survey lines were run around the lake and the four islands. These perimeter lines were run at varying estimated offsets from the edge of tules, edge of willows or edge of the lake.

Where a waterline (edge of lake) was visible from the edge of tules or edge of willows, the distance from the edge of the tules or willows to the visible waterline was estimated and noted for mapping. Such areas are noted on the map as "waterline (approx.)". Points for the digital terrain model were created along the "waterline (approx.)" at an elevation of 10.67 at the noted offset from the sounding and have an elevation of 10.67.

Where a waterline (edge of lake) was NOT visible from the edge of tules or edge of willows, those areas are noted on the map as "waterline not apparent". Points for the digital terrain model were created along the "waterline not apparent" at an elevation 1 foot higher than the sounding at the noted offset from the sounding.

**5.3. Soundings vs. elevations –**

The survey provided *elevations* directly from RTK GPS. However, the range of *depths* below the original water surface are tabulated below.

Bottom elevations	high:	10.2	low:	5.6
Depth below water surface	min:	0.5	max:	5.1

**6. DELIVERABLES**

**6.1. Mapping** – Mapping consists of one sheet.

Sheet 1 of 1, “BENTHIC CONTOURS” (1” = 100’) shows the contours of the bottom of Pismo Lake, survey control points. It also shows the location, station and offset of the cross section points.

These data may have been delivered as a courtesy to the client or other third parties in digital form. Delivery of the electronic file does not constitute the delivery of our professional services. The most recent signed and sealed paper print represents the delivery of professional services and must be referred to for correct information. REESE Water & Land Surveying Services (RWLSS) shall not be responsible for modifications to, or products derived from, the electronic files which are not approved, signed and sealed by RWLSS.

Uncontrolled or unauthorized use by any individual or entity for any purposes whatsoever shall not incur any liability on the part of RWLSS. Copyright © 2009 RWLSS.

**7. RECOMMENDATIONS**

**7.1. Survey control markers** – In order to provide for consistency between this and future surveys and for comparison with subsequent data, preservation of permanent marks for survey control is recommended.

San Luis Obispo, California  
August, 2009.

**DIGITAL COPY – ORIGINAL STAMPED & SIGNED**

\_\_\_\_\_  
Robert J. Reese, PLS 6208

\_\_\_\_\_  
date

## 8. ABBREVIATIONS

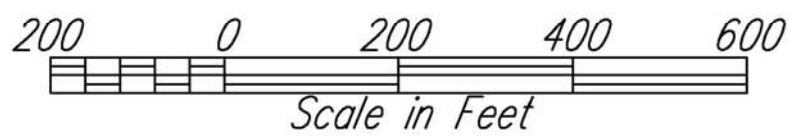
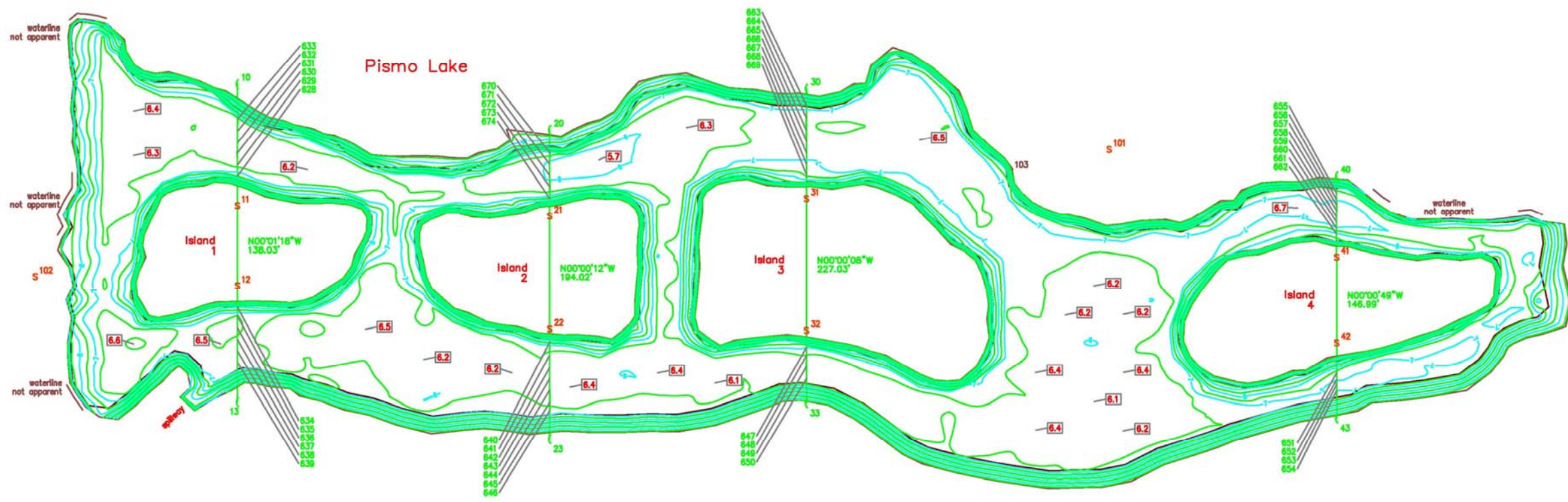
General abbreviations that *may* be found in this report.

AcFt	acre feet
CORS	Continuously Operating Reference Station
CSRS-H	California Spatial Reference System – Horizontal
dbS	depth below surface
dbt	depth below transducer
GPS	Global Positioning System
GNSS	Global Navigation Satellite System
HPGN	High Precision Geodetic Network
HPGN D	High Precision Geodetic Network Densification
HTDP	Horizontal Time Dependent Positioning program from NGS
MSL	Mean Sea Level
NAD83-2002	North American Datum of 1983, observation period in 2002
NAVD88	North American Vertical Datum of 1988
NGRS	National Geodetic Reference System
NGS	National Geodetic Survey
NGVD29	National Geodetic Vertical Datum of 1929
OPUS	Online Position User Service program from NGS
PID	Point Identifier from NGS database
ppm	parts per million
rms	root mean square
RTK	Real Time Kinematic
SOS	speed of sound
SPC	State Plane Coordinates
SV	sound velocity
USC&GS	Unites States Coast & Geodetic Survey (precursor to NGS)
NCRS	National Conservation Resource Service
RWLSS	REESE Water & Land Surveying Services
SLCRCD	San Luis Coastal Resource Conservation District

**9. MAPPING**

Sheet 1 of 1 - BENTHIC CONTOURS 1"=100'

digital copy - original signed



Date	
Designed	Mark Barnett
Drawn	Mark Barnett
Checked	
Approved	

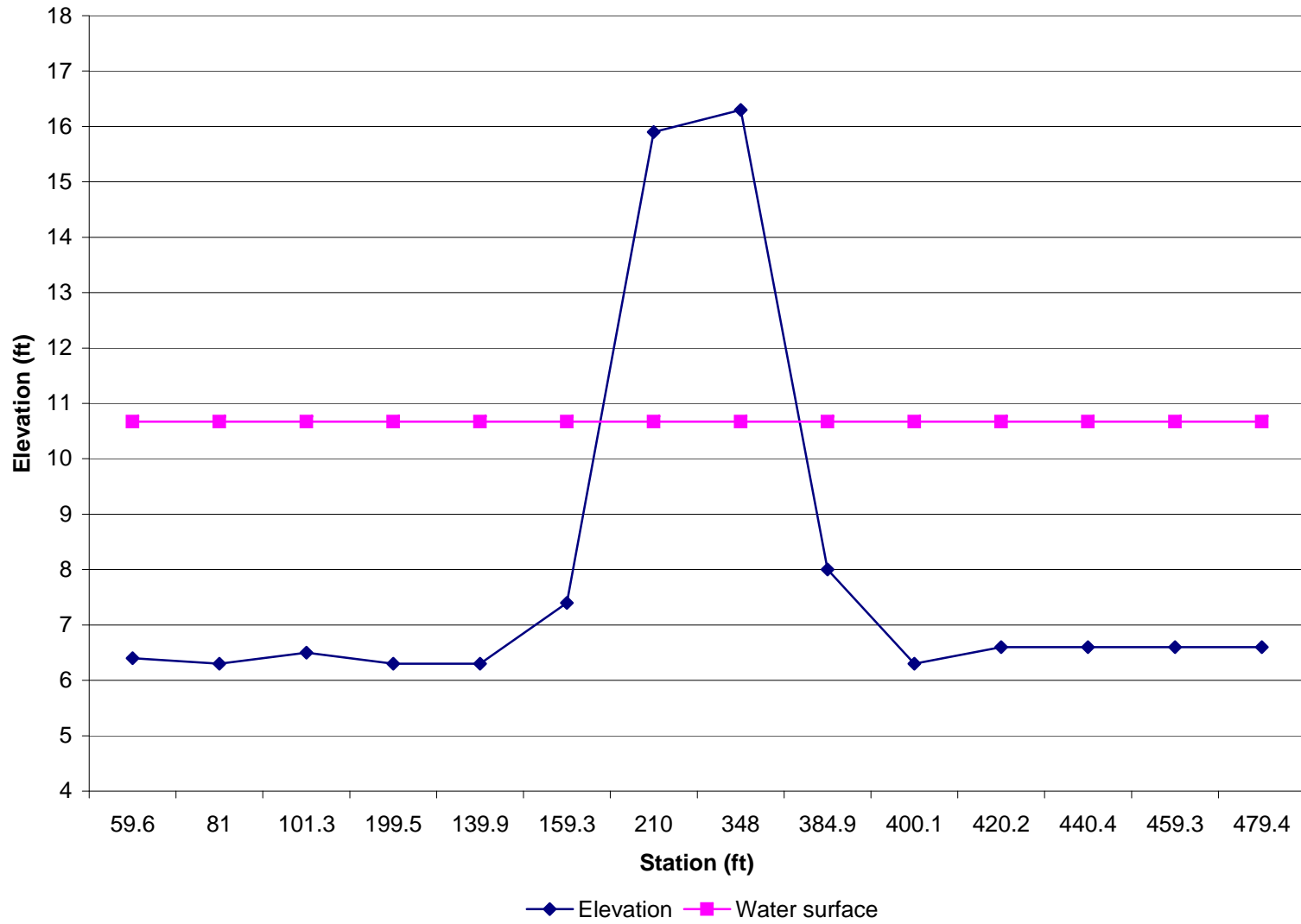
**Pismo Lake Bathymetric Contours**  
**Resse Water & Land Survey**

Coastal San Luis Resource Conservation District  
 California

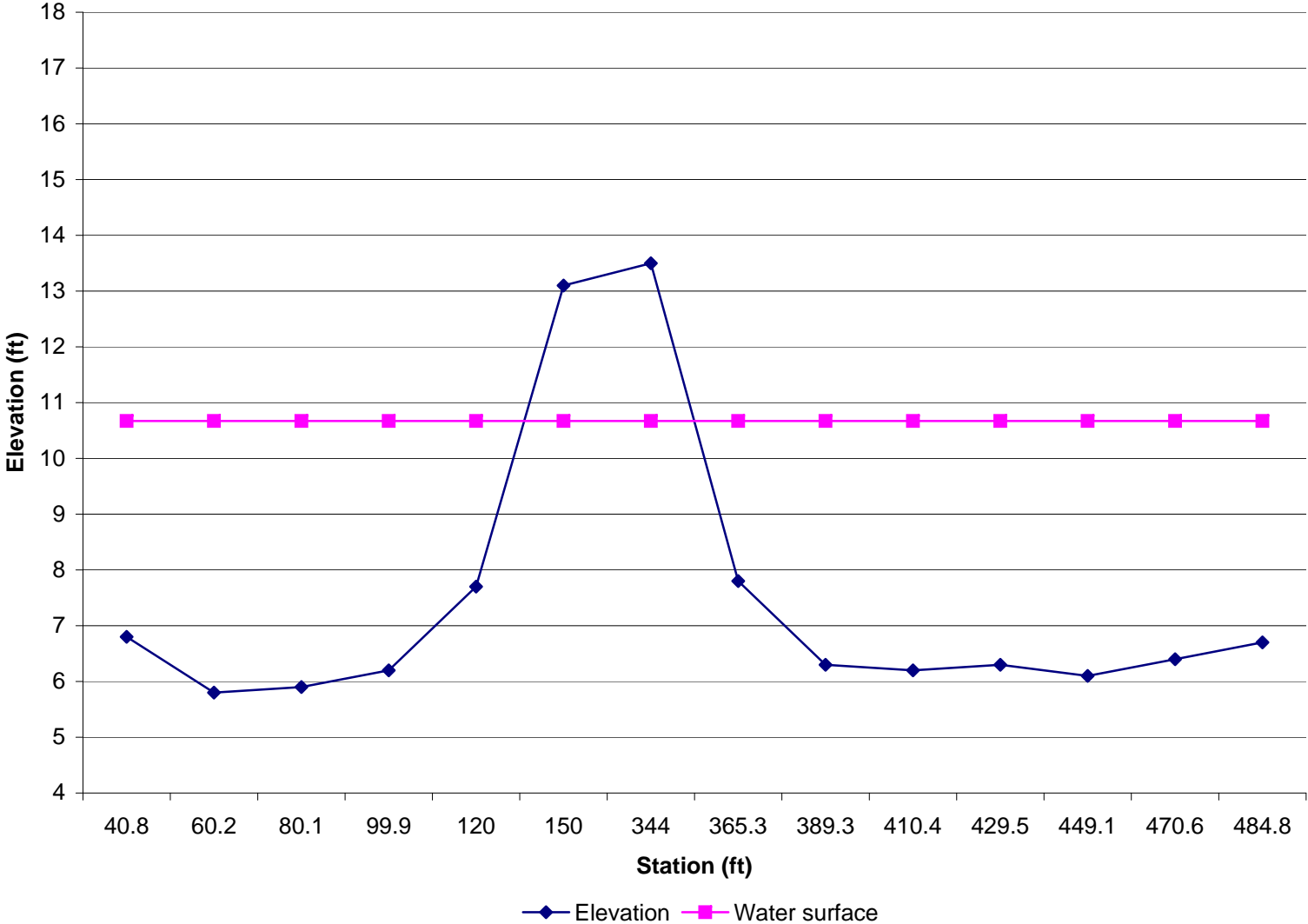


File No.	
Drawing No.	
Sheet	of

### Island 1 Xsection

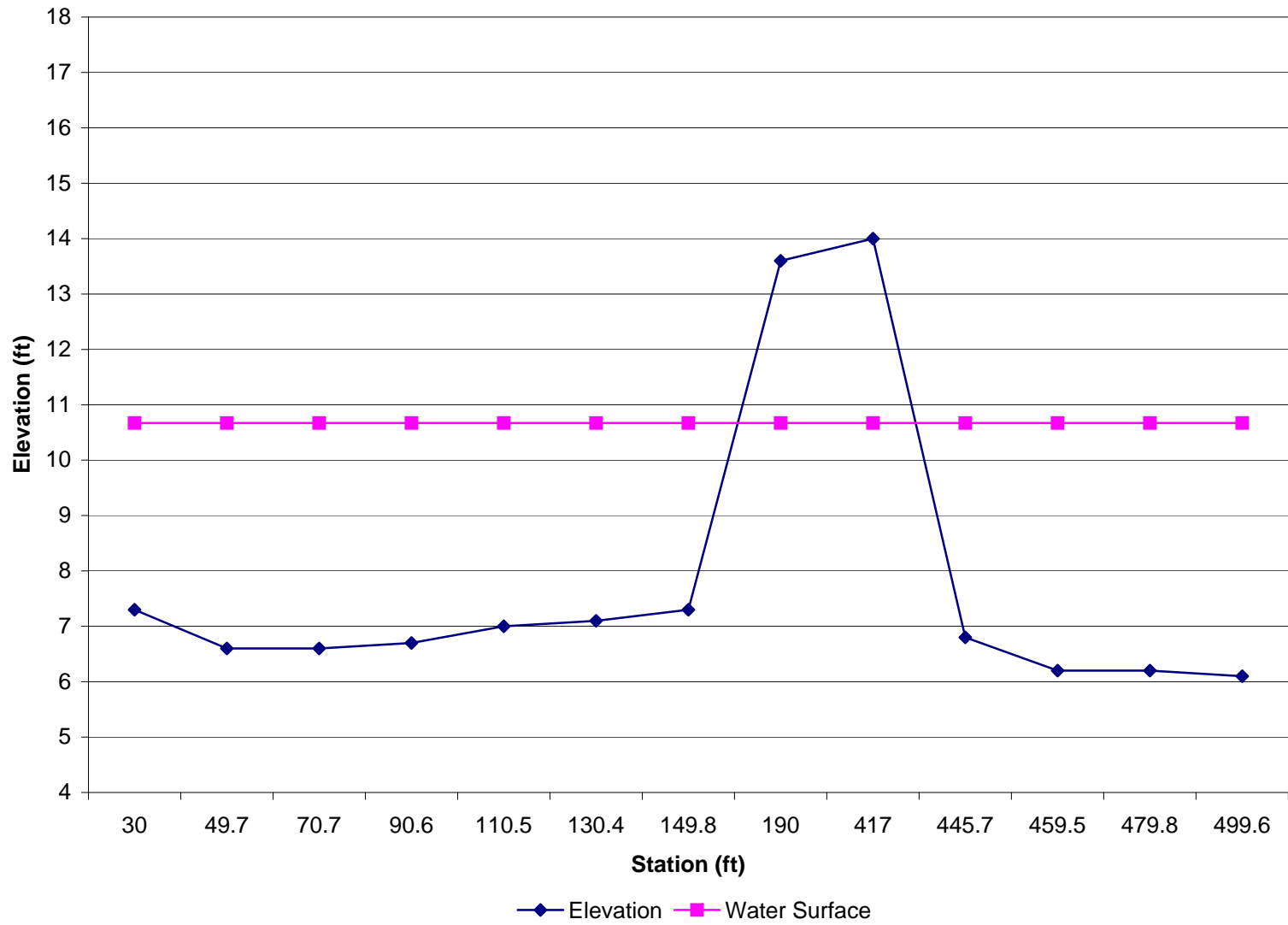


### Island 2 Xsection

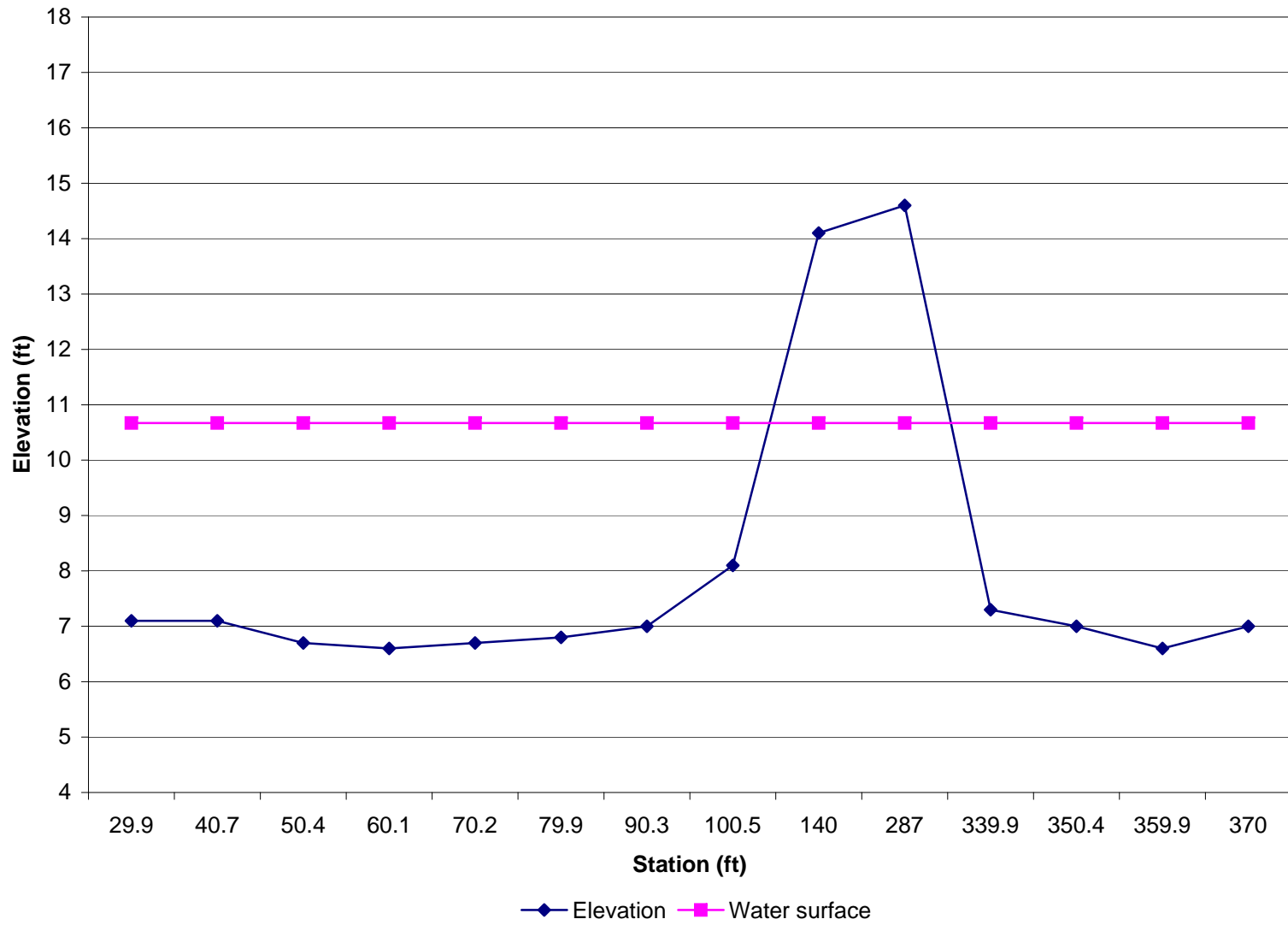




### Island 3 Xsection



### Island 4 Xsection



Appendix M  
Photo Monitoring Sites

## Photo Monitoring Sites

Location: Pismo Lake

Established by: J.Thomas & N. Smith, 2010




Photos are located in the Appendices of the Pismo Lake Natural Resources Inventory Report.

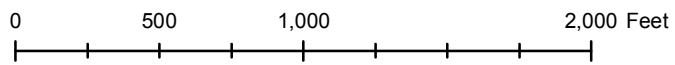
Site	Latitude	Longitude	Photo Numbers	Description
PP1	35.134744	120.623528	8616	At double vehicle gate, facing straight down dirt road
			8617	facing left
			8618	facing right
			8619	facing right
PP2	35.133444	120.624222	8620	facing 110 degrees SE
PP3	35.133614	120.624444	8621	facing 130 degrees SE
			8622	facing 190 degrees S
			8623	facing 60 degrees E
PP4	35.133611	120.6255	8624	facing 240 degrees
			8625	facing 270 degrees
			8626	facing 320 degrees NW
			8627	facing 10 degrees
			8628	facing 61 degrees E
PP5	35.133611	120.625722	8629	facing 305 degrees
PP6	35.133083	120.626194	8632	facing 240 degrees SW
			8633	facing 270 degrees W
			8634	facing 60 degrees NE
PP7	35.133278	120.625694	8635	facing 250 degrees SW
			8636	facing 310 degrees
			8637	facing 350 degrees
			8638	facing 10 degrees
			8639	facing 45 degrees
			8640	facing 80 degrees
			8641	facing 130 degrees SE
			8642	facing 140 degrees
			8643	facing 175 degrees
			8644	facing 200 degrees
PP8	35.134806	120.625778	8647	facing 170 degrees SE
			8648	facing 115 degrees
			8649	facing 100 degrees
			8650	facing 220 degrees
			8651	facing 270 degrees W
			8652	facing 340 degrees
PP9	35.133444	120.625278	8654	facing 210 degrees
			8655	facing 280 degrees
			8656	facing 310 degrees
			8657	facing 350 degrees
			8658	facing 15 degrees
			8659	facing 60 degrees
			8660	facing 105 degrees

			8661 facing 130 degrees SE
			8662 facing 170 degrees SE
			8663 facing 220 degrees
PP10	35.133639	120.622806	8664 facing 240 degrees SW
			8665 facing 280 degrees NW
			8666 facing 340 degrees N
			8667 facing 50 degrees NE
			8668 facing 100 degrees
			8669 facing 185 degrees S
			8670 facing 195 degrees
PP11	35.131944	120.631056	8676 facing 50 degrees NE
			8677 facing 70 degrees
			8678 facing 225 degrees
PP12	35.132083	120.598528	8681
			8682
			8683
			8684
			8685
			8686
			8687
PP13	35.133944	120.631583	8690 facing 150 degrees SE
			8691 facing 135 degrees
			8692 facing 175 degrees

Photo Monitoring Points



-  Pismo Lake Boundary
-  Photo Monitoring Point
-  City of Pismo Boundary



1:8,000

Appendix N  
Past Surveys and Permits

- Coastal Development Permit, 1985
  - Property Transfer, 2007
- Preliminary Report, Pismo Marsh Wildlife Project, 1981
- Biological Inventory Profile: Past, Present and Projected Future, 1984
  - A Study for the Preservation of Pismo Lake
  - Pismo Ecological Reserve Bird Study, 1992
    - Spring Bird Survey, 2000

California Coastal Commission  
SOUTH CENTRAL COAST AREA  
925 De La Vina Street  
Santa Barbara, CA 93101  
(805) 963-6871

### COASTAL DEVELOPMENT PERMIT

No. 4-85-221

Page 1 of 3

On JULY 9, 1985, the California Coastal Commission granted to  
CALIF. DEPT. OF FISH AND GAME, WILDLIFE MANAGEMENT  
this permit for the development described below, subject to the attached  
Standard and Special conditions.

PROJECT LOCATION: Pismo Lake, Marshland adjacent to west side of  
Fourth Street, Pismo Beach, San Luis Obispo Co.

PROJECT DESCRIPTION: Wildlife habitat improvement of an existing  
50 acre wetland State Ecological Area. Project  
includes removal of accumulated sediments,  
development of bird nesting islands  
revegetation, and other improvements

ASSESSOR'S PARCEL NUMBERS(S): 5-242-35

Issued on behalf of the California Coastal Commission by

Michael L. Fischer  
MICHAEL L. FISCHER  
Executive Director  
and

**IMPORTANT: THIS PERMIT IS NOT VALID UNLESS  
AND UNTIL A COPY OF THE PERMIT WITH THE  
SIGNED ACKNOWLEDGEMENT HAS BEEN RE-  
TURNED TO THE COMMISSION OFFICE**

Edward Y. Brown  
Edward Y. Brown  
District Director

**ACKNOWLEDGMENT**

The undersigned permittee acknowledges receipt  
this permit and agrees to abide by all terms and  
conditions thereof.



STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgement. The permit is not valid and construction shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If construction has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Construction shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Compliance. All construction must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.
4. Interpretation. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
5. Inspections. The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.
6. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
7. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

SPECIAL CONDITIONS:

PLEASE SEE PAGE THREE.

Special Conditions1. Corps of Engineers

Prior to commencement of construction permittee shall provide to the Executive Director a copy of U.S. Corps of Engineers permit, or letter of permission or evidence that no Corps permit is necessary.

2. Final Plans

PRIOR TO THE TRANSMITTAL OF THIS PERMIT, the applicant shall submit to the Executive Director for his review and approval, final engineered drawings and plans in conformance with the applicant's submitted proposal.

3. Revegetation Program

PRIOR TO THE TRANSMITTAL OF THIS PERMIT, the applicant shall submit to the Executive Director for review and approval, final revegetation plans and revegetation program delineating revegetation sites, plant type & material, rate, areas, and amount of sources. The final revegetation program shall be undertaken in consultation with the U.S. Fish and Wildlife Service and Soil Conservation Service.

4. Monitoring Program

PRIOR TO THE TRANSMITTAL OF THIS PERMIT, the applicant shall submit for review and approval of the Executive Director, a work program for the implementation of a monitoring program/followup study to determine the effectiveness of the project and identification of necessary maintenance. For a minimum of 3 years annual summary letter reports shall be submitted to the Executive Director.

**NOTIFICATION OF PROPERTY TRANSFER**

TO: Nick Franco DATE: **AUG 08 2008**

San Luis Obispo Coast District

FEE  
 EASEMENT

ADDITION  
 DISPOSAL

The following described  Real Property  
 Interest in Real Property

has been transferred  To  
 From the Department of Parks and Recreation

Parcel History No.  
72-6072

District/Unit No. 740/446	Unit Name Pismo State Beach	DPR/DBP/PRG/SSL No. 7754	OREDS Parcel No. 124300
------------------------------	--------------------------------	-----------------------------	----------------------------

Acquisition Plan No. 29745	County San Luis Obispo	Land Acreage 69.39	Water Frontage 9,603
-------------------------------	---------------------------	-----------------------	-------------------------

Grantor Department of Fish & Game Wildlife Conservation Board	Mineral Rights Acquired by DPR
--	-----------------------------------

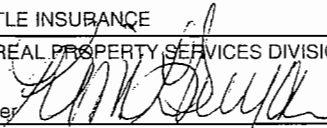
Date Recorded Unrecorded*	Recording Data Doc. No. TR07010C	Transfer of Jurisdiction: 6/22/2007
		Certificate of Acceptance: N/A

Method of Acquisition Fee	<input checked="" type="checkbox"/> Transfer of Jurisdiction Deed <input checked="" type="checkbox"/> Gift <input type="checkbox"/> Exchange	<input type="checkbox"/> Lease <input type="checkbox"/> Condemnation	<input checked="" type="checkbox"/> Improved <input type="checkbox"/> Unimproved
------------------------------	---	---	---

Established Value	DPR Funds Expended
Land \$142,534.00	Land N/A
Improvements N/A	Improvements N/A
TOTAL \$142,534.00	TOTAL N/A

Fund Source  
No cost to DPR.  
Gift Value (from Grantor) = \$142,534.00

Supporting Documents  
Instrument of Conveyance  Preliminary Policy of Title Insurance  Surplus/Disposal Plan or Acquisition Plan  \*Encumbrances

REMARKS:  
\*Unrecorded. Date of document is June 22, 2007.  
This is a no cost transfer from DFG, Wildlife Conservation Board to State Parks. The transfer includes a constraint which states. "Development of trails or other facilities by Parks or other entities shall avoid raparian and wetland resources unless otherwise approved by DFG."  
The established value of \$142,534.00 is based on the historical value of the original purchase price of \$118,660 and gift value of \$23,874 when the property was originally purchased by DFG, WCB.  
APNs: 005-242-039; 005-242-043; 005-242-044 and 005-242-045.  
\*SEE POLICY OF TITLE INSURANCE  
ACQUISITION AND REAL PROPERTY SERVICES DIVISION  
Kim L. Snyder  
Real Property Manager 

RECEIVED  
CA STATE PARKS

AUG 18 2008

SLO Coast District Office

## PROPERTY DATA

ACQUIRING AGENCY: DEPARTMENT OF PARKS AND RECREATION

PARK UNIT: Pismo State Beach

AGENCY PARCEL NUMBERS: 7754

REAL PROPERTY NUMBER: 1173

RESD PROJECT & PARCEL NUMBERS: 124300

COUNTY: San Luis Obispo

ASSESSOR'S PARCEL NUMBERS: 005-242-039; 005-242-043; 005-242-044;  
005-242-045

PUBLIC WORKS BOARD DATE: N/A

PARCEL SIZE: 69.39 acres

GRANTOR: Department of Fish & Game  
Wildlife Conservation Board

RECORDING DATE: Unrecorded. Document date is June 22, 2007

RECORDING NUMBER: Unrecorded. #TRO7010C

INTEREST ACQUIRED: 100% Fee

CONSIDERATION: No Cost to DPR.

FUNDING AUTHORITY: N/A  
GIFT VALUE (based on historical values of original purchase price of \$118,660 and gift value of \$23,874 when the property was originally purchased by DFG, WCB - obtained this value from SPI) = \$142,534.00

ACQUISITION PLAN DRAWING NUMBER: 29745

CONTACT PERSON: Kelley Di Pinto

PARCEL HISTORY NUMBER (assigned by RESD): 72-6072

State of California  
Department of Parks and Recreation  
Attn: Kelley DiPinto  
One Capital Mall, Suite 500  
Sacramento, CA. 95814

OFFICIAL STATE BUSINESS  
EXEMPT FROM RECORDING FEES PER GOVT. CODE 27383

SPACE ABOVE THIS LINE ONLY FOR RECORDER'S USE

**TRANSFER OF JURISDICTION OF  
STATE-OWNED REAL PROPERTY**

Agency: Department of Fish and Game  
Wildlife Conservation Board

Project: Pismo Lake Ecological Reserve--Transfer  
San Luis Obispo County  
TR07010C/ABMS124300

County: San Luis Obispo; Parcels: 005-242-039; 005-242-043; 005-242-044; 005-242-045

Pursuant to the provisions of California Governmental Code 14673, this AGREEMENT is made and entered into this 22<sup>ND</sup> day of June, 2007, by and between the Department of Fish and Game, Wildlife Conservation Board, hereinafter called TRANSFEROR, and the Department of Parks and Recreation, hereinafter called TRANSFEREE, with the approval of Department of General Services (DGS).

WHEREAS, TRANSFEROR has jurisdiction of that certain real property consisting of approximately 65.35 acres (being APN #005-242-039, 005-242-043, 005-242-044 & 005-242-045), located south of Highway 101 between the S.P.R.R and Fourth Street, at Pismo State Beach; and

WHEREAS, TRANSFEREE desires to acquire jurisdiction of said fee interest in real property, and TRANSFEROR is willing to transfer in fee interest jurisdiction of said real property at no cost to TRANSFEREE.

WITNESSETH

NOW, THEREFORE, pursuant to provisions of Section 1348c (2) of the Fish and Game Code and Section 14673 of the Government Code, of the State of California, TRANSFEROR hereby transfers unto TRANSFEREE, and TRANSFEREE hereby accepts fee interest of the real property situated in the County of San Luis Obispo, State of California, more particularly described in Exhibit "A", consisting of four pages, attached hereto and by this reference incorporated herein; and,

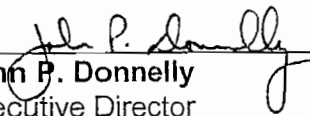
FURTHER, TRANSFEROR stipulates that development of trails or other facilities by TRANSFEREE or other entities shall avoid riparian and wetland resources unless otherwise approved by the TRANSFEROR; and

FURTHER, this document may be recorded at the discretion of either TRANSFEROR or TRANSFEREE and is only intended to provide constructive notice of the location of the real property and real property rights described in the attached Exhibit. The recordation of this document is not intended to provide notice of nor does it authorize a change in title. At the day and year first above written, fee title interest to the real property identified herein is known to be and remains vested in and under the State of California.

IN WITNESS WHEREOF, the parties hereto, by their respective officers thereunto duly authorized, have executed this Agreement the date first above written.

**TRANSFEROR:**  
Department of Fish and Game

**TRANSFeree:**  
Department of Parks and Recreation

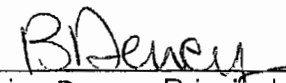
By:   
**John P. Donnelly**  
Executive Director  
Wildlife Conservation Board

By:   
**Stephen R. Lehman**  
Deputy Director  
Acquisition and Development

**APPROVED:**  
Department of General Services

**CONSENTING:**  
Department of Finance

By:  FOR  
Michael Butler, Manager

By:   
Brian Dewey, Principal

## LEGAL DESCRIPTION

### EXHIBIT "A"

#### PARCEL 1:

Parcels A and B of Parcel Map PB-77-77, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map recorded in Book 29, Page 1 of Parcel Maps, in the office of the County Recorder of said County.

#### PARCEL 2:

That portion of Lots 13 and 14 of the Subdivision of the Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a point shown as a stake marked P.141 located at the Southeast corner of Lot 13 as shown map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito, recorded January 7, 1949 in Book 4, Page 117 of Record of Surveys;

thence along the South line of said Lot 13, North 85° 53' West, 632.83 feet to the East right of way line of the Southern Pacific Railroad;

thence along said right of way line, North 3° 45' West, 930.47 feet to the most Westerly corner of Block 1, Tract 123 recorded in Book 6, Page 1 of Maps, said Westerly corner being the true point of beginning;

thence from said point of beginning, continuing along said East right of way line, North 3° 45' West, 1539.98 feet to the most Southerly corner of the land described in the deed to George Murray, Post 3138, Veterans of Foreign Wars, Pismo Beach, California, recorded October 26, 1956 in Book 867, Page 456 of Official Records; thence along the course recited in said deed as "South 58° 30' West, 470.78 feet" North 58° 30' East, 329.62 feet to the Southwesterly line of the land described in the deed recorded February 1, 1966 in Book 1384, Page 202 of Official Records;

thence along said Southwesterly line, South 32° 24' East, 30.00 feet to the Northwesterly line of the lands described in Parcel One of said deed recorded in Book 1273, Page 32 of Official Records;

thence along said Northwesterly line, South 58° 30' West, 277.89 feet;

thence along the Westerly and Southerly lines of said Parcel One the following four courses :

1. South 3° 45' East, 372.49 feet;

2. South 32° 24' East, 296.58 feet;

3. South 67° 24' East, 467.88 feet;

4. North 57° 58' 20" East (North 58° 02' East, Record), 178.27 feet to the most Southerly corner of the lands described in the above recited deed recorded in Book 1384, Page 202 of Official Records;

thence along the Southerly line of last said lands as shown on the Map of Survey of portions of Lots 13 and 14, Rancho El Pismo filed March 14, 1968 in Book 16, Page 47 of Record of Surveys, South 76° 00' East, 335.59 feet;

thence South 74° 18' 16" East, 285.18 feet to a 3/4 inch iron pipe with plastic plug;

thence South 20° 48' 31" West, 190.21 feet to a 3/4 inch iron pipe with plastic plug;

thence South 60° 45' 54" East, 167.14 feet to a 3/4 inch iron pipe with plastic plug.

thence North 60° 27' 28" East, 184.01 feet to a 3/4 inch iron pipe with plastic plug stamped Calif. D.W.R.;

thence North 85° 41' 40" East, 134.58 feet to a 3/4 inch iron pipe with plastic plug stamped Calif. D.W.R.;

thence North 36° 27' 25" East, 256.09 feet to a 3/4 inch iron pipe with plastic plug stamped Calif. D.W.R.;

thence South 86° 59' 32" East, 371.83 feet to a 2 inch iron pipe located at the Southwest corner of Parcel 2 shown on the Parcel Map filed September 29, 1972 in Book 9, Page 64 of Parcel Maps;

thence along the South line of said Parcel 2, North 86° 25' East, 150.21 feet to a 2 inch iron pipe;

thence along the Westerly line of Fourth Street as described in Book 896, Page 217 of Official Records, South 3° 35' East, 306.48 feet and continuing along a curve to the right having a radius of 455.00 feet, through a central angle of 25° 47' 58", an arc distance of 204.88 feet to a point in the course recorded as "South 89° 58' East, 992.74 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records;

thence along said North line, North 89° 58' West, 101.62 feet, South 72° 15' West, 900.00 feet and North 86° 45' West, 463.58 feet to a point in the course recited as "North 49° 22' West 128.80 feet" in the North line of City of Grover City, California, as described in the Resolution of the Board of Supervisors recorded December 21, 1959 as Document No. 28391;

thence along said North line, North 49° 22' West, 103.49 feet and South 67° 22' West, 143.93 feet to the North line of said Parcel 3;

EXHIBIT "A" (continued)

thence along last said North line, North 86° 45' West, 874.70 feet to the hereinabove rectied North line of the City of Grover City;  
thence along last said North line, South 39° 15' West, 350.00 feet and South 86° 15' West, 40.00 feet to the true point of beginning.

PARCEL 3:

That portion of Lot 14 of the Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to the map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Beginning at a 3/4 inch iron pipe tagged R.C.E. 9806 set for corner P-156 on the Easterly line of said Lot 14 shown on the Record of Survey titled, "Part of Lot 11 of the Ranchos El Pismo and San Miguelito, City of Grover City" filed January 6, 1975 in Book 21, Page 57 of Record of Surveys;  
thence along the Southerly line of the "Old County Road", South 73° 29' 46" East, 19.40 feet to the Northwest corner of Lot K of the City of Grover City as shown on the map filed in Book 12, Page 110 of said Record of Survey;  
thence along the line between said Lots 14 and K as shown on the "Map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito" filed January 7, 1949 in Book 4, Page 117 of Record of Surveys, South 21° 35' West, 286.29 feet to the Easterly terminus of the course recited as "South 89° 58' East 992.74 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records;  
thence along said course North 89° 58' West, 772.38 feet to the Easterly line of Fourth Street as described in Book 896, Page 217 of Official Records;  
thence along said Easterly line, from a tangent which bears North 10° 15' 09" East along a curve to the left having a radius of 550.00 feet, through a central angle of 13° 50' 09", an arc length of 132.81 feet and North 3° 35' West, 352.46 feet to a point from which the 2 inch iron pipe located at the Southeasterly corner of Parcel 2 shown on the Parcel Map filed September 29, 1972 in Book 9, Page 64 of Parcel Maps bears North 76° 17' 50" West, 94.26 feet;  
thence South 76° 17' 50" East, 903.02 feet to the point of beginning.

PARCEL 4:

That portion of Lot 14 of the Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to the map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a 3/4 inch iron pipe tagged R.C.E. 9806 set for corner P-156 on the Easterly line of said Lot 14, shown on the xors titled, "Part of Lot 11 of the Ranchos El Pismo and San Miguelito, City of Grover City" filed January 6, 1975 in Book 21, Page 57 of Record of Surveys;  
thence along the Southerly line of the "Old County Road" South 73° 29' 46" East, 19.40 feet to the Northwest corner of Lot K of the City of Grover City, as shown on the map filed in Book 12, Page 110 of Record of Surveys;  
thence along the line between said Lots 14 and K as shown on the "Map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito" filed January 7, 1949 in Book 4, Page 117 of Record of Surveys, South 21° 35' West, 287.76 feet to the Easterly terminus of the course recited as "South 89° 58' East 992.74 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation, recorded September 5, 1963 in Book 1258, Page 710 of Official Records and the true point of beginning;;  
thence from said point of beginning, continuing along said line between Lots 14 and K, South 21° 35' West, 58.19 feet to the Easterly terminus of the course recited as "South 87° 11' West 1036.33 feet" in the North line of the City of Grover City, California, as described in the Resolution of the Board of Supervisors of said County Recorded December 21, 1959 as Document No. 28391;  
thence along said course South 87° 11' West, 777.22 feet to the Easterly line of Fourth Street as described in Book 896, Page 217 of Official Records;  
thence along said Easterly line, from a tangent which bears North 20° 16' 52" East along a curve to the left having a radius of 550.00 feet, through a central angle of 10° 01' 43", an arc length of 96.27 feet to a point in the above recited North line of Parcel 3;  
thence along said North line, South 89° 58' East, 772.38 feet to the true point of beginning.

PARCEL 5:



That portion of Lots 13 and 14 of the Subdivision of Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1889 in Book A, page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a point shown as a stake marked P.141 located at the Southeast corner of Lot 13 as shown on map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito, recorded January 7, 1949 in Book 4, Page 117 of Record of Surveys;

thence along the South line of said Lot 13, North 85° 53' West, 632.83 feet to the East right of way line of the Southern Pacific Railroad;

thence along said right of way line, North 3° 45' West, 930.47 feet to the most Westerly corner of Block 1, Tract 123 recorded in Book 6, Page 1 of Maps;

thence along the North line of City of Grover City, California, as described in the Resolution of the Board of Supervisors recorded December 21, 1959 as Document No. 28391, the following 6 courses:

1. North 86° 15' East, 40.00 feet;
2. North 39° 15' East, 350.00 feet;
3. South 79° 33' East, 252.36 feet;
4. South 86° 21' East, 551.23 feet;
5. North 67° 22' East, 225.20 feet;
6. South 49° 22' East, 103.49 feet to a point in the course recited as "South 86° 45' East, 1550.00 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records, said point being the true point of beginning;

thence from said point of beginning, continuing along said North line of City of Grover City, the following 6 courses:

1. South 49° 22' East, 25.31 feet;
2. South 72° 39' East, 291.99 feet;
3. North 79° 41' East, 162.64 feet;
4. North 67° 03' East, 207.46 feet;
5. North 77° 23' East, 622.85 feet;
6. North 87° 11' East, 108.31 feet to a point on the Westerly line of Fourth Street as described in Book 896, page 217 of Official Records;

thence along said Westerly line, from a tangent which bears North 36° 45' 01" East, along a curve to the left having a radius of 455.00 feet, through a central angle of 14° 32' 03", an arc distance of 155.42 feet to a point in North line of the hereinabove recited Parcel 3;

thence along said North line, North 89° 58' West, 101.62 feet, South 72° 15' West, 900.00 feet and North 86° 45' West, 463.58 feet to the true point of beginning.

PARCEL 6:

That portion of Lots 13 and 14 of the Subdivision of Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a point shown as a stake marked P.141 located at the Southeast corner of Lot 13 as shown on map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito, recorded January 7, 1949 in Book 4, Page 117 of Record of Surveys;

thence along the South line of said Lot 13, North 85° 53' West, 632.83 feet to the East right of way line of the Southern Pacific Railroad;

thence along said right of way line, North 3° 45' West, 930.47 feet to the most Westerly corner of Block 1, Tract 123 recorded in Book 6, Page 1 of Maps;

thence along the North line of City of Grover City, California, as described in the Resolution of the Board of Supervisors recorded December 21, 1959 as Document No. 28391, North 86° 15' East, 40.00 feet and North 39° 15' East, 350.00 feet to the true point of beginning;

thence from said point of beginning, continuing along said North line the following three courses:

1. South 79° 33' East, 252.36 feet;
2. South 86° 21' East, 551.23 feet;
3. North 67° 22' East, 81.27 feet to a point in the course recited as "South 86° 45' East, 1550.00 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records;

thence along last said North line, North 86° 45' West, 374.70 feet to the true point of beginning.

APN: 005-242-039, 005-242-043, 005-242-044, 005-242-045



# Fidelity National Title Company

## PRELIMINARY REPORT

*In response to the application for a policy of title insurance referenced herein, Fidelity National Title Company hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an Exception herein or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations of said Policy forms.*

*The printed Exceptions and Exclusions from the coverage and Limitations on Covered Risks of said Policy or Policies are set forth in Attachment One. Limitations on Covered Risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a Deductible Amount and a Maximum Dollar Limit of Liability for certain coverages are also set forth in Attachment One. Copies of the Policy forms should be read. They are available from the office which issued this report.*

*This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.*

*The Policy(s) of title insurance to be issued hereunder will be policy(s) of Fidelity National Title Insurance Company, a California corporation.*

*Please read the exceptions shown or referred to herein and the exceptions and exclusions set forth in Attachment One of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.*

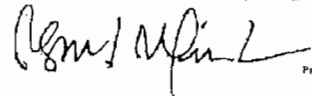
*It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.*

  
Countersigned



Fidelity National Title Company

BY



President

ATTEST



Secretary



# Fidelity National Title Company

8950 Cal Center Drive, Bldg. 3, Suite 100 • Sacramento, CA 95826  
916 364-4070 • FAX 916 364-4093

## PRELIMINARY REPORT

Title Officer: Larry Mitchell  
Escrow Officer: Ruth Sias  
Escrow No.: 07-**5003746**-RS

Title No.: 07-**197058**-LM  
Locate No.: CAFNT0940-0934-0010-0000197058

TO: Department of Fish and Game  
1419 9th Street  
Sacramento, CA 95814

ATTN: Linda Drake  
YOUR REFERENCE: State of California

SHORT TERM RATE: No

**PROPERTY ADDRESS:** Pismo Beach, California

**EFFECTIVE DATE: January 12, 2007, 07:30 A.M.**

The form of Policy or Policies of title insurance contemplated by this report is:

CLTA Standard Coverage Policy - 1990

1. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:  
  
A Fee
2. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:  
  
**State of California**
3. THE LAND REFERRED TO IN THIS REPORT IS DESCRIBED AS FOLLOWS:  
  
SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

DR\DR 01/24/2007

LEGAL DESCRIPTION

EXHIBIT "A"

PARCEL 1:

Parcels A and B of Parcel Map PB-77-77, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map recorded in Book 29, Page 1 of Parcel Maps, in the office of the County Recorder of said County.

PARCEL 2:

That portion of Lots 13 and 14 of the Subdivision of the Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a point shown as a stake marked P.141 located at the Southeast corner of Lot 13 as shown map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito, recorded January 7, 1949 in Book 4, Page 117 of Record of Surveys;

thence along the South line of said Lot 13, North 85° 53' West, 632.83 feet to the East right of way line of the Southern Pacific Railroad;

thence along said right of way line, North 3° 45' West, 930.47 feet to the most Westerly corner of Block 1, Tract 123 recorded in Book 6, Page 1 of Maps, said Westerly corner being the true point of beginning;

thence from said point of beginning, continuing along said East right of way line, North 3° 45' West, 1539.98 feet to the most Southerly corner of the land described in the deed to George Murray, Post 3138, Veterans of Foreign Wars, Pismo Beach, California, recorded October 26, 1956 in Book 867, Page 456 of Official Records;

thence along the course recited in said deed as "South 58° 30' West, 470.78 feet" North 58° 30' East, 329.62 feet to the Southwesterly line of the land described in the deed recorded February 1, 1966 in Book 1384, Page 202 of Official Records;

thence along said Southwesterly line, South 32° 24' East, 30.00 feet to the Northwesterly line of the lands described in Parcel One of said deed recorded in Book 1273, Page 32 of Official Records;

thence along said Northwesterly line, South 58° 30' West, 277.89 feet;

thence along the Westerly and Southerly lines of said Parcel One the following four courses :

1. South 3° 45' East, 372.49 feet;
2. South 32° 24' East, 296.58 feet;
3. South 67° 24' East, 467.88 feet;
4. North 57° 58' 20" East (North 58° 02' East, Record), 178.27 feet to the most Southerly corner of the lands described in the above recited deed recorded in Book 1384, Page 202 of Official Records;

thence along the Southerly line of last said lands as shown on the Map of Survey of portions of Lots 13 and 14, Rancho El Pismo filed March 14, 1968 in Book 16, Page 47 of Record of Surveys, South 76° 00' East, 335.59 feet;

thence South 74° 18' 16" East, 285.18 feet to a 3/4 inch iron pipe with plastic plug;

thence South 20° 48' 31" West, 190.21 feet to a 3/4 inch iron pipe with plastic plug;

thence South 60° 45' 54" East, 167.14 feet to a 3/4 inch iron pipe with plastic plug.

thence North 60° 27' 28" East, 184.01 feet to a 3/4 inch iron pipe with plastic plug stamped Calif. D.W.R.;

thence North 85° 41' 40" East, 134.58 feet to a 3/4 inch iron pipe with plastic plug stamped Calif. D.W.R.;

thence North 36° 27' 25" East, 256.09 feet to a 3/4 inch iron pipe with plastic plug stamped Calif. D.W.R.;

thence South 86° 59' 32" East, 371.83 feet to a 2 inch iron pipe located at the Southwest corner of Parcel 2 shown on the Parcel Map filed September 29, 1972 in Book 9, Page 64 of Parcel Maps;

thence along the South line of said Parcel 2, North 86° 25' East, 150.21 feet to a 2 inch iron pipe;

thence along the Westerly line of Fourth Street as described in Book 896, Page 217 of Official Records, South 3° 35' East, 306.48 feet and continuing along a curve to the right having a radius of 455.00 feet, through a central angle of 25° 47' 58", an arc distance of 204.88 feet to a point in the course recorded as "South 89° 58' East, 992.74 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records;

thence along said North line, North 89° 58' West, 101.62 feet, South 72° 15' West, 900.00 feet and North 86° 45' West, 463.58 feet to a point in the course recited as "North 49° 22' West 128.80 feet" in the North line of City of Grover City, California, as described in the Resolution of the Board of Supervisors recorded December 21, 1959 as Document No. 28391;

thence along said North line, North 49° 22' West, 103.49 feet and South 67° 22' West, 143.93 feet to the North line of said Parcel 3;

thence along last said North line, North 86° 45' West, 874.70 feet to the hereinabove rectified North line of the City of Grover City;  
thence along last said North line, South 39° 15' West, 350.00 feet and South 86° 15' West, 40.00 feet to the true point of beginning.

## PARCEL 3:

That portion of Lot 14 of the Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to the map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Beginning at a 3/4 inch iron pipe tagged R.C.E. 9806 set for corner P-156 on the Easterly line of said Lot 14 shown on the Record of Survey titled, "Part of Lot 11 of the Ranchos El Pismo and San Miguelito, City of Grover City" filed January 6, 1975 in Book 21, Page 57 of Record of Surveys;  
thence along the Southerly line of the "Old County Road", South 73° 29' 46" East, 19.40 feet to the Northwest corner of Lot K of the City of Grover City as shown on the map filed in Book 12, Page 110 of said Record of Survey;  
thence along the line between said Lots 14 and K as shown on the "Map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito" filed January 7, 1949 in Book 4, Page 117 of Record of Surveys, South 21° 35' West, 286.29 feet to the Easterly terminus of the course recited as "South 89° 58' East 992.74 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records;  
thence along said course North 89° 58' West, 772.38 feet to the Easterly line of Fourth Street as described in Book 896, Page 217 of Official Records;  
thence along said Easterly line, from a tangent which bears North 10° 15' 09" East along a curve to the left having a radius of 550.00 feet, through a central angle of 13° 50' 09", an arc length of 132.81 feet and North 3° 35' West, 352.46 feet to a point from which the 2 inch iron pipe located at the Southeasterly corner of Parcel 2 shown on the Parcel Map filed September 29, 1972 in Book 9, Page 64 of Parcel Maps bears North 76° 17' 50" West, 94.26 feet;  
thence South 76° 17' 50" East, 903.02 feet to the point of beginning.

## PARCEL 4:

That portion of Lot 14 of the Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to the map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a 3/4 inch iron pipe tagged R.C.E. 9806 set for corner P-156 on the Easterly line of said Lot 14, shown on the xors titled, "Part of Lot 11 of the Ranchos El Pismo and San Miguelito, City of Grover City" filed January 6, 1975 in Book 21, Page 57 of Record of Surveys;  
thence along the Southerly line of the "Old County Road" South 73° 29' 46" East, 19.40 feet to the Northwest corner of Lot K of the City of Grover City, as shown on the map filed in Book 12, Page 110 of Record of Surveys;  
thence along the line between said Lots 14 and K as shown on the "Map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito" filed January 7, 1949 in Book 4, Page 117 of Record of Surveys, South 21° 35' West, 287.76 feet to the Easterly terminus of the course recited as "South 89° 58' East 992.74 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation, recorded September 5, 1963 in Book 1258, Page 710 of Official Records and the true point of beginning;;  
thence from said point of beginning, continuing along said line between Lots 14 and K, South 21° 35' West, 58.19 feet to the Easterly terminus of the course recited as "South 87° 11' West 1036.33 feet" in the North line of the City of Grover City, California, as described in the Resolution of the Board of Supervisors of said County Recorded December 21, 1959 as Document No. 28391;  
thence along said course South 87° 11' West, 777.22 feet to the Easterly line of Fourth Street as described in Book 896, Page 217 of Official Records;  
thence along said Easterly line, from a tangent which bears North 20° 16' 52" East along a curve to the left having a radius of 550.00 feet, through a central angle of 10° 01' 43", an arc length of 96.27 feet to a point in the above recited North line of Parcel 3;  
thence along said North line, South 89° 58' East, 772.38 feet to the true point of beginning.

## PARCEL 5:

That portion of Lots 13 and 14 of the Subdivision of Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1889 in Book A, page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a point shown as a stake marked P.141 located at the Southeast corner of Lot 13 as shown on map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito, recorded January 7, 1949 in Book 4, Page 117 of Record of Surveys;

thence along the South line of said Lot 13, North 85° 53' West, 632.83 feet to the East right of way line of the Southern Pacific Railroad;

thence along said right of way line, North 3° 45' West, 930.47 feet to the most Westerly corner of Block 1, Tract 123 recorded in Book 6, Page 1 of Maps;

thence along the North line of City of Grover City, California, as described in the Resolution of the Board of Supervisors recorded December 21, 1959 as Document No. 28391, the following 6 courses:

1. North 86° 15' East, 40.00 feet;
2. North 39° 15' East, 350.00 feet;
3. South 79° 33' East, 252.36 feet;
4. South 86° 21' East, 551.23 feet;
5. North 67° 22' East, 225.20 feet;
6. South 49° 22' East, 103.49 feet to a point in the course recited as "South 86° 45' East, 1550.00 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records, said point being the true point of beginning;

thence from said point of beginning, continuing along said North line of City of Grover City, the following 6 courses:

1. South 49° 22' East, 25.31 feet;
2. South 72° 39' East, 291.99 feet;
3. North 79° 41' East, 162.64 feet;
4. North 67° 03' East, 207.46 feet;
5. North 77° 23' East, 622.85 feet;
6. North 87° 11' East, 108.31 feet to a point on the Westerly line of Fourth Street as described in Book 896, page 217 of Official Records;

thence along said Westerly line, from a tangent which bears North 36° 45' 01" East, along a curve to the left having a radius of 455.00 feet, through a central angle of 14° 32' 03", an arc distance of 155.42 feet to a point in North line of the hereinabove recited Parcel 3;

thence along said North line, North 89° 58' West, 101.62 feet, South 72° 15' West, 900.00 feet and North 86° 45' West, 463.58 feet to the true point of beginning.

PARCEL 6:

That portion of Lots 13 and 14 of the Subdivision of Rancho El Pismo, in the City of Pismo Beach, County of San Luis Obispo, State of California, according to map of the Subdivision of a Part of Ranchos El Pismo and San Miguelito, made by R. R. Harris in 1886, recorded April 30, 1886 in Book A, Page 157 of Maps, in the office of the County Recorder of said County, described as follows:

Commencing at a point shown as a stake marked P.141 located at the Southeast corner of Lot 13 as shown on map of Survey of Lot 14 and portions of Lot 13 in Ranchos El Pismo and San Miguelito, recorded January 7, 1949 in Book 4, Page 117 of Record of Surveys;

thence along the South line of said Lot 13, North 85° 53' West, 632.83 feet to the East right of way line of the Southern Pacific Railroad;

thence along said right of way line, North 3° 45' West, 930.47 feet to the most Westerly corner of Block 1, Tract 123 recorded in Book 6, Page 1 of Maps;

thence along the North line of City of Grover City, California, as described in the Resolution of the Board of Supervisors recorded December 21, 1959 as Document No. 28391, North 86° 15' East, 40.00 feet and North 39° 15' East, 350.00 feet to the true point of beginning;

thence from said point of beginning, continuing along said North line the following three courses:

1. South 79° 33' East, 252.36 feet;
2. South 86° 21' East, 551.23 feet;
3. North 67° 22' East, 81.27 feet to a point in the course recited as "South 86° 45' East, 1550.00 feet" in the North line of Parcel 3 described in the deed to Interstate Utilities Corporation recorded September 5, 1963 in Book 1258, Page 710 of Official Records;

thence along last said North line, North 86° 45' West, 874.70 feet to the true point of beginning.

EXHIBIT "A" (continued)

Title No. 07-197058-LM  
Locate No. CAFNT0940-0934-0010-0000197058

APN: 005-242-039, 005-242-043, 005-242-044, 005-242-045



**AT THE DATE HEREOF, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN SAID POLICY FORM WOULD BE AS FOLLOWS:**

1. **Property taxes**, which are a lien not yet due and payable, including any assessments collected with taxes to be levied for the fiscal year 2007-2008.
2. **The lien of supplemental taxes**, if any, assessed pursuant to the provisions of Chapter 3.5 (Commencing with Section 75) of the Revenue and Taxation code of the State of California.

3. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Southern Pacific Railroad Company  
Purpose: The right to extend the slopes of cuttings and embankments and to build and maintain culverts and surface ditches beyond the Railroad right of way  
Recorded: Book 31, Page 200 & 224, of Deeds  
Affects: Parcel 2

4. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Adolph Phillips  
Purpose: Pipe line  
Recorded: November 30, 1906, Book 73, Page 212, of Deeds  
Affects: A portion of said land

5. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Union Oil Company  
Purpose: Public utilities  
Recorded: June 24, 1914, Book 101, Page 224, of Deeds  
Affects: A portion of said land

6. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Pismo Oaks Estates, Inc.  
Purpose: Water line  
Recorded: October 30, 1952, Book 683, Page 25, of Official Records  
Affects: The Easterly 10 feet of Parcel 4

7. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Pacific Gas and Electric Company and Pacific Telephone and Telegraph Company, California Corporations  
Purpose: Public utilities  
Recorded: January 31, 1962, Book 1167, Page 727, of Official Records  
Affects: A portion of said land

8. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Pacific Gas and Electric Company and Pacific Telephone and Telegraph Company, California Corporations  
Purpose: Public utilities  
Recorded: November 2, 1962, Book 1209, Page 499, of Official Records  
Affects: A portion of said land

9. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: D. G. Dumbeck, a married man  
Purpose: Road, sewer and water lines  
Recorded: January 23, 1963, Book 1247, Page 67, of Official Records  
Affects: A portion of said land

10. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Interstate Utilities Corporation, a California Corporation  
Purpose: Roadway  
Recorded: September 5, 1963, Book 1258, Page 718, of Official Records  
Affects: A portion of said land

11. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Don E. Hawes  
Purpose: Roadway, sewer and water lines and utility purposes  
Recorded: April 28, 1964, Book 1294, Page 717, of Official Records  
Affects: A portion of said land

12. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: George Handy, a married man, et al  
Purpose: Road and utility  
Recorded: February 1, 1966, Book 1384, Page 202, of Official Records  
Affects: A portion of said land

13. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Five Cities Shopping Center, a partnership, et al  
Purpose: Water lines  
Recorded: November 1, 1972, Book 1695, Page 305, of Official Records  
Affects: A portion of said land

14. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as delineated or as offered for dedication, on the map of said tract.

Purpose: Drainage  
Affects: A portion of Parcel A of Parcel 1 herein described

Purpose: Public utilities  
Affects: The Westerly 10 feet of Parcel B of Parcel 1

By Quitclaim Deed recorded May 6, 1982 in Book 2404, Page 945 of Official Records, Pacific Telephone and Telegraph Company relinquished all of their right, title and interest in and to said public utility easement over the Westerly 10 feet of Parcel B

15. **An irrevocable offer** to dedicate an easement over a portion of said land for public road.

Recorded: February 1, 1980, Book 2219, Page 139, of Official Records  
Affects: A portion of Parcel 1

16. **Easement(s)** for the purpose(s) shown below and rights incidental thereto as granted in a document.

Granted to: Merrell M. Williams  
Purpose: Drainge  
Recorded: March 13, 1980, Book 2227, Page 687, of Official Records  
Affects: A portion of Parcel A of Parcel 1 herein described

#### END OF ITEMS

**Note 1.** The current owner does NOT qualify for the \$20.00 discount pursuant to the coordinated stipulated judgments entered in actions filed by both the Attorney General and private class action plaintiffs for the herein described property.

**Note 2.** The charge for a policy of title insurance, when issued through this title order, will be based on the Basic (not Short-Term) Title Insurance Rate.

**Note 3.** NOTE: The policy of title insurance will include an arbitration provision. The Company or the insured may demand arbitration. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the insured arising out of or relating to this policy, any service of the Company in connection with its issuance or the breach of a policy provision or other obligation. Please ask your escrow or title officer for a sample copy of the policy to be issued if you wish to review the arbitration provisions and any other provisions pertaining to your Title Insurance coverage.

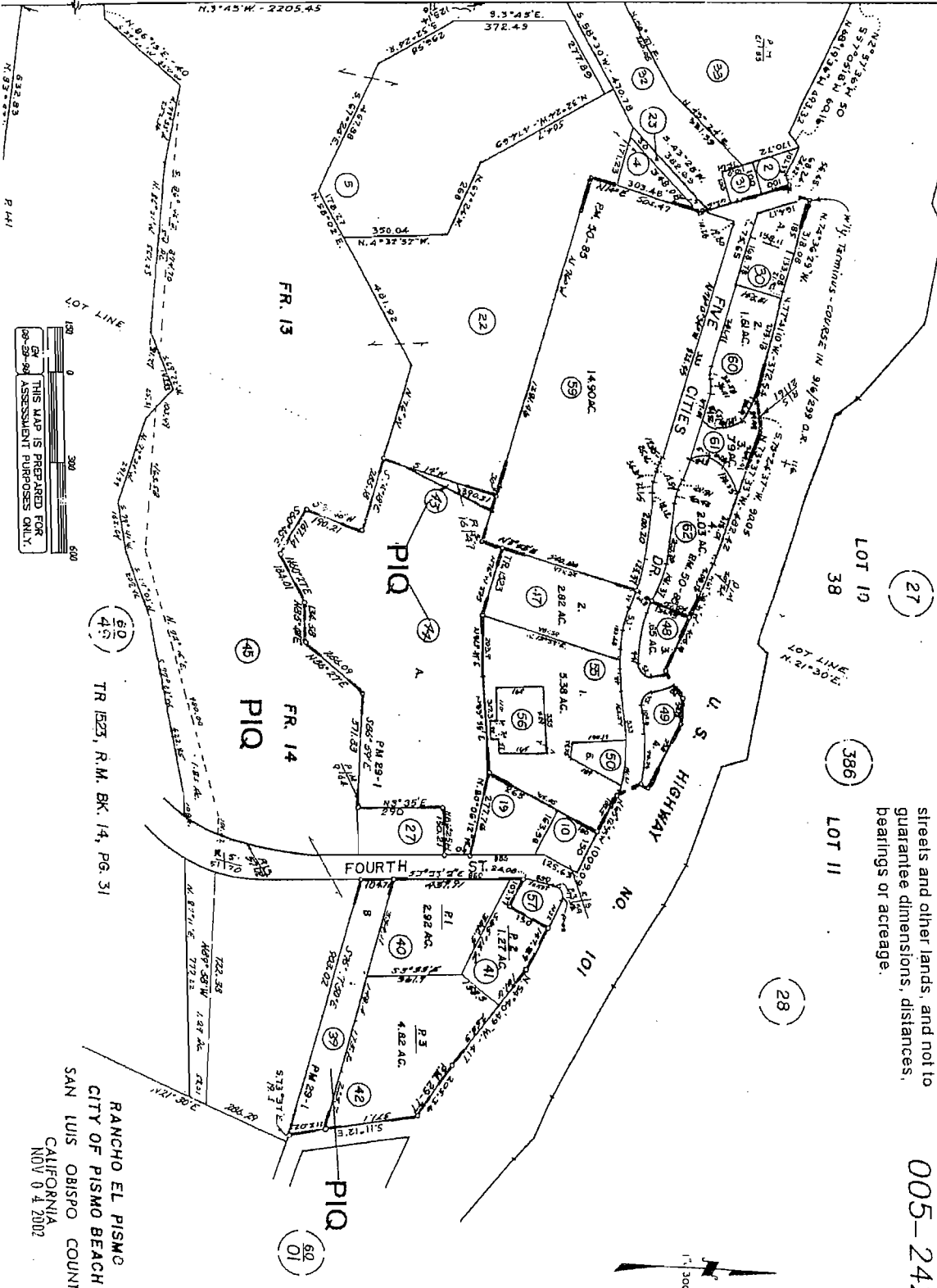
**Note 4.** If a county recorder, title insurance company, escrow company, real estate broker, real estate agent or association provides a copy of a declaration, governing document or deed to any person, California law requires that the document provided shall include a statement regarding any unlawful restrictions. Said statement is to be in at least 14-point bold face type and may be stamped on the first page of any document provided or included as a cover page attached to the requested document. Should a party to this transaction request a copy of any document reported herein that fits this category, the statement is to be included in the manner described.

**END OF NOTES**

REVISIONS	
NO.	DATE
01	08-25-98
02	10-09-07

S P R R

241



150 0 300 450  
 THIS MAP IS PREPARED FOR  
 19-29-98 ASSESSMENT PURPOSES ONLY.  
 R 441

RANCHO EL PISMO  
 CITY OF PISMO BEACH  
 SAN LUIS OBISPO COUNTY  
 CALIFORNIA  
 NOV 0 4 2002

IMPORTANT: This plat is not a survey,  
 it is merely furnished as a convenience  
 to locate the land in relation to adjoining  
 streets and other lands, and not to  
 guarantee dimensions, distances,  
 bearings or acreage.

005-242

## ATTACHMENT ONE

### AMERICAN LAND TITLE ASSOCIATION RESIDENTIAL TITLE INSURANCE POLICY (6-1-87) EXCLUSIONS

In addition to the Exceptions in Schedule B, you are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation. This includes building and zoning ordinances, and also laws and regulations concerning:
  - land use
  - improvements on the land
  - land division
  - environmental protectionThis exclusion does not apply to violations or the enforcement of these matters which appear in the public records at policy date.  
This exclusion does not limit the zoning coverage described in Items 12 and 13 of Covered Title Risks.
2. The right to take the land by condemning it, unless:
  - a notice of exercising the right appears in the public records on the Policy Date
  - the taking happened prior to the Policy Date and is binding on you if you bought the land without knowledge of the taking

In addition to the Exclusions, you are not insured against loss, costs, attorneys' fees, and the expenses resulting from:

1. Any rights, interests, or claims of parties in possession of the land not shown by the public records.
2. Any easements or liens not shown by the public records. This does not limit the lien coverage in Item 8 of Covered Title Risks.

3. Title Risks:
  - that are created, allowed, or agreed to by you
  - that are known to you, but not to us, on the Policy Date unless they appeared in the public records
  - that result in no loss to you
  - that first affect your title after the Policy Date -- this does not limit the labor and material lien coverage in Item 8 of Covered Title Risks
4. Failure to pay value for your title
5. Lack of a right:
  - to any land outside the area specifically described and referred to in Item 3 of Schedule A
  - or
  - in streets, alleys, or waterways that touch your landThis exclusion does not limit the access coverage in Item 5 of Covered Title Risks.

3. Any facts about the land which a correct survey would disclose and which are not shown by the public records. This does not limit the forced removal coverage in item 12 of Covered Title Risks.
4. Any water rights or claims or title to water in or under the land, whether or not shown by the public records.

### CALIFORNIA LAND TITLE ASSOCIATION STANDARD COVERAGE POLICY – 1990 EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.  
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
  - (a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;

- (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
  - (c) resulting in no loss or damage to the insured claimant;
  - (d) attaching or created subsequent to Date of Policy; or
  - (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated.
  5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
  6. Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

### SCHEDULE B, PART I EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

#### PART I

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the public records

ATTACHMENT ONE  
(CONTINUED)

AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (10-17-92)  
WITH A.L.T.A. ENDORSEMENT-FORM 1 COVERAGE  
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
- (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
  - (a) created, suffered, assumed or agreed to by the insured claimant;
  - (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
  - (c) resulting in no loss or damage to the insured claimant;
  - (d) attaching or created subsequent to Date of Policy (except to the extent that this policy insures the priority of the lien of the insured mortgage over any statutory lien for services, labor or material or to the extent insurance is afforded herein as to assessments for street improvements under construction or completed at Date of Policy); or
4. (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage.
5. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable doing business laws of the state in which the land is situated.
6. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
7. Any statutory lien for services, labor or materials (or the claim of priority of any statutory lien for services, labor or materials over the lien of the insured mortgage) arising from an improvement or work related to the land which is contracted for and commenced subsequent to Date of Policy and is not financed in whole or in part by proceeds of the indebtedness secured by the insured mortgage which at Date of Policy the insured has advanced or is obligated to advance.
8. Any claim, which arises out of the transaction creating the interest of the mortgagee insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
  - (i) the transaction creating the interest of the insured mortgagee being deemed a fraudulent conveyance or fraudulent transfer; or
  - (ii) the subordination of the interest of the insured mortgagee as a result of the application of the doctrine of equitable subordination; or
  - (iii) the transaction creating the interest of the insured mortgagee being deemed a preferential transfer except where the preferential transfer results from the failure:
    - (a) to timely record the instrument of transfer; or
    - (b) of such recordation to impart notice to a purchaser for value or a judgement or lien creditor.

AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (10-17-92)  
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
- (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
  - (a) created, suffered, assumed or agreed to by the insured claimant;
  - (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
  - (c) resulting in no loss or damage to the insured claimant;
  - (d) attaching or created subsequent to Date of Policy; or
  - (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the estate or interest insured by this policy.
4. Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
  - (i) the transaction creating the estate or interest insured by this policy being deemed a fraudulent conveyance or fraudulent transfer; or
  - (ii) the transaction creating the estate or interest insured by this policy being deemed a preferential transfer except where the preferential transfer results from the failure:
    - (a) to timely record the instrument of transfer; or
    - (b) of such recordation to impart notice to a purchaser for value or a judgement or lien creditor.

The above ALTA policy forms, dated 10-17-92, may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following General Exceptions:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims, (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof, (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

**ATTACHMENT ONE**  
(CONTINUED)

CLTA HOMEOWNER'S POLICY OF TITLE INSURANCE (10-22-03)  
ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (10-22-03)  
EXCLUSIONS

In addition to the Exceptions in Schedule E, You are not insured against loss, costs, attorneys' fees and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation. This includes ordinances, laws and regulations concerning
  - a. building
  - b. zoning
  - c. Land use
  - d. improvements on Land
  - e. Land division
  - f. environmental protection

This Exclusion does not apply to violations or the enforcement of these matters if notice of the violation or enforcement appears in the Public Records at the Policy Date. This Exclusion does not limit the coverage described in Covered Risk 14, 15, 16, 17 or 24.
2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at the Policy Date.
3. The right to take the Land by condemning it, unless:
  - a. notice of exercising the right appears in the Public Records at the Policy Date; or
  - b. the taking happened before the Policy Date and is binding on You if You bought the Land without knowing of the taking
4. Risks
  - a. that are created, allowed or agreed to by You, whether or not they appear in the Public Records;
  - b. that are Known to You at the Policy Date, but not to Us, unless they appear in the Public Records at the Policy Date;
  - c. that result in no loss to You; or
  - d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8, d, 22, 23, 24 or 25.
5. Failure to pay value for Your Title.
6. Lack of a right:
  - a. to any Land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
  - b. in streets, alleys, or waterways that touch the Land.

This Exclusion does not limit the coverage described in Covered Risk 11 or 18.

**LIMITATIONS ON COVERED RISKS**

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:

- For Covered Risk 14, 15, 16 and 18, Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A

The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	<u>Your Deductible Amount</u>	<u>Our Maximum Dollar Limit of Liability</u>
Covered Risk 14:	1.00% of Policy Amount or <u>\$ 2,500.00</u> (whichever is less)	\$ 10,000.00
Covered Risk 15:	1.00% of Policy Amount or <u>\$ 3,000.00</u> (whichever is less)	\$ 25,000.00
Covered Risk 16:	1.00% of Policy Amount or <u>\$ 5,000.00</u> (whichever is less)	\$ 25,000.00
Covered Risk 18:	1.00% of Policy Amount or <u>\$ 2,500.00</u> (whichever is less)	\$ 5,000.00

**ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (10/13/01)**  
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the Land; (ii) the character, dimensions or location of any improvements now or hereafter erected on the Land; (iii) a separation in ownership or a change in the dimensions or areas of the Land or any parcel of which the Land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the Land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14, and 16 of this policy.  
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the Land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14, and 16 of this policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the Public Records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
  - (a) created, suffered, assumed or agreed to by the Insured Claimant;
  - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
  - (c) resulting in no loss, damage to the Insured Claimant;
  - (d) attaching or created subsequent to Date of Policy (this paragraph does limit the coverage provided under Covered Risks 8, 16, 18, 19, 20, 21, 22, 23, 24, 25 and 26); or
  - (e) resulting in loss or damage which would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of the Insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable doing business laws of the state in which the Land is situated.
5. Invalidity or unenforceability of the lien of the Insured Mortgage, or claim thereof, which arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, except as provided in Covered Risk 27, or any consumer credit protection or truth in lending law.
6. Real property taxes or assessments of any governmental authority which become a lien on the Land subsequent to Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 7, 8(c) and 26.
7. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This exclusion does not limit the coverage provided in Covered Risk 8.
8. Lack of priority of the lien of the Insured Mortgage as to each and every advance made after Date of Policy, and all interest charged thereon, over liens, encumbrances and other matters affecting the title, the existence of which are Known to the Insured at:
  - (a) The time of the advance; or
  - (b) The time a modification is made to the terms of the Insured Mortgage which changes the rate of interest charged, if the rate of interest is greater as a result of the modification than it would have been before the modification. This exclusion does not limit the coverage provided in Covered Risk 8.
9. The failure of the residential structure, or any portion thereof to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at Date of Policy.



## **Notice**

You may be entitled to receive a \$20.00 discount on escrow services if you purchased, sold or refinanced residential property in California between May 19, 1995 and November 1, 2002. If you had more than one qualifying transaction, you may be entitled to multiple discounts.

If your previous transaction involved the same property that is the subject of your current transaction, you do not have to do anything; the Company will provide the discount, provided you are paying for escrow or title services in this transaction.

If your previous transaction involved property different from the property that is subject of your current transaction, you must - prior to the close of the current transaction - inform the Company of the earlier transaction, provide the address of the property involved in the previous transaction, and the date or approximate date that the escrow closed to be eligible for the discount.

Unless you inform the Company of the prior transaction on property that is not the subject of this transaction, the Company has no obligation to conduct an investigation to determine if you qualify for a discount. If you provide the Company information concerning a prior transaction, the Company is required to determine if you qualify for a discount which is subject to other terms and conditions.

Fidelity National Title Group of Companies' Privacy Statement

July 1, 2001

We recognize and respect the privacy expectations of today's consumers and the requirements of applicable federal and state privacy laws. We believe that making you aware of how we use your non-public personal information ("Personal Information"), and to whom it is disclosed, will form the basis for a relationship of trust between us and the public that we serve. This Privacy Statement provides that explanation. We reserve the right to change this Privacy Statement from time to time consistent with applicable privacy laws.

**In the course of our business, we may collect Personal Information about you from the following sources:**

- From applications or other forms we receive from you or your authorized representative;
- From your transactions with, or from the services being performed by, us, our affiliates, or others;
- From our internet web sites;
- From the public records maintained by governmental entities that we either obtain directly from those entities, or from our affiliates or others; and
- From consumer or other reporting agencies.

**Our Policies Regarding the Protection of the Confidentiality and Security of Your Personal Information**

We maintain physical, electronic and procedural safeguards to protect your Personal Information from unauthorized access or intrusion. We limit access to the Personal Information only to those employees who need such access in connection with providing products or services to you or for other legitimate business purposes.

**Our Policies and Practices Regarding the Sharing of Your Personal Information**

We may share your Personal Information with our affiliates, such as insurance companies, agents, and other real estate settlement service providers. We also may disclose your Personal Information:

- to agents, brokers or representatives to provide you with services you have requested;
- to third-party contractors or service providers who provide services or perform marketing or other functions on our behalf; and
- to others with whom we enter into joint marketing agreements for products or services that we believe you may find of interest.

In addition, we will disclose your Personal Information when you direct or give us permission, when we are required by law to do so, or when we suspect fraudulent or criminal activities. We also may disclose your Personal Information when otherwise permitted by applicable privacy laws such as, for example, when disclosure is needed to enforce our rights arising out of any agreement, transaction or relationship with you.

One of the important responsibilities of some of our affiliated companies is to record documents in the public domain. Such documents may contain your Personal Information.

**Right to Access Your Personal Information and Ability to Correct Errors or Request Changes or Deletion**

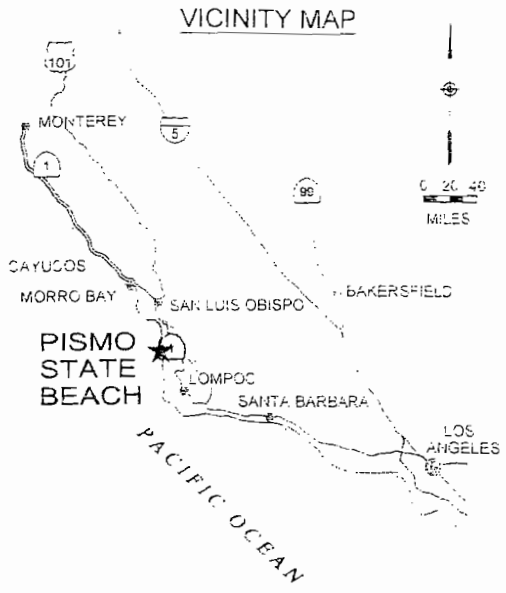
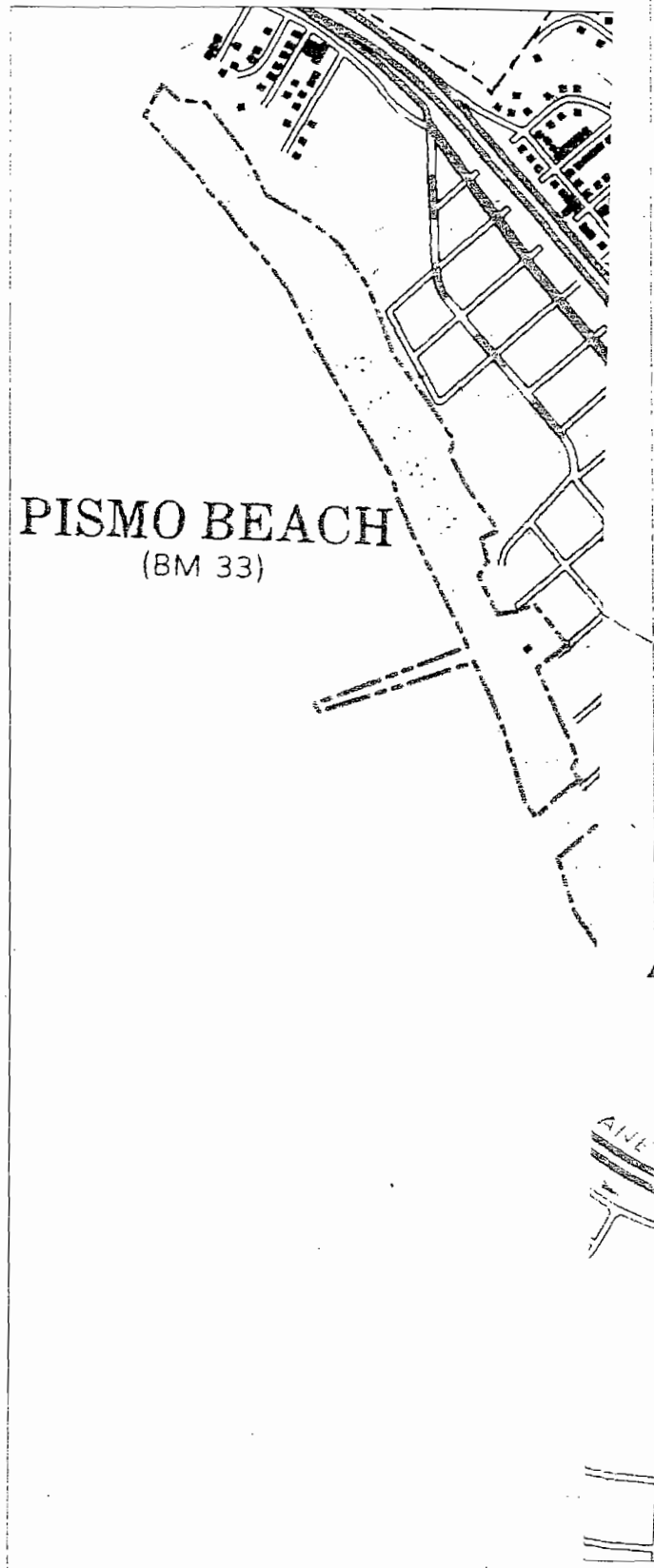
Certain states afford you the right to access your Personal Information and, under certain circumstances, to find out to whom your Personal Information has been disclosed. Also, certain states afford you the right to request correction, amendment or deletion of your Personal Information. We reserve the right, where permitted by law, to charge a reasonable fee to cover the costs incurred in responding to such requests.

All requests must be made in writing to the following address:

Fidelity National Title Group, Inc.  
Privacy Compliance Officer  
601 Riverside Avenue  
Jacksonville, FL 32204

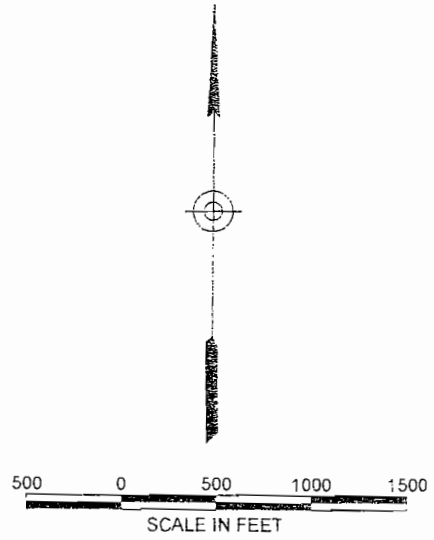
**Multiple Products or Services**

If we provide you with more than one financial product or service, you may receive more than one privacy notice from us. We apologize for any inconvenience this may cause you.



**LEGEND**

- STATE BEACH BOUNDARY
- PROPOSED ACQUISITION BOUNDARY
- ① ACQUISITION PARCEL NUMBER



DATE 05/2007	DRAWN D. AMBAGIS	CHECKED K. DI PINTO
DATE 08/07	REVISIONS ADDED T O J J R	
RESOURCES AGENCY OF CALIFORNIA DEPARTMENT OF PARKS AND RECREATION		
APPROVED	DATE 3/07	
<b>PISMO STATE BEACH ACQUISITION PLAN (T.O.J.)</b>		
PISMO LAKE ECOLOGICAL RESERVE		
DRAWING NO. <b>29745</b>		
SHEET NO.		
OF		



PRELIMINARY REPORT  
PISMO MARSH WILDLIFE PROJECT

Prepared for:

Central Coast Resource Conservation  
and Development Project

by:

Gerald Czarnecki, District Conservationist  
USDA, Soil Conservation Service  
624-B West Foster Road, Suite #1  
Santa Maria, CA 93455

(805) 937-6363

June 11, 1981

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PISMO MARSH  
RESOURCE CONSERVATION AND DEVELOPMENT PROJECT  
PRELIMINARY REPORT

INTRODUCTION

Pismo Marsh is one of the few remaining fresh water marshes in San Luis Obispo County, California. Its importance as a wildlife breeding, rearing, and feeding ground has been well documented by Deneen, et al, Nicholls, 1973, Clunes, 1973, Tidwell, 1972 and others. In addition to its value as a wildlife habitat, the marsh serves as a floodwater retardance basin and sediment trap, a nature study area, and for scientific and educational research.

In recent years its value as a diversified wetland habitat has been significantly reduced because of increased sedimentation caused in part by rapid urbanization of the surrounding drainage area. Because of this increased sedimentation, the marsh is in a rapid state of eutrophication and much of the area will revert to upland habitat unless the process is retarded. Field surveys indicate that the marsh now lacks permanent water storage areas and would be relatively dry throughout most of the year except for several strategically located beaver dams. In December, 1980, a topographic survey was performed in the area and approximately two-thirds of the marsh could be traversed on foot.

Complete elimination of this habitat was prevented because of the concerned effort of the California Department of Fish and Game who acquired the area in 1977. Additional riparian lands along Meadow Creek, the primary tributary, are tentatively scheduled for acquisition by the Department as a mitigation agreement for rights to develop contiguous upland areas.

Location

Pismo Marsh is located in southern San Luis Obispo County, California within the corporate limits of the city of Pismo Beach. It is bounded on the south by the city of Grover City. The marsh is situated about one half mile from the Pacific Ocean and is identified on U. S. Geological Survey 7½ minute quadrangles Pismo Beach and Arroyo Grande NE at 120° 37' 30" west longitude and 35° 08' 00" north latitude.

Climate

The climate of Pismo Marsh is characterized by year-round mild temperatures moving through gradual transitions rather than clearly defined seasons. The annual range of average temperatures is about 13°F while the daily temperature range averages about 20°F from May through September and at a slightly higher range from October through April. Daily maximum temperatures usually do not exceed 73°F or drop lower than 40°F. Freezing temperatures are rare.

### Climate con't.

The rainfall season, typical of the central California coast, is in the late fall and winter with about three-fourths of the precipitation occurring from December through March. The average annual rainfall is about 16 inches, however, the yearly precipitation may vary considerably above or below "normal".

Morning fog is a common occurrence because of the marine influences; however, the fog generally dissipates before noon. Unequal solar heating over land and ocean in conjunction with Pacific high pressure zones causes northwesterly sea breezes during most afternoons. Wind velocities usually range between 10 - 20 mph.

### Hydrology

The gross drainage area is approximately 4000 acres. Within this area are two major drainage sub-systems of 690 acres and 3310 acres. The dominant soils fall within hydrologic soils group "B" according to the Coastal San Luis Obispo County Soil Survey. About 75% of the area is rangeland of varying cover types, but dominated by grassland. Rapid urbanization of the area will doubtless increase runoff in the future. A crude analysis of the hydrologic area indicates that under current land usage runoff will be approximately 2000 cfs for a 100 yr/24 hour storm.

### Hydraulics

The controlling outlet for the marsh is a 5'-0" X 17' - 7" box culvert under the Southern Pacific railroad tracks. The railroad traverses the area in a north to south direction and is, in effect, a dam or barrier which defines the westerly limits of the marsh. Although the marsh floods up the railroad fill area, there does not appear to be any subsidence from water saturation. It is suspected that the railroad may be underlain with filter material or a drainage system. Downstream from the marsh, the channel crosses State Hwy. #1 and traverses through several public and private campgrounds before ultimately outletting into the ocean.

Within the marsh a public road (4th Street) dissects the wetland and creates two marsh sub-systems of 43 acres and 7 acres. The 7 acre area is located upstream of 4th Street. Drainage between the two parcels is controlled by two 12 foot diameter conduits.

### Soils

The dominant soils in the drainage area are within sandy or loamy sand textural classifications. They have similar mechanical characteristics in that they have rapid permeability, low water holding capacity, and are highly vulnerable to water erosion when disturbed. Slopes range up to 30 percent.



Soils con't.

The marsh alluvium is made up of the same soils which contain layers of organic material. Sub-surface drainage within the marsh is poor. Free water is usually within 20 inches of the surface.

Ecological Conditions

There are several factors involved which must be understood to properly develop and manage the marsh, the most important of which is that a marsh is a transitory or intermediate state between a lake and an upland. This ecological process occurs as the result of sedimentation and an accumulation of plant material. One of the objectives of this project will be to retard or if possible, reverse this process.

As this aging, or eutrophication process, occurs plant communities and the animals that occupy these communities respond to the changing environmental conditions. At any stage of development all ecological niches are filled, however, the species that occupy these niches change. In Pismo Marsh, the apparent trend is toward upland species. At present the area is dominated by animal species that are normally associated with wet areas and dense vegetation- a final transition state before upland dominance.

Certain areas within the marsh are dominated by specific, water associated, plants many of which have little value as a food source.

Cattails (Typha angustifolia) dominate approximately 1.4 acres of the marsh. It is a rhizomatous perennial which produces thousands of tiny seeds which are too small and hairy to be attractive to birds. The roots and young shoots are attractive to geese, however, few geese utilize the area. The roots are used extensively by beavers and muskrats in some marshes, however, the beavers in this area seem to prefer willows. No muskrats appear to be present in Pismo Marsh. Although cattails provide escape cover they take the place of more useful plant which could furnish food as well as cover.

California bulrush (Scirpis californicus) is an emergent perennial which spreads vegetatively when established. Bulrushes (tules) dominate approximately 29.7 acres. The seeds from these plants are utilized by waterfowl to a greater extent than cattails, however, tules are aggressive when established, and similar to cattails, tend to displace more valuable plants. Since 1973 tules have increased their area of dominance by about 20 percent.

Coastal saltgrass (Distichlis spicata) is a salt tolerant, sod forming, grass which will tolerate shallow flooding for brief periods. This grass produces relatively small amounts of seed and provides a small percentage of the diet for some birds. The species most likely to use the food resource are Redheads, Shovellers, Teals, Long billed dowitchers and Sora rails. Saltgrass is the dominant plant in about 1.7 acres of the marsh. It is found in association with Mulefat (Baccaris viminea) and Docks (Rumex spp.). Mulefat

Ecological Conditions con't.

did not appear on earlier plant inventories of the area. Since Mulefat is a very aggressive shrub, most likely it will continue to expand its range and probably become dominant in some areas if left unchecked.

Common pickleweed (Salicornia pacifica) is an herbaceous rhizomatous salt tolerant perennial which dominates approximately 0.6 acres. In addition, pickleweed is found on 1.2 acres in association with Frankenia grandifolia and saltbrush (Atriplex patula). Frankenia grandifolia is a low growing bushy perennial herb that has no documented value as a wildlife food resource. Pickleweed has little overall value for waterfowl and it is important only to American Widgeons as a food source.

Willow (Salix spp) are the dominant shrubs along the margins of the marsh (approximately 9.1 acres). In addition, several "island" areas are emerging apparently as the result of silt and organic material buildups. These plants provide escape cover and roosting areas for upland birds. The plants are used extensively by beavers as a food resource and for dam building material. Other mammals and birds may use the foliage and catkins as a small part of their diets. In most places the willow understory is occupied by a nettle, cattail, poison hemlock community.

Upland areas along the southern margins of the marsh are dominated by various species of Eucalyptus which are valued as roosting areas for raptors and blue herons.

The riparian area consists of a dense tangled growth of shrubs, trees, and herbaceous vegetation with an abrupt transition into the upland plant community.

A map illustrating the various plant communities is enclosed (Dwg. 81-09).

This wetland type is described in U. S. Fish and Wildlife Service circular 39 as a Type 4, Inland Freshwater Marsh. In a more recent Dept. of the Interior publication, "Classification of Wetlands and Deepwater Habitat of the United States", the area west of 4th Street is described as a Palustrine System, Emergent class, (saturated/Semi-permanent) seasonal sub-class. Above 4th Street, the marsh is described as a scrub/shrub class and an Intermittantly flooded/Temporary sub-class.

As mentioned previously, many species of plants, mammals, birds, amphibians, and reptiles utilize the area. The documented list of species includes 56 plants, 30 birds, 22 mammals, 9 reptiles or amphibians and one fish that utilize the area during at least part of the year.

THE PROBLEM

As previously mentioned, the most critical problem with Pismo Marsh is the loss of wetland habitat because of an accelerated rate of eutrophication. ?

THE PROBLEM con't.

This filling of the marsh is a product of both sediment accumulation and an accumulation of organic material.

In addition to the obvious problems with the marsh environment, urban encroachment has had a subtle degrading effect on the area because of pedestrian traffic, dog and cat predation and similar people problems. The marsh also serves as a collection basin for urban waste products such as chemical residues.

THE PLAN

Watershed Land Treatment

Extensive sedimentation has occurred in the recent past as the result of erosion during the urban development of an area in the main drainage system. This was caused in part by poor planning techniques and in part by extremely heavy rains during the winter of 1977-78. Since that time the general drainage area has been stabilized with various on-site conservation measures. In addition to the on-site measures, a debris basin was constructed with private funds in an area approximately one mile upstream of the marsh. This debris basin is now functioning; however, it may require spillway reconstruction to replace or repair concrete rubble which does not appear to be stable. In addition, a firm commitment is required from the landusers to develop a cleanout plan to ensure adequate storage capacity.

This site will require an engineering evaluation to determine the relative stability of the spillway. In addition, a geologist should evaluate the probably annual sediment yield from the watershed and recommend a storage capacity for debris accumulation. Maintenance and repair of the debris basin will probably be the responsibility of the land developers. However, there is no firm commitment at this time.

Within the general area there are strong pressures for development. Since there are county zoning ordinances, which allow for certain types of development it is logical to assume that there will be significant building in the years to come.

San Luis Obispo County requires that an environmental impact report be approved prior to any land development. To ensure that best conservation management practices be applied, the Department of Fish and Game and the Coastal San Luis Resource Conservation District will monitor these reports and recommend mitigation practices.

### Marsh Development

The development plan is relatively simple. In essence it is proposed that material be displaced to create a greater diversity of wetland habitat and to ensure the long term productivity of the marsh. This would be accomplished in part by dredging and in part by constructing a low levee system. (See drawing 81-09).

The marsh will be de-watered by gravity and evaporation before construction begins. To accomplish the de-watering it will be necessary to remove several colonies of beavers, (numbers unknown) not later than April 1 of the construction year. Interceptor ditches and temporary water collection basins may be required. Marsh reconstruction should be planned so that the completion date would not be later than October 31. Construction should start as late in summer as possible to allow for a maximum drying period. Marsh re-development will be restricted to the parcel west of 4th Street (approx. 43 acres).

The subsurface profile of the marsh is unknown. The upper horizons are made up of sand and silt and laminated with various layer of organic material. Since there is water within two or three feet of the surface it can be assumed that the marsh is underlain with an impervious consolidated material - probably clay. Exploratory test holes will be required to determine the sub-surface and the type of earth removal equipment which can be used.

Surface organic material will be removed and disposed of. Some of the inorganic material will be used to construct a series of meandering levees. The levees will be 20 feet in width and equipped with permanent drainage spillways at each end. The spillways could be constructed at a fixed grade from earth material. However, if semi-permanent arrangements such as flash boards are used, they should be equipped with locking devices to preclude unauthorized draining. Because of downstream hazards, water levels will be raised a relatively small amount with respect to the existing grade - probably about two feet. Exact elevations will be determined by hydraulic engineer.

Preliminary calculations indicate that approximately 11.5 acre ft. of inorganic material can be utilized on the levee system. The remainder must be moved off-site. The best off-site spoil area appears to be on private, undeveloped lands bordering the north shore of the marsh. Spoils could be used for commercial lot leveling and/or for land reclamation. The reclamation would include the filling in of a series of stabilized arroyos and installing controlled water courses and drop outlets on the fill. The filling in of arroyos would be the most expensive method of disposing of the spoils material because of erosion control requirements, but it could be used as a vehicle for obtaining land rights.

The intent of this project is to create wetlands habitat diversity. A critical element in creating this diversity is to ensure year-round open water areas as well as a variety of fringe or "edge effect" conditions.

Marsh Development con't.

To ensure open water it is proposed that a series of irregularly shaped deep water lagoons be created. These lagoons would require permanent water depth of at least four feet to inhibit photosynthesis of vascular plants. Two feet of depth will be obtained by elevation changes by the levee system. If water input equaled water output then only two feet of excavation would be required. However, discounting surplus (run-off) water, it can be assumed that at least 3.0 vertical feet of water will be lost through evapo-transpiration. Theoretically, the excavation requirements would be the difference between water input during the non-rainy season and the losses from evapo-transpiration, less the two foot elevation gain from the levee system. Losses through ground water percolation were not considered since there is an apparent perched water table relatively close to the surface.

Assuming no recharge, the excavation requirement would be 5 feet. Since there is sub-surface water and some residual surface flow during the summer months, it appears that excavation requirements will be less than 5 feet. For the purposes of this preliminary report, two feet of recharge has been assumed - a 3 foot excavation requirement. If one-third of the area (approximately 14 acres) was dedicated to deep-water habitat then 67,750 cubic yards of material would have to be removed. Approximately 49,150 cubic yards of this material will have to be taken from the marsh. The remainder will be used to construct the levees.

Right-of-way/Easement

The State of California owns the wetland, however, there is no public access into this area. A temporary easement will be required for access roads and equipment storage during the construction period. In addition to ingress/egress easements, right-of-ways will be needed on private lands to "spoil" excess borrow material. As stated previously, there are several potential land fill areas immediately adjacent to the marsh. However, most of these sites will ultimately be used for commercial building so organic materials should not be used in the landfill. Depending on the internal drainage of the marsh during the dewatering period, it may be necessary to place spoils material on spreading grounds for drying before it is used as a landfill.

Organic material will be more difficult to dispose of than the mineral material. Due to the large volume, and equipment binding properties of the dense tule growths, mechanical removal will be difficult. Storage and decomposition would probably be a long-term process since it is likely that an anaerobic environment would be created in the storage area. As an alternative, the use of systemic herbicides should be considered. This would preclude the need for rootstock removal and upright vegetation could be burned in place.

### Land Purchases

There is strong public support for the purchase of a heavily wooded tract of about 40 acres which is contiguous with the south-west borders of the marsh. Purchase of this unit would ensure against further urban encroachment and provide a permanent buffer strip.

A significant area contiguous with the north shore is currently in open space. It is primarily an open annual grassland plant community interspersed with several shrubs. This area will almost surely be developed in the near future. Since the public ownership in the marsh only includes the wetland area, purchase of at least a narrow buffer strip would aid the long-term productivity of the marsh. (There is a possibility that some of this area could be designated as permanent open space and ownership transferred to the Department of Fish and Game, perhaps as a trade for development rights on the level upland areas.)

### Ancillary Measures

Other measures which may be included in the plan are a revegetation scheme for disturbed areas, construction of artificial nesting cavities such as wood duck boxes, observation platform(s) for wildlife study, interpretive trails through upland area and perhaps various plant or habitat identification plaques.

The most important of the supporting measures will be a revegetation plan for disturbed upland areas to reduce erosion hazards. Replacement vegetation in the wetland area will be more difficult because of the limited commercial availability of native plant species, seed or root stocks. Without revegetation the area would probably be reclaimed naturally in a short period of time. Vegetation plans will be recommended the CA Dept. of Fish and Game.

Wood duck boxes encourage nesting pairs to use the marsh; however, wood ducks are not often observed in the general area. Other birds, such as owls and kestrels, may also use these structures for nesting.

An observation platform or several platforms located on the upland area, but in close proximity to the marsh, could enhance education, recreational and scientific opportunities. Interpretive plaques could be of value to the general public.

Construction of Interpretive trails would be predicated on the acquisition of additional land in the upland areas. However, pedestrian traffic and vandalism could possibly degrade the area.

### ECONOMIC DATA

The gross expenditure for the project will be a minimum of \$400,000.00 and could run as high as \$2,000,000.00 depending on which plan options are

Economic Data con't.

exercised. The basic plan would only include rehabilitation of the wetland area. Temporary easements would be secured for site access and spoil areas. An alternative would include the basic plans as well as land purchases in the contiguous upland areas.

Basic Plan Costs:

1. De-water marsh, may include construction of temporary drainage channels and pits and pumping in addition to gravity flow and evaporation ..... \$ 50,000.00
  2. Clearing and grubbing approximately 50,000 cu. yds. of organic material and transportation to an off-site area.. \$150,000.00  
  
(Alternative)  
Kill vegetation in place with systemic herbicides and burn site..... \$ 50,000.00
  3. Install approximately 2500 lineal feet of levees, use wheel or track equipment for compaction. Equivalent to 18,600 cu. yds of material..... \$ 75,000.00
  4. Remove 49,150 cu. yds. of inorganic material and Spoil in off-site location without compaction..... \$150,000.00
  5. Construct mechanical erosion controls on upland Spoils area ..... \$ 30,000.00
  6. Establish vegetation in upland Spoils areas ..... \$ 5,000.00
  7. Establish vegetation on disturbed areas within wetland..... \$ 30,000.00
  8. Miscellaneous measures ..... \$ 10,000.00
- |  |            |                           |
|--|------------|---------------------------|
|  | TOTAL COST | \$400,000.00 - 500,000.00 |
|--|------------|---------------------------|

Basic Plan w/ Land Purchses

Basic Plan		\$400,000.00 - 500,000.00
Land Purchses ( 50 acres)		500,000.00-1,500,000.00
TOTAL		\$900,000.00-2,000,000.00

Potential Funding Sources

1. USDA - Soil Conservation Service
2. California Department of Fish and Game
3. San Luis Obispo County Fish and Game Commission
4. California State Parks System
5. California Coastal Conservancy
6. County of San Luis Obispo
7. Private donations

Potential Service Groups

1. Coastal San Luis Resource Conservation District
2. California Conservation Corps
3. Ad hoc Save Grover City's Green Belt committee
4. Cal Poly University - San Luis Obispo
5. U. C. - Santa Barbara

Benefits

Our wildlife resources are a national heritage with an incalculable dollar value. In this era of diminishing habitats, and in particular diminishing wetland habitats, we cannot afford further losses.

The intrinsic value of wildlife is whatever value is applied to its niche in the ecosystem and its relative value to human welfare. The obvious values such as scientific study, educational opportunity, or aesthetic quality, probably could be equated to a dollar value. However, the intangible value of each organisms relationship to another are not well understood. In essence, a distinct benefit/cost ratio cannot be established.



GENERAL COMMENTS

This project is designed to reverse or at least retard normal ecological successional patterns. To achieve this objective there will be temporary losses of habitat, and some permanent alterations to the habitat. Some of the methods which may be employed, such as herbicides use and burning, are controverserial. Disposition of spoils material may be a problem.

Political involvements are complex. The project is located within the corporate limits of two cities, Pismo Beach and Grover City. The property is owned by the California Department of Fish and Game and is within the jurisdiction of the California Coastal Commission as well as the County of San Luis Obispo. The stream outletting from the marsh is considered a perennial flow, and at some point immediately below the project it is subject to tidal influences. Because of this, consultation may be required with the U. S. Army Corps of Engineers.

PISMO LAKE ECOLOGICAL RESERVE RESTORATION PROJECT

BIOLOGICAL INVENTORY PROFILE: PAST, PRESENT AND PROJECTED FUTURE

\* \* \* \* \*

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December 19, 1984

PISMO LAKE ECOLOGICAL RESERVE RESTORATION PROJECT

BIOLOGICAL INVENTORY PROFILE: PAST, PRESENT AND PROJECTED FUTURE

Vegetation and faunal inventories for Pismo Lake prior to initial Department of Fish and Game surveys in the 1970s cannot be located, and in all probability do not exist. However, some picture of the sequence of plant and animal assemblages can be reconstructed by extrapolation with what is known of analogous existing habitats in other nearby California coastal areas corresponding to the surmised sequence of habitat seral development on the site. This surmise can be based in part on older maps, contemporary field work and commentary from residents familiar with this area over recent years.

\* \* \* \* \*

Sometime prior to the present century, a tidally-influenced marshland intrusion of the coastal littoral gradually evolved into an interior lake (similar in many degrees to the existing Dunes Lakes complex south of nearby Oceano). Now known as Pismo Lake, this area became a totally land-locked marshland with predominantly freshwater affinities following the construction of the Southern Pacific railway right-of-way along its northwestern boundary in the early 1900s. A relatively slow pace of human suburban development (compared to the present pattern) and a resultant comparatively modest rate of sedimentation into the lake from upstream soil disturbance was abruptly accelerated in 1978 with massive sedimentation from upstream watershed disruption. In a period of less than ten years, the present Reserve area was altered from its earlier existence of a marshy lake to today's condition as a shallow partial wetland, its surface area choked with dense stands of emergent vegetation, predominantly California bulrush (Scirpus californicus) and cattail (Typha sp.). Recognizing that a habitat management action would be necessary to reverse the trend toward natural seral succession into an upland (which would

be contrary to the Department's original acquisition goal of maintaining a water-associated habitat within the Reserve, the Department and the U.S. Soil Conservation Service developed a plan of habitat modification that would reverse the natural seral trend and return the environment to a modified version of its earlier condition. In the process of doing this, it was elected to incorporate certain wildlife management amenities into the project design to boost the carrying capacity of the Reserve for certain selected species. The latter modifications and the reasoning behind their selection are discussed beyond in the portion of this report dealing with the proposed future habitat and its biological implications.

#### PAST INVENTORY PROFILE

The earliest graphic depiction of the Reserve known to us is the map of the Arroyo Grande area in the possession of the Santa Barbara office of the State Coastal Commission. This drawing presents the current Reserve in that time as an open body of water without specific identifying features such as interior islands or bordering emergent vegetation. The scale of the map makes depiction of the latter features impractical, but the indication of contours about the lake suggests that an open water body is possible. Assuming that this could be the condition at that time, it is instructive to consult the analogous situation of modern-day Lake Roberts-Laguna Grande between the cities of Monterey and Seaside on the Monterey Peninsula. This is a particularly useful comparison because, until quite recently, Lake Roberts had its entire margin almost completely cleared of any emergent vegetation, while for comparative purposes Laguna Grande (joined to it by a narrow channel only about fifty meters long) was well bordered with a growth of bulrush and cattails ranging in width from three to ten meters wide; there

is also one island composed of a mixture of emergents and willows as well.

The value of these two inter-connected lacustrine bodies for our analogy is that they could well approximate either of the two more likely alternatives of Pismo Lake in the earlier period.

Lake Roberts, now sparsely fringed with emergent vegetation on three sides, features a current depth of about 2½ feet, a bottom of fine silt washed down from the highly disturbed Del Ray Oakes watershed, and would be analogous to Pismo Lake in a stage prior to the construction of the railroad right-of-way that effectively impeded any tidal exchange into Pismo Lake. Making allowances for the fact that the element of tidal exchange would permit the occurrence of some marine invertebrates and vertebrates into the lake system, the food chain would feature small fishes and some crustaceans. Lacking as we do now objective inventories from the past, we can still extrapolate to a degree from inventories extent for yet another coastal wetland with a somewhat similar setting further to the north in San Mateo County. Based on the studies for the Pescadero Marsh Wetland Report developed in 1974 (Elliott, DFG files) a list of identified present, probable or possible fish and crustacean species was developed with the assistance of the Department's Marine Resources personnel. That list (Appendix D of the original report) is appended herewith as Appendix A. Dependent on the extent of the connection between the ocean and the lake existing then, any or all of the thirty fish species on that list would be representative of the type (if not the actual species composition) of fishes to be found in pre-1900 Pismo Lake.

Under the postulated lacustrine situation probably extent then, there would have been notable differences in the species composition of other animal classes as well, with significant declines certain in the species and individuals of

reptiles and most amphibians in a lake rather than marshland environment; only truly aquatic species could exist within a true lake, and without significant areas of protected marshland edge, breeding habitat for riparian forms would be relatively sparse compared to the present situation within the Reserve. The mammal fauna would be both markedly different and reduced in number of individuals. The border of a lake would certainly be attractive to raccoons and other terrestrial species for drinking, but the current presence of beavers within the Reserve, along with several species of terrestrial rodents would be sharply inhibited. Only chiropterans would be relatively unaffected by the difference between the two habitat conditions. The most obvious difference between the two habitats would involve birds. Currently, waterfowl and wading bird use is sharply restricted in contrast to the conditions when Tidwell concluded his study of the area for the Department in mid-1973. He counted 315 individuals of six different duck species utilizing the marsh between mid-February and mid-May; Elliott's 1983-84 observations there suggest no aggregations even remotely approaching these numbers at present. Note that these differences reflect comparative abundance of birds between relatively similar habitat types (marshy lake versus shallow partial wetland) and not the much more contrasting condition of lake versus marshland. Tidwell's waterfowl were all Anatini (dabbling ducks) with no individuals of the Aythyini (divers or pochards and allies) included. It is appropriate to surmise that the latter would have dominated the waterfowl avifauna in a lacustrine situation, with 'puddlers' present only during overnight or stress situations (much analogous to the contemporary situation of the Lake Merritt, Oakland reserve where water depths of two to four feet feature rafts of divers, such as scaup and Canvasback). A lake situation would no doubt also provide the same storm

sanctuary feature for littoral gull species and phalaropes as does present-day Lake Roberts, with large rafts of hundreds of birds resting quietly on the water and/or feeding there during severe weather and high seas beyond the surf line. The situation further along the habitat seral development gradient would trend toward the current day Laguna Grande model. Here, the number of coots increases sharply, and wintering populations of other rallids (probably mostly Sora and Virginia Rails due to the fresh-water condition) would occur. Double-crested Cormorants may have foraged and roosted on lake-side tree limbs (recall that human development about the area was much less than the current disruptive high human population condition) and American Bitterns may have occurred occasionally in the wider extents of emergent vegetation. An emergent littoral would also provide appropriate habitat for blackbirds, Marsh Wrens, and Northern Yellowthroats, as well as the ubiquitous Song Sparrow, all potentially as breeding birds. Diving ducks would still remain in goodly numbers as winter residents, but the shoreside emergents would now also encourage both wintering 'puddlers' and some breeding residue of the latter after the bulk of the waterfowl that wintered left for more abundant northerly nesting habitat.

#### PRESENT INVENTORY PROFILE

Changes in the appearance and biological constituency of the Pismo Lake Reserve have been so dynamic in the last ten years that one is obliged to use qualifying terms to address the "present" inventory. Actually, we have a modest spectrum of study material available to review for this latest stage of the Reserve's fauna. The earliest comprehensive study is that of Tidwell, concluded in 1974 for the purpose of documenting the plant and wildlife values of the marsh. Not only was comparative coverage of the plant species within two study plots expressed in percentage terms by species abundance, but also

water depth measurements, water temperature, pH levels, dissolved oxygen content and turbidity measurements were obtained, along with an extensive vertebrate fauna inventory by both species and number. Equally instructive are photographs in that report showing the extent of vegetation development and water distribution within the marsh.

In September 1981, in response to the needs of a legal action by the State against a private developer involved in watershed alteration activities upstream, a lengthy documentation of the Reserve's resources and biological characteristics was developed. This document was entitled "An Evaluation of Fish and Wildlife Resources of the Pismo Lake Ecological Reserve Relative to the Effects of Sedimentation Resulting from Modification to the Watershed, San Luis Obispo County". This report, the most extensive biological investigation ever conducted on this property, represented the efforts of Department personnel, California Polytechnic State University faculty and staff effort, and participation by several local, State and Federal government agencies. Since the report data is less than four years old, copies of appendices from that document detailing vegetation percentage composition, plant species, benthic invertebrates, fishes, amphibians and reptiles, birds and mammals are appended jointly as Appendix B to this present report to represent a current floral and faunal inventory. The reviewer should of course be aware that species occurrence of faunal and floral elements in this latter inventory may not have changed to any significant degree since its development prior to publication in 1981, but population size of some forms certainly has varied as the seral stage change manifested by the encroachment of emergent vegetation altered conditions for some species, especially those favoring more open water rather than dense emergent vegetation. Animal species especially likely to be affected negatively are diving ducks, cormorants and



some herons, while positive enticement would accrue to bitterns, cottontails (brush rabbits) and small predatory mammals, rodents and the Marsh Harrier. It should be noted that no species on either the State or Federal lists of Rare, Endangered, or Threatened forms occur predictably in the existing marshland, although at least two bird species on the Audubon Society 'Blue List' (Species of Special Concern) do occur here, namely the Northern Yellowthroat and the Black-crowned Night Heron. Neither nests at or near here presently.

Reviewing the faunal elements of the 1981 appendices, the following comments apply to the habitat affinities of classes and certain selected species: benthic invertebrates listed in Appendix X of the 1981 report have not been sampled subsequent to that date, but have certainly undergone reductions in numbers of those species adapted to more open-water niches, with replacement by other forms (in some cases probably congeners) related to the expanding semi-terrestrial environment. Relative numbers must have concurrently exchanged ratios as well. The overall food pyramid impacts of such changes are unknown to us, and financially unknowable since such an extensive and intensive study to acquire that information would be prohibitive both in expense and the time required to obtain it. Given that the protein biomass (the 'bird food factor') would ultimately probably work out to be relatively the same, it is doubtful if the acquisition of that level of information is either justifiable or necessary.

With references to fishes, the answer is apparently simpler, for there are currently only two species known to exist in the remnant open water in the Reserve, and one of these, the Mosquitofish (Gambusia affinis) is an exotic, introduced for insect control.

The balance for most amphibians has probably decline in favor of an increase for many reptiles concurrent with the increasing dryness of the Reserve.

For the moment, it is most likely simply a matter of reduction of individual numbers of the former and a corresponding increase for the latter, with no extirpation or replacement of species. Without the proposed management activities, lacustrine forms such as Western Pond Turtle will disappear and Western Fence Lizards increase.

Currently, many bird species occurring on the 1974 list simply do not have adequate expanses of appropriate habitat to occur here and even some forms on the 1981 list will not likely appear regularly in the near future under existing conditions (i.e., Common Loon and Western Grebe). Habitat for Avocets and Black-necked Stilts is almost gone and will disappear completely within this decade if the current seral succession continues. Likewise, waterfowl will not be able to continue to use the area once the larger pond areas are gone, and large waders such as herons and egrets will of necessity also disappear shortly thereafter. In contrast, upland species such as Valley (California) Quail will increase as the wetlands disappear. In short, water-associated species will yield to upland forms adapted to shrubland, meadow, and coastal chaparral, or persist in remnant numbers for a brief time in the small patches of saltgrass, pickleweed and Frankenia along the southeastern border of the marsh where the inflow from Meadow Creek will continue to keep part of the Reserve adjacent to Fourth Street seasonally moist.

Mammal species abundance and populations will in general benefit from dessication brought on by current trends. Beaver and muskrat will disappear, and raccoon will be reduced in number, but other species, especially rodents will continue to extend their domination as they have during the past decade.

\* \* \* \* \*

#### FUTURE PROJECT CONDITIONS

At this point, the narrative must of necessity shift from relative objectivity to increased extrapolation, speculation and surmise. We will endeavor to present educated guesses as to what effects options for marshland management might produce.

First, it must be emphasized that the proposed project is not a marshland restoration sensu latu, for as we emphasized in the previous section on the possible history of the Reserve, there are earlier phases in the evolution of this area that involved habitat types we have no particular interest in recreating (for example, attidal appendage of the littoral). Rather, the proposed design is a wildlife management activity designed to obtain a diversity of wildlife habitat for species under stress, to the degree practical within the relatively small size of the Reserve and the restraints against significant expansion of the existing wetland boundary. The latter restraints are obvious upon inspection of current maps and aerial photos illustrating the surrounding topography and extent of development about the Reserve periphery. We have opted to enhance the wetland by permanently establishing a variety of habitats, including open water, compatible with the Reserve's dimensions. At this writing, there are only about 2½ acres of open water left in the Reserve. With the tremendous annual volume of organic material entering the marsh or being produced there, the former lake will soon be nothing more than a peat bog, and then a brushy upland pasture shortly thereafter.

Creation of wetland habitat by man is a relatively new undertaking, but that is not to state that there is not precedent extent. Successful programs have been conducted in the Suisun Marsh, on various State and Federal waterfowl refuges, including South San Francisco Bay, in Monterey County's Elkhorn

Slough and in several locations in Southern California. There is admittedly much to learn yet about improvement of applied techniques, but it is also fair to claim that much of what has been tried may be deemed successful, and what is being proposed for Pismo Lake Reserve is a composite of our more successful ventures. The questions to be addressed herein are: 1) what changes in wildlife use would be expected to result from implementing the proposed project as modified to date, and 2) can these proposed changes anticipate any significant increase or decrease in existing species diversity, density, introduction or elimination of species resulting from a project with a practical design?

Enter some ecological concepts: certain animal species are generalists and exist in a wide variety of variations of a habitat type. As an example, some wading birds can be found in a variety of water depth and chemical conditions, with a variety of vegetation associations as surroundings, while other species are quite specialized and require narrowly confined habitat parameters in order to survive on a site. This concept of adaptation to a range of ecological conditions is known as a specie's 'niche' and retention or creation of such a niche by a wildlife manager is a practical and legitimate wildlife management goal for species management. Establishment and retention of certain kinds of habitat niches is only practical on areas of relatively large size since the individual species that require such niches also may require comparatively large expanses of area for foraging and/or breeding territory. Consequently, from a purely practical standpoint, the manipulation of certain environmental settings within the boundaries of comparatively small management areas is not entertainable simply because such a goal is not practical and given the scarcity of ecological reserves and the costs of managing them, practicality must of necessity be a guiding principle.

Hence, we are led to face the question: what is biologically desirable and feasible, that is, practical at Pismo Lake Ecological Reserve? It is our speculation that the following results would obtain from the design recently modified at State Coastal Commission behest and be practical in terms of available funding, time restraints to utilize that funding, and be ecologically viable for the size and biological potential of the area:

1) The amount of critical 'edge effect' would be retained and, depending on a liberal retention of the original spoils island concept, could be significantly enlarged. Under one facet of the spoils deposition design, an existing drain channel along the western boundary of the Reserve would be filled, this action for several reasons including buffering an unstable slope, eliminating a breeding ground for nuisance mosquitos, and serving ultimately to enlarge a border of riparain vegetation. The area proposed to be filled is not a natural feature of the original lake and would be replanted under our proposal with cottonwood, alder and other arborescent native riparian species. However, the existing habitat along both sides of that ditch does constitute a significant linear expanse of riparian edge effect and its replacement would be desirable. This can be effected in the design by establishing a combination of emergent and marshy emergent vegetation about the periphery of the spoils islands within the center of the proposed lake. Scalloping the outline edge of these islands can further increase the linear footage of this edge effect. As discussed beyond, this can have significant benefits, especially for birds. The concept of the proposed spoils islands as fill needs to be accurately addressed. It has been concluded elsewhere that establishment of such islands in mid-lake would constitute fill and thus reduce marshland acreage within the Reserve. This conclusion needs to be reviewed from another perspective. Recall

that we have already established that the Reserve has varied markedly during its history as a wetland. Secondly, all but the pure lacustrine habitat has been some variation of wetland types of which riparian can be a valid constituent. Reference to the modified proposal indicates that during flood water stages, these islands will be inundated and hence more validly classifiable as wetland than the overwhelming majority of the acres existing in the Reserve today. Their surface elevations, relative to the fluctuating water levels that will exist during a 'normal' annual cycle of precipitation, will vary and with that variance there will result a variety of temporal niche conditions. Among those to be anticipated would be muddy margins, emergent borders and extensive willow thickets. The extent of these could actually be enhanced by the introduction of scalloping along the edges, and the isolation of the islands from the banks of the lake adjacent to human developments could then provide the refugias necessary for successful breeding by many nesting bird species. The aspect of predator protection becomes more than a casually peripheral issued given the extend of development encroachment about the marsh. Empirical evidence acquired from observations gathered nation-wide attest that free-ranging domestic and ferla pets inflict considerable predator pressure on wildlife in developed areas.

2) Under the proposed plan, vegetation species composition would remain approximately the same, but percentage of occurence would be altered markedly. Reference to Appendix B shows vegetation percentage composition as compiled in 1980. Our estimates of the change based on the design for management manipulation submitted by the S.C.S. and the Department would be approximately as indicated in the following table:

TABLE 1  
Vegetation Composition Percentage

	<u>1980</u>	<u>Post-Project</u>
<i>Distichlis</i> spp.	31	5
Grass (ES)	20	0
<i>Frankenia</i> spp.	14	14
<i>Juncus</i> spp.	10	0
<i>Scirpus</i> spp.	7	0
<i>Plantago</i> spp.	2	2
<i>Rumex</i> spp.	2	2
<i>Typha</i> spp.	1	1
<i>Polygonum</i> spp.	1	1
<i>Urtica</i> spp.	tr	tr
<i>Polypogon</i> spp.	tr	tr
<i>Salicornia</i> spp.	tr	tr
Unidentified	tr	tr
Litter	8	2
Mud	4	1
	0	62
	<u>100%</u>	<u>100%</u>

tr = less than 1%.

Review of the above indicates that emphasis would be on conversion of plant species with little wildlife food value and only modest cover value, such as saltgrass (*Distichlis*), various annual grasses (many exotics), rush (*Juncus*), and bulrush (*Scirpus*) to areas of open water. Areas designated as litter and mud would also undergo significant reductions in size, but these would rather represent a redistribution of occurrence from existing locations to the periphery of the spoils islands. All emergents mentioned above as targets for removal would undoubtedly begin to reestablish themselves within a few months along the border of the dredged area. These hardy and resistant species can readily recolonize themselves from only a few residual rootstocks remnant after any dredging operation.

3) Our anticipated changes in wildlife use of the Reserve is outlined as follows:

A) Benthic invertebrates; densely-vegetated marshland (semi-terrestrial) species would be replaced by true aquatic forms. No quantitative data to enumerate

the change is available.

B) Fish: Since only two species are involved and anything but deliberate introduction of others not possible, the change anticipated should be one of numbers and distribution. These forms will not utilize deep water areas. With the removal of shallow, vegetation-choked habitat, both these species will move into remnants of emergent vegetation along the spoils island peripheries. There are no plans within this proposal design to introduce any other fish species, native or exotic, into the Reserve.

C) Amphibians and Reptiles: A change in species composition within the Reserve is unlikely (Reserve uplands will not be impacted by dredging), but there will be some significant changes in distribution and abundance. All non-wetland forms (all snakes except Western Aquatic Garter Snake), all four lizard species, and the adult California Slender Salamander) will be reduced in number and confined to the uplands above the dredging boundary. Many of the existing bullfrogs will likewise disappear and the residual population will only occur in the undredged wetlands; these should eventually pioneer the new riparain along the west ditch fill and along the spoils island peripheries. Western Pond Turtle numbers will expand relative to the species' slow reproductive rate. No new species would be expected to occur subsequent to dredging.

D) Birds: By far the most obvious change will involve the distribution and numbers of species favoring terrestrial habitats. These will obviously be reduced in number, especially as breeding birds although aerial-forging swallows may actually increase due to improved feeding conditions over-water. However, any change in the species roster previously recorded on a regular basis is unlikely, since those appearing in Appendix XIII are of annual



occurrence in coastal San Luis Obispo County (the addition of a few additional less common migrant forms, such as Nashville Warbler, since the writing of Tidwell's list is to be expected and does not represent a true change in the avifauna of the Reserve).

The significant modification resulting from type conversion (semi-wet to Lacustrine habitat with enhanced riparian edge and low marshy islands) would markedly benefit water-associated birds. Larger diving birds, especially wintering forms adapted to fresh-water foraging such as Western and Eared Grebes will most probably increase in numbers. Loons may even appear more frequently. Edge-favoring species such as herons should also increase in numbers, and depending on the degree of success in establishing arborescent vegetation on one or more of the islands, it is quite possible that Great Blue and Black-crowned Night Herons, and perhaps Double-crested Cormorants could form a nesting colony such as they do in Vasona Park in Los Gatos. Conditions for wintering diving ducks will improve dramatically, and breeding habitat conditions for Mallard, Gadwall and Cinnamon Teal should markedly improve. Migrant shorebirds will certainly use the mud areas on island borders and nesting opportunities on properly modified islands could then exist for rails, Killdeer, Common Snipe, Spotted Sandpiper, and perhaps even Avocets and Black-necked Stilt, some of these species which currently do not breed in the environs of Arroyo Grande. The isolation of the islands is the key to success in this potential. It is not likely that Least Terns would express interest in the area as proposed; the habitat type is not appropriate for their needs.

E) Mammals: Excepting beaver and possibly muskrat, no mammal species is predicted to be extirpated from the Reserve list by this project. Numbers of those species will however be eliminated from the dredged area. These species

include Trowbridge Shrew, California Mole and various rodents. All are abundant in adjacent upland habitats, some common even in suburban developments. Larger mammal numbers will be reduced, but this must be placed in perspective: there are currently few individuals of these species using the Reserve and all are common elsewhere locally. Certainly, no more than one to three adult striped skunks forage regularly downstream from the Fourth Street crossing of the marsh. At most, one pair of Gray fox hunts on occasion within the Reserve and Bobcat has not been recorded of recent date. In summary, the overall size of the Reserve is so comparatively small relative to the needs of these animals that no significant impact on local population size of these species by the project is likely.

SUMMARY:

The proposed project conversion of a major portion of the existing sediment-impacted wetland to deeper open water complimented with a low relief island design recommended by the Commission staff during on-site discussions on December 12, 1984 will set back seral development in the marshland to a point where the Reserve can more appropriately serve the function for which it was originally acquired, that is, to meet the Department of Fish and Game's goal of preserving aquatic and wetland resources along the lower reaches of Meadow Creek in the Pismo Lake wetland. Without such significantly largescale action, it is likely that the marsh will undergo rapid transition to a relatively dry terrestrial habitat with different vegetative and faunal affinities by the end of this decade.

Our analysis of the sequence of evolutionary development of the present-day habitat postulates a logical development of biota from that of a marine estuary through a terrestrial climax, with the later stage only a few years away as a result of intensive human acceleration of the seral sequence by

carelessness in land use upstream. The proposed project cannot fully arrest the long-term effects of the latter, but it can impede the pace and buy some time for implementation of protective measures in the watershed and reestablish an earlier, more potentially productive stage in the life of this wetland. The majority of the animal species mentioned in the analysis as benefiting from the proposal are species that have experienced significant loss of foraging and/or breeding habitat State-wide and the wildlife management measures proposed in this project design will engender expanded access to quality habitat appropriate for their needs.

## FISH AND SHELLFISH OF THE PESCADERO MARSH AND THE ADJOINING OCEAN

<u>Common Names</u>	<u>Scientific Names 1/</u>	<u>Status 2/</u>
Northern Anchovy	<u>Engraulis mordax</u>	O
Striped Bass	<u>Morone saxatilis</u>	O
Boccacio	<u>Sebastes paucispinis</u>	Po
Cabezon	<u>Scorpaenichthys marmoratus</u>	Po
White Croaker	<u>Genyonemus lineatus</u>	Po
Starry Flounder	<u>Platichthys stellatus</u>	O
Arrow Goby	<u>Clevelandia ios</u>	Po
Bay Goby	<u>Lepidogobius lepidus</u>	Po
Pacific Herring	<u>Clupea harengus</u>	Pr
Jacksmelt	<u>Atherinopsia californiensis</u>	O
Plainfin midshipman	<u>Porichthys notatus</u>	Po
Longjaw mudsucker	<u>Gillichthys mirabilis</u>	Po
Pile Perch	<u>Rhacochilus vacca</u>	Po
Shiner Perch	<u>Cymatogaster aggregata</u>	Pr
Bay Pipefish	<u>Syngnathus griseolineatus</u>	Po
Kelp Pipefish	<u>Syngnathus californiensis</u>	Po
Bat Ray	<u>Myliobatis californica</u>	Pr
Rockfish	<u>Sebastes sp.<sup>11</sup></u>	Po
Speckled Sanddab	<u>Citharichthys stigmaeus</u>	Po

1/ Fish names from American Fisheries Society Special Publication #6, Common and Scientific Names of Fishes from the United States and Canada. Crustaceans and Mollusks from Appendix E, Shellfish of Elkhorn Slough, in The Natural Resources of Elkhorn Slough (Branney, 1972)

2/ O = Known to occur here  
Pr = Probably occurs here  
Po = Possibly occurs here

<u>Common Names</u>	<u>Scientific Names</u>	<u>Status</u>
Pacific Staghorn Sculpin	<u>Leptocottus armatus</u>	Po
Rubberlip Seaperch	<u>Rhinochilus toxotes</u>	Po
Striped Seaperch	<u>Embiotica lateralis</u>	Po
White seaperch	<u>Phanerodon furcatus</u>	Po
Shad	<u>Alosa sp</u>	Po
American Shad	<u>Alosa sapidissima</u>	Pr
Brown Smoothhound Shark	<u>Mustelus henlei</u>	Po
Gray Smoothhound Shark	<u>Mustelus californicus</u>	Po
Surf Smelt	<u>Hypomesus pretiosus</u>	Po
Whitebait Smelt	<u>Allosmerus elongatus</u>	Po
Threespine Stickleback	<u>Gasterosteus aculeatus</u>	O
Topsmelt	<u>Atherinopsis affinis</u>	Po
Diamond Turbot	<u>Hypsonsetta guttulata</u>	Po

\*\*\*\*\*

#### Crustaceans

<u>Common Names</u>	<u>Scientific Names</u>
<u>Crabs</u>	
Rock Crab	<u>Cancer antennarius</u>
Dungeness or Market Crab	<u>Cancer magister</u>
Red Crab	<u>Cancer productus</u>
Purple Shore Crab	<u>Hemigrapsus oregonensis</u>
Kelp Crab	<u>Pugettia producta</u>
<u>Shrimp</u>	
Ghost Shrimp	<u>Callinassa californiensis</u>
Bay Shrimp	<u>Crago nigricauda</u>
<u>Amphipods</u>	
Sand hopper	<u>Grannerus confervicolus</u>

Dave Loomis

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A STUDY FOR THE PRESERVATION

OF

PISMO LAKE

by

Lynne Nakata

&

Garth Pintler

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## INTRODUCTION

The purpose of this report is to document the existing natural resources of the Pismo Lake (marsh) area and to make clear the community benefits that would result from the preservation of this area as open space. Investigation of Pismo Lake is still in the preliminary stage. This report represents the level of current information on the area. Research will continue in order to put together a comprehensive study which will be the basis of an application for state funds for purchase of the area.

Protection of natural wetlands is an urgent and critically important task. 57 million of the nations 127 million acera of wetlands have already been destroyed by drainage, siltation, pollution, dredging, and channelization. And the remaining 70 million acres are being destroyed faster and faster, at a rate of over 1% per year.<sup>1</sup> In California the situation is even worse, with over two-thirds of our original coastal wetlands already filled in, reclaimed or otherwise destroyed.<sup>2</sup> These valuable wetlands are essential habitat for both resident and migratory birds, as well as many resident animals. And such marsh areas are of considerable value to human residents of the area for educational and recreational-esthetic

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<sup>1</sup>National Wildlife Refuges. U. S. Dept. of Interior, Bureau of Sport Fisheries & Wildlife, 1970.

<sup>2</sup>The Natural Resource of Elkhorn Slough. Bruce M. Browning for Calif. Dept. of Fish & Game, Jan. 1972.



purposes.

Despite recent commercial encroachment into the Pismo Lake, it remains the most ecologically important environment within the Pismo Beach city limits. New developments planned for the area, if constructed, will cause further degradation. It is therefore necessary that measures to preserve Pismo Lake be taken quickly, before new development is constructed.

## RECOMMENDATIONS

1. Federal, state, and local governments should co-operatively seek to provide funds to acquire the Pismo Lake area. Included should be as much fringe and upstream area as possible. Management of the area should strive for the maintenance, enhancement, and utilization of the area as a natural preserve. On Plate 7, three separate areas are marked 1, 2, and 3. The numbers indicate the purchasing priority. Area one carries the highest priority of purchase. It should be noted that unless Area 2 is purchased as a fringe, encroaching development may destroy the natural values of the marsh.
2. Local governments should move to pass ordinances requiring that erosion control measures be taken to minimize sedimentation caused by human activity in the Pismo Lake watershed.
3. Areas adjacent to Pismo Lake should be zoned so that encroaching development is discouraged.
4. Once the marsh area is purchased, tall shrubs and/or trees should be planted around the outside edge in order to protect wildlife from disturbance of human activity. These trees could also be used to shield the mobile home park and <sup>U.S.</sup> Route 101 from sight <sup>to</sup> ~~by~~ persons in the marsh area.
5. Further studies should be made to determine the effects of activities in the Pismo Lake watershed on the quality of water entering Pismo Lake.

2. 10. 1964  
 10. 10. 1964

10. 10. 1964

## DESCRIPTION OF THE AREA

Location. Pismo Lake is located about 15 miles south of San Luis Obispo and about one-half mile from the coast (see Plate 1). It is situated between the city of Pismo Beach (population roughly 5,000) and Grover City (population about 6,000). Primary access from neighboring cities is via <sup>U.S.</sup> Route 101. The marsh is situated within a mile of Pismo Beach State Park. It is only minutes from the downtown sections of Grover City and Pismo Beach.

Physical Characteristics. Pismo Lake is a coastal wetland with no known tidal interaction. It provides habitat for a wide variety of wildlife including resident and migratory birds and many small mammals.

The marsh is oblong and runs east-west. It is approximately 3,000 feet long (S. P. Railroad to Fourth St.) and has an average width of approximately 660 feet. The actual submerged marsh, shown as Area 1 on Plate 7, has an area of 45 acres.

To the north of the marsh is a mobile home park, the Five Cities Shopping Center, and some other light commercial activity. Slightly farther north is <sup>U.S.</sup> Route 101, running east-west. Beyond <sup>U.S.</sup> Route 101 is a large area of undeveloped rolling hills. To the northeast there is an open area consisting of mostly herbaceous vegetation. Interspersed are a few riparian sections. To the south of the marsh is a large residential district in Grover City. Development extends up to the crest of the hill overlooking the marsh. On the hillside between the residential development and the marsh is a natural area including many large trees (oaks and eucalyptus) and dense undergrowth. The east boundary of the marsh is marked by Fourth Street. Beyond Fourth Street is a large expanse of riparian habitat

including a small section of marsh (shown as area 3 on Plate 7). The west boundary of the marsh is marked by the Southern Pacific Railroad. A small outlet channel passes underneath the railroad berm. To the west of the railroad line is a large area of trailer parks, including a small commercial sector. To the southwest is the North Beach Campground, part of Pismo Beach State Park.

Land Ownership and Property Values. The major portion of the area under consideration is owned by Aqueduct Farms, Inc. See Plate 2 for ownership boundaries. The fringe area to the south of the marsh is owned by H. V. Bogwell Co., Inc. - Grover City Development Co., Inc. Much of the area to the east of Fourth Street (area 3 on Plate 7) is owned by Aqueduct Farms. A part of this area is owned by W. McEwen (not shown on Plate 2).

The following property values are market values estimated by the County of San Luis Obispo Assessors Office. Current tax rates for areas under consideration were not available. Tax figures for entire ownership areas are available. But since these rates reflect the much higher assessed value of adjacent areas not under consideration, the figures would not be informative (example: areas north of marsh are assessed at a market value of more than 20 times that of marsh area, so tax figures would not apply to marsh).

- 1) Area 1 (Plate 7) - Acres - 45  
     Estimated cost per acre - \$100  
     Owner - Aqueduct Farms, Inc.  
     Total Cost - \$4,500
  
- 2) Area 2 - North Fringe only- Acres - 8.6  
     Estimated cost per acre \$1,500  
     Owner Aqueduct Farms, Inc.  
     Total Cost - \$12,900

- 3) Area 2 - South fringe only- Acres- 10.8  
 Estimated cost per acre - \$200  
 Owner - H. V. Bagwell Co., Inc.  
 Total Cost - \$2,160
- 4) Area 3 - Marsh section only (see Plate 7)  
 Acres - 4.6  
 Estimated cost per acre - \$100  
 Owners - Aqueduct farms, Inc.  
 Total Cost - \$460
- 5) Area 3 - Excluding marsh section - Acres 22.8  
Rough cost per acre - \$400  
 Owners - Aqueduct Farms, Inc.  
 Total Cost - \$9,120

Drainage. Water drains into Pismo Lake primarily through two streams, Meadow Creek and the East Fork of Meadow Creek. These streams drain a small area of rolling hills, dotted with ranches. The drainage area is 5.9 square miles or approximately 3,800 acres.

Climate. Pismo Beach is characterized by a mediterranean climate. Summers are hot and dry, and most of the rain comes in the winter (November, December, and January). The rainfall is about 18 inches per year for a 16 year average. Climate data is summarized in the following table.

Period	AVERAGE TEMPERATURE			RAIN Inches	HUMIDITY		
	Min.	Mean	Max.		4 A.M.	Noon	4 P.M.
January	42.8	51.7	60.4	4.19	82	66	70
April	45.2	54.1	62.9	1.81	88	69	70
July	50.8	59.1	67.3	0.04	94	74	73
October	51.1	61.1	71.3	0.49	84	66	70
Year	47.6	56.6	65.5	18.02	87	69	71

Elevation: 0 - 300 feet.

Prevailing Winds : Direction - NW  
 Mean Hourly Speeds - 7 to 10

Source: City Weather Station  
 16 year average

## NATURAL RESOURCES

Habitat and Ecology. In actuality, Pismo Lake is not a lake, but a shallow body of water with many of the characteristics of a fresh water marsh.

Fresh water marshes are treeless expanses, which usually have dense growths of herbaceous plants (such as cattails and bulrushes), and grasses which are rooted in shallow water.

Pismo Lake is a semi-enclosed body of water with an outlet running beneath the railroad berm to the open sea. The drainage through this small outlet is sporadic, depending upon the water level. This outlet does not allow any substantial amount of salt water intrusion into the marsh. It has been theorized that the several salt "sinks" found in the upper portion of the marsh can be attributed to land drainage. The suspended materials in the drainage water (gaseous and solid substances) from upstream agricultural and ranching lands settle into the enclosed area. During the dry summer months, the marsh usually dries up, allowing the salt deposits to accumulate. The salt indicators in the upper portion of the marsh are perennial pickleweed, saltgrass, and franklinia. It must be remembered that this is only a plausible explanation and it has yet to be verified.

There are two main tributaries which feed Pismo Lake. They are the larger Meadow Creek tributary and the smaller East Fork of Meadow Creek. These creeks travel back into the uplands for approximately four miles. The approximate area of the watershed is 3,800 acres.

Wetlands are among the world's most productive lands. They can provide several times the plant growth of a well-tended field. The ecological

exchange of energy in wetlands knows no waste. Pismo Lake is no exception.

Due to the fluctuating environmental nature of wetlands, fresh water wetlands may support several types of plant communities. Their nature depends upon the depth of water, climate, type of soil and other physical factors. For each kind of plant community, characteristic plant and animal associations can be found.

The principle vegetation of Pismo Lake in the lower end is tule, a fresh water indicator. This dominant and hardy specie comprises almost all of the vegetative cover in this part of the marsh. The variety of plant life is limited to only small pockets of cattails and perennial pickleweed. There is virtually no submerged vegetation but algae blooms are plentiful. The dominant algae is the common long-filamentous spirogyra.

The vegetation in the upper portion of the marsh is much more varied. Many species of herbaceous vegetation covers an extensive section of the dry areas. Several large pockets of sage, hemlock, and coyote bush can be found along the fringe of the water. In the wet areas, saltgrass, perennial pickleweed, and frankenia are the dominant plant species, all of which are salt-loving plants.

There is a grove of willows and coast live oaks which border along the southern fringe of the marsh. This complex of trees, shrubs, and grasses provide home and cover for many of the small mammals found in the area. Along the southeastern fringe, there is a large area of eucalyptus trees which provide roosting areas for great blue herons and red-shouldered hawks.

The riparian or riverbank community is a special type of woodland habitat. Riparian vegetation is often rampant in growth. Trees are

crowded together and the underlying brush is a tangled mixing of elderberry, wild rose, poison oak, berry vines and other herbaceous vegetation.

Nettle and various sagebrush species may also be found in these sections.

The closeness to streambank gives riparian areas its special character.

For this reason, the transition from grassland to dense tree groves is very abrupt.

Wildlife. The watery habitat of the marsh, whether brackish or fresh, is productive of much invertebrate life that is attractive to birds as a food source. This prevalence of invertebrates explains why so many birds concentrate within the restricted environment of a marsh.

The category of marshbirds included at least three major subgroups: the long-legged, shallow water waders (herons, egrets, bitterns), the marsh dwellers (rails, coots) and the shorebirds (sandpipers, plovers). These various birds can be found distributed throughout the marsh area according to their specialized feeding habits as determined by their body characteristics (length of legs, type of beaks).

Marshbirds usually contribute very little in the way of economic importance to man. None, except the rails, are prized as gamebirds. However, marshbirds are a very interesting part of the typical life of wetland areas.

The waterbirds category includes all members of the natural family of waterfowl (ducks, geese). In addition, this category embraces birds which obtain their food predominantly from the water (coots, grebes). The migratory waterfowl utilize the marsh as a resting and feeding area during their annual migrations.

The aquatic plants and grasses which the developers destroy is literally the root of marsh life. The aquatic plants which secure solar energy can



be considered the basic unit of energy for which the animals of the marsh contend.

Ordinarily, the diet of the more abundant species of waterfowl (ducks, coots) is comprised of the tender parts of marsh plants. Roots, stalks, and seeds are also highly sought by certain species. Animal food tends to hold a more minimal position in the diet of these birds. The surface feeding birds, as well as a few diving birds are almost entirely vegetarian.

Many waterfowl species, particularly ducks, are regarded by many as valuable gamebirds. The number of hunters who go afield to hunt these birds increases substantially each year. The perpetuation and management of this natural resource has become increasingly difficult. Management should encourage growth of desirable natural plant species and control the growth of undesirable as well as introduced species. Plant species which should be inhibited are cattails, dock, and yellow clover. Desirable species include bulrush, pondweeds, and watergrass. The destruction of our wetlands for agriculture and industry must be curbed. There is already a serious shortage of the natural habitat for the proliferation of these birds.

Many of the marshbirds, waterfowl, and shorebirds utilize the marsh for periods ranging from 6 to 9 months of the year, during their migration in search of wintering grounds. Some birds such as rails, mallards, and coots are known to nest and raise their young in the sheltered areas of the marsh. As residents of the marsh they require relatively large unbroken expanses of water, since they feed primarily on the water surface. Submerged plants exist below the surface of the water and are adapted to a completely underwater existence. The most common of such plants are the pondweeds.

Grebes, loons, and gulls are the most common of the pelagic birds which are found in the marsh. The sheltered waters provide a safe resting place between feeding flights or migrations.

The oak-woodlands adjacent to the marsh provide many land-associated birds with a suitable habitat. Several raptors such as the white-tailed kite, great horned owl, Coopers hawk, sparrow hawk, red-shouldered hawk, and red-tailed hawk have been observed perched in trees or flying overhead. These rather large birds of prey serve an important function in the balancing of population growth of various species of animals, especially rodents. Hawks and owls do not make direct use of vegetation in their diets. Yet, plants and their associated communities are vitally important to their survival. Plants, particularly large trees are the favorite nesting sites of these birds. In addition, the distribution of the animals preyed upon which eat plants (mice, rabbits, birds) is a function of the vegetative abundance and distribution in the area. Still another important factor, is that the foliage provides concealment for their predaceous operations.

Another group of predatory birds, smaller in size than raptors, includes such birds as robins, flycatchers, warblers, and swallows. These birds feed mainly on insects. This way, they may serve a beneficial role by controlling certain insect populations.

Due to their controlling influence upon other populations of wildlife, birds of prey are of great ecological importance. The control of destructive rodents and insects can also be of economic importance. Additionally, these birds possess a special value which cannot be measured in monetary terms. They have a natural place in the wildlife scheme.

The category of songbirds includes practically all other birds not

covered in other categories. This rather inappropriate title includes such unmelodious birds as crows, starlings and shrikes which are common to the area surrounding the marsh. Other birds such as the red-winged blackbird and sparrows are also quite abundant. The red-winged blackbird is the most familiar as well as widespread bird of many marsh areas. This species inhabits both coastal and inland wetland areas, building its nest among cattails or other wetland plants where they can raise their young.

The aesthetic value of songbirds is tremendous. Not only are their songs considered attractive but also the colorful patterns which their plumage displays. Many species help to control insects which are pests to farm crops and gardens. However, other species may have negative economic importance when they damage fruit orchards and grain fields.

The oak-woodlands habitat and the riparian habitats immediately adjacent to the lake supports populations of jackrabbits, gophers, mice, squirrels, and gray fox. Jackrabbits are extremely abundant in the upper portion of the marsh habitat. Opossums have also been sighted in the area. Raccoons are partial to woodland areas and they may be frequently found near the water edge searching for frogs and salamanders.

The coast live oak forms the canopy of this ecosystem. As the name implies, this species of oak is mostly restricted to the Outer Coast Ranges. It is considered an evergreen but many old leaves may be discarded when new foliage is produced in spring. Drought-resistant grasses are usually found sharing the marginal environment of the oaks. Such species as needlegrass, bromes, wild rye and oats, and foxtail chess are common.

The trees and grass offer more than just shade and shelter to their animal associates. They serve also as a major food source. Birds such as

the scrub jay feed on the acorns of the oak trees. A beneficial association has been established between the jays and the oaks. The scrub jay by unconsciously burying the acorns in the ground places the acorns in the most suitable substrate for their germination. Without this aid, the acorns would remain in places where germination would not be probable. In addition to providing a food source for the jays, acorns provide ground squirrels, deer, and other birds with an important food source. The seeds of many of the grasses form a large part of the diet of smaller birds such as titmice and bluebirds.

Many animals use the riparian areas for their activities. Jackrabbits, cottontails, gray foxes, and raccoons are plentiful. Small rodents such as deer mice are found close to seed areas searching for food. Moles and shrews are known to inhabit this area also, digging their homes in the moist soil. Sparrows, flycatchers, towhees, flickers, and horned owls are abundant in the riparian areas.

An important part of the food web is the function of the decomposers, fungi and bacteria, that live by breaking down dead plants and animals into simpler forms. Their importance can be easily overlooked. The decomposers maintain the continuing life of the marsh by insuring the necessary flow of energy.

There are no known rare or endangered species of bird or wildlife which occur in the Pismo Lake area. Some question has been raised about the status of the white-tailed kite. Present evidence indicates that the white-tailed kite has made a successful comeback and is no longer considered an endangered species.

## COMMUNITY USES AND BENEFITS

Nature Study and Aesthetic Pleasure. Pismo Lake should be considered much more than a wasteland of mudflats and cattails. Marshes are very productive areas and can support an amazing quantity and variety of plant and wildlife. As a home for many birds, small mammals, fish, insects, and other terrestrial and aquatic animals and as a resting ground for migratory waterfowl, the marsh is a balanced yet ever changing ecosystem.

More than most natural areas, the marsh is an intricate complex of living things. The inextricable components of this balanced scheme interact with one another and the many elements of their environment -- the water, soil, air, and most importantly the sunlight which surrounds them. The interactions occur on a biological, chemical, and physical level, each subtly linked beyond man's present capacity to comprehend the actual operations. Yet, changes have occurred, negatively altering the basic structure of the internal operations of the marsh. These changes have been carried out with little understanding of their consequences on the marsh ecosystem or of their effects on other ecosystems nearby.

As an attempt to provide invaluable information that will aid in the preservation of Pismo Lake as a natural area, the various facets of public use must be explored. The creation of unforeseen new problems must be avoided. Attempts must be made to manage and improve the area for public use.

The aesthetic value of Pismo Lake is very great. The value of any natural area, as a wildlife refuge or as environmental open space increases more than arithmetically when it can offer unusual opportunities for enjoyment, recreation, and education to an urban population. However, an important point which cannot be overlooked, is the fact that the watery environment of the marsh is a benefit and necessity to the wildlife itself.

In the past few years, a growing awareness and concern for our wetlands has developed. This increasing appreciation has enabled more people to take advantage of the few remaining undisturbed ecological areas. The city of Pismo Beach recognizes the significant natural resources of Pismo Lake and its potential utilization as an urban wilderness preserve.

The benefits which would be derived from a public use program initiated in the Pismo Lake area would be very rewarding, not only to the immediate community but to visitors from many areas. A successful public use program would engender respect, knowledge, curiosity and appreciation of the natural world. As a secondary role, the Pismo Lake area could serve an interpretive function, through the participation and responsibility of those who utilize it, to develop more wildlife oriented recreation.

A visitor to the edge of the marsh can now see a large number and variety of ducks, grebes, coots and other waterfowl as well as many land-associated birds. Many species of water-associated birds may be clearly visible in the open water areas involved in activities as feeding and resting. Many resident and migratory birds nest and raise their young in the marsh.

The enjoyment and aesthetic appeal of avian species provides rewarding experiences for the observer, whether he be an amateur or professional student. A knowledgeable picture of avian life can be drawn from patient observation.

With the drastic decrease in the amount of wetlands, every available marsh is an important link, along the Pacific flyway for migrating birds. Marshes are inextricably part of a large system, as well as being distinct ecosystems in themselves. At present, the marsh is man's hunting ground where the destruction by the developers renders little respect or regard for the existence of marshes.

A very valuable concept related to child development, is a child's need

for open areas to explore and play in. During a child's formative years, it is important that he be exposed to nature. Any area of open space, particularly an ecological area can convey an important feeling of respect and understanding for nature. This feeling for nature is lacking in our large metropolitan centers.

Currently there are many Chapters of the Audubon Society which travel to the Pismo Lake area for bird observation. Several members of the Sierra Club have expressed a great deal of interest in the preservation of the marsh.

Scientific and Educational Uses. The scientific and educational use of the Pismo Lake area is perhaps the most important use of its natural resources. Pismo Lake is a "living laboratory" which can convey the function and value of wildlife resources. The marsh is suitably situated in an urban area, where it can offer maximum usage to many of the local schools. (see plates 4 & 5).

The study of the natural attractions and wildlife resources of any wetland area will broaden the knowledge base of environmental studies. This is particularly true of Pismo Lake. Research and study promotes realization of the area as an intricate ecological system. The educational wealth which can be imparted to visiting school children is worth far more than a number of lectures. A visit can more easily arouse curiosity and enjoyment -- it is a more appreciative experience.

The diverse characteristics of this unique wetland area and its associated riparian areas come together in a number of biological communities. The assets which Pismo Lake can offer are innumerable. Because of these accessible advantages, students and professors from the colleges and universities nearby can utilize the marsh for research and study. General and advanced studies in natural history, general biology, botany, zoology, and ecology can be pur-

sued.

The two institutions of higher learning in the immediate area are California Polytechnic State University and Cuesta College in San Luis Obispo. Professors and students from these schools have occasionally used the area for research and study, and would make more extensive use of the marsh if it were protected and made more accessible.

Pismo Lake has the potential to attract other school groups. The marsh is located in the Lucia Mar Unified School District. This district contains nine elementary schools, three intermediate schools, and two high schools. All of these schools are located within a few minutes of Pismo Lake. The possible number of organized field trips by teachers and students from these schools is large. Excursions can be a favorable method of learning, especially since the workings of nature can be directly observed.

Open Space vs. Development. On a purely economic basis, there is substantial evidence that it is less expensive for a city to keep land in open space than to allow it to be developed. The evidence comes from the Open Space vs. Development study done for the city of Palo Alto, California. In this study, twenty two different patterns of development were studied for foothill areas. None of these patterns resulted in monetary gains for the city. The cost of municipal utilities and services outweighed the revenues from property tax, sales tax, utility sales, and other sources. The cost to the school district also outweighed the increased revenue from new taxpayers. In addition, the presence of open space was shown to help keep property values up, thus providing a benefit to established home owners in the area.

The hillside to the south of Pismo Lake is now mostly open, but it is a prime area for more tract housing. This hillside is similar to many foot-



hills above the city of Palo Alto; the same financial analysis probably applies. It therefore would be very likely of financial benefit to the Grover City government and taxpayers to keep this hillside as it is, rather than permit development. Similar consideration should be given to potentially developable areas to the east of the marsh.

PROBLEMS AND USE CONFLICTS

Water Control. The major alterations of the natural drainage patterns which have occurred are as follows:

1) The gravel fill of the Southern Pacific Railroad constructed sometime prior to 1926 - the date of the most recent ~~air~~<sup>erial</sup> photograph - blocks natural flow and forces water moving through the marsh to exit through a small channel in the southwest corner of the marsh. It is hypothesized that this fill may serve as a partial dam helping to preserve the water level in Pismo Lake.

2) A levee constructed parallel to the south edge of the marsh (see Plate 6) creates a small channel which carries incoming water from Meadow Creek. The levee is cut through in places to allow water to flow in and out of the marsh.

3) Meadow Creek and other small tributaries entering the marsh from the north have been directed through concrete channels where they pass under U.S. Route 101.

Water Quality. The quality of water entering the marsh from Meadow Creek has not been monitored. It has only been recently that any chemical determinations of the marsh water have been taken by the California Fish and Game Department. The preliminary results are shown graphically in Plate 9. It is quite certain that the ranches in the Pismo Lake watershed contribute some quantity of phosphate and nitrate (nutrients) above the amounts found in natural runoff waters. The addition of nutrients leads to overproduction of aquatic vegetation which dies and decays, producing an oxygen deficiency in marsh waters. This often causes foul odors, and hastens the filling in of the marsh. The extent of this nutrient pollution is not

known. This problem should be studied to determine the magnitude of effect it has on Pismo Lake.

Sedimentation. Marshes serve as natural settling basins for suspended materials entering from the upstream areas. The end result of this process is the filling in of the marsh. Human activity in the watershed can play an extremely significant role in accelerating the filling of a marsh. One study (Burgy, 1970) compared the sediment loads of three streams on the west slopes of Bolinas Ridge, California. The sediment loads in two streams draining areas disturbed by logging were approximately five times as great as in a nearby stream draining a relatively undisturbed area. Though the activities and climate conditions in the Pismo Lake watershed are different from the Bolinas situation, it is true that significant alteration has taken place in the Pismo Lake watershed area. This example serves only to emphasize the possible importance of human activities on rates of sedimentation.

A brief survey of areas in the Pismo Lake watershed (5/18/73) showed several disturbances resulting from human activity which contribute large quantities of sediment to Pismo Lake. (Some of these are shown on <sup>Plate</sup>~~Map~~ 7).

1) The most serious erosion was noted at the Hacienda del Pismo Mobile Home Park (adjacent to the marsh). Many empty trailer lots have <sup>a</sup>great number of erosion channels cut into the soil. At the ends of three streets which terminate at the marsh edge, severe undercutting of the fill and erosion several feet deep can be seen. The result of this erosion is three filled-in areas which extend out into the marsh. These areas measured approximately 30 ft. x 85 ft., 35 ft x 85 ft., and 25 ft. x 85 ft. The total area covered by these deposits is 7,650 square feet. (See Plate 8.)

2) A second mobile home park is located about one mile up Meadow Creek.

Severe erosion was noted on empty lots and also where cuts had been made to provide space for lots. Sediment was visible in the streets and along gutters.

3) Farther upstream, at the entrance to Elvinar Rancho, there is a large disturbed area containing piles of debris (mostly broken-up asphalt and mounds of soil). It covers an area about 100 ft. x 100 ft.

4) Still farther upstream, just beyond the Eighteenth Avenue overcrossing, there is a recently bulldozed area (approximately 50 ft. x 100 ft.) containing a great deal of loose soil.

5) There is evidence of significant erosion along the base of <sup>U.S. 101</sup> route 101 in a gully across from the Five Cities Shopping Center. This sediment is carried east along the gully, then south, where it crosses under the frontage road and continues on into Pismo Lake. Severe erosion is occurring on both sides of frontage road along the sides of the gully. It is also occurring on the north side. This erosion is causing undercutting of the road.

6) Another eroded area is on the slope leading up to the graded plot near the corner of frontage road and Fourth Street.

7) To the east of Fourth Street is a badly eroded channel leading into the upper marsh.

8) Farther upstream, in the hills to the north of <sup>U.S.</sup> Route 101, there is a smattering of ranches. Drainage canals filled with sediment (recently dredged) along Noyes Road are evidence of the sediment contribution of this area. It is impossible to guess how much of this is natural. Some obvious sources of sediment were the many dirt roads, cleared horse corrals, and moist fields where the hooves of cattle cut into soil.

If activities such as these noted are allowed to continue unchecked, the life span of Pismo Lake will decrease in direct proportion. Many of

these sources of sediment could be entirely or partially eliminated if local governments would move to require control measures.

Urban Development. Urban development is perhaps the greatest threat to the natural values of Pismo Lake. To the north of the marsh, the Hacienda del Pismo Mobile Home Park has displaced a portion of the marsh. The planned Five Cities Apartment Complex, soon to be built, will bring with it the short-term noise and commotion of construction, as well as the long-term impact of increased human activity in the area. The existing open graded areas on the northside (see Plate 7) are likely to be developed in the near future. The existence of the Five Cities Shopping Center, several gas stations, and a medical clinic make these areas prime targets for residential developments. The open area on the east side of Fourth Street is also desirable for residential development.

On the south side of the marsh, residential development has been slowly spreading towards the marsh. at present, the trees along the south edge of the marsh provide sufficient protection from noise and other human activity. However, a new development of 29 homes, planned for the southwest corner of the marsh frönge (see Plate 7), would extend all the way to the edge of the marsh. It would be necessary to remove most, if not all of the large Eucalyptus trees in this area and perhaps two or three large oaks on the east edge of the planned development. The major effects of this development would be:

- 1) loss of habitat of the Great Blue Heron and Red-shouldered Hawk that presently use the eucalyptus trees for roosting and possibly nesting,
- 2) the west end of the marsh would be subjected to human activity from both sides, rendering it undesirable to many timid species of wildlife,

3) the loss of a portion of riparian vegetation which serves as habitat for many species of wildlife, and

4) if this development is allowed, the precedent would be set for similar such developments along the south edge, virtually insuring the total loss of the use of Pismo Lake by many species of wildlife.

On the east edge of the marsh, the railroad right-of-way keeps human activity at a minimum, and poses no serious threat to wildlife.

Access. Access to certain areas of the marsh can pose several problems.

Entrance is virtually restricted to the Grover City side of the marsh. Due to the Private ownership and development of the land adjacent to the marsh, public access cannot be fully developed. The mobile home park has expanded its boundaries to the very edge of the marsh. The feasibility of access through the mobile home park has not been determined.

On the northeast side of the marsh, near Fourth Street, several "NO TRESPASSING" signs are posted. Planned development on the Grover City side may further cut off the accessibility of the area. There is also planned development for a Five Cities apartment complex on the north side of the marsh, adjacent to the Five Cities Shopping Center. This project will border along the edge of the riparian area. (See Urban Development section.)

If the marsh is to be fully developed for such nonconsumptive uses as scientific study and nature study, access and observation points should be developed. The only possible places to park presently are at the top of Fourth Street, in the Five Cities Shopping Center, and on residential streets in Grover City.

Paths are available within the oak-woodlands habitat. However, there are no foottrails on the north side of the marsh. Future intensive use may

require the establishment of more trails. Acquisition of the marsh land may provide these additional facilities.

APPENDIX A.  
BIRD SPECIES OF THE PISMO LAKE AREA\*

<u>Common Name</u>	<u>Scientific Name</u>	<u>Population Peak**</u>
<u>Shore birds</u>		
Kildeer	<u>Charadrius vociferus</u>	R
Plover, snowy	" <u>alexandrius</u>	R
Plover, semi-palmated	<u>Ereunetes pusillus</u>	WV
Snipe, common	<u>Capella gallinago</u>	WV
Stilt, black-necked	<u>himantopus mexicanus</u>	Occ.M
<u>Wading Birds</u>		
Bittern, American	<u>Botaunis lentiginosus</u>	R
Egret, common	<u>Casmerodius albus</u>	AY
" , snowy	<u>Leucophoyx thula</u>	AY
Heron, black-crowned night	<u>Nycticorax nycticorax</u>	R
" , great blue	<u>Ardea herodias</u>	R
" , green	<u>Butorides virescens</u>	R
<u>Gulls</u>		
Gull, Calif.	<u>Larus californicus</u>	AY
<u>Waterfowl</u>		
Mallard	<u>Anas platyrhynchos</u>	R
Pintail	" <u>acuta</u>	WY, AY
Ruddy Duck	<u>Oxyura jamaicensis</u>	M
Shoveler	<u>Spatula clypeata</u>	WV
Teal, cinnamon	<u>Anas cyanoptera</u>	R
Teal, green-winged	" <u>carolinensis</u>	WV
<u>Miscellaneous Marsh and Water-Associated Birds</u>		
Coot, American	<u>Fulica americana</u>	R
Grebe, horned	<u>Podiceps auritus</u>	WV
" , western	<u>Aechmophorus occidentalis</u>	WV
Rail, Virginia	<u>Rallus limicola</u>	R
<u>Miscellaneous Coastal and Pelagic Birds</u>		
Loon, common	<u>Gavia immer</u>	WV
<u>Land-Associated birds</u>		
blackbird, Brewer's	<u>Euphagus cyanocephalus</u>	R
" , red-winged	<u>Agelaius phoeniceus</u>	R
" , tricolor	" <u>tricolor</u>	R
Bushtit, common	<u>Psaltriparus minimus</u>	R
Crow, common	<u>Corvus brachyrhynchos</u>	R
Dove, mourning	<u>Zenaidura macroura</u>	R
Finch, house	<u>Carpodacus mexicanus</u>	R
Flicker, red-shafted	<u>Colaptes cafer</u>	R
Flycatcher, western	<u>Empidonax difficilis</u>	SV
Hawk, Cooper's	<u>Accipiter cooperii</u>	R
" , red-shouldered	<u>Buteo lineatus</u>	R
" , red-tailed	" <u>jamaicensis</u>	R
" , sparrow	<u>Falco sparverius</u>	R



## Appendix A - Birds

<u>Common Name</u>	<u>Scientific name</u>	<u>Population Peak**</u>
<u>Land-Associated Birds</u>		
Hummingbird, Anna's	<u>Calypte anna</u>	R
Jay, scrub	<u>Aphelocoma coerulescens</u>	R
Junco, Oregon	<u>Junco oregonus</u>	R
Kingbird, western	<u>Tyrannus vociferans</u>	SV
Kite, white-tailed	<u>Elanus leucurus</u>	Occ.R
Meadowlark, western	<u>Sturnella neglecta</u>	R
Owl, great-horned	<u>Bubo virginianus</u>	R
Pigeon, band-tailed	<u>Columba fasciata</u>	R
Quail, California	<u>Lophortyx californicus</u>	R
Robin	<u>Turdus migratorius</u>	R
Shrike, loggerhead	<u>Lanius ludovicianus</u>	R
sparrow, white-crowned	<u>Zonotrichia leucophrys</u>	WV
" , song	<u>Melospiza melodia</u>	R
Starling	<u>Sturnus vulgaris</u>	
Swallow, barn	<u>Hirundo rustica</u>	SV
" , cliff	<u>Petrochelidon pyrrhonota</u>	SV
" , rough-winged	<u>Stelgidopteryx ruficollis</u>	SV
" , violet-green	<u>Tachycineta thalassina</u>	SV,AY
Towhee, brown	<u>Pipilo fuscus</u>	R
Warbler, Wilson's	<u>Wilsonia pusilla</u>	SV
" , yellowthroat	<u>Dendroica dominica</u>	R

\*\*Taken from a list prepared by A. Roest for the Morro Coast Audubon Society.

\*This list was compiled by Mr. George Tidwell of California Fish and Game between the months of January and May of 1973, and was based on actual field observations. Abbreviations are as follows:

WV - winter visitor, usually between September and May.

SV - summer visitor, usually between April and October; most of these breed here.

AY - a few present all year, but normally more abundant at some seasons.

M - migrant; observed mainly during spring or fall months.

R - resident; present all year and known to breed.

Occ. - occasional; observed regularly, but considered unusual.

APPENDIX B  
 PLANT SPECIES OF THE PISMO LAKE AREA\*

<u>Common Name</u>	<u>Scientific Name</u>
Australian saltbush	<u>Atriplex semibaccata</u>
Barley	<u>Hordeum spp.</u>
Blue elderberry	<u>Sambucus coruleaus</u>
Blue-eyed grass	<u>Sisyrinchium bellum</u>
Brass buttons	<u>Cotula coronopifolia</u>
Bristly ox-tongue	<u>Picris echioides</u>
Bush lupine	<u>Lupinus chamissonis</u>
	<u>" arboreus</u>
California sage	<u>Artemisia californica</u>
Cattail	<u>Typha latifolia</u>
Coastal sage	
Coast live oak	<u>Quercus agrifolia</u>
Common windmillet	<u>Echinochloa crusgalli</u>
Coyote bush	<u>Baccharis pilularis</u>
Curly Dock	<u>Rumex crispus</u>
Eucalyptus	<u>Eucalyptus spp.</u>
iddle cock	<u>Rumex pulcrer</u>
Flaree	<u>Erodium</u>
Foxtail chess	<u>Bromus rubens</u>
Garden lippia	<u>Lippia lanceolata</u>
German ivy	<u>Senecio mikanioides</u>
Glasswort	<u>Salicornia virginica</u>
Heliotrope	<u>Heliotropium curassaviicum</u>
Iceplant	<u>Mesembryanthemum edule</u>
Morning glory	<u>Convolvulus spp.</u>
Murr	<u>Rumex conglomeratus</u>
Plantain	<u>Plantago purshii</u>
Poison hemlock	<u>Conium maculatum</u>
Purple needlegrass	<u>Stipa pulchra</u>
Rushes	<u>Juncus spp.</u>
Rye grass	<u>Lolium multiflorum</u>
Salt grass	<u>Distichlis spicata</u>
Sand-spiney	<u>Spergularia spp.</u>
Sedge	<u>Carex spp.</u>
Shrub lupine	<u>Lupinus spp.</u>
Soft chess	<u>Bromus mollis</u>
Spring vetch	<u>Vicia sativa</u>
Stinging nettle	<u>Urtica holosericea</u>
Streamside willow	<u>Salix spp.</u>
Tule	<u>Scripus robustus</u>
Vetch	<u>Vicia benghalensis</u>

## Appendix B - Plants

<u>Common Name</u>	<u>Scientific Name</u>
Western goldenrod	<u>Solidago occidentalis</u>
White sweet clover	<u>Melilotus albus</u>
Wild blackberry	<u>Rubus ursinus</u>
" mustard	<u>Brassica geniculata</u>
" oats	<u>Avena fatua</u>
" raddish	<u>Raphanus sativus</u>
" rose	<u>Rosa spp.</u>
Yellow sweet clover	<u>Melilotus indicus</u>
	<u>Bromus vulgaris</u>
	<u>Haplopappus spp.</u>
	<u>Gnaphalium luteo-album</u>
	<u>Frankenia grandifolia</u>
	<u>Geranium dissectum</u>
	<u>Jaunea carnosia</u>

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\*This list was compiled by Mr. George Tidwell of Calif. Fish and Game between the months of January and May of 1973 and was based on actual field observations. Additions were made by Mr. Glen Holstein, senior biology major, Cal Poly.

APPENDIX C  
ANIMAL SPECIES OF THE PISMO LAKE AREA\*

<u>Common Name</u>	<u>Scientific Name</u>
Adorned shrew	<u>Sorex</u>
Black-tailed hare	<u>Lepus californicus</u>
Broad-tailed mole	<u>Scapanus latimanus</u>
California deer mouse	<u>Peromyscus maniculatus</u>
" pocket mouse	<u>Perognathus californicus</u>
Common opossum	<u>Didelphis marsupialis</u>
Gray fox	<u>Urocyon cinereoargenteus</u>
Ground squirrel	<u>Citellus beecheyi</u>
Long tailed weasel	<u>Mustela frenata</u>
Pocket gopher	<u>Thomomys bottae</u>
Raccoon	<u>Procyon lotor</u>
Trowbridge shrew	<u>Sorex trowbridgi</u>

---

\*This list was compiled by Mr. George Tidwell of California Fish and Game between the months of January and May of 1973 and was based on actual field observations.

APPENDIX D  
 AMPHIBIAN AND REPTILES OF THE PISMO LAKE AREA\*

<u>Common Name</u>	<u>Scientific Name</u>
Bull frog	<u>Rana catesbeiana</u>
Common garter snake	<u>Thamnophis sirtalis</u>
" king snake	<u>Lanpropeltis getulus</u>
Gopher snake	
Pacific tree frog	<u>Hyla regilla</u>
Western <sup>fence</sup> lizard	<u>Sceloporus occidentalis</u>
" toad	<u>Bufo boreas</u>

Fish Species of the Pismo Lake Area\*

<u>Common Name</u>	<u>Scientific Name</u>
Threespine stickleback	<u>Gasterosteus spp.</u>

\* This list was compiled by Mr. George Tidwell of California Fish and Game between the months of January and May of 1973, and was based on actual field observations.

## BIBLIOGRAPHY

Bakkar, Elna, An Island Called California, University of California Press, Berkeley, 1972.

Burgy, R. H., Bolinas Lagoon Study, The Watershed Runoff and Sedimentation, prepared for the conservation foundation, may 1970.

Cleeves, rreiras, Sanville, A Coastline Study for the City of Pismo Beach, California Polytechnic State University, 1973.

Livingston and Blayney, Open Space vs. Development: Final Report to the City of Palo Alto, Foothills Environmental Design Study, 1971.

Martin, Alexander C., Herbert S. Zim, Arnold L. Nelson, American Wildlife and Plants - A Guide to wildlife Food Habits, Dover Publications Inc., New York, 1951.

Niering, William A., The Life of the Marsh, McGraw Hill Book Company, New York, 1966.

Environmental Impact Report: Five Cities Apartments, Pismo Beach Community Development Dept., December 1972.

Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of representatives, Ninety-second Congress, First session on San Francisco Bay national wildlife Refuge, Tinicum Environmental Center, October 29, 1971.

National Wildlife Refuges, U. S. Dept. of Interior, Bureau of Sport Fisheries and Wildlife, 1970.

The Natural Resources of Elkhorn Slough, Their Present and Future uses, California Department of Fish and Game, January 1972.

The natural Resources of Goleta Slough and Recommendations for Use and Development, California Department of Fish and Game, August 1970.

Interviews were held with the following people:

1. Mr. Berry, City Administrator for Grover City
2. Mr. Bill Denneen, Teacher, Hancock College, Santa Maria.
3. Prof. V. L. Holland, Calif. Polytechnic State University.
4. Mr. Glen Holstein, senior biology major, California Polytechnic State University.
5. Dr. Bob Horton, State of California Division of Highways.  
D.R.



6. Prof Erik Johnson, Calif. Polytechnic State University.
7. Mr. Robert London, City Planner, Pismo Beach.
8. Meyer, Merriam and Associates, Architects and Planners, San Luis Obispo.
9. Mrs. Emily Polk, Small wilderness Area Preserve.
10. Mrs. Dorothea Ribel
11. Mr. George Tidwell, Biologist, California Department of Fish and Game.

Letters were written to:\*

\*California Division of Fish and Game.

Lloyd Dunkall, Morro Bay Natural History Museum.

\*Gene Gerdes, Associate Wildlife Manager biologist

Norman B. Livermore, Secretary to resources, Regional Director, Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service.

\*replies were received.

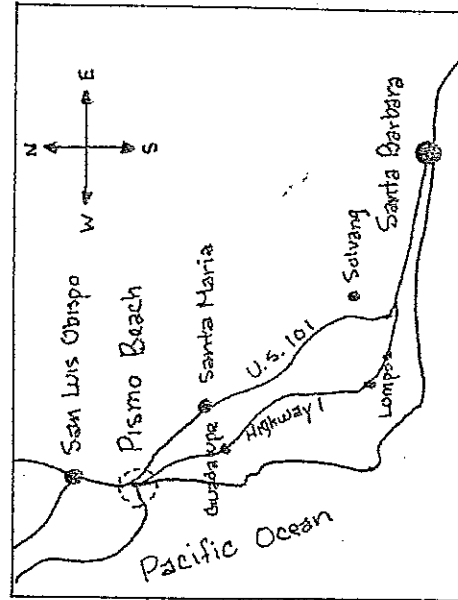
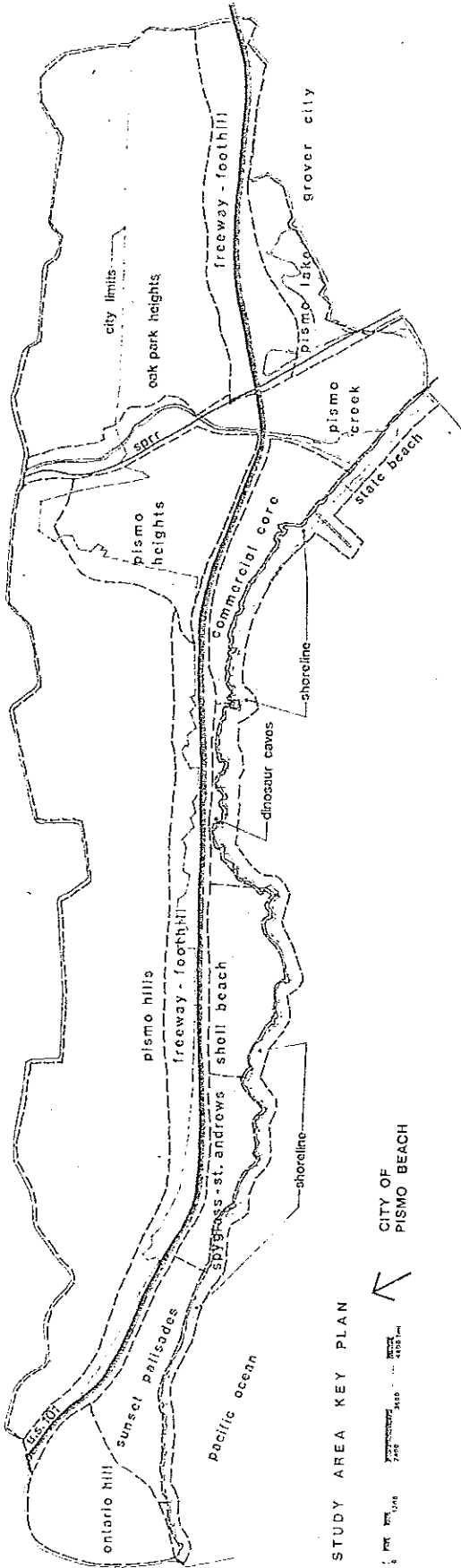


Plate 1 Locational Map



4TH STREET

1" 300'



PLATE 2

LAND OWNERSHIP

SAN  
LUIS  
CLINIC

PHILLIPS PETROLEUM CO.

Hwy. 101

UNIQUE STATIONS INC.

GULF OIL CORP. OF CALIF.

AQUEDUCT

FARMS

INC.

AGPO

REALTY

FIVE CITIES SHOPPING CENTER

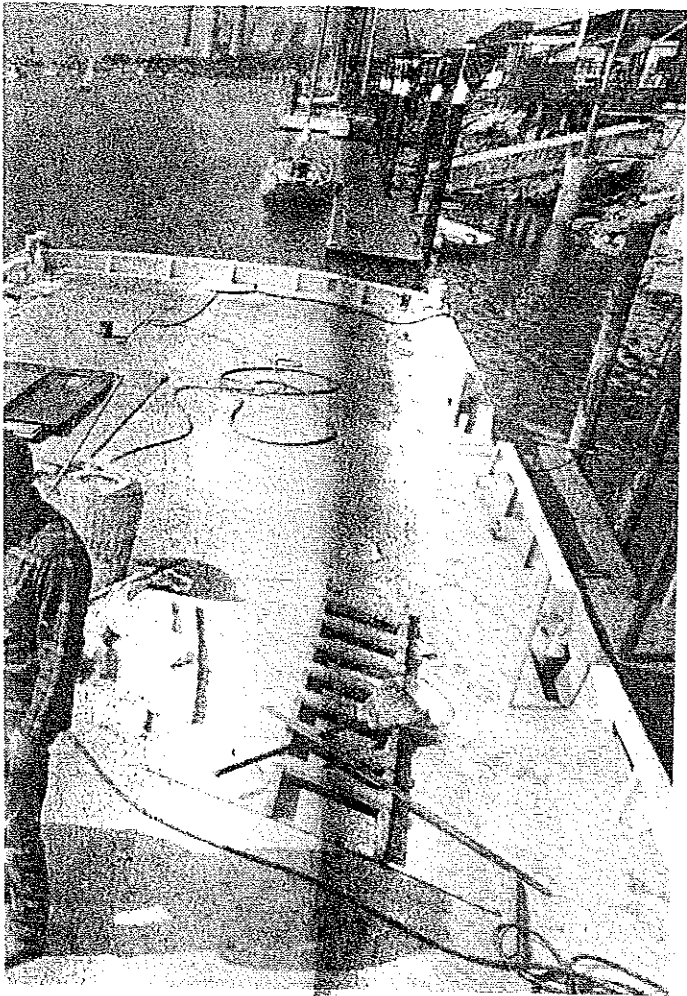
KIPLING CO. INC.

KIPLING CO. INC.

S. P. R. R.

Hwy 1





Robert Dyer/Telegram-Tribune

facilities. Sons Richard, center, and Keith, get to work.

# Pismo habitat could be at risk

By Patricia Porter  
Telegram-Tribune

One of the county's last, unspoiled riparian habitats would be destroyed if a proposed golf course is built in Price Canyon, according to a local environmentalist.

"Golf courses, while aesthetically attractive, are environmentally disastrous," said John Ashbaugh, executive director of the San Luis Obispo County Land Conservancy. "Wildlife would be affected terribly by replacing a relatively natural ecosystem of native oaks and grasses with exotic vegetation."

The Land Conservancy is hoping the land will be purchased and preserved in its natural state with money raised by hiking the state sales tax by half a cent in San Luis Obispo County.

Ashbaugh said he will be asking the county Board of Supervisors to put an initiative to raise the sales tax on the November ballot.

The tax would raise \$9 million a year. Much of it would be used for road repairs. But a portion would go to finance a \$30 million bond to buy open space, including land in Price Canyon just east of Pismo Beach.

"A (wildlife) survey of that canyon would probably show at least 200 species of vegetation, and 100 species of birds. It's really of regional significance as far as wildlife is concerned."

A golf course would damage that habitat and the fertilizers uses on the grass could pollute the ground water and leach into Pismo Creek, said Ashbaugh.

One way of minimizing damage, according to Ashbaugh, would be to build the course in the flatter, rolling



John Ashbaugh  
... warns of risk to ecosystem

country farther from the city limits and closer to Highway 227.

The Pismo Beach City Council has not decided whether to build the 150-acre, 18-hole, municipal course, and no specific plan has been proposed.

Councilman Jamie Foster was unaware of possible environmental hazards.

"I had not heard of any major environmental problems putting in golf courses," Foster said. "But we haven't gotten very far. I'm sure there's a lot we're going to learn."

Price Canyon is one of six sites targeted for preservation by the Land Conservancy, which hopes to purchase environmentally sensitive undeveloped land throughout the county.

## face in Morro

Alaska where it worked for Exxon, assisting with the oil spill clean-up effort. It ran workers and supplies between the camps where the crews were stationed.

Antone Sylvester Tug Service also owns and operates the Ensenada Express in San Diego.

The new, improved Colleen will be a sister ship to the Express. The two boats will be docked at the B Street Pier there.

According to Sylvester's president Dick Kelsey, the company intends to use the boat for passenger service between San Diego and Santa Catalina Island — permit applications for that service are still pending. It may also be used for additional service to Ensenada and will be available for

## Will sign at county line say 'Pop. 1,000,000?'

One million people will live in San Luis Obispo County within five decades, a Cal Poly professor predicts.

and more people.

"Ultimately, it's all a political decision," Crawford said.

**PISMO ECOLOGICAL RESERVE  
BIRD STUDY**

**By**

**Cathy A. Moore**

**Natural Resources Management Department  
California Polytechnic State University  
San Luis Obispo**

**1992**

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8/28/92  
Date

# PISMO ECOLOGICAL RESERVE BIRD STUDY

by

Cathy A. Moore

## ABSTRACT

This study was conducted to determine what species of birds are using the Pismo Ecological Reserve area, located in Pismo Beach, California, during the months of July and August in 1992.

The development of this ecological reserve was finished in 1986. Today many species of birds and wildlife use this reserve. There is a need for an information base on which birds are actually using this site. This information will be useful for future management. This study also looks briefly at the different habitats in this area.

This study was requested by Jim Lidberg, the Fish and Game Warden of San Luis Obispo County. The results of this study will be used by the Department of Fish and Game as part of an active management program for particular desired species.

CALIFORNIA POLYTECHNIC STATE UNIVERSITY  
Natural Resources Management Department  
August, 1992

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## ACKNOWLEDGEMENTS

I would like to thank Jim Lidberg for giving me the opportunity to do this study. The Department of Fish and Game's need for the results of this study made the project much more worthwhile for me.

I also appreciate Joan Carter, a member of the Morro Bay Audubon Society, for her valued knowledge of birds and for giving her time to help me with this project. Another great resource was Frank Little, President of the Morro Bay Audubon Society. He accompanied me to the site and helped with the identification of the many species of birds.

## INTRODUCTION

This project is directed towards two main objectives: 1) to discover what different bird species utilize the Pismo Ecological Reserve Area and 2) to give a basic description of the site and the different habitat types found in the area. Since this site has been developed there has been no information collected on which birds are using this location. This study serves to fulfill that need.

## HISTORY

In 1977 the Department of Fish and Game purchased property (69.15 acres) in Pismo Beach, California, to construct an ecological reserve area. The area already contained a pond with heavy sediment inflow. Eventually the tules took over the pond and it became solid tules with no open water. Construction began on the site and a new larger lake was created which included several islands. About seven thousand dollars has been spent by the Department of Fish and Game to complete this project. In 1986 the construction was finished.

Now that the project is complete, an information base on which species of birds are using the area, should be compiled for future management. Also an analysis of the habitat needs to be developed to help manage for particular desired species. For example, if the Department of Fish and Game desires more Black-headed Grosbeak in the area, they could provide a larger carrying capacity for these birds by increasing the coyote bush in their habitat.

### DESCRIPTION OF THE SITE

The Pismo Ecological Reserve is a sixty-nine acre site that is located in Pismo Beach, California (Figure 1). It is near 4th Street and Five Cities Drive behind the Pismo Beach Shopping Center. An entrance to the site is in the northwest corner of the Williams Brothers parking lot.

The site contains a thirty acre fresh water lake with several islands. There is a variety of different habitats in the reserve area including a salt marsh and swamp area, as well as dry grass lands.

The property is bisected by 4th Street. About eleven acres lie on the east side of 4th Street. The area is surrounded by housing sites as well as the noisy 4th Street that leads into Grover City. It is not very secluded or free from human presence. Despite this, the area seems to be alive with birds and other wildlife.

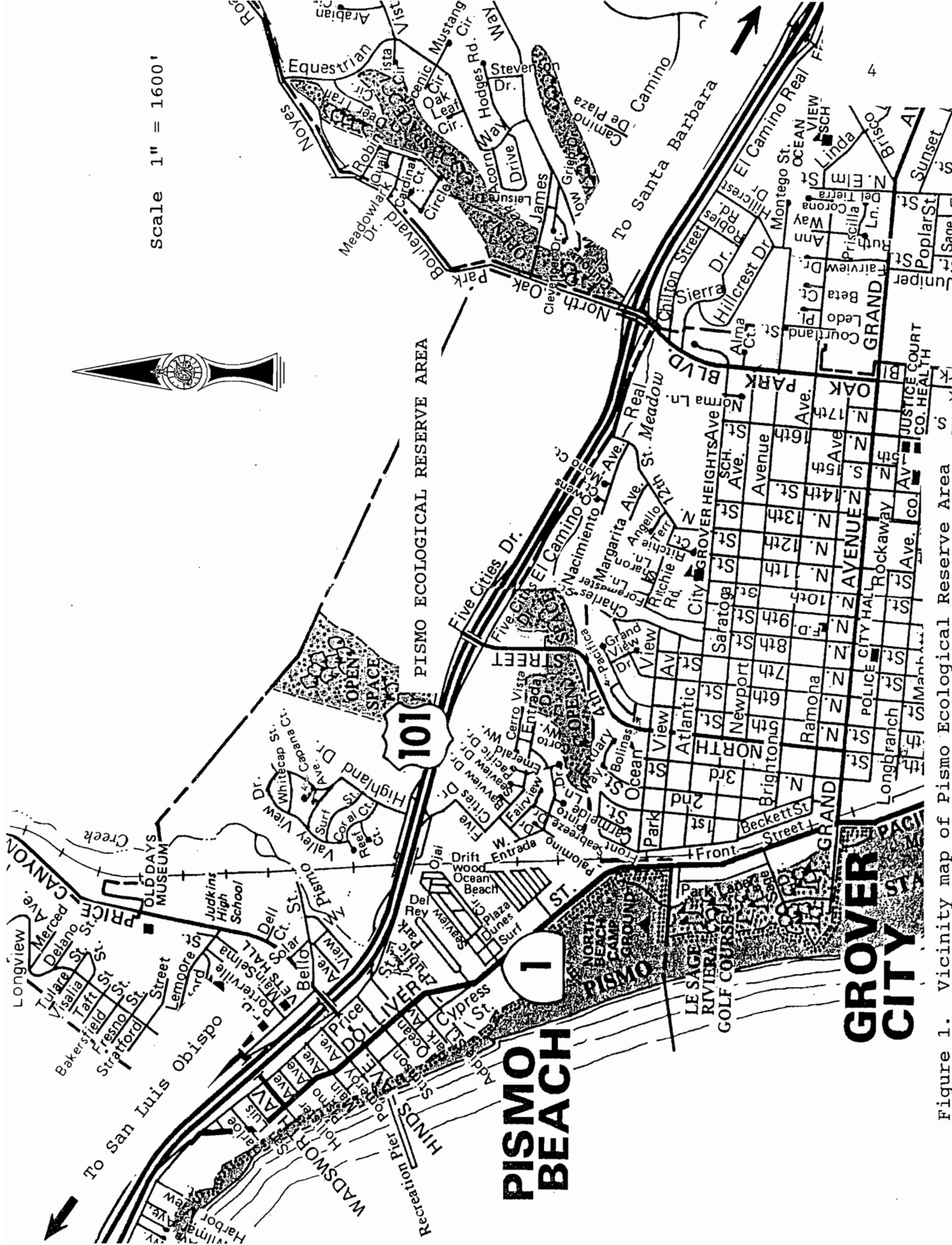
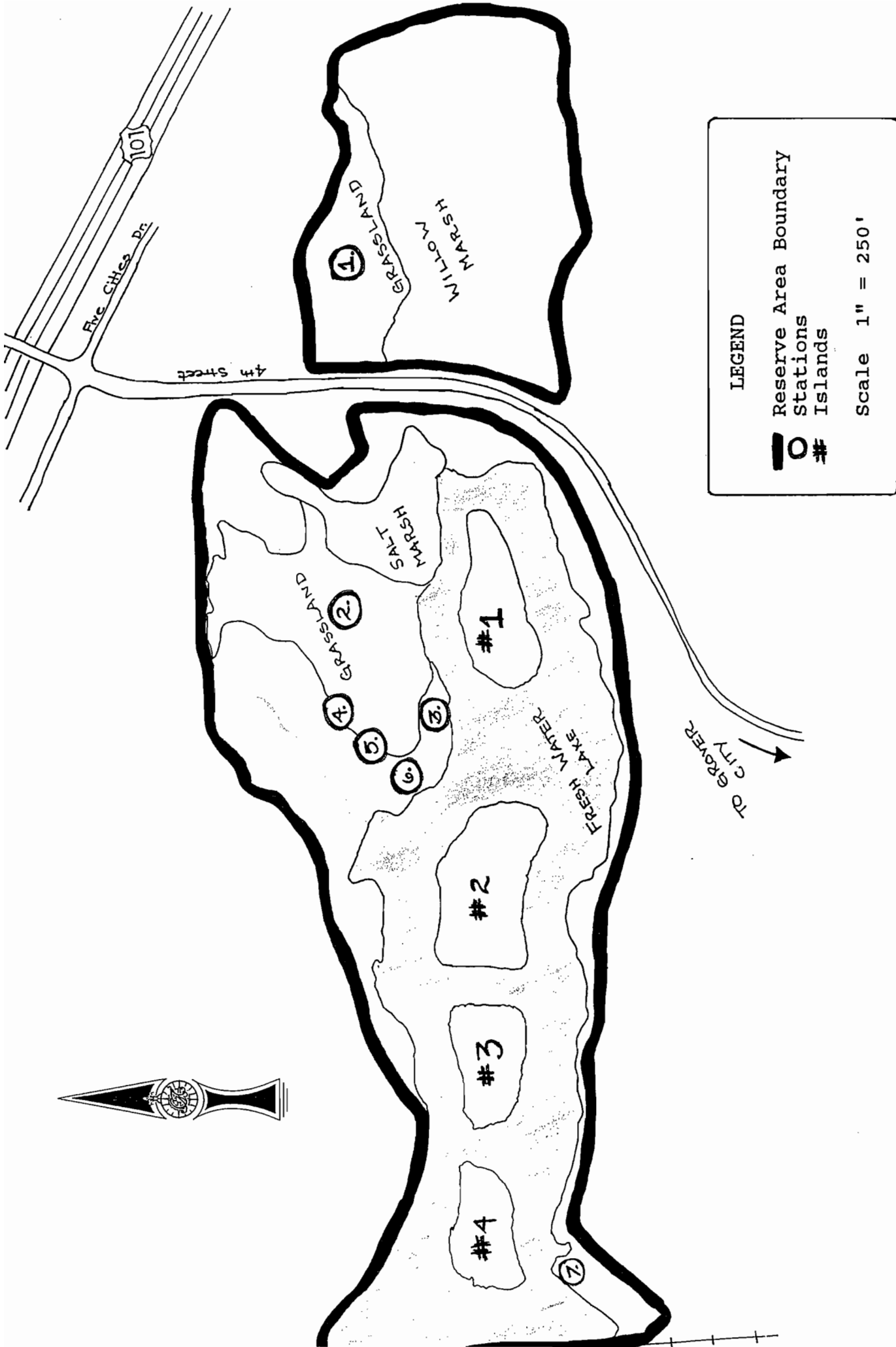


Figure 1. Vicinity map of Pismo Ecological Reserve Area

### Habitat Analysis

An aerial photograph of the area was provided by the Department of Fish and Game to help in the description of the habitat. This large photograph (4' x 2') was taken in December of 1987, a year after the project was finished. There has been some change since that time because the vegetation has been allowed to grow and thrive.

Figure 2 is a map of the reserve showing the various habitats. The smallest island, island #1, is approximately 1.54 acres. The second island is 1.63 acres. The third is 2.90 acres and the fourth island is approximately 1.97 acres. The saltmarsh is nearly 2.5 acres, but this may have changed in the last four years. The willow swamp located on the east side of 4th Street is approximately ten acres. There are approximately nine acres in dry grassland. This area is heavily populated with coyote bush (*Baccharis pilularis*) There is also a large amount of willows (*Salix lasiolepis*) in the area. The lake shores have grown heavy with tules (*Scirpus*) and reeds (*Trochoon*).



**LEGEND**

**—** Reserve Area Boundary

**○ #** Stations

**○ #** Islands

Scale 1" = 250'

Figure 2. Site map of Pismo Ecological Reserve Area



## PROCEDURE

All of the field work was done through direct observation. The information base of birds in the area was collected by a method called a standard count pattern. This method was used to count, identify, and observe the birds' behavior. Seven stations were established in the reserve area from which to observe and count the birds. These stations represented different habitats. These stations are identified in the site map located in Figure 2. Once-a-week trips to survey the birds were made starting July 13 and ending the week of August 17, 1992.

These once-a-week trips included visiting each station for a period of five minutes. Visits were generally made in the early morning hours (6 a.m. - 9 a.m.). Birds were most active at this time and least disturbed by human activity. The birds seen from each station during the five minutes were identified and the results are shown in Table 1. Also, an estimated count was recorded of the number of each species in the area. Their positions were also noted, whether in open water or active in the vegetated marsh, to determine which habitat they were using (Table 2).

Table 1. Common name and scientific names of the birds identified at the Pismo Ecological Reserve Area

Common Name	Scientific Name
Blackbird, Brewer's	<i>Euphagus cyanocephalus</i>
Blackbird, Red-winged	<i>Agelaius phoeniceus</i>
Bushtit	<i>Psaltriparus minimus</i>
Chickadee, Chestnut-backed	<i>Parus rufescens</i>
Coot, American	<i>Fulica americana</i>
Cormorant, Double Crested	<i>Phalacrocorax auritus</i>
Cowbird, Brown-headed	<i>Molothrus ater</i>
Crow, American	<i>Corvus brachyrhynchos</i>
Dove, Mourning	<i>Zenaida macroura</i>
Dove, Rock	<i>Columba livia</i>
Duck, Ruddy	<i>Oxyura jamaicensis</i>
Egret, Great	<i>Casmerodius albus</i>
Egret, Snowy	<i>Egretta thula</i>
Finch, House	<i>Carpodacus mexicanus</i>
Goldfinch, American	<i>Carduelis tristis</i>
Goldfinch, Lesser	<i>Carduelis psaltria</i>
Grebe, Pied-billed	<i>Podilymbus podiceps</i>
Grosbeak, Black-headed	<i>Pheucticus melanocephalus</i>
Gull, Ring-billed	<i>Larus delawarensis</i>
Gull, Western	<i>Lawus occidentalis</i>
Hawk, Red-tailed	<i>Buteo jamaicensis</i>
Heron, Black-crowned Night-	<i>Nycticorax nycticorax</i>
Heron, Great Blue	<i>Ardea herodias</i>
Hummingbird, Anna's	<i>Calypte anna</i>
Jay, Scrub	<i>Aphelocoma coerulescens</i>
Killdeer	<i>Charadrius vociferus</i>
Kingfisher, Belted	<i>Ceryle alcyon</i>
Mallard	<i>Anas platyrhynchos</i>
Mockingbird, Northern	<i>Mimus polyglottos</i>
Oriole, Hooded	<i>Icterus cucullatus</i>
Pewee, Western Wood-	<i>Contopus sordidulus</i>
Phoebe, Black	<i>Sayornis nigricans</i>
Pintail, Northern	<i>Anas acuta</i>
Sparrow, Song	<i>Melospiza melodia</i>
Starling, European	<i>Sturnus Vulgaris</i>
Swallow, Barn	<i>Hirundo rustica</i>
Swallow, Cliff	<i>Hirundo pyrrhonota</i>
Swallow, Tree	<i>Tachycineta bicolor</i>
Tern, Caspian	<i>Sterna caspia</i>
Towhee, Brown	<i>Pipilo fuscus</i>
Towhee, Rufous-sided	<i>Pipilo erythrophthalmus</i>
Vireo, Solitary	<i>Vireo solitarius</i>
Vulture, Turkey	<i>Cathartes aura</i>
Warbler, Wilson's	<i>Wilsonia pusilla</i>
Woodpecker, Downey	<i>Picoides pubescens</i>
Wren, Bewick's	<i>Thryomanes bewickii</i>
Wren, Marsh	<i>Cistothorus palustris</i>
Wrentit	<i>Chamaca fasciata</i>

Table 2. Common name and location sighted of the birds identified at the Pismo Ecological Reserve Area

---

Common Name	Location Sighted
Blackbird, Brewer's	coyote bush
Blackbird, Red-winged	tules
Bushtit	in reeds along shore
Chickadee, Chestnut-backed	willows
Coot, American	swimming
Cormorant, Double Crested	flying & on shore line
Cowbird, Brown-headed	coyote bush
Crow, American	flying
Dove, Mourning	flying
Dove, Rock	flying
Duck, Ruddy	swimming
Egret, Great	flying & on log
Egret, Snowy	willows & on shore line
Finch, House	coyote bush
Goldfinch, American	willows
Goldfinch, Lesser	willows
Grebe, Pied-billed	swimming
Grosbeak, Black-headed	coyote bush
Gull, Ring-billed	flying
Gull, Western	flying
Hawk, Red-tailed	flying
Heron, Black-crowned Night-	in reeds along shore
Heron, Great Blue	flying & on shore line
Hummingbird, Anna's	willow tree tops
Jay, Scrub	willows
Killdeer	flying
Kingfisher, Belted	flying
Mallard	swimming
Mockingbird, Northern	coyote bush
Oriole, Hooded	willows
Pewee, Western Wood-	willows
Phoebe, Black	coyote bush
Pintail, Northern	flying
Sparrow, Song	willows
Starling, European	flying
Swallow, Barn	flying & reeds along shore
Swallow, Cliff	flying
Swallow, Tree	flying
Tern, Caspian	flying
Towhee, Brown	willows & on ground
Towhee, Rufous-sided	willows
Vireo, Solitary	willows
Vulture, Turkey	flying
Warbler, Wilson's	willows
Woodpecker, Downey	tall dead tree
Wren, Bewick's	willows
Wren, Marsh	coyote bush
Wrentit	in reeds along shore

---

Most birds had to be identified using binoculars, so some overlapping of the recorded birds did occur; but it was minimized as much as possible.

### INTERPRETATION OF DATA

The results of this study were very interesting. Even though the study only covered about a month's time, the results are still useful. This senior project was to be completed in the summer quarter at California Polytechnic State University. During this time frame, including submitting my proposal and turning in the completed project, only a six week period was allowed to do this study. A continuation of this study for a prolonged period, one year or more, would give much more detail in data records and trends.

Overall, forty-eight different species of birds were identified. This is a fairly good number considering that the breeding season is over. The number of different birds seen after the breeding season is usually lower. There is a need to extend this study through the breeding season. This will give a more accurate record of the birds using the reserve.

The birds identified in the area were all common and expected to be found there except for the sighting of one Northern Pintail which flew over the area early in the study. They are more commonly seen around April. No

unusual or rare birds were seen during the duration of the study.

The data was condensed to show the total number of birds sighted in the area during the duration of the study (Figure 3). The most abundant birds identified, by far, were the cliff swallows. There were approximately eight-hundred of these birds seen over the observation period. There were over one-hundred blackbirds, finches, herons, mallards, and sparrows counted. Some of the birds were only seen during one visit and then not seen again, such as the Wilson's Warbler.

One very noticeable trend was the increase in the amount of mallards at the site. The first couple of weeks only a few mallards were seen. By the end of the study over twenty mallards were seen at several different stations on the same visit. They also became very active and were flying around the area frequently. Mallards are known to move around a lot to different ponds, so the increase is most likely due to this trend.

One other very noticeable trend was a decrease in the amount and variety of swallows in the reserve area. At the start of the study, the area was dominated by swallows. Well over two-hundred birds were flying around, catching insects, on each visit to the site. By the last two weeks

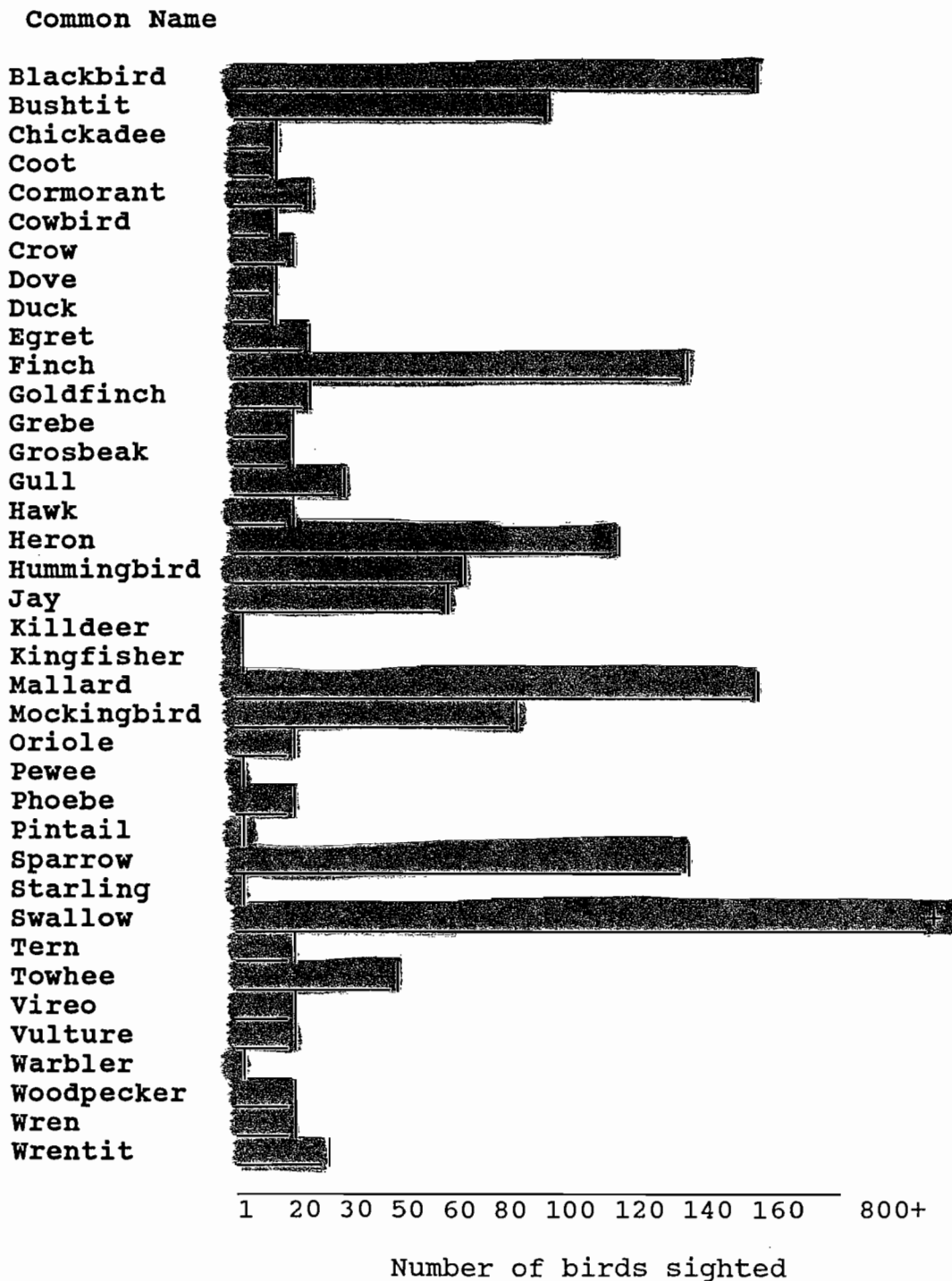


Figure 3. Total number of each species of birds seen from 7/16/92 to 8/21/92 at the Pismo Ecological Reserve Area

the amount of swallows seen had dropped significantly. This could be due to changes in the temperature for each visit. When the sun finally came out the swallows activity slowed because of the increasing temperature. But this factor was not always consistent with the number of swallows seen. Another possibility for this trend could be due to the fact that when the study began the swallows were just ending their breeding season. This would mean a lot more activity for these birds and they would be spotted easily.

The total number of birds identified at each station during the duration of the study was compared and the results are shown in Figure 4. Station 1 was located in the grassland on the outskirts of the thick willow swamp. The total number of birds seen there was around two hundred.

Stations 3, 4, 5, and 6 were all located on the edge of the grasslands next to a creek filled with willows. Station 3 was a location of the most sightings because it looked out over the lake. The highest number of birds observed was from station 2. This location looked out over the salt marsh and a highly vegetated inlet of the lake.



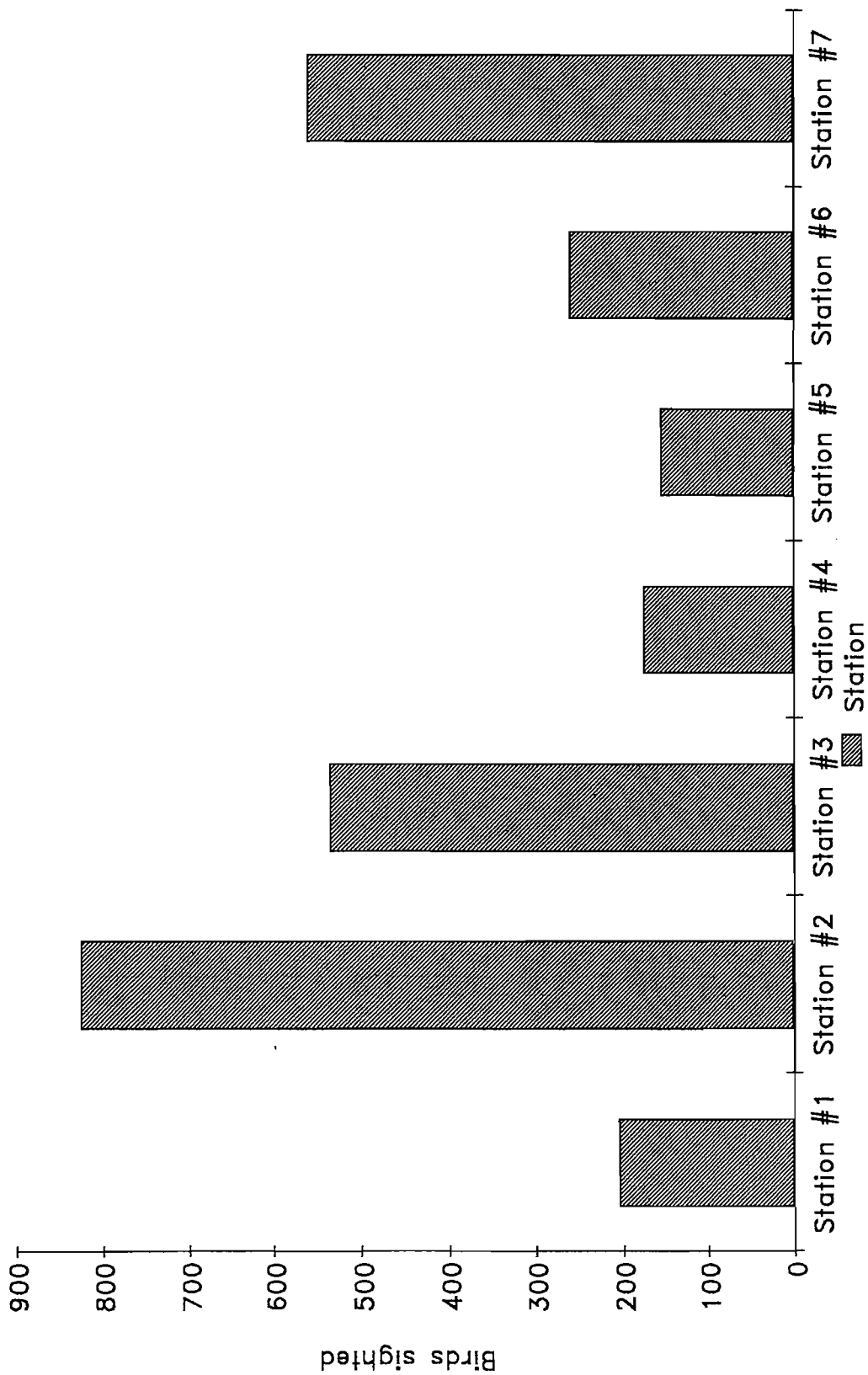


Figure 4. Total number of birds sighted at each station from 7/16/92 to 8/21/92 at the Pismo Ecological Reserve Area

### CONCLUSION

The overall findings of this study can be very useful in the future management of this reserve area. A continuation of this study is recommended to get a larger data base. This can lead to a more thorough and accurate description of the birds using this site.

The Pismo Ecological Reserve Area is a great and beautiful benefit to the Pismo Community and neighboring cities. In the midst of human disturbance, it is a priceless sanctuary. This land is an asset to the community. I hope it will continue to serve its purpose as a wildlife sanctuary and a learning tool for the public.

## BIBLIOGRAPHY

- Edell, Tom. 1985. The Birds of San Luis Obispo County California. Morro Coast Audubon Society.
- Peterson, Roger Tory. 1961. A Field Guide to Western Birds. Houghton Mifflin Company.
- Robbins, Chandlers. 1983. A Guide to Field Identification Birds of North America. Western Publishing Company Inc.
- Udvardy, Miklos D.F. 1977. The Audubon Society Field Guide to North American Birds. Alfred A. Knoph. Leaflet.

## Appendix

Date: 7/16/92  
 Time: 7:00 AM  
 Conditions: cool, foggy

S T A T I O N

	1	2	3	4	5	6	7
1 Blackbird, Brewer's		S					
2 Blackbird, Red-winged			F				
3 Bushtit						S	
4 Chickadee, Chestnut-backed							
5 Coot, American							
6 Cormorant, Double Crested							F
7 Cowbird, Brown-headed		F					
8 Crow, American							
9 Dove, Mourning							
10 Dove, Rock							
11 Duck, Ruddy							
12 Egret, Great							
13 Egret, Snowy						F	
14 Finch, House		S			S		
15 Goldfinch, American							
16 Goldfinch, Lesser							
17 Grebe, Pied-billed							
18 Grosbeak, Black-headed							
19 Gull, Ring-billed							
20 Gull, Western							
21 Hawk, Red-tailed							
22 Heron, Black-crowned Night-			F				
23 Heron, Great Blue				F			
24 Hummingbird, Anna's				F			
25 Jay, Scrub							
26 Killdeer							
27 Kingfisher, Belted							
28 Mallard			F				
29 Mockingbird, Northern		S					
30 Oriole, Hooded							
31 Pewee, Western Wood-							
32 Phoebe, Black							
33 Pintail, Northern							
34 Sparrow, Song			S				
35 Starling, European							
36 Swallow, Barn		F					
37 Swallow, Cliff	F	M	M			M	M
38 Swallow, Tree							
39 Tern, Caspian			F				
40 Towhee, Brown							
41 Towhee, Rufous-sided			F				
42 Vireo, Solitary				F			
43 Vulture, Turkey							
44 Warbler, Wilson's							
45 Woodpecker, Downey							
46 Wren, Bewick's							
47 Wren, Marsh							
48 Wrentit							

F = few : 1-5 birds  
 S = several : 5-20 birds  
 M = many : more than 20 birds

Date: 7/24/92  
Time: 8:00 AM  
Conditions: cool, foggy

S T A T I O N

	1	2	3	4	5	6	7
1 Blackbird, Brewer's		F		F			
2 Blackbird, Red-winged		M					
3 Bushtit						S	
4 Chickadee, Chestnut-backed							F
5 Coot, American							F
6 Cormorant, Double Crested					F		
7 Cowbird, Brown-headed							
8 Crow, American							
9 Dove, Mourning			F	F			
10 Dove, Rock							F
11 Duck, Ruddy							F
12 Egret, Great			F				F
13 Egret, Snowy							F
14 Finch, House	F	F		F	F	F	
15 Goldfinch, American					F		
16 Goldfinch, Lesser						F	
17 Grebe, Pied-billed			F				
18 Grosbeak, Black-headed					F		F
19 Gull, Ring-billed						F	F
20 Gull, Western							F
21 Hawk, Red-tailed				F			
22 Heron, Black-crowned Night-						S	S
23 Heron, Great Blue							F
24 Hummingbird, Anna's				F			
25 Jay, Scrub							
26 Killdeer							
27 Kingfisher, Belted		F					
28 Mallard			F				
29 Mockingbird, Northern		F		F			
30 Oriole, Hooded				F			
31 Pewee, Western Wood-						F	
32 Phoebe, Black					F		F
33 Pintail, Northern							F
34 Sparrow, Song	S					S	
35 Starling, European							F
36 Swallow, Barn							F
37 Swallow, Cliff	F	M	M			S	M
38 Swallow, Tree							F
39 Tern, Caspian							F
40 Towhee, Brown							
41 Towhee, Rufous-sided				F	F		
42 Vireo, Solitary							
43 Vulture, Turkey				F			
44 Warbler, Wilson's							F
45 Woodpecker, Downey							
46 Wren, Bewick's	F						
47 Wren, Marsh							
48 Wrentit						F	

F = few : 1-5 birds  
S = several : 5-20 birds  
M = many : more than 20 birds

Date: 7/31/92 21  
 Time: 8:00 AM  
 Conditions: cool, foggy

	S T A T I O N						
	1	2	3	4	5	6	7
1 Blackbird, Brewer's							
2 Blackbird, Red-winged		M					
3 Bushtit							S
4 Chickadee, Chestnut-backed							
5 Coot, American							
6 Cormorant, Double Crested							
7 Cowbird, Brown-headed							
8 Crow, American		F					
9 Dove, Mourning							
10 Dove, Rock							
11 Duck, Ruddy							
12 Egret, Great						F	
13 Egret, Snowy							
14 Finch, House	F						
15 Goldfinch, American	F						
16 Goldfinch, Lesser							
17 Grebe, Pied-billed							
18 Grosbeak, Black-headed							
19 Gull, Ring-billed					F		
20 Gull, Western							
21 Hawk, Red-tailed							
22 Heron, Black-crowned Night-			F			F	F
23 Heron, Great Blue							
24 Hummingbird, Anna's					F		
25 Jay, Scrub	F						
26 Killdeer							
27 Kingfisher, Belted							
28 Mallard		S				F	F
29 Mockingbird, Northern		F	F	F			
30 Oriole, Hooded							
31 Pewee, Western Wood-							
32 Phoebe, Black							
33 Pintail, Northern							
34 Sparrow, Song		S					
35 Starling, European							
36 Swallow, Barn							
37 Swallow, Cliff	F	M	M			S	M
38 Swallow, Tree							
39 Tern, Caspian							
40 Towhee, Brown							
41 Towhee, Rufous-sided	F						
42 Vireo, Solitary							
43 Vulture, Turkey	F						
44 Warbler, Wilson's							
45 Woodpecker, Downey							
46 Wren, Bewick's							
47 Wren, Marsh							
48 Wrentit	F						

F = few : 1-5 birds  
 S = several : 5-20 birds  
 M = many : more than 20 birds

Date: 8/7/92  
 Time: 8:00 AM  
 Conditions: cool, sunny

S T A T I O N

	1	2	3	4	5	6	7
1 Blackbird, Brewer's							
2 Blackbird, Red-winged		S	S				
3 Bushtit							
4 Chickadee, Chestnut-backed							
5 Coot, American							
6 Cormorant, Double Crested							F
7 Cowbird, Brown-headed					F		
8 Crow, American				F			
9 Dove, Mourning							
10 Dove, Rock							
11 Duck, Ruddy							
12 Egret, Great							
13 Egret, Snowy							
14 Finch, House	F	F		S		F	F
15 Goldfinch, American							
16 Goldfinch, Lesser							
17 Grebe, Pied-billed		F					F
18 Grosbeak, Black-headed			F				
19 Gull, Ring-billed		F					
20 Gull, Western							
21 Hawk, Red-tailed							
22 Heron, Black-crowned Night-			S			F	S
23 Heron, Great Blue			F				
24 Hummingbird, Anna's					F		
25 Jay, Scrub	F			F	S		
26 Killdeer							
27 Kingfisher, Belted							
28 Mallard		S					
29 Mockingbird, Northern		F	F				
30 Oriole, Hooded							
31 Pewee, Western Wood-							
32 Phoebe, Black							
33 Pintail, Northern							
34 Sparrow, Song			S				S
35 Starling, European							
36 Swallow, Barn		F	M				
37 Swallow, Cliff		M					M
38 Swallow, Tree							
39 Tern, Caspian							
40 Towhee, Brown	F						
41 Towhee, Rufous-sided							
42 Vireo, Solitary							
43 Vulture, Turkey		F					
44 Warbler, Wilson's							
45 Woodpecker, Downey							
46 Wren, Bewick's							
47 Wren, Marsh							
48 Wrentit							

F = few : 1-5 birds  
 S = several : 5-20 birds  
 M = many : more than 20 birds



Date: 8/16/92Time: 7:30 AMConditions: cool, sunny

	S T A T I O N						
	1	2	3	4	5	6	7
1 Blackbird, Brewer's		F					
2 Blackbird, Red-winged		S					
3 Bushtit	S						
4 Chickadee, Chestnut-backed							
5 Coot, American			F			F	
6 Cormorant, Double Crested			F				
7 Cowbird, Brown-headed							
8 Crow, American				F			
9 Dove, Mourning							
10 Dove, Rock							
11 Duck, Ruddy			F			F	
12 Egret, Great							
13 Egret, Snowy							
14 Finch, House		S		S			
15 Goldfinch, American					F		
16 Goldfinch, Lesser		F					
17 Grebe, Pied-billed			F				
18 Grosbeak, Black-headed							
19 Gull, Ring-billed			F				
20 Gull, Western							
21 Hawk, Red-tailed				F			
22 Heron, Black-crowned Night-			F				
23 Heron, Great Blue							
24 Hummingbird, Anna's	S				S		
25 Jay, Scrub	F			F			
26 Killdeer		F					
27 Kingfisher, Belted							
28 Mallard			S				F
29 Mockingbird, Northern			S		S		
30 Oriole, Hooded							
31 Pewee, Western Wood-							
32 Phoebe, Black							
33 Pintail, Northern							
34 Sparrow, Song	S						
35 Starling, European							
36 Swallow, Barn							
37 Swallow, Cliff		M					M
38 Swallow, Tree							
39 Tern, Caspian		F					
40 Towhee, Brown	F						
41 Towhee, Rufous-sided					F		
42 Vireo, Solitary					F		
43 Vulture, Turkey							
44 Warbler, Wilson's							
45 Woodpecker, Downey	F						
46 Wren, Bewick's	F			F			
47 Wren, Marsh			F				
48 Wrentit		F					

F = few : 1-5 birds

S = several : 5-20 birds

M = many : more than 20 birds

Date: 8/21/92  
Time: 7:30 AM  
Conditions: cool, foggy

S T A T I O N

	1	2	3	4	5	6	7
1 Blackbird, Brewer's			F				
2 Blackbird, Red-winged	F	F	F				
3 Bushtit			S				S
4 Chickadee, Chestnut-backed							F
5 Coot, American							F
6 Cormorant, Double Crested			F				
7 Cowbird, Brown-headed							
8 Crow, American							F
9 Dove, Mourning							
10 Dove, Rock							
11 Duck, Ruddy			F				
12 Egret, Great							
13 Egret, Snowy							
14 Finch, House	F			S			
15 Goldfinch, American							
16 Goldfinch, Lesser							
17 Grebe, Pied-billed							
18 Grosbeak, Black-headed							
19 Gull, Ring-billed							
20 Gull, Western							
21 Hawk, Red-tailed		F					
22 Heron, Black-crowned Night-						S	F
23 Heron, Great Blue							
24 Hummingbird, Anna's				F			
25 Jay, Scrub	F			F	F		
26 Killdeer							
27 Kingfisher, Belted							
28 Mallard		M				F	M
29 Mockingbird, Northern	F	F		F	F		
30 Oriole, Hooded				F			
31 Pewee, Western Wood-							
32 Phoebe, Black							
33 Pintail, Northern							
34 Sparrow, Song		S					S
35 Starling, European							
36 Swallow, Barn							
37 Swallow, Cliff		F					F
38 Swallow, Tree							
39 Tern, Caspian							
40 Towhee, Brown	F						
41 Towhee, Rufous-sided							
42 Vireo, Solitary							
43 Vulture, Turkey				F			
44 Warbler, Wilson's							
45 Woodpecker, Downey	F						
46 Wren, Bewick's							
47 Wren, Marsh							
48 Wrentit							

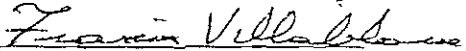
F = few : 1-5 birds  
S = several : 5-20 birds  
M = many : more than 20 birds



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DATE SUBMITTED: March 7, 2001

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Spring 2000 Bird Survey of Pismo Lake Ecological Reserve

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San Luis Obispo

2001

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## INTRODUCTION

Pismo Lake Ecological Reserve (PLER), our study site, is located within San Luis Obispo County, California. The reserve is on the ocean side of Highway 101, directly between the Union Pacific railroad tracks and 4th Street, about ½ mile from the coast. This area lies on the southern edge of Pismo Beach city limits and is bordered to the south by the city of Grover Beach (Figure 1).

The boundaries of PLER have been defined by human development. The 69-acre reserve is composed of a variety of habitats including a 30-acre lake, marsh vegetation, riparian corridors, oak woodlands, coastal scrub, and grasslands. The lake is unique because it is influenced by both fresh and salt water (Honeycutt 1999). This is a contributing factor to the high plant and animal biodiversity seen in these wetlands. Wetlands, in general, are characterized by high levels of both nutrient content and productivity, which support a large invertebrate biomass. These, in turn, support many species of amphibians, birds and mammals (Brewer 1994). Birds utilize wetlands for feeding, breeding and nesting purposes. Moreover, migratory species depend on wetlands as rest stops and water sources along their journeys. PLER is located along the Pacific Flyway, a major migratory route (Welty 1988).

Wetlands are delicate ecosystems, influenced by on-site and upstream activity. PLER has remained relatively "isolated" from direct human disturbance. This seclusion is a contributing factor to the large biodiversity found at PLER. There is no maintained trail for public access or a designated entrance. Areas of poison-oak, blackberry patches, and steep slopes prevent public use. Reaching the islands requires crossing the lake in a boat or canoe. Unfortunately, years of shortsighted development along Meadow Creek, upstream from Pismo Lake, caused mass sedimentation deposits, which reduced the lake to merely 2.5 acres of open water. In 1986, the California Department of Fish and Game (DFG) and the Soil Conservation Service combined efforts to restore PLER to its previous 30 acres of lake. Sediment removal and re-vegetation were finished in 1987 (Honeycutt 1999). Since that time, Pismo Beach and Grover Beach have been pressuring DFG to develop the property in various ways. Although biological studies were conducted on the reserve prior to the restoration project, none have been completed to investigate the reserve post-restoration. Without these studies, DFG cannot assess how successful the

project has been. One of the department's main goals is to retain the integrity of the wetlands as a reserve, but, unfortunately, DFG has no formal evidence to justify preventing development of the area.

Our role is to provide DFG with a comprehensive inventory of the resident and migratory bird species using the reserve in the spring of 2000. Our purpose also includes, not only identifying species, but also associating them with particular habitats in the reserve. Another point of interest would be to acknowledge which of the species are endangered, threatened, or of special concern. This study is not intended to be quantitative with respect to demographics, populations or territory sizes. In addition, we are not attempting to align ourselves with either side of the development issue.

## MATERIALS and METHODS

The following methods were created in order to perform a study on PLER to produce a list of all bird species observed over the period from March 28, 2000 to June 5, 2000, along with the habitats they were perceived to use. Before the actual birding began, time was spent at the site assessing the sizes and shapes of the reserve's habitats, so that birds would be observed from stations representative of all areas. Transects were chosen as the basis for observations. Each of six habitats (grassland, Coast Live Oak woodland, willows, Northern coastal scrub dominated by Coyote Bush (*Baccharis pilularis*), reeds dominated by a *Scirpus* Bulrush, and lake) were represented with one or more transects, which were intended to include at least four stations per transect. Care was taken to remove as much bias as possible. For example, stations amongst the reeds were placed along the mainland, as well as the islands.

Staking out of the birding stations was done in the following manner:

1. A specific habitat was entered from a randomly chosen spot, and an area was chosen within (surrounded by that specific habitat for  $\geq 25$  meters when possible) that habitat to be the site for the first stake of the transect.
2. A wooden stake was hammered into the soil, and fluorescent pink tape was tied around it. The tape was then labeled according to its station number, designated in the following manner:
  - a. Each transect was given a specific letter, between A and I. Each station was designated "the letter" followed by a number combination, which read how many meters the station was from the first station in that transect (Table 1 & Figure 2). For example, a station which was marked "C 1 + 50" was on the "C" transect, 150 meters from that transect's origin, station "C 0 + 00."

Note: Stakes were not used in the reeds. Instead, the tape was simply tied to a bundle of reeds at the estimated intervals along the transect.

3. Thirty-eight stations were set up, representing all habitats except for the lake. All attempts were made to make the station intervals along a transect 50 meters in length. One person stood at a freshly staked station, and another person walked ahead with a tape measure, staying completely within the habitat, until 50 meters of tape was unrolled. Every effort was also made to walk in a nearly straight path (to get 50 meters from the previous station), but within the willows, oak woodland, and alongside the reeds that was impossible. So, within the willows and oaks, 50 meters was unrolled, but the complete transect line was not always straight. Along the reeds, the 50 meters were estimated.

Note: The matter of importance was that stations within a transect were far enough away from each other, or that the view from one station to another was obstructed by vegetation, so that an area observed from one station did not overlap with other stations' observational radii. To this end, multiple counts of the same bird were minimized. (Of course, with birds' movements and the distance traveled by the songs/calls of birds, observations of the same bird more than once could not be eliminated.) The 50 meter interval was based on two assumptions, 1) 25 meters, or halfway to the next station, was a comfortable maximum distance to allow identification of birds, and 2) an average territory size for a bird would have a radius of roughly 25 meters, decreasing our chances of recounting the same bird from the previous station.

4. The number of stations per habitat type was a function of amount of each habitat in PLER. This was only an approximation, since determining actual habitat area was not within the scope of this project.

**Time spent birding at each station:**

1. One of the goals of the study was to log a total of 40 hours of birding. Those hours did not include looking through field guides, use of the CD player (not to instigate "callbacks," but) for self-reassurance of correct identification of birds through their vocalizations, or any other action that took focus of eyes and ears away from observational area. In order

to accumulate 40 hours, 4 minutes was spent at each of the 50 stations, twelve times through. One "cycle" constituted hitting all 50 stations (50 stations/cycle X 4 minutes/station X 12 cycles = 2400 minutes, or 40 hours). The total of 50 stations was the result of a combination of the previously mentioned 38-staked stations plus 12 "floating, drifting" stations on the lake (see below).

2. The lake was treated slightly differently. Twelve "floating stations" were chosen to represent the lake for two reasons, 1) to get a total of 50 stations, and, the more scientific reason, 2) if the lake was considered a linear habitat like our others, then the 691.2 meter "length" divided by 50 meter intervals equals approximately 14 stations. It was decided that 12 stations would suffice. The "length" measure was derived from measuring, with measuring tape, the real length of a city block that could be found on an aerial photograph of the reserve and surrounding area, and scaling the map accordingly to acquire the real length of the lake.

The birding for data collection procedure follows:

1. Upon arrival to the reserve, air temperature (measured with a laboratory thermometer), date and starting time, sky conditions (with designations, such as "clear," "high fog," and the like), wind speed (according to the Beaufort Wind Scale, Table 2), and the names of the birders were recorded on the data sheet (Table 3).
2. The transect to begin on was chosen on a day-to-day basis. A goal of the study was to collect data from each transects at various times throughout the day. Emphasis, and consequently more birding time, was placed on the morning hours, since it is well known that breeding birds are most active in the early morning hours (See Table 4 for a breakdown on the number of times transects were visited at different time periods throughout the day).
3. Any station along the transect could be chosen to start with, as long as all stations on the transect were hit once.
4. On arriving at a station, a "quiet-down" period took place before the start of the 4 minutes. This period was to let any birds that may have been scared off by the approach of the birders

return to the area. Hence, longer "quiet-down" periods were taken with noisier approaches. "Quiet-down" periods lasted between 1 to 3 minutes.

5. The 4 minutes was then begun on a stopwatch. As long as the time was running, eyes and ears were devoted solely to birding the area surrounding that station. Birds using adjacent habitats were not recorded under that station (See below). Binoculars were used immensely for scanning for bird activity as well as to get a close-up look of potential identifications. The time could be stopped as often as necessary, at any time, for any reason, such as to look a bird up in the field guide, check bird songs/calls on the CD player, etc. The time would then resume until the 4 minutes expired. In practice, the time was stopped seldom.
6. When a bird was accurately identified, its species name was recorded onto the data sheet (Table 3), under that station number. If more than one member of that species was observed, and if time permitted, numbers of individuals were estimated. Any additional notes on the observation were recorded if time permitted also. "Observations" by sight or sound were recorded. Birds that could not be accurately identified were not recorded. Of course, it was possible to observe multiple species at a single station, and all species observed were recorded.

Note: The term "observation" is key. This is because recounts of the same birds could not be avoided at all times. For this reason, throughout the study, each station was treated independently, in that any bird observed from that station was recorded under that station number, regardless of the possibility that it may have been the same one observed from the last station. Therefore, our counts are not to be interpreted as population counts, but instead a measure of the number of "observations."

7. At the conclusion of the 4 minutes, birder(s) next moved on to the remaining stations on that transect, until the transect was complete.
8. The next transect to be birded was chosen according to 1) how close it lie to the transect just completed, and 2) the aforementioned goal of hitting all transects at various times

throughout the day.

Note regarding **birding on the lake**: A canoe was used to move around the lake's entirety, birding along the way. Forty-eight minutes were spent birding on the lake, since 4 minutes multiplied by the 12 "floating, drifting" stations equals that amount of time. The lake was considered transect "1," and number designations for the 12 "stations" were not used.

9. Birds observed (either with time running, or not) outside of the habitat in which one was birding could be recorded, but only in the following manner: Birds that were seen only using the air, and not a specific habitat on the ground, would be noted as "aerial" on the data sheet, and would later be included in "Aerial" section of the master list (to be described later). Birds that were observed 1) in a habitat outside of the habitat in which one was birding, or 2) at a time when the clock was not running (for example, walking between stations or transects) could be noted on the data sheet as birds observed "en route," and would be thus categorized on the master list. Observations recorded "en route" also had to include the habitat the bird was using.
10. A portable CD player and speakers with two CDs containing a comprehensive collection of bird songs/calls were used whenever desired to attempt to call out secretive or unidentified birds. Primary use took place along the reeds and in the willows.
11. When birding was complete for the day, ending time was recorded. If the full cycle of 50 stations was completed in that single outing, it was recorded as such on the data sheet. If the outing was not a complete cycle, it was recorded as "Part 1" (if a new cycle was started that day) or "Part 2" (if an unfinished cycle was completed). Splitting a cycle up into more than 2 outings was avoided. Part 2 was done at the soonest day possible after leaving a cycle uncompleted.
12. **A master data list** (Table 5) was created on a spreadsheet, and updated after each outing. As more cycles were completed, the estimated counts (number of observations for each species) gave way to the relative abundance designations, "rare, uncommon, common, and abundant." These were easy to assign with time spent on the reserve. The intent of



the list was to have a running log of all observations from the field, including species, and the habitat they were using, and any "en route" or "aerial" observations, as well as random, dated notes, such as "beaver spotted (4/4)."

13. Following the completion of the twelfth and final cycle, the master data list was updated, finalized, analyzed, and submitted to DFG. It represented an attempt to provide a species-habitat-association report (Table 6), which was as comprehensive and as up-to-date as possible.
14. All stakes, tape, and canoe were then removed from the reserve.

## RESULTS

After twelve completed cycles, we observed seventy-two bird species utilizing PLER. Species information is detailed in the Master Data List and Species-Habitat-Association Report of Appendix A (Tables 5 and 6 respectively).

The Master Data List is a tally of the actual data sheets used in the field. This list acknowledges each habitat (separate transects of the same habitat designation are combined) and the species which were observed utilizing that habitat. The list includes the number of times a species was observed and how many cycles it was observed. Any notes or additional observations recorded in the field have been included.

The Species-Habitat-Association Report attempts to relate a species to the habitat that it was observed in. An X in a Habitat column indicates the presence of a species; it does not denote the number of times a species was observed in the particular habitat. The column Total refers to the number of habitats a species was observed using throughout the entire length of the study. The row Habitat Diversity Totals is the total number of bird species observed in that habitat. For example, using this indicator value, the willow habitat proves to be the most diverse habitat with thirty-seven different species observed.

## DISCUSSION

The CDFG web site and references therein were used to evaluate the 72 species found on PLER. None of the birds currently observed a PLER are ranked on the State or Federal listings for Endangered, Threatened or Special Concern Species. However, 14 of the species do carry rankings of other kinds, which may prove useful when considering the future of PLER (Table 7). Several of these lists carry legal authority, that may necessitate special protection; others do not. For example, 5 of the species appear only on the Audubon Watchlist, which hold no authority, but can be used as an additional tool when helping to conserve local bird populations. Even a list that holds no legal authority may be indicative of a problem in the future and warrants attention. All were included because they are recognized by CDFG either in our state, or nationwide. (For detailed explanations of list and ranks see Appendix C.)

Of the 14 species with rankings, only those observed utilizing the reserve will be discussed. Both the **Northern harrier** and **Caspian tern** were recorded at the reserve as aerial species during 1 and 2 cycles respectively. It is possible that either species could use PLER as an area to hunt/fish, but our data does not illustrate this. Their presence should be duly noted for future studies, but at this time, does not warrant further mention. All other species were observed using PLER, whether habitually or rarely, and will be discussed below.

**Double-crested cormorants** were observed during all 12 cycles at PLER. Birds were found in groups of 2-10 individuals perched on a fallen, partially submerged tree at the west side of the lake. Usually, the largest groups were found on the snag early in the morning. As the sun got higher in the sky, the birds were observed to warm their wings, and the group slowly dismantled. It would appear that Pismo Lake is a common roosting spot for the Double-crested cormorant. Due to the restricted range of this species, PLER presents itself as an important habitat. Future observations are needed to determine if there is an increase or decrease in usage by the cormorants, and thus, establish the importance of the reserve as cormorant habitat.

Both the **Great egret** and the **Great blue heron** are classified by CDF as Sensitive: requiring special management techniques for timber operations around nesting sites. Neither species were

observed to be nesting on PLER. However, both are common to the reserve, generally found hunting at the lake/shore interface. In particular, the Great blue heron was observed 14 times utilizing the reeds, willows and oak woodland near the lake. These species were not observed to be nesting on the reserve presently, but may in the future. PLER supports a wide variety of trees and extensive riparian corridors, which could serve as potential nest sites. The birds have already been observed using these areas and may establish rookeries in seasons to come.

According to the NDDB, statewide status of **Black-crowned night herons** is rare with restricted range. Black-crowned night herons were observed utilizing the reeds and adjacent willows of the lake during all cycles. Although we never meant for our data to be interpreted as an actual population count, to an extent, relative abundance can be inferred. The night herons were observed 57 different times, and "flocks" (more than 10 individuals) were observed 4 times. This is an estimated running total of 97 observations during 12 cycles: approximately 8 individuals seen each day of the study. Both adults and juveniles were present at each cycle as well. These observations may imply a resident population of black-crowned night herons during the spring.

PLER also supports two resident **White-tailed kites**. One or both kites were present at the reserve during 7 cycles using a multiple of habitats. The kites were frequently observed perched in the small patch of oak woodland flanking the south side of the grassland. (A transect was not established at this site due to the small size of the community. Nevertheless, the white-tailed kites could easily be observed from the grassland, coastal scrub or parking lot.) Also, both kites were commonly observed hunting and kiting over the grassland and coastal scrub. No mating behavior or nests were observed on PLER during this time, but the two birds were often together. The USFWS lists the White-tailed kite as a species of concern due to a documented or apparent decline in population. The potentiality of a breeding pair of white-tailed kites exists at the reserve, and this should be taken in to account when assessing the future of PLER.

Although the NDDB reports the statewide status of the **Olive-sided flycatcher** to be apparently secure, the USFWS lists it as a species of concern due to a documented or apparent population decline. The Olive-sided flycatcher also appears on the Audubon Watchlist as a High Priority species in our county, which helps to confirm a potential problem. The Olive-sided flycatcher was only observed once at

the reserve perched atop a willow, calling. This data does not support a continued use of the reserve, but in light of this species' status, it should not be ignored. Further observations will be needed.

In addition to being listed as a Special Concern Species with DFG, the **Yellow warbler** is rare statewide. The Yellow warbler was observed only one time at PLER. Nonetheless, both a male and female were observed foraging together in the willows. The male was also observed to be singing and calling. This may be indication of breeding or nesting: two adult birds and a territorial male. Considering the statewide rarity of the species, the reserve should be looked at for further evidence as Yellow warbler habitat.

The remaining 5 species (Pacific-slope flycatcher, Nuttall's woodpecker, Black-headed grosbeak, Allen's hummingbird and Chestnut-backed chickadee) were included in our list of species of concern because they all appear on the Audubon Watchlist as High Priority in Area 92, the California Foothills, which include San Luis Obispo County. Both the **Pacific-slope flycatcher** and **Nuttall's woodpecker** were recorded only once at the reserve, flycatching in the coastal scrub and foraging in the willows, respectively. Our data does not suggest a habitual use of the reserve by either species. Likewise, this study has not established a continued use of the reserve by the **Black-headed grosbeak**. It was observed during two different cycles, once in the willows and once in the coastal scrub. Although these species do not appear to be constant at PLER, this may be a result of our methodology or other factors. Observations in seasons to come would generate more accurate data.

In contrast to the aforementioned species, the Allen's hummingbird and Chestnut-backed chickadee have presented themselves as consistent members of the reserve, and in particular, the willow habitat. The **Allen's hummingbird** was observed in the willows 8 times during 6 cycles. One individual was observed perched, and often calling, on the same branch six of the eight times. With this data and the knowledge of the territoriality of hummingbirds, it can be inferred that this Allen's is a resident in the willows. (An Allen's was also recorded once in the oak woodland.) The **Chestnut-backed chickadee** was observed 22 times during half the cycles. This species was always seen in the willows foraging and collecting nesting material.

Obviously, the results and interpretation of this study are the products of our methodology, which was thoroughly established prior to data collection. In retrospect, several things could be changed in

order to increase efficiency and ease of data collection, as well as, expand on the data previously collected.

The transects along the reeds presented several unforeseen problems. The first was the actual dynamics of having a transect that had to be observed from the lake surface. It was difficult to fight the current on the lake and keep the canoe at a station to make observations. It became necessary to have two birders for any water transects. One individual was the primary birder while the other person had to paddle and maneuver to stay in place. It was also easier to make observations looking into the reeds if the canoe was positioned 3-4 meters back. The second problem stemmed from the difficulty the CD player presented. Finding particular tracks, adjusting volume, and switching between the two CDs took up much of the observation time and was a difficult task for only two people who were already trying to deal with paddling and observing. In hindsight, it would have been more efficient to make tapes for each habitat with the calls of common species occurring there.

A comment must be made about the west side of the lake. Initially, this area did not present itself as accommodating; Access was treacherous due to the steep slope and dense coverage of poison-oak. Upon further inspection, the west side became increasingly less favorable. According to the methods, a transect had to consist of a least four stations. Vegetation did not stay consistent throughout a line of four stations: the riparian corridor of willows and coast live oaks quickly gave way to a backyard community of Eucalyptus and other ruderal plants. This presented a problem in the classification process as well. Our inability to construct a transect within a uniform habitat, as well as the inability to walk through the entire plot made the west side of the lake undesirable as a study area. A transect was not place here.

Unfortunately, during the period of this study, this area proved to be rich in avian diversity. It is in close proximity to the islands, and many birds were observed to move between the island scrub and riparian corridor. En route observations were made for this area if they seemed important. For instance, the first siting of an Ash-throated flycatcher was made in this plot and was included in the data, while Red-winged blackbirds, which appeared throughout the reserve, were not noted. In the master list, any en route observations of this zone were noted as such and classified as "Willow" habitat. It was decided, for ease of data collection in the field, to classify the habitat as "Willow" due to its close proximity to the water. Essentially, the entire "Willow" habitat and the west side are riparian corridors and, in any future

studies, it may be easier to label them that way. In addition, a transect of this zone may be useful and would be possible if observed from the lake surface.

In order to account for discrepancies and biases, an effort was made to visit the reserve at different times of the day. In essence, each habitat should have been observed in the morning, mid-afternoon, etc. Unfortunately, at least six hours were needed to complete one cycle at the reserve. It is difficult to find six hours in one birder's schedule, let alone two. It became necessary to split a majority of the cycles into two days. Much of this was done in the early morning to mid-afternoon, resulting in little representation of the late afternoon and evening. Fortunately, morning cycles resulted in the greatest number and diversity of birds, both of which seemed to decrease as the day progressed. As a solution to this problem, either a shorter cycle must be developed or birders in subsequent studies must have more time in their schedules.

At the conclusion of this study, the species list of the reserve was exhausted. While our efforts did produce a list of 72 bird species, the birds observed and the number of times they were observed are, in part, a function of behavior, as well as our methods. Birds with secretive behavior would appear only rarely or never in our data. In particular, the willows and the reeds were very difficult to see into, and thus difficult to see and identify species. This problem was anticipated, and for that reason, there are two transects for the willows and oak woodlands: one within the habitat and one looking into the habitat. (Obviously, the same could not be done for the reeds.) This was helpful, but, many times, calls and singing could be heard, but no birds were seen. In this situation, the CD player was used to either identify calls and songs or tempt birds out into view. This did not always work. In order to identify all birds, regardless of behavior, it may be useful to record the activity from those difficult habitats. It would then be possible to identify all species later.

Obviously, it is difficult to analyze data or speculate on any trends with only one season of data collection. Studies of consecutive seasons are needed to truly determine the full extent of any species at the reserve or the future of the reserve itself. It is also critical to take inventory of the reserve in the winter, as well as the spring. It was the hope of this particular study to encompass both the late-winter and spring populations. To a small extent, this was accomplished. The data illustrates several common migration trends. For example, Ruby-crowned kinglets are only observed during the first three cycles,

while the Ash-throated flycatchers begin to appear at the reserve during the eighth cycle. Still, a complete inventory of species during both seasons would generate a more inclusive list.

In conclusion, our study was an attempt to produce a comprehensive list of bird species at PLER, and from this list, identify any species of concern that may need consideration when assessing the future of the reserve. PLER is home to 72 species of birds, none of which are Endangered, Threatened, or Special Concern species. On the other hand, 14 of the species observed appear on other recognized lists and necessitate some consideration with any future activities at the reserve. In addition, PLER supports a diversity of habitat, which in turn, supports a wide variety of fauna and activities. The willows provide for over half the avian species recorded (37 of the 72) and 6 of the birds that appear on our special concern list. There is a nesting pair of Barn owls and Hairy woodpeckers in the willows as well. The other habitats are important as well. Bushtits were observed building a nest in the oak woodland. There are at least 5 Marsh wren nests in the reeds, and although no nests were found, several female mallards were observed with ducklings. There is always a plethora of swallows utilizing the entire reserve to feed. Swallows were seen collecting mud on the lake bank. Tree swallows were observed in the nesting boxes and mating on top of them. Not only were birds observed and recorded at PLER, but also, American Beavers were noted, along with Western Pond turtles and a Red Fox. PLER has proven to be diverse in flora and fauna, which all warrant substantial consideration with any future development.



### REFERENCES

- Brewer, Richard. The Science of Ecology, Second Edition. 1994. San Diego: Saunders College Publishing. p 589-590.
- California Department of Fish & Game website: [www.dfg.gov](http://www.dfg.gov).
- Cornell Laboratory of Ornithology. Instructions for Breeding Bird Census. 1990. New York.
- Honeycutt, Ella. History of the Restoration of Pismo Lake Ecological Reserve. 1999. San Luis Obispo: Coastal San Luis Resource Conservation District.
- Honeycutt, Ella. Lake of Wonders: A South County Nature Preserve Deserves Our Continued Attention. 23-30 Sept 1999. San Luis Obispo: New Times. p 4.
- Morro Coast Audubon Society, Inc. The Birds of San Luis Obispo County. 1996. Morro Bay.
- National Geographic Society. Field Guide to the Birds of North America, Third Edition. 1999. Washington, D.C.: Nat'l Geo. Soc. Publishers.
- Peterson Field Guides. Western Bird Songs: a 2-compact disc set. 1992. Boston: Houghton Mifflin Company.
- United States Geologic Survey, in cooperation with California Department of Water Resources; Arroyo Grande NE, Calif. Quadrangle, 1965, Revised 1993, DMA 1854 II NE-Series v 895 (& Pismo Beach, Calif. Quadrangle, 1965, Revised 1994, DMA 1854 II NW-Series v 895) Denver, CO.
- Welty, J.C. and Luis Baptista. The Life of Birds, Fourth Edition. 1988. San Diego: Saunders College Publishing. p 499.

APPENDIX A

Table 1. 50 Birding Stations.

<u>TRANSECT</u>	<u>HABITAT</u>	<u>STAKE #</u>	<u>LOCATION</u>
A	grassland	A 0+00	north of lake,
A	grassland	A 0+50	up on plateau
A	grassland	A 1+00	
A	grassland	A 1+50	
A	grassland	A 2+00	
B	scrub	B 0+00	north of lake, lakeside
B	scrub	B 0+50	(mainland)
B	scrub	B 1+00	
B	scrub	B 1+50	
C	willows	C 0+00	north of lake,
C	willows	C 0+50	within willows
C	willows	C 1+00	
C	willows	C 1+50	
D	oak woodld	D 0+00	north of lake,
D	oak woodld	D 0+50	near 4 <sup>th</sup> Street
D	oak woodld	D 1+00	
D	oak woodld	D 1+50	
D	oak woodld	D 2+00	
E	willows	E 0+00	across 4 <sup>th</sup> Street,
E	willows	E 0+50	outside of willows,

Table 1 (cont.)

E	willows	E 1+00	looking in
E	willows	E 1+50	
E	willows	E 2+00	
F	reeds	F 0+00	along north shore
F	reeds	F 0+50	of mainland
F	reeds	F 1+00	
F	reeds	F 1+50	
F	reeds	F 2+00	
G	scrub	G 0+00	islands; first on isl.
G	scrub	G 0+50	nearest RR and next
G	scrub	G 1+00	on isl. nearest to 4th
G	scrub	G 1+50	
G	scrub	G 2+00	
H	reeds	H 0+00	along islands
H	reeds	H 0+50	
H	reeds	H 1+00	
H	reeds	H 1+50	
H	reeds	H 2+00	
I	lake	N/A	on lake, position varies with paddling

(12 "stations")

Table 2. Beaufort Wind Scale.

<u>SCALE</u>	<u>MPH</u>	
0	<1	smoke rises vertically
1	1-3	wind direction shown by smoke
2	4-7	wind felt on face, leaves rustle
3	8-12	leaves, small twigs in constant motion
4	13-18	raises dust and loose paper



Table 4. Numbers of times each transect was visited within specific time periods.

	6-9 AM	9 AM-Noon	12-3 PM	3-6 PM	6 PM-Dusk
Grassland	6	2	2	2	
C. Scrub - 2	7	6	6	4	1
Willows - 2	7	5	6	5	1
Oak Woodland	3	3	4	2	
Reeds - 2	5	7	8	2	2
Lake	3	3	4	1	1

Note: The coastal scrub, willows, and reeds were represented by 2 transects each, as denoted by the "2" following the habitat name, whereas the others were represented by a single transect each.

Table 5. Master Data List.

NOTES (date)

RUNNING TOTAL OF # OF CYCLES  
#'s OF OBSERVATIONS SP. OBSERVED  
 (estimates only / # flocks) (out of 12)

HABITAT WITH ASSOCIATED SPECIES

GRASSLAND

Anna's Hummingbird	2		
Ash-throated Flycatcher	1		
Brewer's Blackbird	1		aerial (4/1)
Barn Swallow	6		
Bushtit	1		
Cliff Swallow	4		
Common Yellowthroat	2		
House Finch	5		
Lesser Goldfinch	1		
Mourning Dove	1		
Red-winged Blackbird	2		
Savannah Sparrow	2		
Song Sparrow	7		
Tree Swallow	5		aerial only (3/28)
Violet-green Swallow	1		
White-tailed Kite	3		Kiting (3/28)

COAST LIVE OAK WOODLAND

Allen's Hummingbird	1		
American Crow	2		
Bewick's Wren	1		
Bushtit	10		
California Towhee	2		
House Finch	1		
Ruby-crowned Kinglet	3		
Song Sparrow	3		
Spotted Towhee	3		
Swallow (mixed flock)	2		
Tree Swallow	1		leaving Oak Wldd (3/28)
Western Scrub Jay	4		
White-crowned Sparrow	2		
Wrentit	1		

Table 5. Master Data List (cont.).

<u>WILLOWS</u>				
Allen's Hummingbird	8/0		6	
American Crow	8/0		3	
Anna's Hummingbird	18/0		7	
Barn Owl	1/0		1	
Bewick's Wren	10/0		6	
Blue-gray Gnatcatcher	1/0		1	
Bushtit	30/2		9	
California Towhee	2/0		2	
Cedar Waxwing	1/0		1	
Chestnut-backed Chickadee	22/0		6	
Common Yellowthroat	8/0		5	
Downy Woodpecker	6/0		4	
House Finch	2/0		2	
Mourning Dove	12/1		4	leaving Willows (3/28)
Northern Mockingbird	1/0		1	
Nuttall's Woodpecker	1/0		1	
Red-shouldered Hawk	2/0		1	aerial (3/30) (5/2)
Red-winged Blackbird	19/0		8	
Song Sparrow	29/0		8	
Spotted Towhee	12/0		6	
Warbling Vireo	8/0		5	
Western Scrub Jay	31/0		8	
White-crowned Sparrow	2/0		1	
Wilson's Warbler	18/0		8	very responsive when his song is played (4/6)
Wrentit	1/0		1	
Yellow Warbler	2/0		1	
Yellow-rumped Warbler	6/0		3	
<u>COASTAL SCRUB</u>				
American Goldfinch	2/0		2	solo female (3/28)
Anna's Hummingbird	33/0		11	
Barn Swallow	8/1		5	
Black-headed Grosbeak	1/0		1	
Black Phoebe	2/0		2	
Brewer's Blackbird	3/0		2	



Table 5. Master Data List (cont.).

<u>COASTAL SCRUB (cont.)</u>				
Brown-headed Cowbird	1	1 \ 0		
Bushtit	9	36 \ 2		
California Towhee	1	1 \ 0		
Cliff Swallow	3	7 \ 1		
Common Yellowthroat	12	31 \ 0		
Hairy Woodpecker	1	1 \ 0		in pairs (3/28)
House Finch	12	67 \ 7		
Lesser Goldfinch	1	1 \ 0		pair mating (5/15)
Mourning Dove	6	13 \ 0		
Pacific-slope Flycatcher	1	1 \ 0		
Red-winged Blackbird	12	75 \ 2		singing VERY actively (3/28)
Song Sparrow	12	69 \ 0		
Swainson's Thrush	1	1 \ 0		
Tree Swallow	8	24 \ 10		
Violet-green Swallow	1	1 \ 0		
Western Meadowlark	1	1 \ 0		
Western Scrub Jay	4	5 \ 0		
White-crowned Sparrow	4	7 \ 0		
White-tailed Kite	2	3 \ 0		kiting OVER scrub (4/4)
<b>REEDS</b>				
American Coot	6	13 \ 0		
Black-crowned Night-Heron	12	47 \ 4		perch in willows above reeds, don't seem to be paired (3/28)
Black Phoebe	4	5 \ 0		
Brewer's Blackbird	2	2 \ 0		
Bushtit	1	1 \ 0		
Cinnamon Teal	3	10 \ 0		paired (3/28)
Common Yellowthroat	3	5 \ 0		leaving Reeds (3/28)
Great Blue Heron	1	1 \ 0		
Great Egret	1	1 \ 0		
Green Heron	1	1 \ 0		
Mallard	9	31 \ 0		in pairs, same-sex groups, or solo (3/28)
Marsh Wren	9	13 \ 0		frequent chattering (4/4)
Pied-billed Grebe	1	1 \ 0		
Red-winged Blackbird	12	45 \ 7		perches on birdhouse pole (3/28)

Table 5. Master Data List (cont.).

<u>REEDS (cont.)</u>			
Song Sparrow	14\10	5	
Sora	2\0	2	
Tree Swallow	1\2	3	
<u>LAKE</u>			
American Coot	21\10	10	
Belted Kingfisher	1\0	1	female
Brewer's Blackbird	5\0	2	on snag, drinking (5/3)
Brown-headed Cowbird	2\0	1	on snag
Cinnamon Teal	11\0	3	
Double-crested Cormorant	44\1	12	always 1st found daily on snags in the lake (4/8)
Great Blue Heron	3\0	2	
Great Egret	1\0	1	lake-willow interface hunting
Green Heron	7\0	5	
Mallard	26\7	12	ducklings (5/29)
Pied-billed Grebe	6\0	4	
Ruddy Duck	23\5	11	ducklings (4/29)
Western Grebe	4\0	3	
Swallows (mixed: cliff, barn, tree)	0\7	7	dipping down and splashing down into water (5/3)
<u>AERIAL</u>			
American Avocet	1\0	1	
American Crow	16\2	7	
Barn Swallow	6\2	3	
Caspian Tern	3\0	2	
Great Blue Heron	5\0	4	
Great Egret	2\0	2	
Hooded Oriole	1\0	1	
Mourning Dove	5\0	3	
Northern Harrier	1\0	1	
Red-shouldered Hawk	12\0	5	
Red-tailed Hawk	6\0	4	
Rock Dove	0\6	6	
Tree Swallow	0\11	6	
Turkey Vulture	22\1	9	
Western Tanager	3\0	2	

Table 5. Master Data List (cont.).

<u>AERIAL (cont.)</u>			<u>HABITAT</u>
White-tailed Kite	2 1 0	2	Reeds
<u>OBS'D EN ROUTE BETWEEN STATIONS</u>			
American Coot	8 1 0	3	Oak Woodland
American Crow	1 1 0	1	Willows
American Robin	1 1 0	1	Willows, Island Scrub
Anna's Hummingbird	2 1 0	1	Willows(vocalization), Island Scrub
Ash-throated Flycatcher	2 1 0	1	Willows
Barn Owl	4 1 0	4	Coastal Scrub
Bewick's Wren	1 1 0	1	Scrub, Reeds, Willows
Black Phoebe	13 1 0	4	Reeds
Black-crowned Night-Heron	10 1 0	4	Willows
Black-headed Grosbeak	1 1 0	1	Scrub
Bushtit	1 1 0	1	Reeds (perched)
Cliff Swallow	0 1 1	1	Willows
Common Yellowthroat	7 1 0	5	Willows
Chestnut-backed Chickadee	4 1 0	2	Reeds, Oak Woodland, Willows
Great Blue Heron	5 1 0	4	Willows-Reed interface
Green Heron	4 1 0	3	Willows
Hairy Woodpecker	1 1 0	1	Willows, Coastal Scrub
House Finch	3 1 0	2	Vocalization
Killdeer	1 1 0	1	Willows
Lesser Goldfinch	3 1 0	2	Island Scrub
Mallard	16 1 0	6	Reeds
Marsh Wren	6 1 0	3	Coastal Scrub, Willows
Mourning Dove	3 1 0	3	Urban-Willows border, Island Scrub, Oak Woodland
Northern Mockingbird	1 1 0	1	Willows
Nuttall's Woodpecker	1 1 0	1	Willows
Olive-sided Flycatcher	1 1 0	1	Willows
Pied-billed Grebe	2 1 0	1	Lake
Red-winged Blackbird	6 1 0	2	Coastal Scrub, Reeds
Snowy Egret	3 1 0	2	Lake Snags, Reeds
Song Sparrow	6 1 0	3	Coastal Scrub, Willows, Reeds
Spotted Towhee	6 1 0	4	Willows
Swainson's Thrush	1 1 0	1	Willows
Virginia Rail	5 1 0	5	Reeds

Table 5. Master Data List (cont.).

<u>OBSVD EN ROUTE BETWEEN STATIONS (cont.)</u>	<u>HABITAT</u>			
Western Grebe	Lake	1	1 10	
Western Scrub Jay	Coastal Scrub, Willows, Island	3	5 10	
Western Tanager	Willows	1	4 10	
White-tailed Kite	Oak Woodland (perched usually)	3	4 10	
White-crowned Sparrow	Willows	1	1 10	
Wilson's Warbler	Willows	3	4 10	
Wren-tit	Coastal Scrub	1	1 10	
Yellow-rumped Warbler	Willows	3	7 10	
<u>ANY ADDITIONAL NOTES</u>				
Bushtit nest found mid-canopy in Oak Woodland			<u>DATE</u>	
Swallow (?) mud-nests found in Willows			3/28	
Domestic cat in scrub 75 yds from parking lot, very skittish			3/28	
American Beaver spotted in reeds, lake			3/30, 4/12	
Large nest in willows high above whitewash on blackberries below --> most likely barn owls'			4/1, 4/4, 4/29, 6/5	
Turtle's head poking out of water near reeds			4/6	
Several Mallards flying over scrub at 5 pm			4/8	
Much frog noise after dusk in reeds & willows			4/8	
Much moving around (mostly unid'd) in reeds after nightfall, including swallows roosting			4/9	
Most of singing is done by dusk, few still sing			4/8	
Results of trying to call out goatsuckers and owls: only Barn Owl responded, with overhead fly-bys, and returned screeching			4/8	
2 Turtles spotted again using beds of reeds			(30 minutes to 1 hr after sunset)	
Gulls spotted high overhead nearly every visit			4/12	
Huge numbers of dragonflies on PLER			4/12	
R-w Blackbirds often chase larger birds (ex: GB Heron, B-c Night-Heron)			4/12	
American Crow chases Red-shouldered Hawk			4/12	
Anna's Hummer (usually sits in willows between E0+00, E0+50) chasing a bushtit			5/2	
Tree swallows on lake are using nesting boxes			5/3	
Tree swallows mating on top of nest boxes			5/3	

Table 5. Master Data List (cont.).

DATE  
6/5  
6/5

ANY ADDITIONAL NOTES (cont.)

Red Fox spotted near B 0+00  
5 Turkey Vultures perched on rocks at lake  
shore

Table 6. Species-Habitat-Association Report.

<u>SPECIES</u>	<u>GRASSLAND</u>	<u>COAST LIVE OAK WOODLAND</u>	<u>WILLOW</u>	<u>COASTAL SCRUB</u>	<u>REED</u>	<u>LAKE</u>	<u>AERIAL</u>	<u>TOTAL</u>
Allen's Hummingbird		X	X				X	2
American Avocet					X			1
American Coot					X	X		2
American Crow		X					X	3
American Goldfinch				X				1
American Robin			X*					1
Anna's Hummingbird	X		X	X				3
Ash-throated Flycatcher	X		X*	X*				3
Barn Owl			X					1
Barn Swallow	X	X		X		X	X	4
Belted Kingfisher						X		1
Bewick's Wren		X	X	X*				3
Black-crowned Night-Heron					X			1
Black-headed Grosbeak			X*	X				2
Black Phoebe			X*	X	X			3
Blue-gray Gnatcatcher			X					1
Brewer's Blackbird	X			X	X	X		4
Brown-headed Cowbird				X	X			2
Bushtit	X	X	X	X	X			5
California Towhee		X	X	X				3
Caspian Tern							X	1
Cedar Waxwing			X					1
Chestnut-backed Chickadee			X					1
Cinnamon Teal					X	X		2
Cliff Swallow	X	X		X	X*	X		4
Common Yellowthroat	X		X	X	X			4
Double-crested Cormorant			X			X		1
Downy Woodpecker			X					1
Great Blue Heron		X*	X*		X	X	X	5
Great Egret					X	X	X	3
Green Heron			X*		X	X		3
Gulls							X	1
Hairy Woodpecker								1
Hooded Oriole				X				1
House Finch	X	X	X	X			X	4
Killdeer								vocalization
Lesser Goldfinch	X		X*	X				3
Mallard				X*	X	X		3



Table 7. Species of Concern. List generated from the analogous table on the CDFG web site.

(For detailed explanations of list and ranks see Appendix C.)

Bird	NDDB Rank	State	Federal	Other
Double-crested cormorant	G5S3			DFG: CSC
Great egret	G5S4			CDF: Sensitive
Great blue heron	G5S4			CDF: Sensitive
Black-crowned night heron	G5S3			
Northern harrier	G5S3			DFG: CSC
White-tailed kite	G5S3			FWS: MNBMC DFG: Fully protected
Caspian tern	G5S4			
Olive-sided flycatcher	G?S4			FWS: MNBMC Audubon: Cal WL
Pacific-slope flycatcher				
Yellow warbler	G5T2S2			DFG: CSC
Allen's hummingbird				Audubon: Cal WL, National WL
Nuttall's woodpecker				Audubon: Cal WL, National WL
Chestnut-backed chickadee				Audubon: Cal WL
Black-headed grosbeak				Audubon: Cal WL



APPENDIX B

TOPO map printed on 01/23/00 from "Statbar top" and "Untitled.tpg"

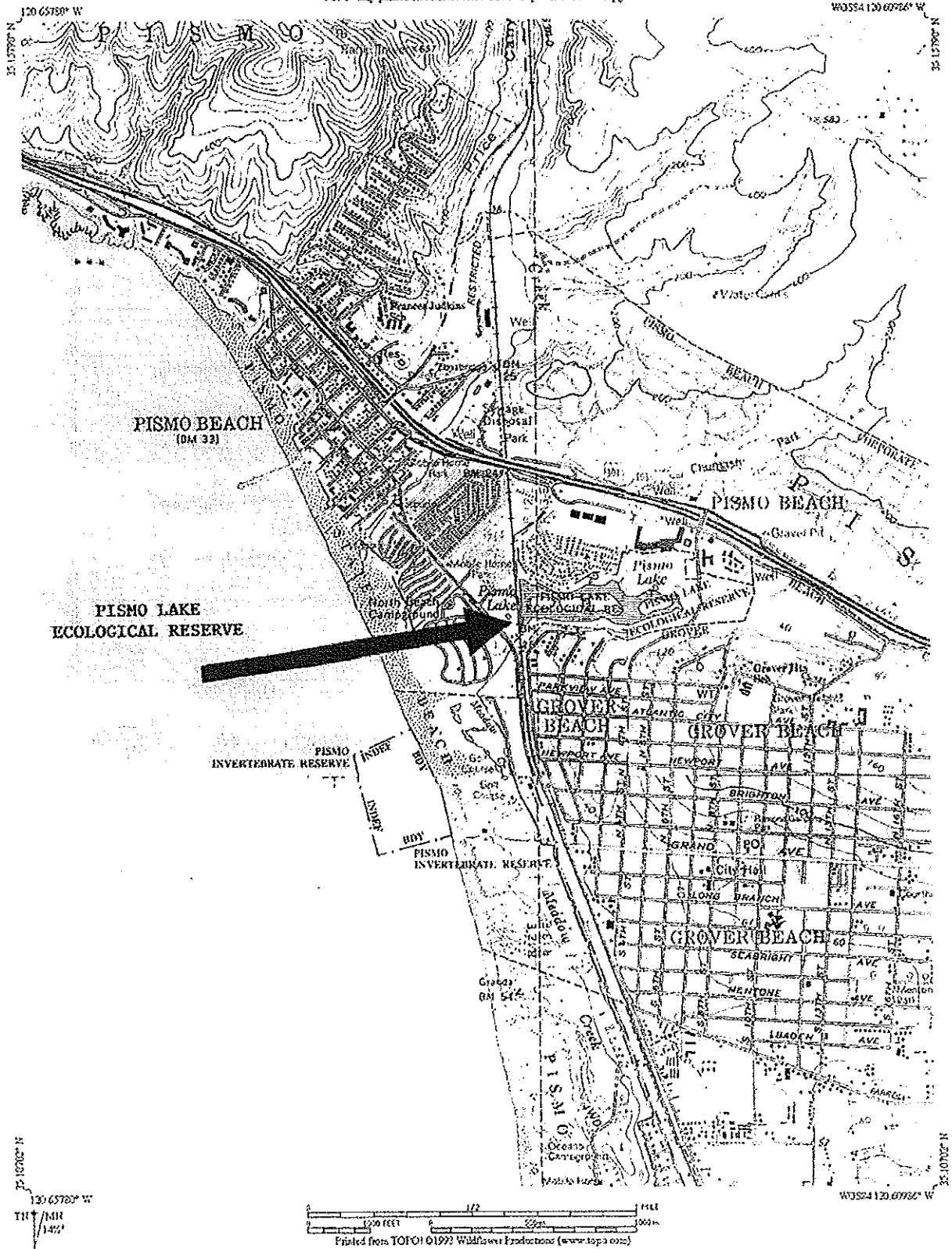


Figure 1. Topographic map of study area.

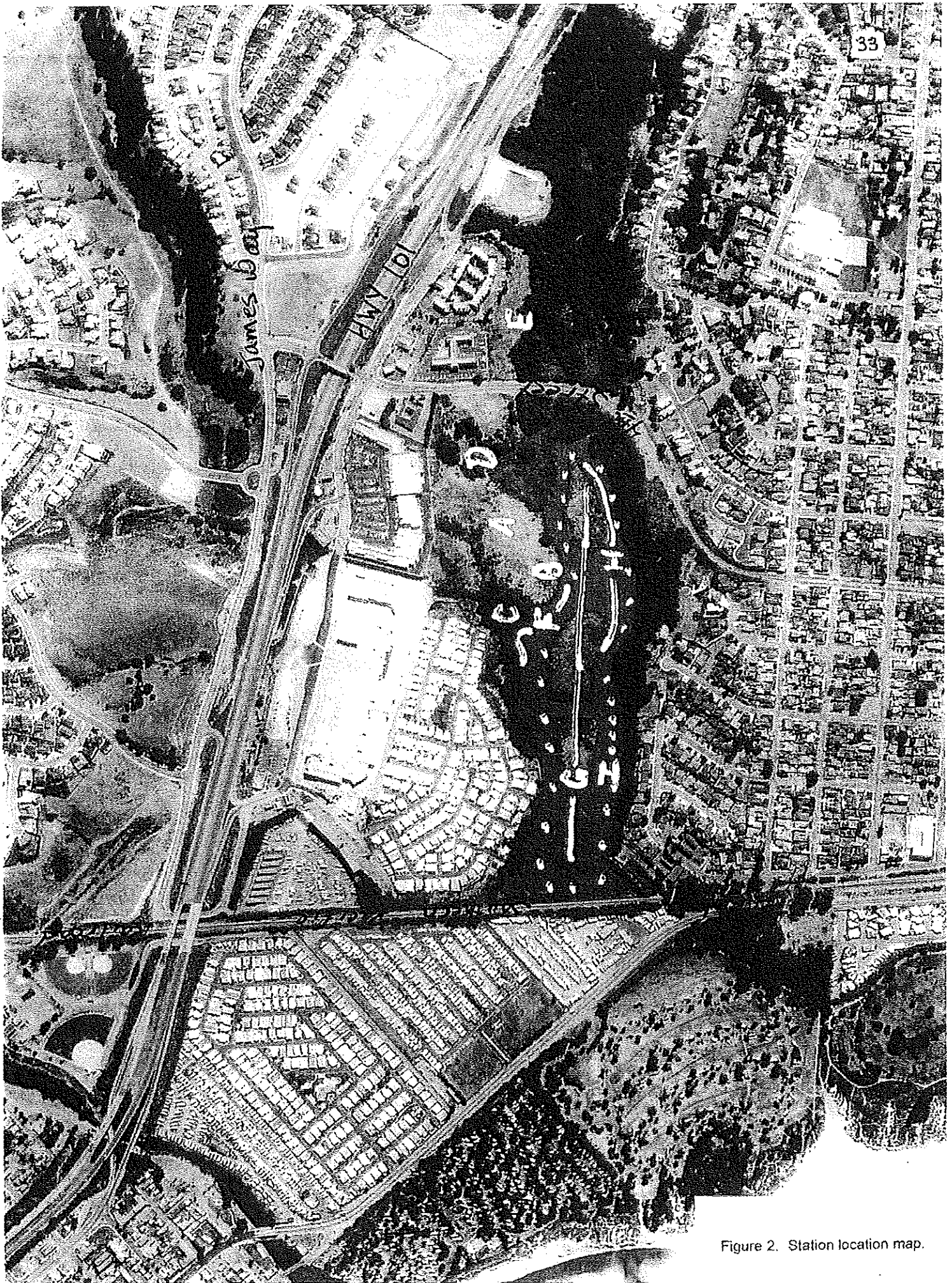


Figure 2. Station location map.



Figure 3. Pismo Lake.



Figure 4. Willows and grassland habitats in Pismo Lake Ecological Reserve.



Figure 5. View of Pismo Lake Ecological Reserve and surrounding urban development from Union Pacific railroad tracks.



Figure 6. Habitat diversity at Pismo Lake Ecological Reserve.

### APPENDIX C

**Natural Diversity Data Base (NDDB)-** The NDDB is a computerized inventory of location information on the more rare animals, plants, and natural communities in California. "Special Animals" is a general term used to describe all taxa the NDDB is interested in tracking, regardless of their legal or protection status. "Special Animals" are generally either officially listed or proposed for listing under the State and/or Federal Endangered Species Acts, candidates for possible listing, or taxa which meet the NDDB criteria for listing. Criteria for listing is as follows: taxa considered by the Department to be a Species of Special Concern; taxa that are biologically rare, very restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their lifecycle which warrants monitoring; populations in California that may be on the periphery of a taxon's range, but are threatened with extirpation in California; taxa closely associated with habitat that is declining in California at an alarming rate (wetlands, riparian, native grasslands, etc.); or taxa designated as special status, sensitive or declining species by other state or federal agencies or non-governmental organizations.

State Rank: indicates the statewide status of a full species or a sub-species (S5-S1)

S5- demonstrably secure to ineradicable in California: commonly found throughout its historic range. NO THREAT RANK

S4- apparently secure: some factors exist to cause some concern such as narrow habitat or continuing threats. NO THREAT RANK

S3- restricted range, rare: about 21-100 viable element occurrences (EO) or 3,000-10,000 individuals or 10,000-50,000 acres of occupied habitat

S2- endangered: about 6-20 EO's or 1,000- 3,000 individuals or 2,000- 10,000 acres of occupied habitat

S1- Less than 6 EO's or less than 1,000 individuals or less than 2,000 acres

S?- Not enough information to rank species

Global Rank: indicates the worldwide status of a full species (G5-G1)

same designations as above



T-Rank: status of a sub-species (T5-T1)

same designations as above

**Department of Fish and Game: California Special Concern Species (DFG: CSC)**- It is the goal of DFG to maintain viable populations of all native species. To this end, the Department has designated certain vertebrate species as "special concern" due to declining population levels, limited range, and/or the presence of continuing threats that have made a species vulnerable to extinction. The goal of this designation is to halt or reverse a species decline by calling attention to its plight, as well as to address the issues of concern early enough to secure the long term viability of a population. Not all "special concern" species have declined at equal rates.

**California Department of Forestry: Sensitive (CDF: Sensitive)**- The California Department of Forestry's Fire Prevention Board classifies a "sensitive species" as those that warrant special protection during timber operations.

**U.S. Fish and Wildlife Service: Migratory Nongame Birds of Management Concern (FWS: MNBMC)**- A primary goal of the U.S. FWS is to conserve avian diversity in North America; this includes reducing the likelihood of having to propose any migratory bird species for Federal listing as Endangered or Threatened. The designation's purpose is to identify those species of migratory nongame birds that are considered to be of concern due to documented or apparent population declines, small or restricted populations, or dependent on restricted or vulnerable habitats.

**Audubon: California State Watchlist (Cal WI)**- The Audubon Society's state Watchlist for California was developed using the Partners in Flight (PIF) data and prioritization process. The state lists carry no official authority, but serve as an additional tool designed to help conserve local bird populations the Audubon Society believes to be potentially threatened.

## ERRATUM

*(Added by M. Mendelsohn in 2008)*

Approval Pg: 1) no change needed, but note that Danielle's married name is Horsley

2) page should be replaced with one including V.L. Holland's signature

Pg iv: change "Natural Resource Conservation Society" to "Natural Resources Conservation Service"

Pg 4 (under "Note"): change "...an average territory size for a bird would have a radius of roughly 25 meters, decreasing our chances of recounting the same bird from the previous station." to "...an average territory size for a bird would have a radius of roughly 25 meters, decreasing our chances of recounting the same bird from the previous station. However, other researchers have recommended a minimum distance of 250 meters between stations."

\*Pg 10 (second sentence): change "None of the birds currently observed at PLER are ranked on the State or Federal listings for Endangered, Threatened or Special Concern Species. However, 14 of the species do carry rankings of other kinds..." to "None of the birds currently observed at PLER are ranked on the State or Federal listings for Endangered or Threatened Species, however three are listed as California Species of Special Concern. An additional 11 species carry rankings of other kinds..."

Pg 10 (second paragraph): change "Of the 14 species with rankings, only those observed utilizing the reserve will be discussed." to "Of the 14 species with rankings, only those observed utilizing the reserve will be discussed in detail."

Pg 10 (second paragraph): change "...but our data does not illustrate this." to "...but our data do not illustrate this."

Pg 11: change "Black-crowned night heron" to "Black-crowned night-heron" in all occurrences

Pg 12 (first complete sentence): change "This data does not support a continued use of the reserve..." to "These data do not support a continued use of the reserve..."

Pg 12 (first complete paragraph): change "...two adult birds and a territorial male." to "...two adult birds including a territorial male"

Pg 12 (second complete paragraph): change "Our data does not suggest..." to "Our data do not suggest..."

Pg 12 (third complete paragraph): change "With this data..." to "With these data..."

Pg 13 (second complete paragraph): change "...as accommodating; Access was treacherous..." to "...as accommodating; access was treacherous..."

Pg 13 (second complete paragraph): change "...transect had to consist of a least four stations." to "...transect had to consist of at least four stations."

Pg 13 (second complete paragraph): change "A transect was not place here." to "A transect was not placed here."

Pg 13 (last paragraph): change "Unfortunately, during the period of this study, this area proved to be rich in avian diversity." to "It was unfortunate that we did not formally survey this area because it proved to be rich in avian diversity during our study period."

Pg 14 (first complete paragraph): delete unnecessary line break after "...number and diversity of birds, both of which" and before "seemed to decrease as the day progressed."

Pg 14 (second complete paragraph): change "...there are two transects for the willows and oak woodlands: one within the habitat and one looking into the habitat. (Obviously the same could not be done for the reeds.)" to "...there are two transects for the willows (one within the habitat and one looking into the habitat) and two for the reeds (both were surveyed with the observer looking into the reeds)."

Pg 14 (last complete sentence): change "The data illustrates several common migration trends." to "The data illustrate several common migration trends."

\*\*Pg 15 (first and only complete paragraph): change "PLER is home to 72 species of birds, none of which are Endangered, Threatened, or Special Concern Species. On the other hand, 14 of the species observed appear on other recognized lists and necessitate some consideration" to "PLER is home to 72 species of birds, none of which is Endangered or Threatened, but three of which are Special Concern Species. An additional 11 species that were observed appear on other recognized lists and also necessitate some consideration..."

Pg 15 (first and only complete paragraph): change "The willows provide for over half of the avian species..." to "The willows provide habitat for over half of the avian species..."





## Appendix O

### 4<sup>th</sup> Street Overlook Concept Drawing

### DESIGN AND CONCEPT DRAWING

