

# Appendix 1

## Species Lists



**APPENDIX 1.1: PLANTS KNOWN TO OCCUR AT COYOTE LAKE-HARVEY  
BEAR RANCH COUNTY PARK**

\* Indicates non-native species

**DIVISION PTERIDOPHYTA**

**DRYOPTERIDACEAE**

*Dryopteris arguta*

wood fern

**PTERIDACEAE**

*Adiantum jordanii*

maidenhair fern

*Pellaea andromedifolia*

coffee fern

**DIVISION CONIFEROPHYTA**

**PINACEAE**

*Pinus sabiniana*

foothill pine

**DIVISION ANTHOPHYTA**

**CLASS DICOTYLEDONES**

**ANACARDIACEAE**

*Toxicodendron diversilobum*

poison oak

**APIACEAE**

*Anthriscus caucalis\**

bur-chervil

*Conium maculatum\**

hemlock

*Eryngium vaseyi*

coyote thistle

*Lomatium utriculatum*

lomatium

*Lomatium* sp.

lomatium

*Perideridia maculatum*

Kellogg's yampa

*Sanicula bipinnatifida*

purple sanicle

*Sanicula crassicaulis*

gambleweed

*Torilis arvensis\**

field hedge parsley

*Torilis nodosa\**

knotted hedge parsley

**ASCLEPIADACEAE**

*Asclepias fascicularis*

narrow-leaf milkweed

**ASTERACEAE**

*Achillea millefolium*

common yarrow

*Achyrachaena mollis*

blow-wives

*Agoseris heterophylla*

mountain dandelion

*Agoseris grandiflora*

giant dandelion

*Anthemis cotula\**

mayweed

<i>Artemisia californica</i>	California sagebrush
<i>Artemisia douglasiana</i>	mugwort
<i>Aster radulinus</i>	rough-leaved aster
<i>Baccharis pilularis</i>	coyote brush
<i>Baccharis viminea</i>	mulefat
<i>Balsamorhiza macrolepis</i>	balsam-root
<i>Carduus pycnocephalus*</i>	Italian thistle
<i>Centaurea melitensis*</i>	totalote
<i>Cirsium vulgare*</i>	bull thistle
<i>Chamomilla suaveolens*</i>	pineapple weed
<i>Conyza canadensis</i>	horseweed
<i>Cotula coronopifolia*</i>	brass buttons
<i>Crepis vesicaria</i> spp. <i>taraxacifolia*</i>	hawksbeard
<i>Erigeron foliosus</i>	fleabane daisy
<i>Filago gallica*</i>	narrow-leaved filago
<i>Gnaphalium californicum</i>	cudweed
<i>Grindelia camporum</i>	gumplant
<i>Hemizonia congesta</i> ssp. <i>luzulaefolia</i>	hayfield tarweed
<i>Hemizonia pungens</i> ssp. <i>pungens</i>	common spikeweed
<i>Hypochaeris glabra*</i>	smooth cat's-ear
<i>Hypochaeris radicata*</i>	rough cat's-ear
<i>Lactuca saligna*</i>	willow lettuce
<i>Lactuca serriola*</i>	prickly lettuce
<i>Lagophylla ramosissima</i>	common hareleaf
<i>Lasthenia californica</i>	goldfields
<i>Lasthenia glaberrima</i>	goldfields
<i>Lessingia filaginifolia</i>	California aster
<i>Madia gracilis</i>	slender tarweed
<i>Micropus californicus</i>	slender cottonweed
<i>Microseris douglasii</i>	Douglas' microseris
<i>Picris echioides*</i>	bristly ox-tongue
<i>Silybum marianum*</i>	milk thistle
<i>Sonchus asper*</i>	prickly sow thistle
<i>Sonchus oleraceus*</i>	common snow thistle
<i>Taraxacum officinale*</i>	dandelion
<i>Tragapogon porrifolius*</i>	salsify
<i>Uropappus lindleyi</i>	uropappus
<i>Wyethia angustifolia</i>	narrow-leaf mule ears
<i>Wyethia helenioides</i>	mule ears
<i>Xanthium spinosum*</i>	spiny cocklebur
<i>Xanthium strumarium*</i>	cocklebur

#### **BORAGINACEAE**

<i>Amsinckia menziesii</i> var. <i>intermedia</i>	common fiddleneck
<i>Heliotropium curassavicum</i>	chinese parsley
<i>Plagiobothrys bracteatus</i>	popcornflower
<i>Plagiobothrys canescens</i>	popcornflower
<i>Plagiobothrys tenellus</i>	popcornflower

**BRASSICACEAE**

*Brassica nigra*\*  
*Cardamine californica*  
*Cardaria* sp.\*  
*Hirschfeldia incana*\*  
*Rorippa nasturtium-aquaticum*  
*Sisymbrium officinale*\*

black mustard  
milkmaids  
hoary cress  
summer mustard  
watercress  
hedge mustard

**CAPRIFOLIACEAE**

*Lonicera* sp.  
*Sambucus mexicana*  
*Symphoricarpos albus*

honeysuckle  
blue elderberry  
snowberry

**CARYOPHYLLACEAE**

*Cerastium gloweratum*\*  
*Silene gallica*\*  
*Spergularia rubra*\*  
*Stellaria media*\*

mouse-ear chickweed  
common catchfly  
sand-spurrey  
common chickweed

**CHENOPODIACEAE**

*Chenopodium berlandieri*\*

goosefoot

**CONVOLVULACEAE**

*Calystegia subacaulis*  
*Convolvulus arvensis*\*

morning glory  
bindweed

**CUCURBITACEAE**

*Marah fabaceus*

common manroot

**ERICACEAE**

*Arctostaphylos glauca*

big-berried manzanita

**EUPHORBIACEAE**

*Euphorbia spathulata*

reticulate-seeded spurge

**FABACEAE**

*Lathyrus vestitus*  
*Lotus corniculatus*\*  
*Lotus humistratus*  
*Lotus wrangelianus*  
*Lupinus microcarpus* var. *densiflorus*  
*Lupinus bicolor*  
*Lupinus formosus*  
*Lupinus nanus*  
*Lupinus succulentus*  
*Medicago polymorpha*\*  
*Melilotus indica*\*  
*Trifolium albicans*\*  
*Trifolium albopurpureum*  
*Trifolium albopurpureum* var. *dichotomum*  
*Trifolium bifidum* var. *decipiens*

common Pacific pea  
birdfoot trefoil  
lotus  
chick lupine  
miniature lupine  
summer lupine  
sky lupine  
arroyo lupine  
California bur clover  
sourclover  
annual yellow clover  
Rancheria clover  
notch-leaved pinole clover

<i>Trifolium ciliolatum</i>	tree clover
<i>Trifolium dubium*</i>	shamrock
<i>Trifolium gracilentum</i>	pinpoint clover
<i>Trifolium hirtum*</i>	rose clover
<i>Trifolium microdon</i>	Valparaiso clover
<i>Trifolium oliganthum</i>	few-flowered clover
<i>Trifolium subterraneum*</i>	subterranean clover
<i>Trifolium variegatum</i>	white-tipped clover
<i>Trifolium willdenovii</i>	tomcat clover
<i>Trifolium depauperatum</i> var. <i>amplectens</i>	pale sac clover
<i>Vicia americana</i>	American vetch
<i>Vicia villosa*</i>	wooly vetch

#### **FAGACEAE**

<i>Quercus agrifolia</i>	coast live oak
<i>Quercus chrysolepis</i>	interior live oak
<i>Quercus douglasii</i>	blue oak
<i>Quercus lobata</i>	valley oak

#### **GERANIACEAE**

<i>Erodium botrys*</i>	long-beaked filaree
<i>Erodium cicutarium*</i>	red-stemmed filaree
<i>Geranium dissectum*</i>	cut-leaved geranium
<i>Geranium molle*</i>	dove's foot geranium

#### **GENTIANACEAE**

<i>Centaurium</i> sp	centaury
----------------------	----------

#### **GROSSULARIACEAE**

<i>Ribes californicum</i>	hillside gooseberry
<i>Ribes speciosum</i>	flowering gooseberry

#### **HIPPOCASTANACEAE**

<i>Aesculus californica</i>	California buckeye
-----------------------------	--------------------

#### **HYDROPHYLLACEAE**

<i>Phacelia egea</i>	California phacelia
<i>Phacelia imbricata</i>	imbricate phacelia

#### **LAMIACEAE**

<i>Marrubium vulgare*</i>	white horehound
<i>Monardella villosa</i>	coyote mint
<i>Salvia mellifera</i>	black sage
<i>Satureja douglasii</i>	yerba buena
<i>Stachys ajugoides</i> var. <i>rigida</i>	hedge nettle
<i>Trichostema lanceolatum</i>	vinegar weed

#### **LAURACEAE**

<i>Umbellularia californica</i>	California bay
---------------------------------	----------------

**LYTHRACEAE**

*Lythrum hyssopifolium\**

grass poly

**MALVACEAE**

*Malva parviflora\**

*Malvella leprosa*

*Sidalcea diploscypha*

*Sidalcea malvaeflora*

cheeseweed  
malvella  
fringed sidalcea  
checker mallow

**ONAGRACEAE**

*Clarkia purpurea* ssp. *quadrivulnera*

*Epilobium canum*

*Epilobium brachycarpum*

*Epilobium pygmaeum*

clarkia  
California fuchsia  
panicked willow-herb  
smooth boiduvalia

**PAPAVERACEAE**

*Eschscholzia californica*

*Eschscholzia cespitosa*

California poppy  
cespitose poppy

**PLANTAGINACEAE**

*Plantago erecta*

*Plantago lanceolata\**

*Plantago major\**

California plantain  
English plantain  
common plantain

**POLEMONIACEAE**

*Navarretia squarrosa*

skunkweed

**POLYGONACEAE**

*Eriogonum elongatum*

*Eriogonum nudum* var. *auriculaum*

*Polygonum amphibium*

*Polygonum arenastrum\**

*Rumex conglomeratus\**

*Rumex crispus\**

*Rumex acetosella\**

*Rumex pulcher\**

long-stemmed buckwheat  
naked buckwheat  
swamp knotweed  
knotweed  
  
curly dock  
sheep sorrel  
fiddle dock

**PRIMULACEAE**

*Anagallis arvensis\**

*Dodecatheon clevelandii*

scarlet pimpernel  
shooting star

**RANUNCULACEAE**

*Clematis lasiantha*

*Delphinium* sp.

*Ranunculus californicus*

pipestems  
larkspur  
California buttercup

**RHAMNACEAE**

*Rhamnus californica*

coffeeberry

**ROSACEAE**

*Acaena pinnatifida* var. *californica*

California acaena

*Heteromeles arbutifolia*  
*Holodiscus discolor*  
*Oemleria cerasiformis*  
*Prunus ilicifolia*  
*Rosa californica*  
*Rubus ursinus*

toyon  
oceanspray  
oso berry  
holly-leaf cherry  
California rose  
California blackberry

#### **RUBIACEAE**

*Galium aparine*\*  
*Galium californicum*  
*Galium porrigens*

goose grass  
California bedstraw  
climbing bedstraw

#### **SALICACEAE**

*Populus fremontii*  
*Salix laevigata*  
*Salix lasiolepis*

Fremont's cottonwood  
red willow  
arroyo willow

#### **SCROPHULARIACEAE**

*Bellardia trixago*\*  
*Castilleja affinis*  
*Castilleja attenuata*  
*Castilleja densiflora*  
*Castilleja exserta* ssp. *exserta*  
*Mimulus aurantiacus*  
*Mimulus guttatus*  
*Scrophularia californica*  
*Veronica anagalis-aquatica*  
*Triphysaria pusilla*

Indian paintbrush  
valley tassels  
owl's clover  
owl's clover  
sticky monkey flower  
monkey flower  
bee plant  
water speedwell  
dwarf owl's clover

#### **SOLANACEAE**

*Solanum umbelliferum*

blue witch

#### **VALERIANACEAE**

*Plectritis* sp.

plectritis

#### **VERBENACEAE**

*Phyla nodiflora*  
*Verbena bonariensis*\*

garden lippia  
vervain

#### **VIOLACEAE**

*Viola pendunculata*

Johnny jump-up

### **CLASS MONOCOTYLEDONES**

#### **CYPERACEAE**

*Carex praegracilis*  
*Carex tumulicola*  
*Eleocharis macrostachya*  
*Scirpus acutus* var. *occidentalis*  
*Scirpus americanus*

sedge  
sedge  
spikerush  
common tule  
three square

**IRIDACEAE***Sisyrinchium bellum*

blue eyed grass

**JUNCACEAE***Juncus balticus*

wire rush

*Juncus bufonius*

toad rush

*Juncus occidentalis*

western rush

*Juncus patens*

spreading rush

*Juncus phaeocephalus*

brown-headed rush

*Juncus xiphioides*

iris-leaved rush

**JUNCAGINACEAE***Lilaea scilloides*

flowering quill-wort

**LEMNACEAE***Lemna* sp.

duckweed

**LILIACEAE***Allium bolanderi*

wild onion

*Brodiaea elegans*

harvest brodiaea

*Calochortus albus*

white globe lily

*Calochortus luteus*

yellow mariposa lily

*Calochortus venustris*

calochortus

*Chlorogalum. pomeridianum*

soap plant

*Dichelostemma capitatum*

blue dicks

*Triteleia laxa*

Ithuriel's spear

**POACEAE***Agrostis pallens*

thin grass

*Aira caryophylla*\*

hair grass

*Avena barbata*\*

slender wild oat

*Avena fatua*\*

wild oats

*Briza maxima*\*

rattlesnake grass

*Bromus carinatus*

California brome

*Bromus ciliatus*

fringed brome

*Bromus diandrus*\*

rippgut brome

*Bromus hordaeceus*\*

soft chess

*Bromus madritensis*\*

foxtail chess

*Bromus rubens*\*

red brome

*Crypsis vaginiflora*\*

hedgehog dogtail

*Cynosurus echinatus*\*

California oat grass

*Danthonia californica*

salt grass

*Distichlis spicata*

slender hair grass

*Deschampsia elongata*

blue wild rye

*Elymus glaucus*

big squirreltail

*Elymus multisetus**Elymus* sp.*Gastridium ventricosum*\*

nitgrass

*Hordeum brachyantherum* var. *californicum*

meadow barley

*Hordeum marinum* ssp. *gussoneanum*\*

Mediterranean Barley

*Hordeum marinum* ssp. *leporinum*\*

barnyard foxtail

<i>Koeleria macrantha</i>	June grass
<i>Leymus triticoides</i>	creeping wild rye
<i>Lolium multiflorum</i> *	annual ryegrass
<i>Lolium perenne</i> *	lawn ryegrass
<i>Melica californica</i>	California melic
<i>Melica imperfecta</i>	small-leafed melic
<i>Melica torreyana</i>	Torrey's melic
<i>Nassella lepida</i>	foothill needlegrass
<i>Nassella pulchra</i>	purple needlegrass
<i>Phalaris aquatica</i> *	Harding grass
<i>Phalaris paradoxa</i> *	paradox canary grass
<i>Poa annua</i> *	annual poa
<i>Poa secunda</i> ssp. <i>secunda</i>	pine blue grass
<i>Polypogon monspeliensis</i> *	rabbitfoot grass
<i>Tristema</i> sp.	
<i>Vulpia myuros</i> var. <i>myuros</i>	rattail fescue
<i>Vulpia microstachys</i>	Nuttall's fescue
<b>TYPHACEAE</b>	
<i>Typha domingensis</i>	narrow-leaved cattail

**APPENDIX 1.2: KNOWN AND POTENTIAL WILDLIFE SPECIES OF COYOTE LAKE-HARVEY BEAR RANCH COUNTY PARK**

\* Captured, seen, or evidence of species seen during the 1997 or 2001 surveys:

**CLASS:** INSECTA

**ORDER:** Lepidoptera

**FAMILY:** **Hesperiidae**

Common Checkered Skipper\* (*Pyrgus communis*)

Black Skipper\*

Rural Skipper\* (*Ochlodes agricola*)

**FAMILY:** **Papilionidae**

Anise Swallowtail\* (*Papilio zelicaon*)

Chaparral Swallowtail\*

**FAMILY:** **Pieridae**

White\*

Common Sulfur\* (*Colias philodice*)

**FAMILY:** **Lycaenidae**

Hairstreak\*

Acmon Blue\* (*Plebejus acmon*)

**FAMILY:** **Nymphalidae**

Fritillary\* (*Speyeria* sp.)

Mylitta Crescent\* (*Phyciodes mylitta*)

Chalcedon Checkerspot\* (*Occidryas chalcedona*)

California Sister\* (*Adelpha brewdowi*)

Buckeye\* (*Junonia coenia*)

**FAMILY:** **Satyridae**

California Ringlet\* (*Coenonympha californica*)

Monarch\* (*Danaus plexippus*)

Oxeye Satyr\*

**CLASS:** AMPHIBIA

**ORDER:** Caudata

**FAMILY:** **Ambystomatidae**

California tiger salamander (*Ambystoma tigrinum californiense*)

**FAMILY:** **Salamandridae**

California Newt (*Taricha torosa*)

**FAMILY:** **Plethodontidae**

California Slender Salamander (*Batrachoseps attenuatus*)

**ORDER:** **Salientia**  
**FAMILY:** **Bufonidae**  
Western Toad\* (*Bufo boreas*)

**FAMILY:** **Hylidae**  
Pacific Treefrog\* (*Hyla regilla*)

**FAMILY:** **Ranidae**  
Red-legged Frog (*Rana aurora draytonii*)  
Yellow - legged Frog (*Rana boylei*)  
Bullfrog\* (*Rana catesbeiana*)

**CLASS:** **REPTILIA**

**ORDER:** **Squamata**  
**SUB ORDER:** **Saurea**  
**FAMILY:** **Iguanidae**  
Western Fence Lizard\* (*Sceloporus occidentlis*)  
Coast Horned Lizard (*Phrynosoma coronatum*)

**FAMILY:** **Scincidae**  
Western Skink\* (*Eumeces skiltonianus*)

**FAMILY:** **Anguidae**  
Southern Alligator Lizard (*Gerrhonotus multicarinatus*)

**SUB ORDER:** **Serpentes**  
**FAMILY:** **Boidae**  
Rubber Boa (*Charina bottae*)

**FAMILY:** **Colubridae**  
Sharp-tailed Snake (*Contia tenuis*)  
Racer (*Coluber constrictor*)  
Gopher Snake (*Pituophis melanoleucu*)  
King Snake (*Lampropeltis getulus*)  
Common Garter snake\* (*Thamnophis sirtalis*)  
Western Terrestrial Garter Snake (*Thamnophis elegans*)

**FAMILY:** **Viperidae**  
Western Rattlesnake (*Crotalus viridis*)

**ORDER:** **Testudines**  
**FAMILY:** **Emydidae**  
Western Pond Turtle\* (*Clemmys marmorata*)

**CLASS:** AVES

**ORDER:** Podicipediformes  
**FAMILY:** Podicipediformus  
 Pied-billed Grebe\* (*Podilymbus podiceps*)  
 Eared Grebe (*Podiceps nigricollis*)

**ORDER:** Ciconiiformes  
**FAMILY:** Ariidae  
 Great blue Heron\* (*Ardea herodias*)  
 Great Egret (*Casmerodius albus*)  
 Snowy Egret (*Egretta thula*)  
 Green Heron\* (*Butorides virescens*)

**ORDER:** Anseriformes  
**FAMILY:** Anatidae  
 Wood Duck\* (*Aix sponsa*)  
 Green-winged Teal (*Anas crecca*)  
 Mallard\* (*Anas platyrhynchos*)  
 Northern Pintail (*Anas acuta*)  
 Cinnamon Teal (*Anas cyanoptera*)  
 Gadwall (*Anas strepera*)  
 Northern Shoveler (*Anas clypeata*)  
 American wigeon (*Anas americana*)  
 Canada Goose\* (*Branta canadensis*)  
 Bufflehead (*Bucephala albeola*)  
 Ruddy Duck (*Oxyura jamaicensis*)

**ORDER:** Falconiformes  
**FAMILY:** Cathartidae  
 Turkey Vulture\* (*Cathartes aura*)

**FAMILY:** Accipitridae  
 White-tailed Kite\* (*Elanus leucurus*)  
 Northern Harrier (*Circus cyaneus*)  
 Sharp-shinned Hawk (*Accipiter striatus*)  
 Cooper's Hawk\* (*Accipiter cooperii*)  
 Red - shouldered Hawk\* (*Buteo lineatus*)  
 Ferruginous Hawk (*Buteo regalis*)  
 Swainson's Hawk (*Buteo swainsoni*)  
 Red -tailed Hawk\* (*Buteo jamaicensis*)  
 Rough - legged Hawk (*Buteo lagopus*)  
 Golden Eagle\* (*Aquila chrysaetos*)

**FAMILY:** Falconidae  
 American Kestrel\* (*Falco sparverius*)  
 Merlin (*Falco columbarius*)  
 Peregrine Falcon (*Falco peregrinus*)  
 Prairie Falcon (*Falco mexicanus*)

**ORDER:** **Galliformes**  
**FAMILY:** **Phasianidae**  
Wild Turkey\* (*Meleagris gallopavo*)  
California Quail\* (*Callipepla californica*)

**ORDER:** **Gruiformes**  
**FAMILY:** **Rallidae**  
Virginia Rail (*Rallus limicola*)  
American Coot\* (*Fulica americana*)

**ORDER:** **Charadriiformes**  
**FAMILY:** **Charadriidae**  
Black - bellied Plover (*Pluvialis squatarola*)  
Killdeer\* (*Charadrius vociferus*)

**FAMILY:** **Scolopaccidae**  
Greater Yellowlegs (*Tringa melanoleuca*)  
Spotted Sandpiper (*Acitis macularia*)  
Western Sandpiper (*Calidris mauri*)  
Least Sandpiper (*Calidris minutilla*)  
Baird's Sandpiper (*Calidris bairdii*)  
Long - billed Dowitcher (*Limnodromus scolopaceus*)  
Common Snipe (*Gallinago gallinago*)

**FAMILY:** **Laridae**  
Ring - billed Gull (*Larus delawarensis*)  
Forster's Tern\* (*Sterna forsteri*)  
Caspian Tern\* (*Sterna caspia*)

**ORDER:** **Columbiformes**  
**FAMILY:** **Columbidae**  
Rock Dove\* (*Columba livia*)  
Band-tailed Pigeon\* (*Columbia fasiata*)  
Mourning Dove\* (*Zenaida macroura*)

**ORDER:** **Stigiformes**  
**FAMILY:** **Tytonidae**  
Barn Owl\* (*Tyto alba*)

**FAMILY:** **Strigidae**  
Great Horned Owl\* (*Bubo virginianus*)  
Burrowing Owl (*Athene cunicularia*)  
Short-eared Owl (*Asio flammeus*)

**ORDER:** **Apodiformes**  
**FAMILY:** **Apodidae**  
White-throated Swift\* (*Aeronautes saxatalis*)

**FAMILY:** **Trochchidae**  
Anna's Hummingbird\* (*Calypte anna*)  
Allen's Hummingbird\* (*Selasphorus sasin*)

**ORDER:** **Coraciiformes**

**FAMILY:** **Alcedinidae**  
Belted Kingfisher\* (*Ceryle alcyon*)

**ORDER:** **Piciformes**

**FAMILY:** **Picidae**  
Acorn Woodpecker\* (*Melanerpes formicivorous*)  
Nuttall's Woodpecker\* (*Picoides nuttallii*)  
Downy Woodpecker\* (*Picoides pubescens*)  
Northern Flicker\* (*Colaptes auratus*)

**ORDER:** **Passeriformes**

**FAMILY:** **Tyrannidae**  
Western Wood-pewee\* (*Contopus sordidulus*)  
Pacific -slope Flycatcher\* (*Empidonax difficilis*)  
Black Phoebe\* (*Sayornis nigrcans*)  
Say's Phobe (*Sayornis saya*)  
Ash-throated Flycatcher\* (*Myiarchus cinerascens*)  
Western Kingbird\* (*Tyrannus verticalis*)

**FAMILY:** **Vireonidae**  
Hutton's Vireo\* (*Vireo huttoni*)  
Warbling Vireo\* (*Vireo gilvus*)

**FAMILY:** **Corvidae**  
Steller's Jay\* (*Cyanocitta stelleri*)  
Western Scrub-Jay\* (*Aphelocoma californica*)  
Yellow-billed Magpie\* (*Pica nuttalli*)  
American Crow\* (*Corvus brachyrhynchos*)

**FAMILY:** **Alaudidae**  
Tree Swallow\* (*Tachycineata bicolor*)  
Violet-green Swallow\* (*Stelgidopteryx serripennis*)  
Bank Swallow\* (*Riparia riparia*)  
Cliff Swallow\* (*Hirundo pyrrhonota*)  
Northern Rough-winged Swallow\* (*Stelgidopteryx serripennis*)  
Barn Swallow\* (*Hirundo rustica*)

**FAMILY:** **Corvidae**  
Steller's Jay\* (*Cyanocitta stelleri*)  
Scrub Jay\* (*Aphelocoma coerulescens*)  
Common Raven\* (*Corvus corax*)

**FAMILY:** **Paridae**  
Chestnut-backed Chickadee\* (*Poecile rufescens*)  
Oak Titmouse\* (*Parus inoratus*)

**FAMILY:** **Aegithalidae**  
Bushtit\* (*Psaltriparis minimus*)

- FAMILY: Sittidae**  
 Red - breasted Nuthatch (*Sitta canadensis*)  
 White - breasted Nuthatch\* (*Sitta carolinensis*)  
 Pygmy Nuthatch\* (*Sitta pygmaea*)
- FAMILY: Troglodytidae**  
 Bewick's Wren\* (*Thrymanes bewickii*)  
 House Wren\* (*Troglodytes aedon*)  
 Marsh Wren (*Cistothorus palustris*)  
 Rock Wren\* (*Salpinctes obsoletus*)
- FAMILY: Timaliidae**  
 Wrentit\* (*Chamaea fasciata*)
- FAMILY: Regulidae**  
 Ruby-crowned Kinglet\* (*Regulus calendula*)  
 Golden-crowned Kinglet\* (*Regulus satrapa*)
- FAMILY: Sylviidae**  
 Blue-gray Gnatcatcher\* (*Polioptila caerulea*)
- FAMILY: Turdidae**  
 Western Bluebird\* (*Sialia mexicana*)  
 American Robin\* (*Turdus migratorius*)
- FAMILY: Mimidae**  
 Northern Mockingbird\* (*Mimus polyglottos*)
- FAMILY: Sturnidae**  
 European Starling\* (*Sturnus vulgaris*)
- FAMILY: Parulidae**  
 Orange-crowned Warbler\* (*Vermivora celata*)
- FAMILY: Cardinalidae**  
 Black-headed Grosbeak\* (*Pheucticus melanocephalus*)
- FAMILY: Emberizidae**  
 California Towhee\* (*Pipilo crissalis*)  
 Spotted Towhee\* (*Pipilo maculatus*)  
 Lark Sparrow\* (*Chondestes grammacus*)  
 Savannah Sparrow (*Passerculus sandwichensis*)  
 Grasshopper Sparrow\* (*Ammodramus savannum*)  
 Song Sparrow\* (*Melospiza melodia*)  
 Dark-eyed Junco\* (*Junco hyemalis*)
- FAMILY: Icteridae**  
 Western Meadowlark\* (*Sturnella neglecta*)  
 Red-winged Blackbird\* (*Agelaius phoeniceus*)  
 Brewer's Blackbird\* (*Euphagus cyanocephalus*)  
 Brown-headed Cowbird\* (*Molothrus ater*)

Bullock's Oriole\* (*Icterus bullockii*)

**FAMILY:** **Fringillidae**  
Purple Finch\* (*Carpodacus purpureus*)  
House Finch\* (*Carpodacus mexicanus*)  
Lesser Goldfinch\* (*Carduelis psaltria*)  
Lawrence's Goldfinch (*Carduelis lawrencei*)  
American Goldfinch (*Cardueis tristis*)

**FAMILY:** **Passeridae**  
House Sparrow\* (*Passer domesticus*)

**CLASS:** **MAMMALIA**

**ORDER:** **Marsupialia**  
**FAMILY:** **Didelphidae**  
Virginia Opossum\* (*Didelphis virginiana*)

**ORDER:** **Insectivora**  
**FAMILY:** **Soricidae**  
Trowbridges's Shrew (*Sorex trowbridgii*)  
Ornate Shrew (*Sorex ornatus*)

**FAMILY:** **Talpidae**  
Broad-footed mole (*Scapanus latimanus*)

**ORDER:** **Chiroptera**  
**FAMILY:** **Vespertilionidae**  
Big Brown Bat\* (*Eptesicus fuscus*)  
Red Bat (*Lasiurus borealis*)  
Hoary Bat\* (*Lasiurus cinereus*)  
Silver-haired Bat (*Lasionycteris noctivagans*)  
Little Brown Myotis (*Myotis lucifugus*)  
California Myotis (*Myotis californicus*)  
Long-eared Myotis (*Myotis evotis*)  
Long-legged Myotis (*Myotis volans*)  
Yuma Myotis (*Myotis yumanensis*)  
Fringed Myotis (*Myotis thysanodes*)  
Small-footed Myotis (*Myotis leibii*)  
Western Pipistrelle (*Pipistrellus hesperus*)  
Pallid Bat (*Antrozous pallidus*)  
Townsend's Long-eared Bat (*Plecotus townsendii*)

**FAMILY:** **Molossidae**  
Brazilian Free-tailed Bat (*Tadarida brasiliensis*)  
Western Mastiff Bat (*Eumops perotis*)

**ORDER:** **Lagomopha**  
**FAMILY:** **Leporidae**  
Brush Rabbit\* (*Sylviagus bachmani*)  
Black-tailed Hare (*Lepus californicus*)

Desert Cottontail (*Sylvilagus audubonii*)

**ORDER:** Rodentia  
**FAMILY:** Sciuridae

Western Gray Squirrel (*Sciurus griseus*)  
California Ground Squirrel\* (*Spermophilus beecheyi*)  
Merriam's Chipmunk (*Tamias merriami*)

**FAMILY:** Geomyidae  
Botta's Pocket Gopher\* (*Thomomys bottae*)

**FAMILY:** Heteromyidae  
California Pocket Mouse (*Perognathus californicus*)

**FAMILY:** Cricetidae  
Western Harvest Mouse\* (*Reithrodontomys megalotis*)  
Brush Mouse\* (*Peromyscus boylii*)  
Deer Mouse\* (*Peromyscus maniculatus*)  
Pinyon Mouse\* (*Peromyscus truei*)  
Dusky-footed Woodrat\* (*Neotoma fuscipes*)

**FAMILY:** Arvicolidae  
California Vole\* (*Microtus californicus*)

**FAMILY:** Muridae  
Norway Rat (*Rattus norvegicus*)  
House Mouse (*Mus musculus*)

**ORDER:** Carnivora  
**FAMILY:** Canidae

Coyote\* (*Canis latrans*)  
Red Fox (*Vulpes vulpes*)  
Grey Fox (*Urocyon cinereoargenteus*)

**FAMILY:** Procyonidae  
Raccoon\* (*Procyon lotor*)

**FAMILY:** Mustelidae  
Long-tailed Weasel (*Mustela frenata*)  
Badger (*Taxidea taxus*)  
Western Spotted Skunk (*Spilogale gracilis*)  
Striped Skunk\* (*Mephitis gracilis*)

**FAMILY:** Felidae  
Mountain Lion (*Felis concolor*)  
Bobcat\* (*Lynx rufus*)

**ORDER:** Artiodactyla  
**FAMILY:** Cervidae

Black-tailed Deer\* (*Odocoileus hemionus*)

**FAMILY:**     **Suidae**  
Wild Boar\* (*Sus scrofa*)



## Appendix 2

### Wildlife Survey Reports



## **Breeding Bird Inventory Report**

Coyote Lake – Harvey L. Bear Ranch County Park

Site Coordinator: Paul Kephart / Ryan Heacock

Field Biologist:  
Craig Hohenberger

Reporting Biologist: Craig Hohenberger

Craig Hohenberger  
E-mail: [calidralba@jps.net](mailto:calidralba@jps.net)  
Phone: (831) 659-7549



## **SITE REPORT: Coyote Lake - Harvey L. Bear Ranch County Park**

### **INTRODUCTION**

The purpose of this survey is to determine breeding bird use at the Coyote Lake - Harvey L. Bear Ranch County Park site, and extrapolate the migrant and wintering bird use at the location. This assessment is conducted to evaluate the temporal use of avian habitats in regards to historic/present livestock grazing impacts, future land use, and proposed recreational activities for the properties.

### **GENERAL SETTING**

**Location:** Coyote Lake - Harvey L. Bear County Park (CLHRCP) is located off Gilroy Hot Springs Road in the Mount Hamilton Range foothills, about 8 miles east of Gilroy (Hwy 101), Santa Clara County, California.

**Elevation:** 300-1324 ft. (85-375m)

**Site Description:** The CL-HRCP is located at the western edge of the Mount Hamilton Range and watershed, which is part of the Diablo Range of the inner South Coast Ranges of California. The property is comprised of many distinct plant communities and avian habitats: Oak Woodland; mixed Grassland; Chaparral; Riparian; wetlands, rock outcroppings/cliffs, and open water. The topography is characterized by steep canyons, rolling grass hills, and oak woodland canyons that drain into Coyote Lake Reservoir.

### **METHODS**

#### **SEARCH AREAS (Transects)**

There are three non-contiguous search areas (transects), Area 1 is located at the south end of Coyote Lake Reservoir and continuing about 1 km north along the reservoir. Search Areas 2 & 3 are located at the north end of Coyote Lake Reservoir and to the west of the reservoir (Appendix C: Figure C-1). The search areas are rectangular, ranging from 100m width and 2000m in length (20 hectare).

**Search Area 1** (Appendix A & C: Figure C-1).

Dimensions: 100m x 1000m (1 km) (10 ha)

Primary habitat: Coast Live Oak series (ecotonal)

Secondary habitat(s): Arroyo & Red willow series; open water, wetlands, and riparian.

Vegetation: This area is dominated at the western edge of the transect by a broken canopy tree layer of Coast Live Oak (*Quercus agrifolia*), and California Buckeye (*Aesculus californica*). Between the Oak Woodland to the west, and Arroyo and Red Willow (*Salix lasiolepis*, *S. laevigata*) to the east, lies a mesic area (wetland & open water) comprised of Toadbrush (*Juncus bufonius*), Spikebrush (*Eleocharis macrostachys*), and sedges (*Carex spp.*). Some of the understory plants include: Poison Oak (*Rhus trilobata*), California Blackberry (*Rubus ursinus*), Coyote Brush (*Baccharis pilularis*), Snowberry (*Symphoricarpos albus*), Poison Hemlock (*Conium maculatum*), and California Coffeeberry (*Rhamnus californica*). The herb layer is mostly non-native grasses and other forbs. The area is bordered on the west by a campground and entrance road to the park. Coyote Creek flows into the area from the southeast side of the transect. A rich riparian zone borders the eastern edge of the transect and southern edge of Coyote Reservoir.

**Search Area 2** (Appendix A: Figures C-2).

Dimensions: 100m x 500m (5 ha)

Primary habitat: Arroyo & Red willow series

Secondary habitats: Coast Live Oak series

Vegetation. Arroyo and Red Willow (*Salix lasiolepis*, *S. laevigata*) are dominant in this second search area; however Coast Live Oaks (*Quercus agrifolia*) are a close second as dominant canopy trees at the west edge of the transect. Much of the shrub layer is comprised of Poison Oak (*Rhus trilobata*), Coffeeberry (*Rhamnus californica*), Mugwort (*Artemisia douglasiana*), and California Blackberry (*Rubus ursinus*). The herb layer is mostly introduced grasses and forbs. The search area extends onto both sides of the riparian zone 0.5 km north along Coyote Creek. A dirt road parallels the creek to the west and bisects the creek at the northern end of the study area.

**Search Area 3** (Appendix A: Figure C-3).

Dimensions: 100m x 2000m (20 ha)

Primary habitat: Nodding needlegrass series

### Secondary habitat - California annual grassland series

Vegetation. Native grasslands classified as Nassella series are found on the open and exposed hillsides interspersed with Coast Live Oak (*Quercus agrifolia*) and Chaparral. Foothill Needlegrass (*Nassella lepida*), Purple Needlegrass (*Nassella pulchra*), and Blue Wild Rye (*Elymus glaucus*) are the most frequented grasses found on Coyote Lake-Harvey L. Bear properties. Many of the native grasses have been replaced by non-native introduced annual grasses and weeds such as Ryegrass (*Lolium multiflorum*), Wild Oats (*Avena barbata*), Soft Chess (*Bromus hordeaceus*), Ripgut Brome (*Bromus diandrus*) and Rattail Fescue (*Vulpia myuros*). The most dominant non-native grasses are Ryegrass and forbs such as Filaree (*Erodium cicutarium*), Black Mustard (*Brassica nigra*), and Star-thistle (*Centaurea solstitialis*). The non-native grasslands are found mostly on the gently facing westward hillsides.

## **RESULTS**

### **Site Species List** (Appendix B. Table-1)

Avian field studies identified 73 species of birds among 1032 total detections of individual birds at the Coyote Lake-Harvey L. Bear County Park. Morning and afternoon Area Search surveys (Search Areas 1, 2, & 3) conducted by a staff biologist detected 59 species on June 3, 2001, and surveys June 15, 2001, detected 66 species. One rare visitor, a Bank Swallow (*Riparia riparia*) was detected on June 15, 2001 at the southern end of Coyote Lake. Thirty-one species were confirmed as breeding birds, most (19 species) by the presence of recently fledged young and/or feeding young. Field observations found active nests of 4 species: Pied-billed Grebe, American Coot, Northern Rough-winged Swallow, and Barn Swallow. Fifteen species, e.g., Great Blue Heron, White-tailed Kite, California Quail, Northern Flicker, Nuttall's Woodpecker, Pacific-slope Flycatcher, Warbling Vireo, Bank Swallow, Oak Titmouse, Bewick's Wren, Rock Wren, Grasshopper Sparrow, Song Sparrow, Black-headed Grosbeak, and Lesser Goldfinch have been listed on the Conservation Status Report (Appendix B. Table 1.) Appendix B. Table -2 ranks all species in order of relative abundance, based on total detections accumulated from all surveys. However, this ranking should not be interpreted as a measure of abundance of adult breeding pairs. The totals for Cliff Swallow and American Coot, for instance, include many observations of recently fledged young. In addition, Forster's Tern observations were of late migrants and/or visitors.

### **Area Search** (Appendix B. Tables 3 & 4)

The standard Area Search survey method on June 3, 2001 detected 46 species in Area 1, 28 species in Area 2, and 16 species in Area 3. On June 15, 2001 avian surveys recorded 59 species in Area 1, and 33 species in Area 2 (Area 3 was not surveyed). Nine species inhabited all three areas, suggesting a high degree of habitat diversity; seventeen species were observed in only one of the three areas. The ten most abundant species detected by this method were American Coot, American Crow, Violet-green Swallow, Northern Rough-winged Swallow, European Starling, House Finch, Brewer's Blackbird, Red-winged Blackbird, Western Meadowlark, and Barn & Cliff swallows (Table 2.). For readers interested in a more detailed breakdown of area search data, Appendix B lists species and individuals detected in each search area during each site visit, by date.

## **DISCUSSION AND RECOMMENDATIONS**

The bird species composition and richness data presented in this report can be used to assess the quality of riparian, grassland, chaparral, and oak woodland habitats at Coyote Lake - Harvey L. Bear County Park, and thus help guide future habitat management decisions at the site.

### **Use of Riparian, Grassland, Chaparral, and Oak Woodland Habitats by Birds**

The grassland habitat dominates the total percent cover of avian habitat types available at Coyote Lake - Harvey L. Bear Ranch County Park (CL-HRCP) see (Appendix C. Map. C-1.). In the grassland plant community, a widespread distribution of Coast Live Oaks (*Quercus agrifolia*) provides additional habitat for oak woodland dependent occurring species. Therefore, many typically non-grassland species were detected in the Area 1 survey. For management reasons, it is important to consider to what degree the species detected are dependent on grassland or oak woodland habitat for either food or nest sites.

California Partners in Flight (PIF) have chosen seven avian focal species in order to capture the variation in habitat needs occurring in grasslands throughout California to better understand future management and monitoring. For each of the seven grassland focal species, PIF, hopes these species will best represent the habitat needs demonstrated by most or all birds that use California grasslands.

The status of the seven PIF grassland focal species at CL-HRCP: (1) Ferruginous Hawk (*Buteo regalis*) - is a rare to uncommon winter visitor; occurring exclusively recorded from late September-March in the Santa Clara Valley

(Coyote Lake - Harvey L. Bear Ranch County Park); (2) Grasshopper Sparrow (*Ammodramus savannarum*)- is a local uncommon breeder at CL-HRCP from April-August; (3) Mountain Plover (*Charadrius montanus*) - vagrant (fall & winter) in Santa Clara County, no records at CL-HRCP; (4) Northern Harrier (*Circus cyaneus*) - rare to uncommon fall & winter visitor to CL-HRCP from September to March; (5) White-tailed Kite (*Elanus leucurus*) - local uncommon breeder and resident in the Santa Clara Valley, one individual recorded at CL-HRCP during surveys, a possible breeder in area; (6) Western Meadowlark (*Sturnella neglecta*) - common breeder and resident in grassland habitats; (7) Savannah Sparrow (*Passerculus sandwichensis*)- an uncommon to fairly common winter visitor at CL-HRCP from September to late April. Coyote Lake-Harvey L. Bear Ranch County Park is well represented with six of the seven grassland PIF focal species being recorded. Only the Mountain Plover has not been recorded at CL-HRCP, however, this species historically probably never wintered at this site. The Mountain Plover winters locally in the inner coast range of San Benito County.

The narrowness and patchiness of the riparian zone at Coyote Lake-Harvey L. Bear Ranch County Park (south and north ends of Coyote Lake) site necessitated the inclusion of adjacent chaparral and oak woodland habitats with riparian habitat in the areas inventoried for birds. As a result, many typically non-riparian species were detected in the surveys. As stated above, for management reasons, it is important to consider to what degree the species detected are dependent on riparian habitat for either food or nest sites. Passerine bird species can be categorized into one of three groups: *riparian obligate* (>90% of nests in riparian vegetation), *riparian dependent* (60%-90% of nests in riparian vegetation), or *riparian user*.

Riparian Obligate Species. Song Sparrow is one of the important riparian obligate passerine species detected at this site. The Song Sparrow is considered one of the best indicators of riparian health in the western U.S. Non-passerine species in this category include Mallard, Wood Duck, Green Heron, and Killdeer .

Riparian Dependent Species. Warbling Vireo, Black-headed Grosbeak, Bewick's Wren, House Wren, Rock Wren, and Lesser Goldfinch are riparian dependent passerine species at this site.

Riparian User Species. Since the remaining species on the site list (Areas 1 & 2) were found within 50m of the riparian zone, all should be considered, to varying degrees, at least occasional users of riparian habitat. For

example, Acorn Woodpeckers, a species generally considered typical of oak woodlands, was observed foraging in the riparian zone on a few occasions.

Oak woodland is a widely distributed and represented habitat at Coyote Creek- Harvey L. Bear Ranch County Park. California Partners in Flight (PIF) have chosen seven avian focal species in order to capture the variation in habitat needs occurring in oak woodlands throughout California in order to better understand future management and monitoring. For each of the seven oak woodlands focal species, PIF hopes these species will best represent the habitat needs demonstrated by most or all birds that use California oak woodlands.

The status of the seven oak woodland focal species at CL-HRCP: (1) Acorn Woodpecker (*Melanerpes formicivorus*) - is a fairly common breeder and resident at Coyote Lake - Harvey L. Bear Ranch County Park; (2) Blue-gray Gnatcatcher (*Polioptila caerulea*)- is a local uncommon breeder at CL-HRCP from April-August; (3) Western Scrub-Jay (*Aphelocoma californica*) - common breeder and resident at CL-HRCP; (4) Western Bluebird (*Sialia mexicana*) - fairly common (local) breeder and resident at CL-HRCP; (5) Yellow-billed Magpie (*Pica nuttalli*) - local fairly common breeder and resident in the Santa Clara Valley and at CL-HRCP; (6) Oak Titmouse (*Baeolophus inornatus*) - fairly common breeder and resident; (7) Lark Sparrow (*Chondestes grammacus*)- an uncommon to fairly common breeder and resident at CL-HRCP. Coyote Lake-Harvey L. Bear Ranch County Park is well represented with all seven of the PIF oak woodland focal species being recorded as breeders and resident.

### **Comparison of Search Areas**

Examination of area search transect data (Appendix B) shows a higher species richness and abundance in Areas 1 and 2 and a noticeably lower species richness and abundance in Area 3. Riparian Focal Species show a mixed pattern, i.e., area search surveys detected Song Sparrow, Warbling Vireo, and Black-headed Grosbeak in Areas 1, but, Warbling Vireo was absent in Area 2. The absence of Warbling Vireo in Area 2 is likely due to differences in habitat quality and the width of the riparian zone of the search area. The lower species richness and abundance in Area 3 is related to the difference in habitat structure. Typically, temperate and arctic grassland/tundra two-dimensional habitats show significantly lower species richness and abundance due to lower productivity and differences in habitat structure. However, the CL-HRCP oak woodland and grassland habitats indicate a high degree of species richness and abundance, suggesting a seemingly stable habitat structure and plant community.

## **Evidence for Riparian , Oak Woodland, and Grassland Habitat Disturbance at CL-HRCP**

Low Numbers of Riparian Focal Species. The three Riparian Focal Species (Warbling Vireo, Song Sparrow, Black-headed Grosbeak) (RFS) found at CL-HRCP occurred in relatively low-to-moderate numbers relative to other species found at other well studied sites using similar survey techniques. Most of the paucity of Riparian Focal Species at CL-HRCP is due to the fragmentation and limited cover of riparian trees and shrubs.

Disturbance to the oak woodland and grassland habitats is local and limited. Numbers for the seven California Partners In Flight woodland and grassland focal species at CL-HRCP, were well represented in species richness and abundance, with only Mountain Plover being absent at the site. The presence of non-native grasses and forbs (such as star-thistle) indicates grassland habitat disturbances, resulting in the local and patchy distribution of Grasshopper Sparrows. Recreational use at Coyote Lake is local and limited to designated sites, e.g., campgrounds, trails, and cordoned areas on the reservoir. Birds such as American Crow, European Starling, Western Scrub-Jay, and Brown-headed Cowbird populations are often augmented with increased human land use. Increased numbers of the above mentioned species usually negatively impacts many of our native bird numbers.

Presence of Disturbance Species. European Starling (45 birds) and Brown-headed Cowbird (6 birds) species were detected at CL-HRCP which would indicate disturbances in the habitat.

## **Recommendations**

The recommendations summarized below are contingent upon historical and current human use of the site.

1. Minimize clearing of underbrush. Some clearing may be necessary for fire prevention. However, underbrush provides critical forage and nesting habitat for many species (e.g., Song Sparrow). Also, dense habitat makes it more difficult for the Brown-headed Cowbird to locate nests of host species.
2. Avoid removal of snags or fallen dead trees and limbs. Standing and fallen snags provide nest cavity sites; standing snags are used as song and flycatching perches.
3. Removal of non-native plants. Non-native clover could be removed from the riverbed.
4. Restoration. Plant restoration would aid avian species richness and abundance in Areas 1 & 2 Natural local reseeding of native grasses, shrubs and riparian tree species would be sufficient to restore riparian habitat.

5. Develop a Management, Monitoring, and Educational Plan. A comprehensive long-term management plan that includes monitoring and education, will enhance the Park's avian species richness and abundances. Determine grassland bird response to various grazing, burning, mowing, and disking regimes that may be used on the site.

**Migrants and Wintering Birds at Coyote Lake- Harvey L. Bear Ranch County Park**

Undoubtedly, CL-HRCP is a very important site for many spring /fall neotropical migrants and wintering species of birds. Future avian surveys during spring, fall, and winter would reveal many other important conservation status birds (see Appendix B. Table 5. ). The diversity of habitat types at the site provides important cover, food, and stopover sites for birds in transient, as well as birds over-wintering.

## **APPENDIX A: SITE PHOTOS**



FIGURE C-1. AREA SEARCH 1.  
COYOTE LAKE - HARVEY L. BEAR RANCH COUNTY PARK



FIGURE C-1. AREA SEARCH 1.  
COYOTE LAKE - HARVEY L. BEAR RANCH COUNTY PARK



FIGURE C-1. AREA SEARCH 2.  
COYOTE LAKE - HARVEY L. BEAR RANCH COUNTY PARK



FIGURE C-1. AREA SEARCH 2.  
COYOTE LAKE - HARVEY L. BEAR RANCH COUNTY PARK



FIGURE C-1. AREA SEARCH 3  
COYOTE LAKE - HARVEY L. BEAR RANCH COUNTY PARK



FIGURE C-1. AREA SEARCH 3  
COYOTE LAKE - HARVEY L. BEAR RANCH COUNTY PARK





## **APPENDIX B: AREA SEARCH DATA**



**Table 1. Species Observed in All Search Areas During Transect Area Search Surveys**

<b>Coyote Lake-Harvey H. Bear County Park</b>				
<b>Detections by survey method*</b>				
<b>Common Name</b>	<b>Species</b>	<b>Totals</b>	<b>Breeding Evidence**</b>	<b>Conservation Status***</b>
1 Pied-billed Grebe	<i>Podilymbus podiceps</i>	14	NE	
Green Heron	<i>Butorides virescens</i>	2	DIS	
1 Great Blue Heron	<i>Ardea herodias</i>	1		CDF: sensitive
1 Turkey Vulture	<i>Cathartes aura</i>	16		
Canada Goose	<i>Branta canadensis</i>	7		
Wood Duck	<i>Aix sponsa</i>	18	FL	
1 Mallard	<i>Anas platyrhynchos</i>	22	FL	
1 White-tailed Kite	<i>Elanus leucurus</i>	1		DFG
1 Red-shouldered Hawk	<i>Buteo lineatus</i>	3		
1 Red-tailed Hawk	<i>Buteo jamaicensis</i>	4	P/C	
1 American Kestrel	<i>Falco sparverius</i>	2		
Wild Turkey	<i>Meleagris gallopavo</i>	2	FL	
1 California Quail	<i>Callipepla californica</i>	21	DIS; P; C	WL
1 American Coot	<i>Fulica americana</i>	70	NE; FL	
1 Killdeer	<i>Charadrius vociferus</i>	3	DIS	
Forster's Tern	<i>Sterna forsteri</i>	15		
Caspian Tern	<i>Sterna caspia</i>	7	DIS/C	
1 Rock Dove	<i>Columba livia</i>	1		
1 Mourning Dove	<i>Zenaida macroura</i>	7	P	
1 White-throated Swift	<i>Aeronautes saxatalis</i>	8	C	
1 Anna's Hummingbird	<i>Calypte anna</i>	3		
Belted Kingfisher	<i>Ceryle alcyon</i>	3		
1 Acorn Woodpecker	<i>Melanerpes formicivorus</i>	22	G	
1 Northern Flicker	<i>Colaptes auratus</i>	4		WL
1 Nuttall's Woodpecker	<i>Picoides nuttallii</i>	9		WL
1 Downy Woodpecker	<i>Picoides pubescens</i>	3		
Western Wood-Pewee	<i>Contopus sordidulus</i>	13		
1 Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	2		WL
1 Black Phoebe	<i>Sayornis nigricans</i>	22	FL	
1 Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	11		
1 Western Kingbird	<i>Tyrannus verticalis</i>	3		
Hutton's Vireo	<i>Vireo huttoni</i>	8		
Warbling Vireo	<i>Vireo gilvus</i>	6		CA, SC, RFS
1 Steller's Jay	<i>Cyanocitta stelleri</i>	15		
1 Western Scrub-Jay	<i>Aphelocoma californica</i>	12		
Yellow-billed Magpie	<i>Pica nuttalli</i>	8		
American Crow	<i>Corvus brachyrhynchos</i>	68	FL	
1 Tree Swallow	<i>Tachycineta bicolor</i>	20		
Violet-green Swallow	<i>Tachycineta thalassina</i>	48	FY	
Bank Swallow	<i>Riparia riparia</i>	1		ST
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	25		

Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	46	FL/NE	
1 Barn Swallow	<i>Hirundo rustica</i>	27	NE	
Wrentit	<i>Chamaea fasciata</i>	4		
Oak Titmouse	<i>Baeolophus inornatus</i>	23		WL
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	20	FY	
1 Bushy-tit	<i>Psaltriparus minimus</i>	10		
White-breasted Nuthatch	<i>Sitta carolinensis</i>	10		
1 House Wren	<i>Troglodytes aedon</i>	11	FY	
1 Bewick's Wren	<i>Thryomanes bewickii</i>	7		RD
Rock Wren	<i>Salpinctes obsoletus</i>	3	FY	RD
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	2		
Western Bluebird	<i>Sialia mexicana</i>	13		
American Robin	<i>Turdus migratorius</i>	10	DIS	
Northern Mockingbird	<i>Mimus polyglottos</i>	1		(western edge of Coyote Lake)
European Starling	<i>Sturnus vulgaris</i>	45	FL	
Orange-crowned Warbler	<i>Vermivora celata</i>	13	DIS	
California Towhee	<i>Pipilo crissalis</i>	22		
Spotted Towhee	<i>Pipilo maculatus</i>	25		
Lark Sparrow	<i>Chondestes grammacus</i>	6	FY	
Grasshopper Sparrow	<i>Ammodramus savannum</i>	4	FY	FWS, MNBMC
Song Sparrow	<i>Melospiza melodia</i>	22	FL	RFS
Dark-eyed Junco	<i>Junco hyemalis</i>	16		
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	17	FL	RFS
Western Meadowlark	<i>Sturnella neglecta</i>	27		
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	28	FL	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	30	FL	
Brown-headed Cowbird	<i>Molothrus ater</i>	6		
Bullock's Oriole	<i>Icterus bullockii</i>	4		
Purple Finch	<i>Carpodacus purpureus</i>	7		
1 House Finch	<i>Carpodacus mexicanus</i>	33	FL	
1 Lesser Goldfinch	<i>Carduelis psaltria</i>	20		RD
1 House Sparrow	<i>Passer domesticus</i>	3		
<b>TOTAL SPECIES</b>		<b>73</b>		
<b>TOTAL INDIVIDUALS</b>		<b>1032</b>		

**\* Survey Method:**

Area Search Transects

**\*\* Breeding Codes**

**FL** = recently fledged young

**DIS** = Displaying

**NE** = nest

**FY** = feeding young

**C** = courtship

**P** = pair

**\*\*\* Conservation status codes**

**CDFG SC:** Calif. Dept. of Fish and Game species of Special concern

**WL:** Audubon Watch list

**CA SC:** Calif. Species of Special Concern

**RFS:** Partner's In Flight Riparian Focal Species

**RD:** Partner's In Flight Riparian Dependent Species

**CDF:** California Dept. of Forestry

**ST:** State-listed as threatened

**MNBMC:** F&W Service Migratory Non-game Bird of Manag. Concern

**Table 2. Species Observed During Transect Area Search Surveys Ranked by Relative Abundance Coyote Lake-Harvey H. Bear County Park**

<b>Common Name</b>	<b>Species</b>	<b>Totals</b>
American Coot	<i>Fulica americana</i>	70
American Crow	<i>Corvus brachyrhynchos</i>	58
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	46
European Starling	<i>Sturnus vulgaris</i>	45
Violet-green Swallow	<i>Tachycineta thalassina</i>	40
House Finch	<i>Carpodacus mexicanus</i>	33
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	30
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	28
Western Meadowlark	<i>Sturnella neglecta</i>	27
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	25
Belted Kingfisher	<i>Ceryle alcyon</i>	23
Mallard	<i>Anas platyrhynchos</i>	22
California Towhee	<i>Pipilo crissalis</i>	22
Barn Swallow	<i>Hirundo rustica</i>	21
Tree Swallow	<i>Tachycineta bicolor</i>	20
Song Sparrow	<i>Melospiza melodia</i>	20
Black Phoebe	<i>Sayornis nigricans</i>	19
Oak Titmouse	<i>Baeolophus inornatus</i>	19
Spotted Towhee	<i>Pipilo maculatus</i>	17
Turkey Vulture	<i>Cathartes aura</i>	16
Wood Duck	<i>Aix sponsa</i>	16
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	16
Lesser Goldfinch	<i>Carduelis psaltria</i>	16
California Quail	<i>Callipepla californica</i>	15
Forster's Tern	<i>Sterna forsteri</i>	15
Pied-billed Grebe	<i>Podilymbus podiceps</i>	14
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	14
Western Bluebird	<i>Sialia mexicana</i>	13
Steller's Jay	<i>Cyanocitta stelleri</i>	11
House Wren	<i>Troglodytes aedon</i>	11
Orange-crowned Warbler	<i>Vermivora celata</i>	11
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	11
Western Scrub-Jay	<i>Aphelocoma californica</i>	10
Bushtit	<i>Psaltriparus minimus</i>	10
American Robin	<i>Turdus migratorius</i>	10
Dark-eyed Junco	<i>Junco hyemalis</i>	10
Wild Turkey	<i>Meleagris gallopavo</i>	8
White-throated Swift	<i>Aeronautes saxatalis</i>	8
Western Wood-Pewee	<i>Contopus sordidulus</i>	8
Yellow-billed Magpie	<i>Pica nuttalli</i>	8

<b>Common Name</b>	<b>Species</b>	<b>Totals</b>
White-breasted Nuthatch	<i>Sitta carolinensis</i>	8
Canada Goose	<i>Branta canadensis</i>	7
Caspian Tern	<i>Sterna caspia</i>	7
Nuttall's Woodpecker	<i>Picoides nuttallii</i>	7
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	7
Bewick's Wren	<i>Thryomanes bewickii</i>	7
Purple Finch	<i>Carpodacus purpureus</i>	7
Hutton's Vireo	<i>Vireo huttoni</i>	6
Warbling Vireo	<i>Vireo gilvus</i>	6
Lark Sparrow	<i>Chondestes grammacus</i>	6
Mourning Dove	<i>Zenaida macroura</i>	5
Brown-headed Cowbird	<i>Molothrus ater</i>	5
Red-tailed Hawk	<i>Buteo jamaicensis</i>	4
Northern Flicker	<i>Colaptes auratus</i>	4
Grasshopper Sparrow	<i>Ammodramus savannum</i>	4
Bullock's Oriole	<i>Icterus bullockii</i>	4
Red-shouldered Hawk	<i>Buteo lineatus</i>	3
Killdeer	<i>Charadrius vociferus</i>	3
Anna's Hummingbird	<i>Calypte anna</i>	3
Western Kingbird	<i>Tyrannus verticalis</i>	3
House Sparrow	<i>Passer domesticus</i>	3
Green Heron	<i>Butorides virescens</i>	2
American Kestrel	<i>Falco sparverius</i>	2
Downy Woodpecker	<i>Picoides pubescens</i>	2
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	2
Wrentit	<i>Chamaea fasciata</i>	2
Rock Wren	<i>Salpinctes obsoletus</i>	2
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	2
Great Blue Heron	<i>Ardea herodias</i>	1
White-tailed Kite	<i>Elanus leucurus</i>	1
Rock Dove	<i>Columba livia</i>	1
Bank Swallow	<i>Riparia riparia</i>	1
Northern Mockingbird	<i>Mimus polyglottos</i>	1

**Detections by survey method\***

<b>TOTAL SPECIES</b>	<b>73</b>
<b>TOTAL INDIVIDUALS</b>	<b>964</b>

**\* Survey Method:**

Area Search Transects

Table 3.

## Species Observed in Transect Areas Surveyed June 3, 2001

## Coyote Lake-Harvey H. Bear County Park

## Detections by survey method\*

Date: June 3, 2001

Common Name	AREA 1 Birds/ha	AREA 2 Birds/ha	AREA 3 Birds/ha	Totals
Pied-billed Grebe	0.6	0	0	6
Green Heron	0.1	0	0	1
Great Blue Heron	0.1	0	0	1
Turkey Vulture	0.1	1.2	0.4	15
Canada Goose	0	0	0	0
Wood Duck	0	0.2	0	1
Mallard	0.3	0.2	0	4 (4FL)
White-tailed Kite	0	0	0	0
Red-shouldered Hawk	0.1	0	0	1
Red-tailed Hawk	0	0.4	0	2
American Kestrel	0	0	0	0
Wild Turkey	0	0	0	0
California Quail	0	0	0	0
American Coot	2.6	0.8	0	30
Killdeer	0	0.4	0	2
Forster's Tern	1.5	0	0	15
Caspian Tern	0.2	0	0	2
Rock Dove	0	0	0	0
Mourning Dove	0.2	0	0	2
White-throated Swift	0	0.6	0	3
Anna's Hummingbird	0.2	0	0	2
Belted Kingfisher	0.1	0.2	0	2
Acorn Woodpecker	1	0.4	0	12
Northern Flicker	0	0.2	0	1
Nuttall's Woodpecker	0.1	0.2	0.1	4
Downy Woodpecker	0	0	0	0
Western Wood-Pewee	0.2	0.2	0	3
Pacific-slope Flycatcher	0	0	0	0
Black Phoebe	0.2	0.2	0	3
Ash-throated Flycatcher	0	0	0.05	1
Western Kingbird	0	0	0.05	1
Hutton's Vireo	0.2	0	0	2
Warbling Vireo	0.2	0	0	2
Steller's Jay	0.3	0	0	3
Western Scrub-Jay	0.6	0.4	0.1	10
Yellow-billed Magpie	0.3	0	0	3
American Crow	2	1	0.25	30
Tree Swallow	1	0	0	10
Violet-green Swallow	1.5	0	0	15
Bank Swallow	0	0	0	0

Cliff Swallow	2.5	0	0	25
Northern Rough-winged Swallow	0.2	4.6	0	25
Barn Swallow	0.4	0.4	0.45	15
Wrentit	0	0.4	0	2
Oak Titmouse	0.8	1	0.1	12
Chestnut-backed Chickadee	0.8	0	0	8
Bushtit	0.5	0	0	5
White-breasted Nuthatch	0.2	0.4	0	4
House Wren	0.2	0.8	0	6
Bewick's Wren	0.1	0	0	1
Rock Wren	0	0.2	0	1
Blue-gray Gnatcatcher	0	0	0	0
Western Bluebird	0.3	0.4	0.2	9
American Robin	0	0	0	0
Northern Mockingbird	0	0	0	0
European Starling	1.4	0.8	0.6	30
Orange-crowned Warbler	0.4	0.6	0	7
California Towhee	0.3	0.6	0.2	10
Spotted Towhee	0.5	0	0	5
Lark Sparrow	0	0	0.3	6
Grasshopper Sparrow	0	0	0.2	4
Song Sparrow	0	0	0	0
Dark-eyed Junco	0.2	0	0	2
Black-headed Grosbeak	0.1	0	0	1
Western Meadowlark	0	0	1.25	25
Red-winged Blackbird	0.3	0	0	3
Brewer's Blackbird	0	0	0.75	15
Brown-headed Cowbird	0.1	0	0	1
Bullock's Oriole	0.1	0	0.1	3
Purple Finch	0.2	0	0	2
House Finch	0.5	2.6	0	18
Lesser Goldfinch	0.2	0.4	0	4
House Sparrow	0	0	0	0
<b>TOTALS</b>	<b>236</b>	<b>99</b>	<b>100</b>	<b>435</b>
<b>Birds/100 ha</b>	<b>23.6</b>	<b>19.8</b>	<b>5</b>	
<b>TOTAL SPECIES</b>	<b>46</b>	<b>28</b>	<b>16</b>	
<b>TOTAL INDIVIDUALS</b>	<b>435</b>			
<b>TOTAL SPECIES (all)</b>	<b>59</b>			

**\* Survey Method:**

Area Search Transects

**Area 1: 1 km transect at south end of Coyote Lake**

**Area 2: 0.5 km transect at north end of Coyote Lake (Dam)**

**Area 3: 2 km transect to the west of Coyote Lake**

**Table 4.****Species Observed in Transect Areas Surveyed June 15, 2001****Coyote Lake-Harvey H. Bear County Park****Detections by survey method\*****Date: June 15, 2001**

<b>Species</b>	<b>AREA 1 Birds/ha</b>	<b>AREA 2 Birds/ha</b>	<b>Totals</b>
Pied-billed Grebe	0.8	0	8
Green Heron	0.1	0	1
Great Blue Heron	0	0	0
Turkey Vulture	0.1	0	1
Canada Goose	0.7	0	7
Wood Duck	1.5	0.4	17
Mallard	1.8	0	18
White-tailed Kite	0.1	0	1
Red-shouldered Hawk	0.2	0	2
Red-tailed Hawk	0	0	0
American Kestrel	0.1	0	1
Wild Turkey	0.2	0	2
California Quail	1.5	1.2	21
American Coot	4	0	40
Killdeer	0.1	0	1
Forster's Tern	0	0	0
Caspian Tern	0.5	0	5
Rock Dove	0.1	0	1
Mourning Dove	0.3	0.4	5
White-throated Swift	0	1	5
Anna's Hummingbird	0.1	0	1
Belted Kingfisher	0	0.2	1
Acorn Woodpecker	0.2	1.6	10
Northern Flicker	0.2	0.2	3
Nuttall's Woodpecker	0.3	0.4	5
Downy Woodpecker	0.2	0.2	3
Western Wood-Pewee	0.5	1	10
Pacific-slope Flycatcher	0.2	0	2
Black Phoebe	1.6	0.6	19
Ash-throated Flycatcher	0.6	0.8	10
Western Kingbird	0.2	0	2
Hutton's Vireo	0.4	0.4	6
Warbling Vireo	0.4	0	4
Steller's Jay	0.8	8	12
Western Scrub-Jay	0.2	0	2
Yellow-billed Magpie	0.5	0	5
American Crow	2.8	2	38
Tree Swallow	1	0	10
Violet-green Swallow	2.5	1.6	33
Bank Swallow	0.1	0	1

Cliff Swallow	0	0	0
Northern Rough-winged Swallow	0	4.2	21
Barn Swallow	0.6	1.2	12
Wrentit	0	0.4	2
Oak Titmouse	0.7	0.8	11
Chestnut-backed Chickadee	0.8	0.8	12
Bushtit	0.5	0	5
White-breasted Nuthatch	0.4	0.4	6
House Wren	0.5	0	5
Bewick's Wren	0.5	0.2	6
Rock Wren	0	0.4	2
Blue-gray Gnatcatcher	0	0.4	2
Western Bluebird	0.4	0	4
American Robin	1	0	10
Northern Mockingbird	0	0	0
European Starling	1.5	0	15
Orange-crowned Warbler	0.4	0.4	6
California Towhee	1.2	0	12
Spotted Towhee	1.2	1.6	20
Lark Sparrow	0	0	0
Grasshopper Sparrow	0	0	0
Song Sparrow	2	0.4	22
Dark-eyed Junco	0.8	1.2	14
Black-headed Grosbeak	1	1.2	16
Western Meadowlark	2	0	2
Red-winged Blackbird	2.5	0	25
Brewer's Blackbird	1.5	0	15
Brown-headed Cowbird	0.1	0.8	5
Bullock's Oriole	0.1	0	1
Purple Finch	0.5	0	5
House Finch	1.5	0	15
Lesser Goldfinch	1.2	0.8	16
House Sparrow	0	0.6	3
<b>TOTALS</b>	<b>463</b>	<b>134</b>	<b>597</b>
<b>Birds/100 ha</b>	<b>46.3</b>	<b>26.8</b>	
<b>TOTAL SPECIES</b>	<b>59</b>	<b>33</b>	
<b>TOTAL INDIVIDUALS</b>	<b>597</b>		
<b>TOTAL SPECIES: (ALL)</b>	<b>66</b>		

**\* Survey Method:**

Area Search Transects

**Area 1: 1 km transect at south end of Coyote Lake**

**Area 2: 0.5 km transect at north end of Coyote Lake (Dam)**

**Area 3: (not surveyed on June 15, 2001)**

**Table 5. Special Status Species Not Observed During Surveys But Likely to Occur in Park  
Coyote Lake-Harvey H. Bear County Park**

<b>Common Name</b>	<b>Species</b>	<b>Conservation Status</b>
Osprey	<i>Pandion haliaetus</i>	<b>DFG: CSC; CDF: Sensitive</b>
Northern Harrier	<i>Circus cyaneus</i>	<b>DFG: CSC</b>
Golden Eagle	<i>Aquila chrysaetos</i>	<b>DFG: CSC; DFG: Fully protected</b>
Bald Eagle	<i>Haliaeetus leucocephalus</i>	<b>FT; SE; CDF: Sensitive; DFG: Fully protected</b>
Sharp-shinned Hawk	<i>Accipiter striatus</i>	<b>DFG: CSC</b>
Cooper's Hawk	<i>Accipiter cooperi</i>	<b>DFG: CSC</b>
Ferruginous Hawk	<i>Buteo regalis</i>	<b>ESA; FSC; DFG: CSC; Aud.: Cal WL; FWS: MNBMC</b>
Merlin	<i>Falco columbarius</i>	<b>DFG: CSC</b>
Prairie Falcon	<i>Falco mexicanus</i>	<b>DFG: CSC; Audubon: Cal WL</b>
Burrowing Owl	<i>Athene cunicularia hypugea</i>	<b>(FSC); DFG: CSC; FWS: MNBMC (Full species);</b>
Vaux's Swift	<i>Chaetura vauxi</i>	<b>DFG: CSC; FWS: MNBMC; Audubon: Cal WL</b>
Olive-sided Flycatcher	<i>Contopus borealis</i>	<b>Audubon: Cal WL; FWS: MNBMC; FS: Sensitive</b>
Loggerhead Shrike	<i>Lanius ludovicianus</i>	<b>(FSC); DFG: CSC; Aud.: Cal WL; FWS: MNBMC</b>
California Horned Lark	<i>Eremophila alpestris actia</i>	<b>DFG: CSC</b>
Yellow Warbler	<i>Dendroica petechia brewsteri</i>	<b>DFG: CSC</b>
Yellow-breasted Chat	<i>Icteria virens</i>	<b>DFG: CSC; FWS: MNBMC; PIF: WL</b>
Tricolored Blackbird	<i>Agelaius tricolor</i>	<b>ESA; FSC; DFG: CSC; FWS: MNBMC; Aud.: Cal WL</b>
Lawrence's Goldfinch	<i>Cardeulis lawrencei</i>	<b>PIF: Watch List; FWS: MNBMC; Aud. Cal WL</b>

**\*\*\* Conservation status codes**

**CDFG SC:** Calif. Dept. of Fish and Game Species of Special Concern

**WL:** Audubon Watch list

**CA SC:** Calif. Species of Special Concern

**RFS:** Partner's In Flight Riparian Focal Species

**RD:** Partner's In Flight Riparian Dependent Species

**CDF:** California Dept. of Forestry

**ST:** State-listed as threatened

**CDF: Sensitive:** California Dept. of Forestry

**FSC:** Federal Special Concern Species

**PIF:** Partners In Flight Watch List

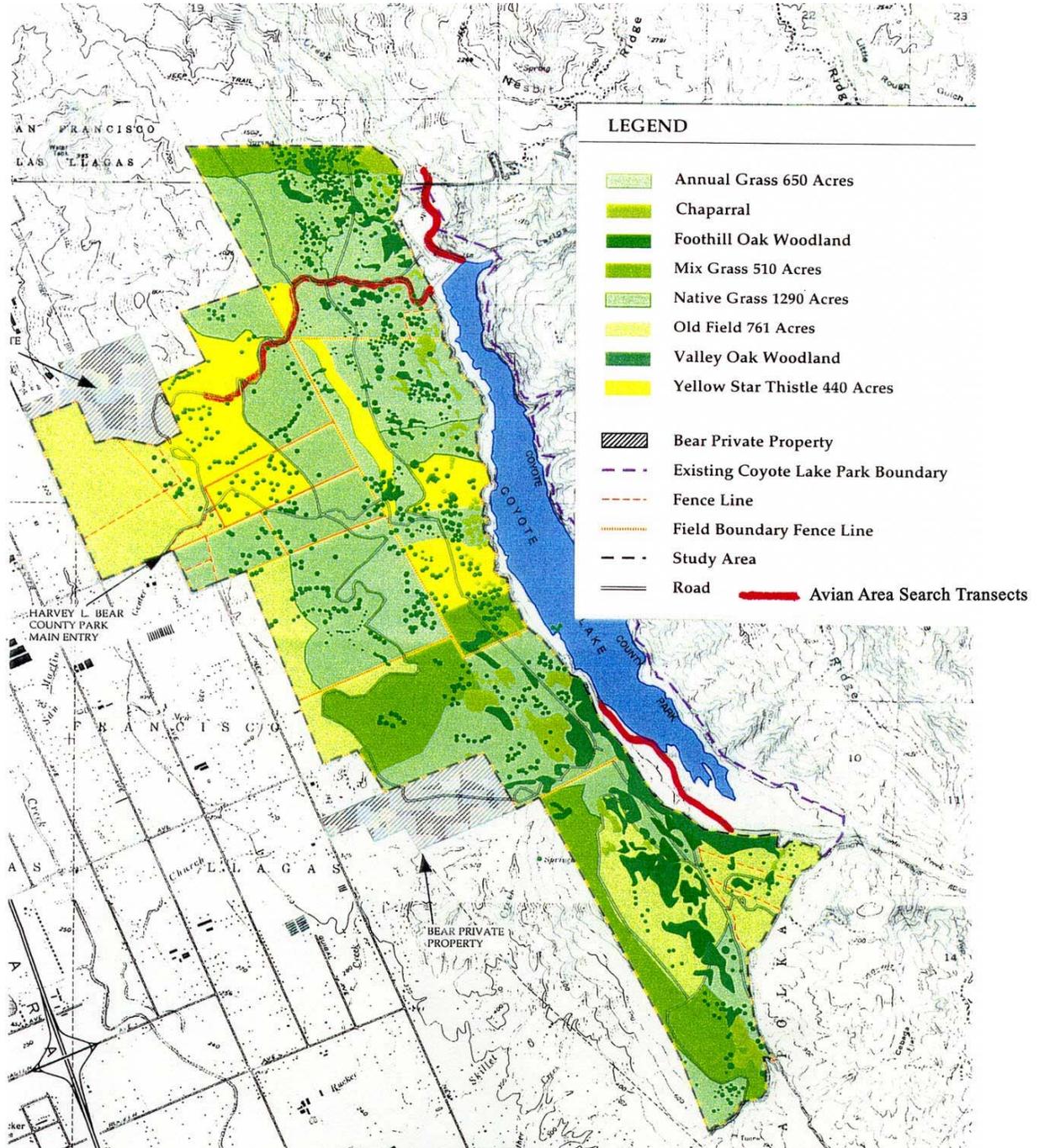
**DFG: CSC;** California Special Concern Species

**MNBMC:** Fish and Wildlife Service Migratory Non-game Bird of Management Concern



## **APPENDIX C: MAP**





**Avian Area Search Transects Surveyed June 3 and 15, 2001**



## **Summary report on Bear/Mendoza Ranch Small Mammal Trapping**

Site Coordinator: Paul Kephart / Ryan Heacock

Field Biologist: Matina C. Kalcounis-Rüppell

Reporting Biologist: Matina C. Kalcounis-Rüppell



## **Summary report on Bear/Mendoza Ranch small mammal trapping.**

I went to the Bear/Mendoza Ranch property to trap and look for mammals on 10-12 August 2001. The following is a summary of the mammals at the Bear/Mendoza Ranch property and should be read with the appended table and aerial photo overlays. In addition to the mammals listed below, I also saw a group of 7-9 female turkeys (*Meleagris gallopavo*) on two different occasions.

The list of mammals that I saw, captured, or saw evidence of, is in the appended table. The list also includes those mammals species that have distributions that fall within the range of the property. In some cases, the habitat requirements of the species are not specifically met on the property and sightings and captures of the species are not expected.

In total, I saw, captured, or saw evidence of 17 of 47 possible mammal species on the Bear/Mendoza Ranch property. A total of 190 trap nights yielded 36 small mammal captures of the following species: piñon mouse (*Peromyscus truei*; n=15), the deer mouse (*Peromyscus maniculatus*; n=10), the brush mouse (*Peromyscus boylii*; n=5) and western harvest mouse (*Reithrodontomys megalotis*; n=6). Evidence of the California vole (*Microtus californicus*) was seen in the form of old runways with clipped vegetation and fecal pellets characteristic of this species. Evidence of Botta's pocket gopher (*Thomomys bottae*) was seen in the form of mound tailings characteristic of this genus. Evidence of the dusky-footed woodrat (*Neotoma fuscipes*) was seen in the form of piles of fecal pellets at the base of two hollow oak trees and evidence of nest construction within, and at the base of these trees. In addition to the captures and evidence described above, sightings of the following species were made on the property itself or on the road adjacent to the property at the shore of Coyote Lake Reservoir: Virginia opossum (*Didelphis virginiana*), mule deer (*Odocoileus hemionus*), wild boar (*Sus scrofa*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), brush rabbit (*Sylvilagus bachmani*), and the California ground squirrel (*Spermophilus beecheyi*).

The specific placement of the traps (standard Sherman and B&B style traps) is shown on the appended map. Traps were set in straight transects that had a trap placement either every approximate 5 or 10 meters (approximated by counting paces). An effort was made to trap in the following representative habitat types: contiguous forest, rock-outcrops, grassland, and riparian edge. Habitat use patterns were clear with respect to rodent species captured. The deer mouse and western harvest mouse were found in the grassland habitat. The brush mouse was found in riparian and rock-outcrop habitat. The piñon mouse was found in rock-outcrop habitat and grassland habitat on the edge of mature trees. All four species were additionally caught near flowing water either at the springs or along the riparian edge transect. Habitat associations for sightings are described in the appended table.

In all habitats, the occurrence of wood from old dead trees was the best predictor of productivity in terms of trap captures. The piñon mouse had a particular affinity to this woody microhabitat. In addition, the fecal pellets of larger species (dusky-footed woodrats and California mice- *Peromyscus californicus*) were found on, in, or around wood from old, dead trees. Because this microhabitat type appeared to be important for a number of rodent species and dead-wood is not that common on the property, an effort should be made not to disturb the patches of dead-wood debris.

The level of bat activity on the property was extremely high. Although it is almost impossible to identify free-flying bats, I was able to see the distinct coloration of the wings of the hoary bat and I was relatively certain that I was seeing big brown bats because of the unique size and shape of this species, relative to the other bat species present. Regardless of the particular species that make up the bat community on the property, the natural roosting requirements of these bats are relatively similar. Both the solitary and communally roosting bat species that are likely to be present on the property require large, old, live and dead trees, especially those that have a tree bole created by a lightning strike, heart rot, or a primary cavity excavator like a woodpecker. An effort should be made to conserve this potential roost habitat.

None of these species are rare, threatened, or endangered. Juveniles of both the western harvest mouse and the piñon mouse were captured suggesting that the breeding season on the reserve, at least for small mammals, is year-round.

*Matina C. Kalcounis-Rüppell, 25 August 2001*



## **Summary Report on Amphibian Survey**

Coyote Lake - Harvey Bear Ranch County Park

Site Coordinator: Paul Kephart / Ryan Heacock

Field Biologist: Mark Stromberg, Ph.D.

Reporting Biologist: Mark Stromberg, Ph.D.



## **Amphibian Survey Summary**

Surveyed and sampled all ponds with water at Bear Ranch and Mendoza property on May 16 2001 and one day in early June 2001. Seined for non-native fish, salamanders, frogs and toads. Walked edges to look for California red-legged frog; no definitive sightings. No salamander larvae found, but additional seining recommended. Evidence of bull frogs at all ponds.

Pond north of Bear ranch house most intact, with western pond turtles, bull frogs (20 - 30 seen jumping), pacific tree frogs (thousands of larvae), western toads (thousands of newly metamorphosed toadlets), and abundant insects. Pond south of Mendoza ranch house adjacent to County road (Roop road) almost devoid of insects with only 3-5 bullfrogs seen and nothing else in seine hauls. Isolated pond in canyon southwest of Mendoza ranch house was similarly limited to a few bull frogs, suggesting warm water fish (bass?) in the pond.

*Mark Stromberg, Ph..D.*



## Appendix 3

# Photographic Documentation of Erosion Hazards





Gully 1





Gully 2



Gully 3



Gully 4



Gully 5



Headcut 1



Headcut 2



Headcut 2



Headcut 3



Stream Channel Erosion(see) 1





Stream Channel Erosion 2



Stream Channel Erosion 3



## Appendix 4

Datasheets for Vegetation Sampling and Survey  
Protocols for the California Red-legged Frog and the  
California Tiger Salamander





*The following information was obtained from the Ventura, California Office of the U.S. Fish and Wildlife Service: <http://ventura.fws.gov/SurveyProt/calredlegfrog.htm>*

**Guidance on Site Assessment and Field Surveys  
for California Red-legged Frogs (*Rana aurora draytonii*)  
U.S. Fish and Wildlife Service**

**February 18, 1997**

**I. Introduction**

A final rule determining threatened status for the California red-legged frog (*Rana aurora draytonii*) under the Endangered Species Act of 1973, as amended (Act), was published on May 23, 1996 (61 *Federal Register* 25813) and became effective on June 24, 1996. Since then the United States Fish and Wildlife Service (Service) has received numerous requests from private and government entities for guidance in planning for the protection of the California red-legged frog at the sites of proposed developments or of other land use activities. This document provides guidance for two procedures to accurately assess California red-legged frog status in the vicinity of a project site: (1) an assessment of California red-legged frog locality records and potential California red-legged frog habitat in and around the project area; and (2) focused field surveys of aquatic habitats to determine whether California red-legged frogs are present. Both procedures may be recommended because California red-legged frogs are mobile and, during different life history stages or different seasons of the year, may occupy a variety of aquatic and upland habitats. Both procedures should be incorporated into any assessment of the potential effects of projects on California red-legged frogs, unless field surveys are determined to be unnecessary based on the site assessment (see "Interpreting the results of the site assessment" section).

Ongoing contact and discussions with the Service before, during, and after site assessments and field surveys are a crucial element of this guidance. Results of the site assessment and field survey should also be reported to the Service (see "Reporting the results" sections below); however, results of the site assessment should be reported prior to proceeding with field surveys. The addresses and phone numbers of the appropriate field office are provided in section V below.

**II. Site Assessment**

Careful evaluation of the following information about California red-legged frogs and their habitats in the vicinity of projects or other land use activities is important because this information indicates the likelihood that California red-legged frogs may occur on the project site.

**Protocol**

1. Is the project site within the range of the California red-legged frog?

Because knowledge of the distribution of the California red-legged frog is likely to change as new locality information becomes available, surveyors should contact the appropriate Service field office (see section V below) to determine if a project site is within the range of this species.

2. What are the known localities of California red-legged frogs within the project site and within 8 kilometers (km) (five miles) of the project boundaries?

The surveyor should consult the Natural Diversity Data Base (NDDB) maintained by the California Department of Fish and Game's Natural Heritage Division to determine known localities of California red-legged frogs. Information on the NDDB is attached to the end of this document. Other information sources on local occurrences of California red-legged frogs should be consulted. These sources may include, but are not limited to, biological consultants, local residents, amateur herpetologists, resource managers and biologists from municipal, State, and Federal agencies, environmental groups, and herpetologists at museums and universities. The surveyor should report to the Service all known California red-legged frog localities within the project site and within 8 km of the project boundaries.

3. What are the habitats within the project site and within 1.6 km (one mile) of the project boundaries?

Describe the upland and aquatic habitats within the project site and within 1.6 km of the project boundaries. The aquatic habitats should be mapped and characterized (e.g. ponds vs. creeks; pool, riffle, rootball, vegetation) The information provided in section 4 of the attached appendix serves as a guide to the features that will indicate possible California red-legged frog habitat.

**Reporting the results of the site assessment.** Surveyors should prepare a report that includes the following: photographs of the project site, survey dates and times, names of surveyors, a description of the methods used, and a map of the site showing habitat as requested in section II(3) above. The report should include copies of those portions of the 7.5' topographic quads that contain the site and the area within 1.6 km of its boundaries. A list of California red-legged frog localities as requested in section II(2) above should be included. The report should be provided to the appropriate Service field office (see section V below).

**Interpreting the results of site assessment.** After completing elements 1-3 of the site assessment above, the appropriate Service field office should be contacted for technical assistance. Based on the information provided from the site assessment, the Service will provide guidance on how California red-legged frogs should be addressed, including whether field surveys are needed or whether incidental take authorization should be obtained through section 7 consultation or a section 10(a)(1)(B) permit pursuant to the Act. A protocol for field surveys is presented below.

### **III. Field surveys**

Frogs can be detected opportunistically in various habitats depending on weather and time of year. Aquatic sampling during the summer months is a reliable method of detecting frogs. Care should be taken to apply a level of effort and to use a style of surveying appropriate to the site. For instance, survey methods may differ according to habitat extent and type (e.g. deep pond, shallow pond, creek). In addition, field work should be conducted according to the best professional judgement of the surveyor (e.g. dogs should not be brought on surveys as they disturb frogs). The Service recommends that surveyors have field experience in the identification of California amphibians. The Service is willing to cooperate with surveyors who have specific needs not addressed by this field survey protocol and who may wish to propose alternative methods.

#### **Protocol**

1. Surveys should be conducted between May 1 and November 1. These sampling dates were selected because they allow surveys to be conducted with minimal disturbance of breeding frogs, eggs, or tadpoles during a period when frogs can be reliably detected.

2. All aquatic habitat identified during the site assessment should be surveyed four times, twice during the day and twice at night. Surveyors should wait at least twenty-four hours and possibly longer, to meet the environmental conditions described in section III(3) below, before repeating surveys at the same site.
3. Day-surveys should be conducted on clear, sunny days. Night-surveys should be conducted on warm, still nights between one hour after sunset and 12 midnight. Warm, still nights are preferable for surveying because the probability of observing frogs tends to decrease under cold, windy conditions. In some circumstances where safety issues preclude night-surveys, the Service can provide alternatives to the surveyor on a case-by-case basis to ensure that safe surveys are conducted.
4. Surveyors should work along the entire shore (either on the bank or in the water), visually scanning all shoreline areas in all aquatic habitats identified during the site assessment. This methodology should be applied to both day- and night-surveys. In the case of water bodies covered with floating vegetation such as duckweed, both the shoreline and surface of the water should be scanned. When wading, surveyors should take maximum care to avoid disturbing sediments, vegetation, and any visible larvae. When walking on the bank, surveyors should take care to not crush rootballs, overhanging banks, and stream side vegetation that might provide shelter for frogs.
5. When conducting night-surveys for eyeshine, flashlights and headlamps that use one 6-volt or four to six D-cell batteries are recommended. High-powered spotlights are prohibited to avoid harming frogs.
6. Although not required, photographs of frogs observed during field surveys may aid in verification of species identifications. Surveyors should limit photography to the extent necessary to document the presence of California red-legged frogs and should not attempt to photograph frogs if this is likely to disturb them.

Reporting the results of field surveys. Any information on California red-legged frog distribution resulting from field surveys should be sent to the Natural Diversity Data Base (NDDB) administered by the Natural Heritage program of the California Department of Fish and Game. Information about the NDDB is attached to the end of this document. Copies of the NDDB form should be mailed immediately to both the Service and CDFG.

Surveyors should also prepare a final report that includes the following: copies of all field notes, data sheets, photographs of the project site and of frogs observed, and a typed summary providing survey dates and times (both begin and end times), names of surveyors, temperature (water and air), wind speed, a description of the methods used, numbers and size classes of all amphibians observed, a map of the site showing survey locations, habitat and frog sightings, a copy of the NDDB form, and a description of possible threats to California red-legged frogs observed at the site. The report should be provided to the appropriate Service field office (see section V below).

Interpreting the results of field surveys. Based on the results of field surveys, the Service will provide guidance on how California red-legged frog should be addressed. If California red-legged frogs are found, the Service will work with the project proponent through the section 7 or section 10(a)(1)(B) process to determine a further course of action, including the consideration of avoidance or minimization measures and whether incidental take authorization is needed. If frogs are observed but not identified to species, additional survey effort may be recommended. If the Service recommended that field surveys be conducted and if California red-legged frogs were not identified during these field surveys conducted

according to this protocol, the Service will consider the California red-legged frog not to be present on the project site and will not recommend any further take avoidance or mitigation measures. The Service may question the results of field surveys conducted under this protocol for any of the following reasons: 1) if the appropriate Service field office was not contacted prior to field surveys being conducted; 2) if field surveys were conducted in a manner inconsistent with this protocol; 3) if field surveys were incomplete; or 4) if the reporting requirements, including submission of NDDB forms, were not fulfilled.

#### **IV. Statement on permitted activities.**

This field survey protocol allows for conducting visual surveys for California red-legged frogs. Surveys following this protocol do not require a section 10(a)(1)(A) recovery permit pursuant to the Act. Activities that would require a section 10(a)(1)(A) recovery permit include: 1) any capture or handling of California red-legged frog adults, larvae, or eggs; 2) any activity intended to significantly modify the behavior of California red-legged frogs; 3) any activity that subjects California red-legged frogs to some environmental condition not naturally present (e.g. experiments designed to study a frog's response to heat, moisture, noise) other than low-level illumination for night surveys as described in section III(5); and 4) any survey methods not covered in this field survey protocol if any form of "take" would occur during such activities. All surveyors using this field survey protocol should make all possible efforts to avoid unintentionally disturbing California red-legged frogs or their habitat. Surveyors should direct inquiries about section 10(a)(1)(A) recovery permits to the Service's Regional Office (see section V below).

#### **V. Service Contacts**

For project sites and land use activities in Santa Cruz, Monterey, San Benito, San Luis Obispo, Santa Barbara, and Ventura Counties, portions of Los Angeles and San Bernardino Counties outside of the Los Angeles Basin, and portions of Kern, Inyo and Mono Counties east of the Sierra Crest and south of Conway Summit, contact:

Ventura Field Office,  
2493 Portola Road, Suite B  
Ventura, California, 93003 (805/644-1766).

For project sites and land use activities in all other areas of the state south of the Transverse Ranges, contact:

Carlsbad Field Office  
2730 Loker Avenue West  
Carlsbad, California, 92008 (619/431-9440).

For project sites and land use activities in all other areas of the state, contact:

Sacramento Field Office  
3310 El Camino Avenue, Suite 130  
Sacramento, California 95821  
(916/979-2725).

For information on section 10(a)(1)(A) recovery permits, contact:

Regional Office,  
Eastside Federal Complex 911 N.E., 11th Avenue  
Portland, Oregon 97232-4181  
(503) 231-6241.

February 18, 1997

**U.S. Fish and Wildlife Service Guidance on Site Assessment and Field Surveys for California Red-legged Frogs**

**Appendix  
California red-legged frog ecology and distribution.**

1. Identification

The California red-legged frog *Rana aurora draytonii* is a relatively large aquatic frog ranging from 4 to 13 centimeters (cm) (1\* to 5 inches) from the tip of the snout to the vent. From above the California red-legged frog can appear brown, gray, olive, red or orange, often with a pattern of dark flecks or spots. The skin usually does not look rough or warty. The back of the California red-legged frog is bordered on either side by an often prominent dorsolateral fold of skin running from the eye to the hip. The hindlegs are well-developed with large webbed feet. A cream, white, or orange stripe usually extends along the upper lip from beneath the eye to the rear of the jaw. The undersides of adult California red-legged frogs are white, usually with patches of bright red or orange on the abdomen and hindlegs. The groin area can show a bold black mottling with a white or yellow background.

California red-legged frog tadpoles range from 14 to 80 millimeters (mm) (\* to 3 1/4 inches) in length. They are generally brownish with darker marbling and lack distinct black or white spotting or speckling. Large California red-legged frog tadpoles often have a wash of red coloration on their undersides.

Positive diagnostic marks should be used to accurately distinguish California red-legged frogs from other species of frogs that may be observed. A positive diagnostic mark is some attribute of the animal that will not be found on any other animal one might expect to encounter at the same locality. The following features are positive diagnostic marks that, if observed, will distinguish California red-legged frogs from yellow-legged frogs *Rana boylei* and bullfrogs *Rana catesbeiana*:

- a. Prominent dorsolateral folds (thick upraised fold of skin running from eye to hip) on any frog greater than 5 cm long from snout to vent. Young yellow-legged frogs can show reddish folds; these usually fade as the frogs attain maturity.
- b. Bright red dorsum.
- c. Well defined stripe as described above running along upper lip.

Because California red-legged frogs are often confused with bullfrogs, surveyors should note those features that might be found on bullfrogs that will rarely be observed on California red-legged frogs. These features are:

- a. Bright yellow on throat.
- b. Uniform bright green snout.
- c. Body length greater than 15 cm (6 inches).
- d. Tympanum (ear disc) distinct and much larger than eye.

Please note that some frogs may lack all of the above characteristics given for both California red-legged frogs and bullfrogs. Surveyors should regard such frogs as "unidentified."

California red-legged frogs are cryptic because their coloration tends to help them blend in with their surroundings, and they can remain immobile for one half hour or more. When an individual California red-legged frog is disturbed, it may jump into the water with a distinct "plop." The California red-legged frog may do this either when the surveyor is still distant or when a surveyor is very near. Bullfrogs exhibit similar behavior but will often emit a "squawk" as they dive into the water. Because a California red-legged frog is unlikely to make such a sound, a "squawk" from a fleeing frog will be considered sufficient to positively identify the frog as a bullfrog.

## 2. Reproduction

California red-legged frogs breed during the winter and early spring from late November through April. Adults engage in complex courtship behaviors that result in the female depositing from 2,000 to 6,000 eggs, each measuring between 2 and 3 mm. California red-legged frog eggs are typically laid in a loose mass attached to emergent vegetation near the surface of the water body, where they can be easily dislodged. Eggs hatch within 6 to 14 days after deposition at which time the newly hatched tadpoles are delicate. California red-legged frog tadpoles transform into juvenile frogs in 3.5 to 7 months.

## 3. Movement

California red-legged frogs may move up to 1.6 km (one mile) up or down a drainage and are known to wander throughout riparian woodlands up to several dozen meters from the water. On rainy nights California red-legged frogs may roam away from aquatic sites as much as 1.6 km. California red-legged frogs will often move away from the water after the first winter rains, causing sites where California red-legged frogs were easily observed in the summer months to appear devoid of this species.

## 4. Habitat

California red-legged frogs occur in different habitats depending on their life stage and the season. All life history stages are most likely to be encountered in and around breeding sites, which are known to include coastal lagoons, marshes, springs, permanent and semipermanent natural ponds, ponded and backwater portions of streams, as well as artificial impoundments such as stock ponds, irrigation ponds, and siltation ponds. California red-legged frog eggs are usually found in ponds or in backwater pools in creeks attached to emergent vegetation such as Typha and Scirpus. California red-legged frog tadpoles remain in these habitats until metamorphosis in the summer months. Young California red-legged frogs can occur in slow moving, shallow riffle zones in creeks or along the margins of ponds. In the summer, older California red-legged frogs are often found close to a pond or a deep pool in a creek where emergent vegetation, undercut banks, or semi-submerged rootballs afford shelter from predators. Older California red-legged frogs may also take shelter in small mammal burrows and other refugia on the banks up to several dozen meters from the water any time of the year and can be encountered in smaller, even ephemeral bodies of water in a variety of upland settings. California red-legged frogs are frequently encountered in open grasslands occupying seeps and springs. Such bodies may not be suitable for breeding but may function as foraging habitat or refugia for wandering frogs. Creeks and ponds where California red-legged frogs are found often have dense growths of woody riparian vegetation, especially willows (*Salix* sp.). The absence of Typha, Scirpus, and Salix at an aquatic site does not rule out the possibility that the site provides habitat for California red-legged frogs, but the presence of one or all of these plants is an important indicator that the site may provide foraging or breeding habitat for California red-legged frogs.

The following information was obtained from the Ventura, California Office of the U.S. Fish and Wildlife Service: [http://ventura.fws.gov/SurveyProt/ct\\_salamander.htm](http://ventura.fws.gov/SurveyProt/ct_salamander.htm)

State of California  
The Resources Agency  
DEPARTMENT OF FISH AND GAME  
1416 Ninth Street  
Sacramento, California 95814

Inland Fisheries - Informational Leaflet No. 44

SURVEY PROTOCOL FOR  
CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense*)<sup>1,2,3</sup>

INTRODUCTION

The California tiger salamander (CTS) is a California Department of Fish and Game (DFG) Species of Special Concern and a United States Fish and Wildlife Service (FWS) Candidate Species. Following review of a petition to list the species as federally Endangered (Long 1992), the FWS ruled that Threatened or Endangered status was "warranted but precluded" (Sorenson 1994). Current law states that the FWS must therefore evaluate the species' status annually and publish a ruling.

For purposes of environmental review of projects, the DFG considers the CTS to be a Threatened species under Section 15380(d) of the California Environmental Quality Act (CEQA). Refer to Jennings and Hayes (1994) for justification of the recommended "Threatened" status.

This protocol was developed to ensure that an adequate level of background examination and field work is conducted to determine the occurrence of the CTS on a specific site and to ensure an appropriate level of sensitivity when working with this animal. Also, by standardizing the survey effort and reporting information directly to existing agency databases, trends of salamander numbers at various locations can be monitored range-wide following baseline data provided by Shaffer et al. (1993) and others.

- 
1. Prepared by John M. Brode, Senior Biologist Specialist, Endangered Species Project, Inland Fisheries Division, Department of Fish and Game, Rancho Cordova, CA 95670. (Date).
  2. Primary contributors were Mark L. Allaback, David M. Laabs, Richard B. Seymour, and Michael F. Westphal. Primary reviewers were Caitlin Bean and Mark R. Jennings.
  3. This Protocol may be revised in the future as more information becomes available.

PROCEDURES

A site analysis shall be completed for each project. A habitat assessment shall be completed for each project within the range of CTS. Biological surveys shall be conducted until CTS are found or the criteria for a Negative Finding are met.

## Site Analysis

The first task is to determine if the project site is within the historic range of CTS as provided by Jennings and Hayes (1994), Shaffer et al. (1993), and Stebbins (1985). If the parcel is no more than 1 km (0.62 mile) outside the recognized limit of the historic range of the species, it shall be considered to be within the range. The closest known breeding locality should be determined. A review of the DFG Natural Diversity Data Base and request for information on localities from the Endangered Species Office of the FWS are essential. Communications from both agencies must be documented. If the parcel is found to be more than 1 km (0.62 mile) outside the range of the species, the site analysis should include information in support of this determination.

## Habitat Assessment

The CTS is most commonly associated with grasslands in rolling terrain or foothills that contain suitable underground retreats such as burrows of the California ground squirrel (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*). CTS have been found, however, in areas with no apparent underground retreats (M. Allaback, W.Cox, G. Monk, pers. comm.) In these areas CTS may utilize cracks in the ground or may burrow into loose soil, or seek refuge in and under rotting logs or fallen branches. CTS have been observed in captivity to readily burrow into loose substrate such as decomposed oak leaves (W. Cox, pers. comm.). Breeding ponds are typically vernal pools or other small, temporary waters that fill during winter rains and are dry by mid-summer. CTS can utilize artificial impoundments (farm ponds), even permanent ones, if they do not contain fish. Refer to Jennings and Hayes (1994) for a more detailed discussion of suitable habitats. Sites which contain suitable breeding locations and upland habitat (or sites with upland habitat and potential breeding locations within 1 km [0.62 mile] should be considered potential habitat. Characteristics of the site that should be recorded include topography, plant communities, presence and types of water bodies, fossorial mammal burrows, current land use, and a description of adjacent lands.

## Biological Surveys

Biological surveys shall be conducted for all sites with potential habitat. Proper permits must be obtained from the DFG and FWS prior to conducting field surveys. Before nocturnal field work is conducted, the proper authorities (DFG wardens, local sheriff, etc.) must be notified. To obtain a permit, applicants must have prior experience working with CTS that demonstrates their ability to locate and identify all life stages. At least one individual with the required permit must be present to supervise or otherwise oversee field activities.

In 1994, the vernal pool tadpole shrimp (*Lepidurus packardii*), longhorn fairy shrimp (*Branchinecta longiantenna*), and Conservancy fairy shrimp (*Branchinecta conservatio*) were listed as Endangered, and the vernal pool fairy shrimp (*Branchinecta lynchi*) was listed as Threatened by the FWS (Nagano and Browning 1994). These species occupy seasonal wetlands within the range of CTS. A permit must be obtained from FWS that allows aquatic surveys for amphibians in vernal pool habitats within the range of listed crustaceans.

### Nocturnal Surveys

Nocturnal surveys are used to detect CTS when they are active above ground during rainstorms. They can be observed at night, under certain conditions, before, during, and after breeding migrations, thereby providing a wide survey window.

A standard nocturnal survey requires five separate night surveys during the same weather year. All surveys must be conducted during optimal conditions or when CTS are known to be active in the region. Optimal conditions are during storm systems with 7-10°C (45-50°F) or greater air temperature when it has rained during the day and continues after dark. At least one visit must be performed during each of the months of December, January, and February. Two additional visits may occur during separate storm systems in these months or in November or March. A minimum of four person hours should be spent surveying during each visit at most study sites. Large sites may require more effort.

As a general guideline, two experienced surveyors can examine approximately 2 hectares (5 acres) of habitat in one hour, if the vegetation is not dense. Larger tracts of land containing multiple breeding locations should be sampled using randomized walk, quadrat, or transect design within 0-500 meters (0-1,640 feet) of breeding sites (Jaeger and Inger 1994, Crump and Scott 1994). The study design for large projects should be formulated in consultation with agency biologists or qualified researchers. Sampling 1-4 hectare (2.5-10 acre) plots within 0-500 meters (0-1,640 feet) of potential breeding locations is recommended.

Transects should be situated 5-15 meter (16-50 feet) apart. Transects should be walked slowly using flashlights and head-lamps to scan on either side of the transect. All mammal burrows should be inspected by looking down the tunnel as far as possible. Flagging suspected underground retreats and the perimeter of the site with reflective tape prior to the survey is helpful.

Depending on permit conditions, CTS should be sexed (see Stebbins 1985) if possible and measured (snout-vent and total length) before returning them to the exact capture location in the same direction of travel. Photographs of adult animals should be available for agency identification. Map all observations in relation to breeding locations and note apparent direction of travel. Quantify the survey effort by recording weather conditions, transect width, amount of area sampled, and person hours.

### Aquatic Surveys

A standard aquatic survey requires two separate aquatic surveys during one calendar year. The first survey shall be conducted between March 15 and April 15 and the second between April 15 and May 15. There shall be at least 15 days between surveys. Surveys should not begin prior to March 15 in order to reduce disturbance to eggs and to facilitate larval identification. Surveys for eggs should not be conducted. Every suspected breeding location must be sampled twice during the same season if the initial visit was negative. Surveys initiated after 15 May can not be used to report negative findings because larvae may metamorphose by this time. Standard aquatic surveys must be performed at all potential breeding sites for two calendar years to support a negative finding.

CTS larvae, particularly small sizes under 35 mm (total length), are fragile and captured individuals should remain in nets only long enough to record an approximate total length measurement before being released. All other pool fauna should be treated with similar case. Sampling should cease once presence has been determined in order to minimize disturbance of pool flora and fauna.

In areas that contain numerous pools, the sampling effort should focus on pools expected to hold water for at least 10 weeks, which is approximately the minimum necessary for larvae to reach transformation (Feaver 1971). It is important to collect data regarding the type and quality of each pool sampled. At a minimum this data should include the date and time, location, type of water body (i.e. vernal pool, seasonal wetland, artificial impoundment, etc.), dimension and depth of pond, water temperature, turbidity, presence of aquatic vegetation (submergent and emergent), introduced species, and vertebrates and invertebrates present. Photographs of pools and adjacent upland areas are helpful and copies should be included in the final report.

All pools should be initially sampled using D-shaped, long-handled dipnets (typically 30 cm [12 inches] or larger), with 3 mm (1/8-inch) mesh or smaller. Most shallow ponds approximately 3 m (10 feet) in diameter or smaller can be completely sampled with dipnets. Sample approximately 50 percent of the surface area of the pond by spacing dipnet sweeps accordingly from one end of the pool to the other to sample different depths.

If fairy shrimp or tadpole shrimp are located, sampling should cease until the animals are identified to species. Return fairy shrimp immediately back to the pond. Empty nets as completely as possible before sampling different pools in proximity in order to minimize inadvertent transfer to fairy shrimp and other species. For the same reasons, nets should be thoroughly rinsed before proceeding to the next study site to ensure that pool fauna are not transferred from one region to another.

Seining can be very disruptive and this method should only be used in large pools and impoundments after dipnetting has been unsuccessful and if fairy shrimp are not present. Finemesh minnow seines of varying lengths are used to sample larger pools of different depths and sizes. They should be ordered with weights along the bottom and floats along the top edge. Attach doweling (2.4 cm by 1.5 m [1 inch by 5 feet]) or PVC pipe to the end of the seine so the bottom edge can be dragged along the bottom of the pool (Shaffer, et al. 1994; Jennings, pers. comm.) Whenever possible, pull the seine from one edge of the pond to the other (Shaffer et al. 1994). Estimate the amount of surface area sampled.

#### Other Survey Methods

Under certain circumstances, this protocol may be combined with other survey methods, such as pit-fall/drift fence surveys, to determine the extent of negative effects on CTS from proposed projects or to conduct more detailed scientific research. However, modifications to this protocol will only be approved on a case-by-case basis in consultation with DFG personnel.

### NEGATIVE FINDINGS

In order for a suggested negative finding to be accepted, it must be supported by one or more of the following conditions or minimum survey efforts:

1. The site analysis and/or habitat analysis demonstrate that the area is not suitable for CTS, or
2. Standard aquatic surveys in two consecutive years with one standard nocturnal survey during the second year survey window all have negative results, or
3. There is no aquatic habitat on site and a standard nocturnal survey is negative.

### WRITTEN REPORT

A written report should be prepared that includes the following analyses and information:

1. Site Analysis: Determine if the site is within historic range of CTS. Describe current and past land-use practices. Conduct a thorough record search in order to document the closest known breeding locality. If the parcel is found to be outside the range of the species, the report should include information in support of this determination.
2. Habitat Assessment: Provide a site description including location, size, topography, soil type, plant communities, type of water bodies, fossorial mammals detected, current land use, and information on adjacent lands. Include an assessment of the suitability of the site as upland and/or breeding habitat for CTS. Include a site map and representative photographs of upland and potential breeding habitat.

3. Nocturnal Surveys: Include date and time of each visit, weather conditions, transect spacing, area surveyed, time spent surveying, describe visibility (i.e. grass height and density, intensity of rainfall, etc.), enumerate or estimate the number of ground squirrel burrows examined (if present), map their distribution, and note presence of livestock. List all CTS measured, sexed, and photographed. Show locations of CTS on a site map.
4. Aquatic Surveys: Include the date, materials and methods used, time spent surveying, and estimate the surface area of each pond sampled. List the species of vertebrates and at least the order or family of invertebrates captured in each pool sampled.
5. Record locations of CTS, other special-status vertebrates, suspected introduced *Ambystoma* populations, and fairy shrimp on California Natural Diversity Data Base Field Survey Forms. Forms are available from the DFG (Natural Diversity Data Base, California Department of Fish and Game, 1807 Thirteenth Street, Suite 202, Sacramento, California 95814)
6. Include all required supporting information if a negative finding is being suggested.

#### LITERATURE CITED

Crump, M.L. and N.J. Scott, Jr. 1994. Visual encounter surveys. Pages 84-92. In: Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Foster (editors). 1993. Measuring and monitoring biological diversity: standard methods for amphibians. Smithsonian Institution Press, Washington and London.

Feaver, P.E. 1971. Breeding pool selection and larval mortality of three California amphibians: *Ambystoma tigrinum californiense* (Gray), *Hyla regilla* (Baird and Girard) and *Scaphiopus hammondi hammondi* (Girard). M.A. Thesis, Fresno State College, Fresno, CA.

Jaeger, R.G., and R.F. Inger. 1994. Quadrat sampling. Pages 97-102. In: Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Foster (editors). 1993. Measuring and monitoring biological diversity: standard methods for amphibians. Smithsonian Institution Press, Washington and London.

Jennings, M.R., and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA, under Contract (8023).

Long, M.M. 1992. Endangered and threatened wildlife and plants; 90-day finding and commencement of status review for a petition to list the California tiger salamander. Federal Register 57 : 54545-54546

Nagano, C., and J. Browning. 1994. Endangered and threatened wildlife and plants: determination of endangered status for the conservancy fairy shrimp, longhorn fairy shrimp, and the vernal pool tadpole shrimp; and threatened status for the vernal pool fairy shrimp. Federal Register, 59(180): 48136-48153.

Shaffer, H.B., R.A. Alford, B.D. Woodward, S.J. Richards, R.G. Altig, and C. Gascon. 1994. 10. Quantitative sampling of amphibian larvae. Pages 131-141. In: Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Foster (editors). 1993. Measuring and monitoring biological diversity: standard methods for amphibians. Smithsonian Institution Press, Washington and London.

Shaffer, H.B., R.N. Fisher, and S.E. Stanley. 1993. Status report: the California tiger salamander (*Ambystoma californiense*). Final report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, under Contracts (FG 9422 and FG 1383)

Stebbins, R.C. 1985. A field guide to reptiles and amphibians of western North America, Second edition, Revised. Houghton Mifflin Company, Boston.

Sorensen, P.C. 1994. Endangered and threatened wildlife and plants; 12-month petition finding for the California tiger salamander. Federal Register, 59 (74): 18353-18354.



## Appendix 5

### Grasslands Journal Article

“Resource Management Demonstration at Russian  
Ridge Preserve”





# GRASSLANDS

A Publication of the California Native Grass Association Volume XI, No. 1, Spring 2001

## Resource Management Demonstration at Russian Ridge Preserve

Paul Kephart, Rana Creek Habitat Restoration

### Abstract

Five management options were explored for their effectiveness in maintaining biodiversity and limiting the spread of invasive exotic plant species into Coastal Grassland habitat on Midpeninsula Open Space District lands in San Mateo County, California. Management techniques included time-controlled intensive grazing, fire followed by spot application of herbicide, fire followed by seeding of native species, hand weedeating, tractor mowing, and spot application of herbicides. Costs and effectiveness for each treatment option are presented. Various options reduced yellow star thistle cover; others were effective in reducing the number and cover of exotic species, and some increased the cover and number of native species.

### Introduction

Coastal Prairie Grasslands occur along the coastal mountains and on wetter interior ridges of central California (Holland 1995). Coastal Prairie Grasslands that contain California oat grass (*Danthonia californica*) are among the most diverse plant communities of California (Stromberg, Kephart, and Yadon 2000) and among the most threatened plant communities statewide (Noss and LaRoe 1995; Peters and Noss 1995). Russian Ridge is one of the most diverse of the interior ridge grasslands in the Santa Cruz Mountain bioregion and ranks high on a state level as well (Stromberg, Kephart, and Yadon 2000). Remaining examples of this native community are rare and are threatened by development wherever they occur. Old fields in California that revert to the typical California annual grassland (Heady et al. 1988) and old fields that remain weedy are extremely stable if simply left alone, in a reserve, even for many years (Stromberg and Griffin 1996). This demonstration was done in part to alert land managers and regulatory agencies to the significance of this diverse, coastal grassland and to show that active management is required and can be effective to sustain or restore these diverse grasslands.

Russian Ridge Preserve is located in the Santa Cruz Mountains on an open ridgeline that contains mixed evergreen forest, oak woodlands, steep redwood canyons, and significant areas of open grassland. Open grassland occupies approximately 400 acres of the preserve.

The grasslands of the Russian Ridge Preserve are relicts of Interior Coastal Prairie that extend southward from the Oregon border to the San Luis Obispo County coast and are sub-Arctic in origin (Heady 1992; Holland 1997). Native grasslands are among the most endangered ecosystems in California and in North America (Noss and LaRoe 1995; Peters and Noss 1995). These native grasslands are among the rarest in California and have been fragmented by development and agriculture throughout their range.

The Russian Ridge Preserve grassland is dominated by species such as purple needlegrass (*Nassella pulchra*), June grass (*Koeleria macrantha*), meadow barley (*Hordeum brachyantherum*), squirrel tail (*Elymus elymoides*), and blue wild rye (*Elymus glaucus*). California oat grass (*Danthonia californica*) and Idaho fescue (*Festuca idahoensis*) are present but not abundant. Diverse flowering perennials and herbaceous plants are associated with this grassland. Showy carpets of wildflowers, late-germinating annual forbs, and clovers occupy the bare soil between perennial grass plants. Owl's clover (*Castilleja exserta* var. *exserta*), ruby chalice clarkia (*Clarkia rubicuda*), and California poppies (*Eschscholzia californica*) are a few spring-blooming flowers found throughout Russian Ridge Preserve. Numerous perennial flowers such as blue-eyed grass (*Sisyrinchium bellum*), blue dicks (*Dichelostemma capitatum*), suncups (*Camissonia ovata*), johnny jump-ups (*Viola pedunculata*), checkerbloom (*Sidalcea malaefolia*), and elegant brodiaea (*Brodiaea elegans*) occupy moist soil sites.

### Resource Management Demonstration

The resource management demonstration was initiated in 1996 with a survey conducted to map exotic species at Russian Ridge Preserve. Significant areas of yellow star thistle (*Centaurea solstitialis*), Harding grass (*Phalaris aquatica*), and other invasive thistles (*Cirsium* spp.) were mapped (Kan 1996). Exotics were most abundant in disturbed soils, including trails and roadsides, old fields, south-facing slopes with high populations of gophers (*Thomomys bottae*), seasonally wet meadows, and gently sloping benches and plains historically used as feeding or loafing locations by livestock. A restoration and management plan was prepared (Kephart 1997) that targeted (1) reduction and control of annual exotic seed production, (2) depletion of the exotic seed bank in the soil, and (3) the introduction and management of competitive native plants to displace exotic species.

### Methods

Throughout the demonstration, five combinations of treatments were

### IN THIS ISSUE:

Russian Ridge .....	1
From the President's Desk .....	2
Advice for Authors .....	3
Calls for Information .....	3
Letters to the Editor .....	4
What's So Great About Native Grasses? ...	7
Announcements .....	16
CNGA Shopper's Corner .....	18

*RUSSIAN RIDGE, continued from page 1*

consistently applied to at least two plots. No control plot was left untreated, but casual observations of untreated areas showed no change from pretreatment conditions. Each year at least two sampling plots received a unique combination of single treatments or combined treatments.

Treated areas were sampled during early spring when species were most easily detected. Sampling occurred within 20 × 50 m plots placed along the topographic contour. Treated areas ranged from 2 to 20 acres. All species found within each 20 × 50 m plot were recorded. Permanent T-bar stakes were installed at each end of a 50 m sampling transect located in the center of the plot. Workers placed 20 × 50 cm steel quadrats at 2.5 m intervals along the transect. The quadrats were painted to facilitate recognition of six cover classes (0–5%, 5–25%, 26–50%, 51–75%, 76–95%, and 96–100%). A cover class for each species present within the quadrat was recorded. A value of 0.01 was assigned to species found only within the larger 20 × 50 m plot. Cover for each species was calculated by averaging midpoints of the cover class assigned to each species for 20 quadrat samples per plot (Daubenmire 1959). A comparison analysis was conducted before and after successive treatments on each plot. Our objective was to determine a trend or shift in the percentage of cover of individual species within each treatment plot.

Six resource management techniques were used at the preserve from 1997–2000: grazing, herbicide applications, prescribed fire, mowing, hand control, and planting native seeds. These applications were conducted individually as well as in combination (e.g., prescribed fire and native plant seeding).

**1. Hand Control.** Roving exotic-control teams equipped with gas-line-powered weeders accomplished hand control of yellow star thistle (YST). Emerging flower heads of YST, as well as bull thistle and Italian thistle, were cut prior to seed maturation. Hand control was conducted each year for a 4-month period beginning in April. Hand-control efforts were conducted on 3 acres in 1997 and 1998.

**2. Tractor Mowing.** In 1997 and 1998, patches of YST were mowed with a tractor-mounted rotary mower. The treated area varied between years from 0.5 to 3 acres. Each year, YTS was mowed three times to control flowering.

**3. Herbicide.** Two 5-acre, steep, southwest-facing slopes were treated with Transline™ by hand crews. Individual exotic plants were sprayed. To minimize harm to the abundant native forb species growing actively within the areas chosen for herbicide treatment, application was delayed until YST was in the bolting stage. Typically, Transline™ is applied to YST at the earlier rosette stage (Lanini et al. 1995). Backpack sprayers were used to apply the Transline™ in July to plants that were just at or past the bud stage at a rate of 2 oz per acre. Harding grass was sprayed as above with a 2% solution of Roundup.

**4. Grazing.** In 1997, vegetation was sampled before grazing. Then, 500 goats were grazed within a 13-acre treatment plot for 12 days starting May 5. An electric fence enclosed the single 13-acre treatment area in 1997. Grazing began when 50% of the YST achieved bud stage. To achieve control of YST (1-inch stubble height), nearly all the vegetative cover was consumed and steep ravines were grazed in most places to mineral soil. Trees, shrubs, and brush were defoliated at the browse line. Although a reduction in YST was achieved the first year, another less

intensive and more selective approach was needed.

In 1998, the vegetation was monitored, then the grazing frequency and duration was planned. Along with 40 goats, 17 sheep were used. The animals were contained in smaller (1/4 ac.) cells for short times (2–3 days) until the entire 13-acre area was grazed. This meant grazing continued in 1998 from April 25 for 42 days. The grazing-treatment plots were monitored in 1999 but were not grazed.

**5. Burning.** Fuel breaks were mowed or grazed to establish a fire line; goat and sheep grazing were used to reduce fuel in steep ravines near forest habitats.

Prescribed fire was used on 80 acres in July 1998, and on 120 acres in August 1999 (including the 80 acres previously burned). About 85% of the ground surface was blackened, and very little white ash was present. Midsummer dates maximized YST control (Hastings and DiTomaso 1996).

**6. Planting Native Seeds.** To provide site-specific seed for this project, Midpeninsula Open Space staff were trained to identify and collect native plant seed. All seed used on the preserve was grown under guidelines provided by the USDA California Crop Improvement Association (CCIA) Wildland Collected Seed Program. By following the USDA program, the proper identity and purity of native grasses and forbs can be assured; reproductive material and records through all stages of collection and production have been maintained. Twenty native plant species were collected and cleaned for seeding at Russian Ridge Preserve in 1999 and 2000. Russian Ridge sources of purple needlegrass (*Nassella pulchra*), California brome (*Bromus carinatus*), Blue wild rye (*Elymus glaucus*), California fescue (*Festuca californica*), meadow barley (*Hordeum brachyantherum*), and June grass (*Koeleria macrantha*) were registered with the CCIA Certified Seed Program.

Grass seeds were drilled in one direction with a tractor-driven Truax no-till native grass seed drill. The drill was then cleaned and filled with dicot seeds and pulled at 90° to existing drill lines for grass seed. This allowed for mixed seeding but spatially isolated grasses and dicots.

## Results

During the implementation of the management techniques, changing management priorities resulted in the following combinations of treatments; (1) hand control (weedeating), (2) herbicide application, (3) grazing, (4) tractor mowing, (5) prescribed fire and planting native seeds, and (6) prescribed fire, application of herbicide on Harding grass, and planting native seeds. Here five responses are discussed; (1) cover of YST, (2) cover of native species, (3) cover of exotic species, (4) number of native species, and (5) number of exotic species.

**1. Hand Control.** The cost of hand control was \$1,140.53 per acre. After the 1998 season, staff determined the cost of hand control prohibitive for large-scale, sustainable resource management. Measured responses to hand control and cost comparisons are shown in Figs. 1–5. Hand control effectively reduced cover of YST, had no effect on cover of native species, was somewhat effective in reducing cover of exotics, and had no effect on the number of native or exotic species.

**2. Herbicide Treatment.** Within 5 days, the YST was withered and dead. The herbicide control method was the most effective treatment for control of outlying colonies and individual weed plants. Plants that were sprayed died, and unlike hand control, reapplication was not required. Herbicide application cost \$298 per acre/year including hand

*Continued on page 9*

**RUSSIAN RIDGE, continued from page 8**

labor, materials, and mobilization. Measured responses to herbicides and cost comparisons are given in Figs. 1–5. Herbicide treatment dramatically reduced cover of YST, and had little effect on cover of native species or cover of exotic species in general, or number of exotic and native species.

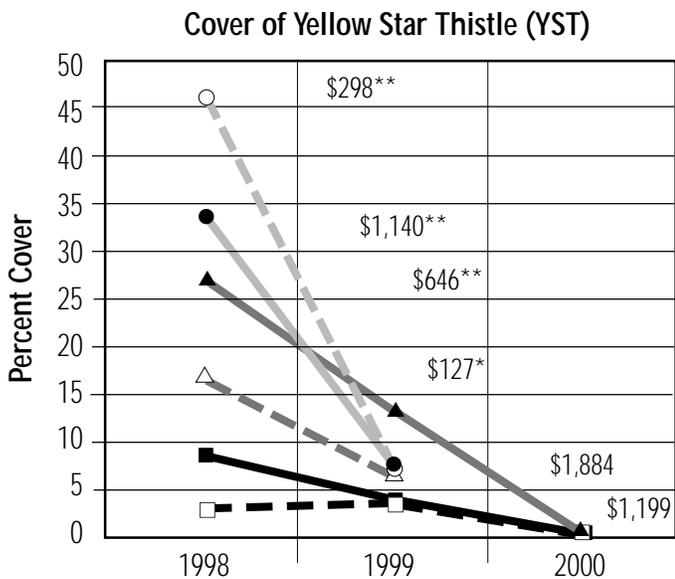
**3. Tractor Mowing.** Tractor mowing cost \$127.00 per acre, including mobilization cost. Measured responses to tractor mowing and cost comparisons are given in Figs. 1–5. Tractor mowing reduced cover of YST slightly, did not affect cover of native species (in general), reduced cover of exotic species, and resulted in negligible changes in the number of native or exotic species.

**4. Grazing.** In both years, the sheep and goats preferred YST to other less palatable species. With more abundant rains, more forage was available in 1999, so grazing was initiated prior to the presence of YST flowers. As the dominant annuals cured, YST entered the bud stage and became the only green forage available. To keep the YST vegetative and palatable, the frequency of grazing between cells was increased to daily movements. By controlling the frequency of herd movement, the animals targeted YST and ignored annual grass, dried forbs, and leaf litter.

The cost of grazing was \$646.88 per acre including the full-time herder, dogs, and temporary housing. Measured responses to grazing and cost comparisons are given in Figs. 1–5. Grazing significantly reduced the cover of YST, was associated with a negligible increase in cover of native species, increased cover of exotic species, had the greatest effect on increasing the number native species, and a negligible effect on the number of exotic species.

**5. Prescribed Fire and Native Plant Seeding.** The direct cost of prescribed fire on Russian Ridge was \$77.90 per acre. This cost did not

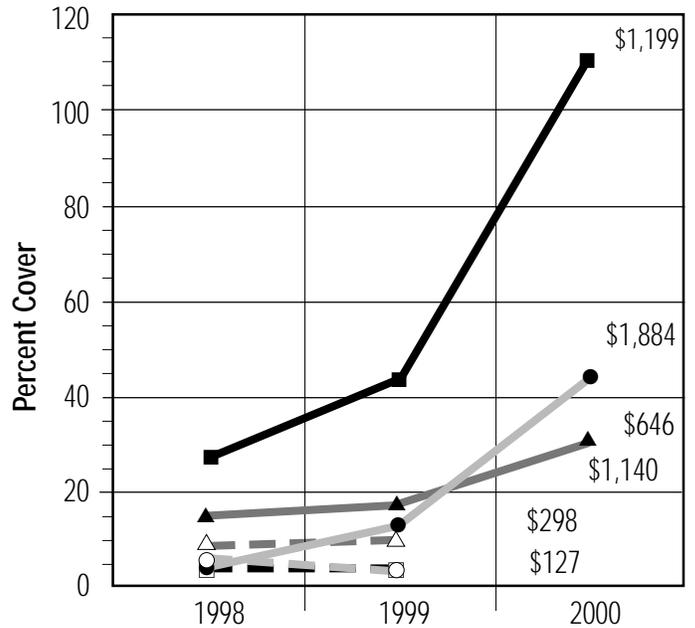
*Continued on page 10*



**Figure 1.** Change of YST cover with various treatments and associated costs at Russian Ridge Preserve.

○ = Herbicide; ● = Hand control; ▲ = Graze;  
 △ = Tractor mow; ■ = Burn, Harding grass control, Seed;  
 □ = Burn, seed; \$ = Cost per acre; \*\* = < .001; \* = < .05.

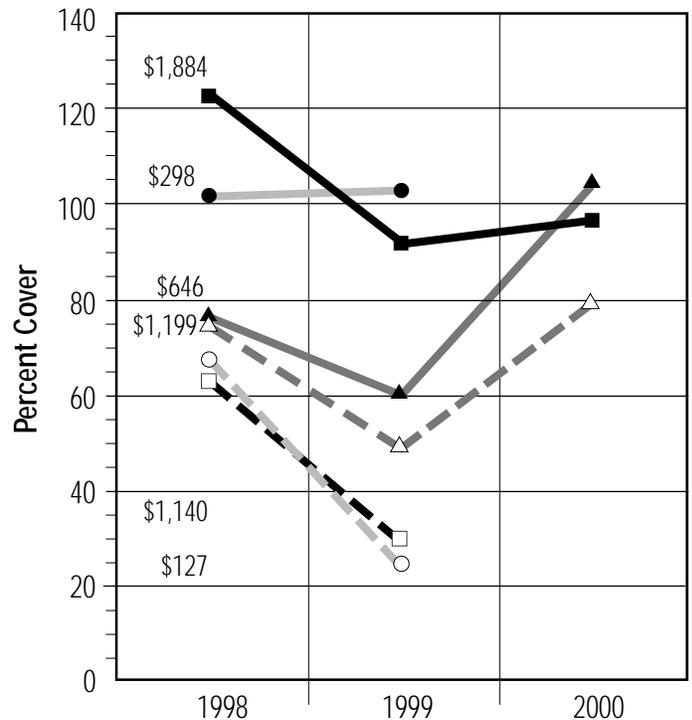
**Cover of Native Species**



**Figure 2.** Change in cover of native species with various treatments and associated costs at Russian Ridge Preserve.

■ = Burn, seed; ● = Burn, Harding grass control, Seed;  
 ▲ = Graze; △ = Hand control; □ = Herbicide;  
 ○ = Tractor mow; \$ = Cost per acre.

**Cover of Exotic Species**



**Figure 3.** Change in cover of exotic plant species with various treatments and associated costs at Russian Ridge Preserve.

■ = Burn, Harding grass control, Seed; ● = Herbicide;  
 ▲ = Graze; △ = Burn, seed; □ = Hand control;  
 ○ = Tractor mow; \$ = Cost per acre.

RUSSIAN RIDGE, continued from page 9

include staff time to prepare documents, advertise and implement the fire, and consultant's time. Private contractors that offer plans and implementation charge from \$65 to \$100 per acre (North Tree Fire 2000).

The dominant forbs that thrived after planting include tidy tips (*Layia platyglossa*), yarrow (*Achillea millefolium*), checkerbloom (*Sidalcea malvaeflora*), sky lupine (*Lupinus nanus*), owl's clover (*Castilleja exserta* var. *exserta*), and California poppy (*Eschscholzia californica*). Blue wild rye (*Elymus glaucus*) was the most successful native grass planted. The cost per acre for prescribed fire and native plant seeding was \$1,199.15. Measured responses to burning and planting and cost comparisons are given in Figs. 1–5. Burning and planting native seeds had no effect on YST cover, but did increase the cover and number of native species. Burning and planting only slightly increased the cover of exotic grasses but reduced the number of exotic species.

**6. Prescribed Fire, Harding Grass Control, and Native Plant Seeding.** In 1998 planting native seeds in areas historically cultivated and planted to Harding grass (*Phalaris aquatica*) began. As a result of the previous cultivation and seeding, native plant cover was limited, diversity was low, and Harding grass dominated the site. To prepare for the control of Harding grass and drill seeding a prescribed fire was conducted. In October, following the fire, the new green leaves of Harding grass were sprayed with a 2% solution of Roundup.

Follow-up spraying of approximately 10% of the Harding grass was required. The cost per acre for prescribed fire, hand control of Harding grass, and native plant seeding was \$1,884.12. Measured responses to burning, herbicide control of Harding grass, and planting native seeds, and cost comparisons are given in Figs. 1–5. The combined treatment of burning, spraying Harding grass, and planting native seeds had an insignificant effect on cover of YST, increased cover of native species, slightly reduced cover of exotic species, increased the number of native species, and slightly increased the number of exotic species.

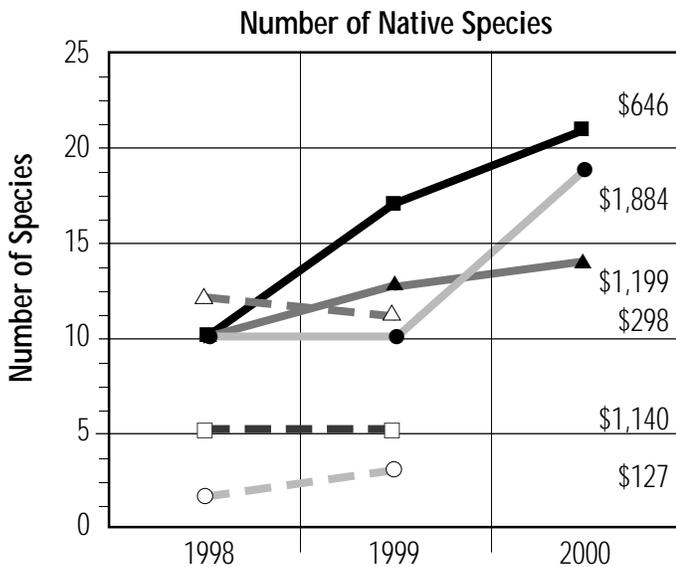


Figure 4. Change in number of native plant species with various treatments and associated costs at Russian Ridge Preserve.

■ = Graze; ● = Burn, Harding grass control, seed;  
 ▲ = Burn, seed; △ = Herbicide; □ = Hand control;  
 ○ = Tractor mow; \$ = Cost per acre.

Discussion

The results of the resource management program have a profound effect on visitors who are in awe of the stunning wildflower displays. Many visitors expressed sincere appreciation of Midpeninsula Open Space District administration and staff efforts to manage and maintain the sensitive grassland habitat of Russian Ridge Preserve.

During the course of the work, it became clear which treatment or combination of treatments worked best to reach stated ecological outcomes, and the relative value of the treatments could be assessed by tracking and recording the costs. In addition, the intended ecological outcomes were redefined to include the maintenance of native plant diversity and an increase in cover of native plant species. For example, early efforts were narrowly focused on the control of YST. Seeding native plants became a higher priority in 1999; thus the acreage and diversity of the species planted were increased. Management alone was not sufficient to restore biological diversity in some parts of the preserve. The absence of a native seed bank in the soil, primarily from historic cultivation and land use, affected the species that regenerated after grazing and fire.

Participants learned about the diversity and complexity of native grassland habitats. About 100 species of forbs and 30 species of grasses inhabit Russian Ridge Preserve. The grassland is highly variable. Plant composition and density can change radically from one site to another and between years. Slope, aspect, soil type, and exposure can vary greatly over the topographic relief. Grass, forb, and exotic components all

Continued on page 11

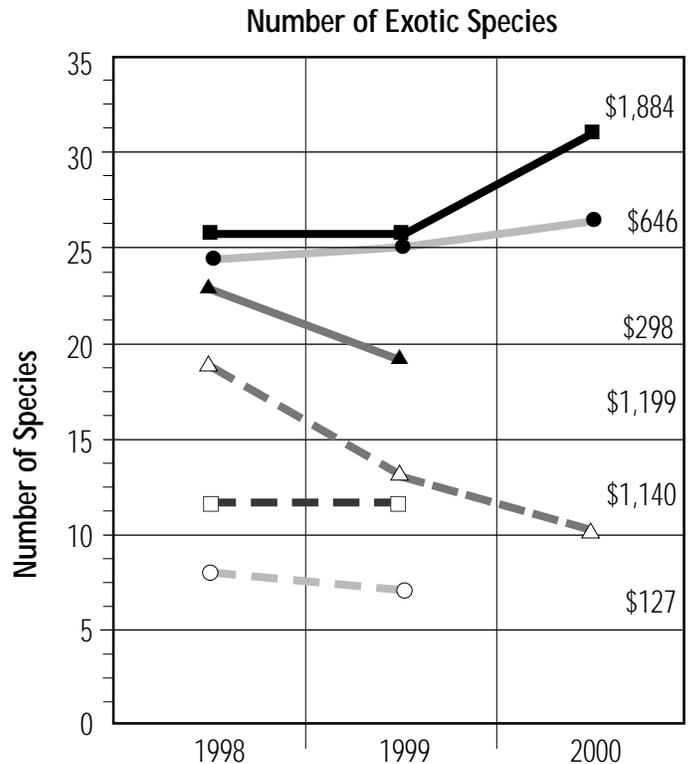


Figure 5. Change in the number of exotic species with various treatments and associated costs at Russian Ridge Preserve.

■ = Burn, Harding grass control, seed; ● = Grazing;  
 ▲ = Herbicide; △ = Burn, seed; □ = Hand control;  
 ○ = Tractor mow; \$ = Cost per acre.

## RUSSIAN RIDGE, continued from page 10

respond differently to the various management tools that were applied. Based on resulting data collections, general patterns have emerged.

All treatments except combined prescribed fire and seeding reduced YST cover. Use of the herbicide Transline™ was most effective, fastest acting, and least expensive treatment. Grazing effectively reduced the cover of YST to 1% overall and was an effective alternative to herbicide use. Hand control and tractor mowing reduced cover of YST and are appropriate where prescribed fire and grazing are not options to the District staff. Because of the cost, these treatments should not be prescribed for large-scale operations. The prescribed fire, Harding grass control, and native seeding treatment resulted in total reduction of YST cover.

Increasing and maintaining cover of native species was a primary goal of the resource management program. In areas where the prescribed fire and native seeding treatment was used, native plant cover significantly increased, the increase mostly represented by those species that were seeded. Disturbance-loving native species also increased in cover as a result of grazing. Native *Madia*, clovers, and annual flowers represented species that regenerated after grazing. The seeds of these species were evidently dormant for many years until the thatch layers were removed and the soil surface disturbed. Use of herbicide, mowing, and hand control had little effect on increasing native plant cover.

Mowing and hand control were most effective in reducing the cover of exotic species overall. These treatments decreased exotic forbs such as *Rumex* and *Cirsium*. Exotic species, mostly annual grasses, increased as a result of grazing. The annual grass *Avena fatu* (wild oats) as well as *Erodium cicutarium* (filaree) were the exotic plants that increased in cover as a result of the prescribed fire and native-plant seeding treatment.

Species richness increased most significantly under the grazing treatment. The combined treatment of prescribed fire, Harding grass control, and native seeding also resulted in increased species richness, primarily as a result of seeding. Hand control and tractor mowing had little or no effect on species richness.

On some grazed areas (but not the sampling plots), especially in wet swales, within 5 days after grazing ended YST that was not grazed below secondary basal stems re-sprouted, and nearly all produced flowers by July 15th. In these areas, after goat grazing, all remaining YST flowers were cut again with weed eaters. As late as August 20, new flowers in these wetter grazed areas continued to appear on YST and required additional hand mowing. After each mowing, about 50% of the plants regrew flowers; thus they required mowing at least three times.

A quick study of the affects of fire on YST seed viability was conducted. YST seed was collected within the prescribed fire areas of the preserve. Nonburned seed was compared to seed that was burned. The burned florets collected were from intact erect stems that were only singed by fire. The seed was placed in Petri dishes on September 9, 1998; the dishes contained 25 seeds each from four samples. Nine days later 24% germination in the nonburned seed was observed, and no germination for seeds that were burned.

The prescribed fire and native seeding treatment was most effective in the reduction of exotic species, followed by the herbicide treatment. Prescribed fire was effective on most broadleaf exotics such as *Cirsium* sp. and *Crepis* sp. The herbicide Transline™ targeted YST but also reduced *Trifolium*, *Crepis*, and *Cirsium* species. Grazing increased the cover of two exotic Mediterranean species, wild oats (*Avena fatua*) and

filaree (*Erodium cicutarium*). Species richness also increased where prescribed fire was used. After the second year of prescribed fire and restoration, native plants increased by approximately 18%. Prescribed fire followed by herbicide applications resulted in 27% reduction in Harding grass cover. By spraying the Harding grass in the late fall after fire and regrowth, the amount of herbicide needed to kill the plants was lessened, and accuracy of the spraying was enhanced.

Overall where the District planted wildland-collected seed, cover of native species nearly doubled, especially native grasses and forbs. The seeding of these native plants will in turn contribute to the native seed bank lost as a result of the previous agricultural land use.

The prescribed fire resulted in spectacular flower displays and a 50% reduction in cover of annual weedy plants. By conducting the prescribed fire program, the District demonstrated to the community its ability to manage and maintain a sensitive resource, reduce the risk of wildfire regionally, and coordinate resource management objectives with other resource agencies. The District also learned that prescribed fire could be used the following year after drill seeding and not kill the young native grasses and plants seeded the previous year.

Through the course of the 4-year program, resource management treatments commonly available to the District were demonstrated and analyzed on an operational basis. As a result of this study the District can conduct more informed resource policy and management decisions by understanding the biological effects and economics of those management actions. Based on the results of this study, the District has gained valuable information in regard to future management prescriptions for native grassland restoration and management. This information is important to conservation, restoration, and resource management on a regional scale as well.

## Literature Cited

- Daubenmire, R.F. 1959. Canopy coverage method of vegetation analysis. *Northwest Sci.* 33:43–64.
- Hastings, M.S., and J.M. DiTomaso. 1996. Fire controls yellow star thistle in California grasslands. *Restor. Manage. Notes* 14:124–128.
- Heady, H.F., T.C. Foin, M.M. Hektner, D.W. Taylor, M.G. Barbour, and W.J. Barry. 1988. *Valley Grassland*. M.G. Barbour and J. Major, Eds. *Terrestrial Vegetation of California*. John Wiley and Sons, New York. pp. 491–514.
- Heady, H.F., J.W. Bartolome, M.D. Pitt, G.D. Savelle, and M.C. Stroud. 1992. *California Prairie*. R.T. Coupland, Ed. *Natural grasslands: Introduction and Western Hemisphere*. Elsevier, Amsterdam, pp. 313–335.
- Holland, V.L., and D.J. Keil. 1995. *California Vegetation*. Kendall/Hunt, Dubuque, IA, 516 pp.
- Kan, T. 1966. Distribution and abundance of exotic species on Russian Ridge Preserve. Report to Midpeninsula Regional Open Space District. Los Altos, CA.
- Kephart, P. 1997. Resource management plan for Russian Ridge. Report to Midpeninsula Regional Open Space District, Los Altos, CA.
- Noss, R., M. Scott, and E.T.I. LaRoe. 1995. Endangered ecosystems of the United States: a preliminary assessment of loss and degradation. *National Biological Service (USGS)*, p. 28.
- Peters, R.L., and R.F. Noss. 1995. America's endangered ecosystems. *Defenders* 70:16–27.
- Stromberg, M.R., and J.R. Griffin. 1996. Long-term patterns in coastal California grasslands in relation to cultivation, gophers and grazing. *Ecological Applications* 6:1189–1211.
- Stromberg, M.R., P. Kephart, and V. Yadon. 2001. Composition, invasibility, and diversity in coastal California grasslands, 35 pp. (Submitted to Madroño, Jan 2000).

