

# TOLAY LAKE REGIONAL PARK

---

# MASTER PLAN

January 2017  
revision June 2018







# Acknowledgements

This Master Plan is the culmination of years of collaborative work that could not have been completed without the concerted effort of many public agencies, non-profits, stakeholders, and individuals. Regional Parks would like to express gratitude to all the agencies, non-profits, stakeholders, neighbors, staff, and community members who participated and contributed to this Plan through committees, workshops, focus groups, web in-put, and planning meetings.

## Sonoma County Board of Supervisors

David Rabbitt, 2nd District

Shirlee Zane, 3rd District

James Gore, 4th District

Lynda Hopkins, 5th District

Susan Gorin, 1st District

## Funding Partners

Bay Joint Venture

California State Parks

California Department of Fish and Wildlife

California Wildlife Conservation Board

Gordon and Betty Moore Foundation

City of Petaluma

Save the Bay

City of Sonoma

State Coastal Conservancy

Federated Indians of Graton Rancheria

Sonoma County Agricultural Preservation and Open Space District

Friends of Tolay Lake Park

Sonoma County Regional Park Foundation

Gold Foundation

The Bay Institute

Land And Water Conservation Fund

U.S. Fish & Wildlife Service

National Oceanic Atmospheric Administration

## Sonoma Land Trust

Wendy Elliot, Conservation Director

Bob Neale, Stewardship Director

## California Coastal Conservancy



## Federated Indians of Graton Rancheria

Thank you to all of the tribal citizens of the Federated Indians of Graton Rancheria for supporting the project through sharing tribal ancestral knowledge, tribal perspective, and stewardship values.

Greg Sarris, Tribal Chairman

Charles Johnson, FIGR Monitor

Lorelle Ross, Vice-Chair

David Carrillo, FIGR Monitor

Melissa Elgin, Tribal Secretary

Nick Tipon, former Sacred Sites Committee Member

Gene Buvelot, Treasurer

Jeannette Anglin, former Council Member

Robert Stafford Jr., Member at Large

Joanne Campbell, former Council Member

Lynn Silva, Member at Large

Kathleen Smith, Tolay Advisory Group

Lawrence Stafford

Robert Baguio, Tolay Advisory Group

Buffy McQuillen, Tribal Heritage Preservation Officer

Yana Ross, Tolay Advisory Group

Peter Nelson, Chair of Sacred Sites Protection Committee

Roberta Martinez, Tolay Advisory Group

Gillian Hayes, Director of Planning and Development

Eric Goziak, Tolay Advisory Group

Nick Tipon, Sacred Sites Protection Committee

Lisa Ouse, Tolay Advisory Group

and the Tribal Environmental Department

## Tolay Trails Focus Group

Carolyn Verheyen

John Baas

Ken Wells, E.D., Sonoma County Trails Council

Steve Burchfield, Regional Parks Mounted Assistant Unit

Roger Appleby, Regional Parks Mounted Assistant Unit

Carol Velluntini, Sierra Club - outings

Jeanette Griffiths, Sierra Club - outings

Jerry Lyman, Empire Runners Association

Gary Helfrich, Sonoma County Bike Coalition

Sarah Reid, Horse Council

Kathy Bell, SRJC Disability

Devin Chatoian, FIGR

Gillian Hayes, FIGR



## Ocidental Arts and Ecology

### Lakeville Volunteer Fire Department

Nick Silva, Chief

### Marin/Sonoma Mosquito and Vector Control Distirct

Erik Hawk, Assistant Manager

## Neighbors of Tolay Lake Regional Park

## Sonoma County Permit and Management Resource Department

### Sonoma County Regional Parks

Bert Whitaker, Director

Caryl Hart, Former Director

Melanie Parker, Deputy Director

Steve Ehret, Park Planning Manager

David Robinson, Park Manager

Bethany Facendini, Park Community Engagement Manager

Christina McGuirk, Youth & Community Programs Coordinator

Brandon Bredo, Administrative Ranger Supervisor

Karen Davis-Brown, Planner II

Andrew Stricklin, Former Planning Technician

### Prepared by MIG

Carolyn Verheyen, Principal in Charge

John Baas, Project Manager

Katrina Hardt-Holoch, Environmental Analysis Task Lead

Ivy Ku, Master Plan Production

Mark Brandi, GIS Analysis

Maria Mayer, Public Outreach Support

### In Association With

**Architectural Resources Group**, Cathleen Malmstrom, Historic Buildings Evaluation

**Peter Baye**, Lake Restoration Design Peer Review

**Clearwater Hydrology**, William Vandivere, Lake Restoration Design Peer Review

**Fall Creek Engineering**, Peter Haase and Emily Corwin, Wastewater System Design

**Fehr and Peers**, Dana Weissman, Site Circulation and Access Road Design

**Garcia and Associates**, Barbara Siskin and Cassidy Debaker, Cultural Resources

**Kennedy Jenks**, Mike McLeod, Groundwater Hydrology and Potable Water Evaluation

**WRA**, Geoff Smick, Biological Resources, and George Salvaggio, Lake Restoration Design



*This page intentionally left blank.*



## TABLE OF CONTENTS

---

### INTRODUCTION

|  |    |
|--|----|
| Overview and Purpose of the Master Plan        | 3  |
| Components and Organization of the Master Plan | 4  |
| Master Plan Process                            | 4  |
| Acquisition                                    | 4  |
| Park Setting                                   | 5  |
| History of the Park                            | 10 |
| Natural History                                | 10 |
| Cultural History                               | 12 |
| Park History                                   | 19 |

### PURPOSE, VISION, AND GOALS

|   |    |
|---|----|
| Purpose   | 23 |
| Objectives  | 23 |
| Goals   | 24 |
| Habitat Restoration and Enhancement                           | 24 |
| Cultural Resource Conservation                                | 26 |
| Public Access   | 28 |
| Open Space Protection   | 29 |
| Environmental, Cultural, and Agricultural Study and Education | 29 |

## **PUBLIC OUTREACH**

|                                      |           |
|--------------------------------------|-----------|
| <b>Background and Methodology</b>    | <b>33</b> |
| <b>Summary of Community Meetings</b> | <b>33</b> |
| Community Workshop #1                | 33        |
| Community Workshop #2                | 34        |
| Community Workshop #3                | 35        |
| <b>Focus Group on Trail Users</b>    | <b>35</b> |
| Ideal Trail System                   | 35        |
| Desires for Trail Infrastructure     | 36        |
| Seasonal Trail Closures              | 36        |
| Access and Staging                   | 36        |
| Special Events and Races             | 37        |

## **REGULATORY SETTING AND POLICY FRAMEWORK**

|  |           |
|--|-----------|
| <b>Federal</b>   | <b>41</b> |
| Archaeological Resources Protection Act                    | 41        |
| The Native American Graves Protection and Repatriation Act | 41        |
| National Register of Historic Places (NRHP)                | 41        |
| Federal Endangered Species Act                             | 42        |
| The Migratory Bird Treaty Act                              | 42        |
| Clean Water Act Sections 404 and Section 401               | 42        |
| <b>State</b>   | <b>43</b> |
| Assembly Bill 52   | 43        |
| California Register of Historical Resources                | 44        |
| California Endangered Species Act                          | 45        |
| Fully Protected Species and Species of Special Concern     | 45        |
| Other Sensitive Plants – California Native Plant Society   | 45        |
| Porter-Cologne Water Quality Control Act                   | 45        |
| California Fish and Game Code Section 1600-1616            | 46        |
| Sensitive Vegetation Communities                           | 46        |
| Caltrans   | 46        |
| <b>County</b>  | <b>46</b> |
| Sonoma County General Plan                                 | 46        |
| Sonoma County Public Works                                 | 46        |

## TOLAY LAKE MASTER PLAN CONCEPTUAL SITE PLAN OPTIONS

|   |           |
|---|-----------|
| <b>Concept Plan Description</b>                           | <b>49</b> |
| Interpretation Plan                                       | 49        |
| Developing Conceptual Site Plan Options                   | 51        |
| Preferred Site Plan Option                                | 52        |
| Utilities and Infrastructure                              | 53        |
| <b>Trails</b>   | <b>61</b> |
| Trail Types   | 61        |
| <b>Tolay Lake Restoration</b>                             | <b>62</b> |
| Background  | 62        |
| Historic and Current Lake Conditions                      | 63        |
| Ecological Processes of a Late Holocene Period Tolay Lake | 64        |
| Habitat Values and Species                                | 66        |
| Opportunities and Constraints                             | 67        |
| Lake Restoration Alternatives                             | 67        |
| <b>Implementation and Phasing Strategy</b>                | <b>73</b> |
| Project Types   | 73        |
| Implementation Phases                                     | 73        |

## RESOURCE MANAGEMENT PLAN

|  |            |
|--|------------|
| <b>Introduction</b>  | <b>81</b>  |
| Overview and Purpose   | 81         |
| Support Studies and Methodology                                | 81         |
| <b>Existing Conditions</b>                                     | <b>82</b>  |
| Setting and Location   | 82         |
| Land Use and Infrastructure                                    | 83         |
| Climate and Watershed  | 83         |
| Geology and Soils  | 84         |
| Biological Resources   | 86         |
| Cultural Resources   | 87         |
| Encumbrances   | 87         |
| Existing Resource Management Practices                         | 91         |
| <b>Natural and Cultural Resources Management</b>               | <b>94</b>  |
| Natural Resources  | 94         |
| Cultural Resources   | 128        |
| <b>Proposed Habitat Restoration and Enhancement Activities</b> | <b>130</b> |
| Overview   | 130        |
| Wetland and Tolay Lake   | 131        |



|                                       |            |
|---------------------------------------|------------|
| Stream and Riparian                   | 131        |
| Native Grassland and Wildflower Field | 132        |
| <b>Adaptive Management</b>            | <b>132</b> |
| Adaptive Monitoring and Management    | 132        |
| Effects of Climate Change             | 133        |
| Monitoring Methods                    | 135        |

## **EDUCATION AND INTERPRETIVE ELEMENTS**

|   |            |
|---|------------|
| <b>Introduction</b>   | <b>155</b> |
| <b>Purpose and Significance of the Interpretive Master Plan</b> | <b>155</b> |
| Context for Interpretation                                      | 156        |
| Definition  | 157        |
| <b>Resources for Interpretation</b>                             | <b>157</b> |
| Natural Features  | 157        |
| Cultural Heritage Features                                      | 159        |
| Agricultural Features   | 161        |
| Site Analysis   | 162        |
| <b>Audience Evaluation</b>                                      | <b>164</b> |
| Capacity Analysis   | 164        |
| Audience  | 165        |
| <b>Thematic Structure</b>                                       | <b>167</b> |
| Goals   | 167        |
| Themes, Messages, and Stories                                   | 168        |
| <b>Challenges and Strategies</b>                                | <b>174</b> |
| Planning Approach   | 174        |
| Challenges  | 175        |

## TRAILS PLAN

|  |     |
|--|-----|
| Types of Trails                              | 181 |
| Multiple Use Trails                          | 182 |
| Single Use Trails                            | 182 |
| Existing Trails                              | 182 |
| Description                                  | 182 |
| Proposed Trails                              | 184 |
| Description                                  | 184 |
| Road and Trail Decommissioning               | 187 |
| Trail Design and Construction                | 187 |
| General Trail Design                         | 187 |
| Multiple-Use Trails                          | 190 |
| Educational Nature Trails (Pedestrians Only) | 191 |
| Accessible Trails                            | 192 |
| Emergency Access Roads                       | 193 |
| Trail Tread                                  | 194 |
| Trail Drainage Structures                    | 195 |
| Litter Removal Standards                     | 195 |

## OPERATIONS AND MAINTENANCE

|  |     |
|--|-----|
| Business Plan, Operations, and Maintenance | 199 |
| Business Plan                              | 199 |
| Operations and Maintenance                 | 200 |

## REFERENCES

|                       |     |
|-----------------------|-----|
| Chapter 1             | 210 |
| Chapter 2 - Chapter 5 | 211 |
| Chapter 6             | 211 |
| Chapter 7             | 218 |
| Chapter 8             | 218 |
| Chapter 9             | 218 |

## FIGURES

|  |     |
|--|-----|
| Figure 1-1 Regional Location                                     | 7   |
| Figure 1-2 Existing Project Site                                 | 8   |
| Figure 1-3 Existing Park Complex                                 | 9   |
| Figure 5-1 Preferred Option for Park Complex                     | 55  |
| Figure 5-2 Preferred Option for Park Interior                    | 56  |
| Figure 5-3 Groundwater Availability                              | 57  |
| Figure 5-4 Preferred Wastewater Treatment System                 | 58  |
| Figure 5-5 Proposed Cannon Lane Roadway Improvements             | 59  |
| Figure 5-6 Diversion Ditch Habitat Restoration                   | 70  |
| Figure 5-7 Target Habitats – Restoration Alternative 1           | 71  |
| Figure 5-8 Preferred Tolay Lake Restoration                      | 72  |
| Figure 6-1 Soils   | 145 |
| Figure 6-2 Existing Restoration Areas and Biological Communities | 146 |
| Figure 6-3 Special Status Species Occurrences                    | 147 |
| Figure 6-4 Invasive Species Occurrences                          | 148 |
| Figure 6-5 Park Complex and Visitor Center Area                  | 149 |
| Figure 6-6 Existing Grazing Infrastructure                       | 150 |
| Figure 6-7 Proposed Restoration Areas and Biological Communities | 151 |
| Figure 7-1 Proposed Conceptual Interpretive Plan                 | 177 |
| Figure 9-1 Proposed Park Complex Emergency Access                | 203 |
| Figure 9-2 Proposed Park Site Emergency Access                   | 204 |

## TABLES

|  |     |
|--|-----|
| Table 5-1 Meeting Participant Voting Patterns on Site Plan Options         | 52  |
| Table 5-2 Size and Storage Volume for Each of the Restoration Alternatives | 68  |
| Table 5-3 Specifications for the Preferred Lake Restoration Alternative    | 69  |
| Table 5-4 Tolay Lake Master Plan Phasing                                   | 75  |
| Table 6-1 Soil Mapping Units and Characteristics                           | 85  |
| Table 6-2 Summary of Proposed Habitat Restoration and Enhancement Areas    | 131 |
| Table 6-3 Long-Term Monitoring of Natural Resources Tasks                  | 139 |
| Table 6-4 Schedule for Long-Term Natural Resources Monitoring              | 143 |
| Table 6-5 Schedule for Long-Term Cultural Resource Monitoring              | 144 |
| Table 8-1 Trails on Existing Alignments                                    | 182 |
| Table 8-2 Trail Implementation Phasing and Mileage                         | 184 |
| Table 9-1 Historical, Current, and Projected Revenue                       | 199 |
| Table 9-2 Historic, Current, and Projected Expenditures                    | 200 |
| Table 9-3 Revenue Less Expenditures  | 200 |



## APPENDICES

Appendix A Community Workshop and Survey Reports

Appendix B Conceptual Site Plan Options

Appendix C Historic Structures Report

Appendix D Groundwater Availability Memo

Appendix E Wastewater Treatment Options

Appendix F Analysis of Allowable Park Uses

Appendix G Technical Memorandum - Water Budget Analysis

Appendix H Tolay Lake Conceptual Ecological Model for Restoration Goals

Appendix I Biological Resources Report

Appendix J Biological Resources Study for Tolay Lake Regional Park

Appendix K Biological Resources Study for Tolay Creek Ranch

Appendix L Rangeland Resources Study

Appendix M Tolay Creek Ranch Grazing Plan

Appendix N Wildlife Conservation Board Easement

Appendix O SCAPOSD Conservation Easement for Tolay Lake Ranch

Appendix P SCAPOSD Conservation Easement for Tolay Creek Ranch

Appendix R Capital Investments, Revenue Stream, Expenditures, and Phasing  
Analysis

Appendix S Operations and Maintenance Checklist

*This page intentionally left blank.*

# Introduction







Photo credit: Regional Parks staff



## INTRODUCTION

Tolay Lake was once the largest freshwater lake in Sonoma County and was revered by the indigenous people, the Alaguali, a Coast Miwok tribe, as a sacred spiritual center and gathering place due to diverse habitat, abundant wildlife, lush valley lakebed, and spectacular vistas. Today, Tolay Lake continues to be a premiere locale within Sonoma County and continues to resonate with residents and visitors alike. The acquisition of Tolay Lake Ranch and Tolay Creek Ranch properties and its transition to a Regional Park will make this area widely accessible to residents of Sonoma, Marin, Napa, and Solano counties.

The Native American archeology, history, and culture of the site is unparalleled in California, and has the potential to provide numerous research and education opportunities. Through community partnerships between Sonoma County Regional Parks (Regional Parks), the Federated Indians of Graton Rancheria (Tribe), the Sonoma Land Trust (Land Trust), and the Sonoma County Agricultural Preservation and Open Space District (District), over 3,400 acres of scenic landscape, natural resources, and prehistoric cultural resources have been preserved.

Regional Parks and the Tribe are partnering to co-manage the park and its archaeological resources, while the District and Land Trust provides oversight for natural resource conservation. This interagency collaboration will help preserve the land's heritage and natural resources, in addition to providing educational and recreational opportunities for the public.

### Overview and Purpose of the Master Plan

The Tolay Lake Regional Park Master Plan (Master Plan) is a collaborative effort between Regional Parks and the Tribe. The Tribe has an ancestral connection to the Tolay Valley and serves as the co-stewards of Tolay Lake Regional Park (Park) by overseeing cultural resource preservation and interpretation. This relationship will enable the Park to offer education and research activities that are compatible with cultural resource preservation.

The Master Plan is intended to guide development, improvements, and public access to the Park. Implementation of the Master Plan will enable cultural interpretation and education; full use of the recreational potential of the Park; and restoration and enhancement of the property's diverse natural resources.

The Master Plan provides recommendations for habitat restoration; preservation and protection of prehistoric cultural resources; recreational improvements; interpretation of the prehistoric, historic, and natural resources; and land and agricultural management policies. Restoration includes returning Tolay Lake to a natural but smaller lakebed condition, and enhancing the Tolay Creek watershed within the Park. Strategies are provided for prehistoric cultural resource protection, preservation, and interpretation. Recreational improvements include development and improvements for public access, including park complex, trails, picnicking and camping. Interpretive programs take a holistic approach by exploring the historical interaction of people with the land. Select topics covered by the interpretive program include the site's geology, hydrology, regional significance, land management practices, conservation practices, restoration efforts, agriculture practices, and anthropology. The Resource Management Plan (Chapter 6 of this Master Plan) provides comprehensive policies for protecting preserving or restoring the Park's prehistoric/historic, cultural, and natural resources using adaptive management and best management practices. These policies help balance resource protection with public access.



Photo credit: Regional Parks staff

## Components and Organization of the Master Plan

The Master Plan is organized around two major components: the conceptual design plan for Park facilities and improvements, and management for natural, pre-historical, historical, and cultural resources.

- Chapter 1 outlines the Master Plan process, Park setting, and natural and cultural history of the Park.
- Chapter 2 describes the Master Plan purpose, goals, and objectives.
- Chapter 3 presents a summary of public participation for the Master Plan process.
- Chapter 4 describes the regulatory setting and policy framework surrounding the Master Plan.
- Chapter 5 includes the conceptual site plan alternatives.
- Chapter 6 is the Park Resource Management Plan.
- Chapter 7 includes the Education and Interpretive Elements for the Park.
- Chapter 8 details the Trails Plan.
- Chapter 9 outlines the Master Plan operations, which includes a Business, Operations, and Maintenance Plan; cost estimates; and an Implementation and Phasing Strategy.

## Master Plan Process

The Tolay Lake Regional Park master planning process was divided into three major phases: Phase 1 - Discovery, Phase 2 - Plan Development, and Phase 3 - Environmental Impact Report (EIR).

Phase 1, Discovery, took place between January and June 2013. It included a variety of public engagement activities designed to solicit stakeholder and community input regarding desired future activities in the Park.

During Phase 2, Plan Development, the project team developed the Master Plan based on input from Phase 1. The first step in Phase 2 was to develop conceptual plan alternatives for development. The conceptual plan alternatives were evaluated for consistency with existing Regional Parks policies; impacts on health and safety; impacts to neighbors; costs to build, operate, and maintain; and consistency with federal, state and local environmental laws.

Phase 3 includes preparation of an Environmental Impact Report (EIR) to evaluate the environmental impacts of implementing the Master Plan. The EIR will also identify all the necessary steps required to implement actions in the Master Plan, such as obtaining environmental permits and public access easements. Once the EIR process is complete, the Master Plan will be adopted as the guiding instrument for development and management of the Park.

## Acquisition

The Master Plan area consists of two properties. The Tolay Lake Ranch (formerly Cardoza Ranch) is open to the public on a limited basis as Tolay Lake Regional Park. The second property is a portion of the former Roche Ranch property, currently referred to as Tolay Creek Ranch. This second property is not open to the public, and is currently being managed by the Land Trust. The combined properties make up the 3,400 acre Tolay Lake Regional Park.

The Tolay Lake Ranch property is approximately 1,737 acres. The Tribe and Regional Parks worked as a team to obtain the necessary funding to acquire the property. The property was purchased in 2005 with more than half of the needed funds provided by the Sonoma County Agricultural Preservation

and Open Space District and the remaining funds for the purchase from the Department of Fish and Game (now California Department of Fish and Wildlife), Wildlife Conservation Board, State Coastal Conservancy, Land and Water Conservation Fund, National Oceanic and Atmospheric Administration, California Proposition 12 funds, and private foundations, businesses, and individual donors.

In 2008 the Tolay Creek Ranch property was purchased by the Land Trust. The property was purchased with supporting funds from the California State Coastal Conservancy, the Wildlife Conservation Board, the Gordon and Betty Moore Foundation, and additional funds through the purchase of a Conservation Easement by the Sonoma County Agricultural Preservation and Open Space District. Tolay Creek Ranch totals approximately 1,665 acres, bordered by Tolay Lake Regional Park to the north and Highway 121 to the south. The Tolay Creek Ranch property title was transferred to Sonoma County Regional Parks in 2017 and the District will hold Conservation Easements over portions of both properties in perpetuity.

## Park Setting

The Park is located in a valley between two ridgelines and is characterized by rolling hills, moist grasslands, wetlands, riparian and upland habitat, and remnant stands of coast live oak woodland (see Figure 1-2). This property has a rich history of activity and development, which dates back millennia. Living members of the Tribe can directly trace their heritage to the Alaguali, the indigenous Coast Miwok of the region.



Tolay Lake Regional Park is located approximately five miles southeast of the City of Petaluma, within 30 minutes of Santa Rosa and Sonoma Valley, and within 60 minutes of approximately 1.2 million residents in the adjacent counties of Marin, Napa, and Solano (see Figures 1-1 and 1-2). The primary entrance to the Park is located at 5869 Cannon Lane, a County-maintained road off of Lakeville Highway. Secondary access is provided from Highway 121, near the Tolay Creek undercrossing.

The Park is named for the approximately 200-acre shallow lake in the center of the valley. The first written reference of “Tolay” is in Padre Jose Altimira’s 1823 journal as the name used by local tribes for the Chief of the tribe. The origin and meaning of the word ‘Tolay’ has been lost because the Coast Miwok have suffered from disease, massacre, and the forced loss of language and culture following European settlement. The Park is a cherished place to the Tribe because it connects the descendants of the Aliguali to their ancestors and heritage through prehistoric artifacts, sacred beauty, and unique landscapes.



The Lake is connected to Tolay Creek, which drains the valley to San Pablo Bay. Streams and artificial ponds form other water features on site. The east and west ridgelines that form the Tolay Valley provides spectacular views of the Petaluma River Valley, San Pablo Bay, surrounding cities, and other significant land features surrounding the bay. The first original established ranch includes homes, barns, and corrals, located in the northwest corner of the Tolay Lake property - just west of the lake.

Entry roads from the north and the south end of the Park connect the site to the surrounding community, and ranch roads and trails provide a circulation network within the site. There are also maintenance and emergency access easements to both properties. The roads and trails at the Park include features like gates, fences, and bridges, which relate to the site's historical and current agricultural use. Historic Lakeville Road runs north to south, parallel to Tolay Creek.

This area has served many people over millennia. For the Alaguali, this site served as a gathering place so that they could trade and heal. The arrival of missionaries and settlers in the region changed this way of life - tribal populations diminished by as much as ninety percent as settlement, agriculture, and ranching consumed the land. This pattern lasted for nearly two centuries – between the early-19th century and late-20th century.

Today, the site is transitioning from an agricultural site with limited visitor use to a region-wide gathering space. It is the intent of this Master Plan to preserve the land for native species habitat conservation and restoration, and to protect and to interpret the important prehistoric and historic stories the site provides.



Photo credit: Regional Parks staff





Figure 1-1

Regional Location



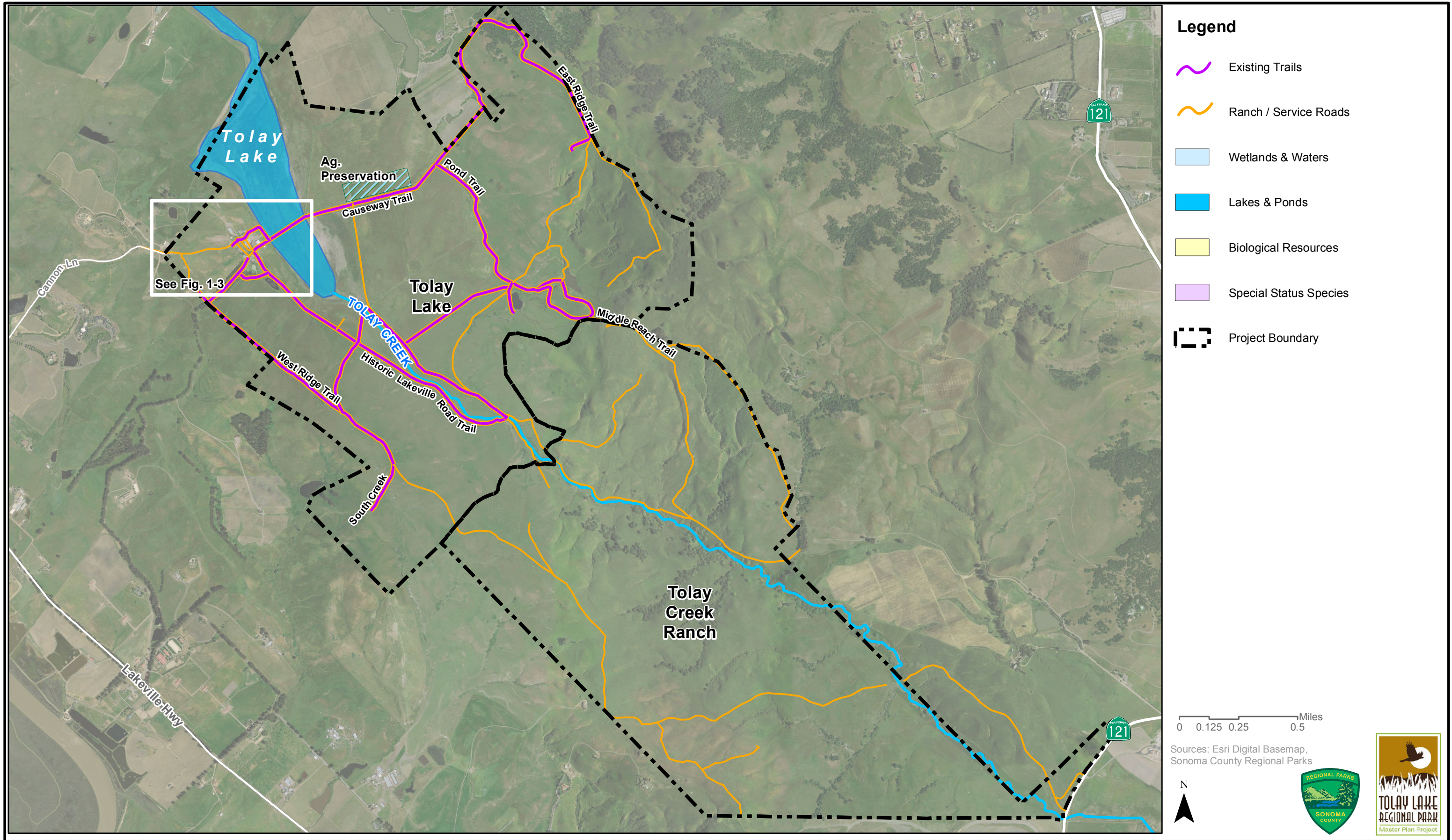
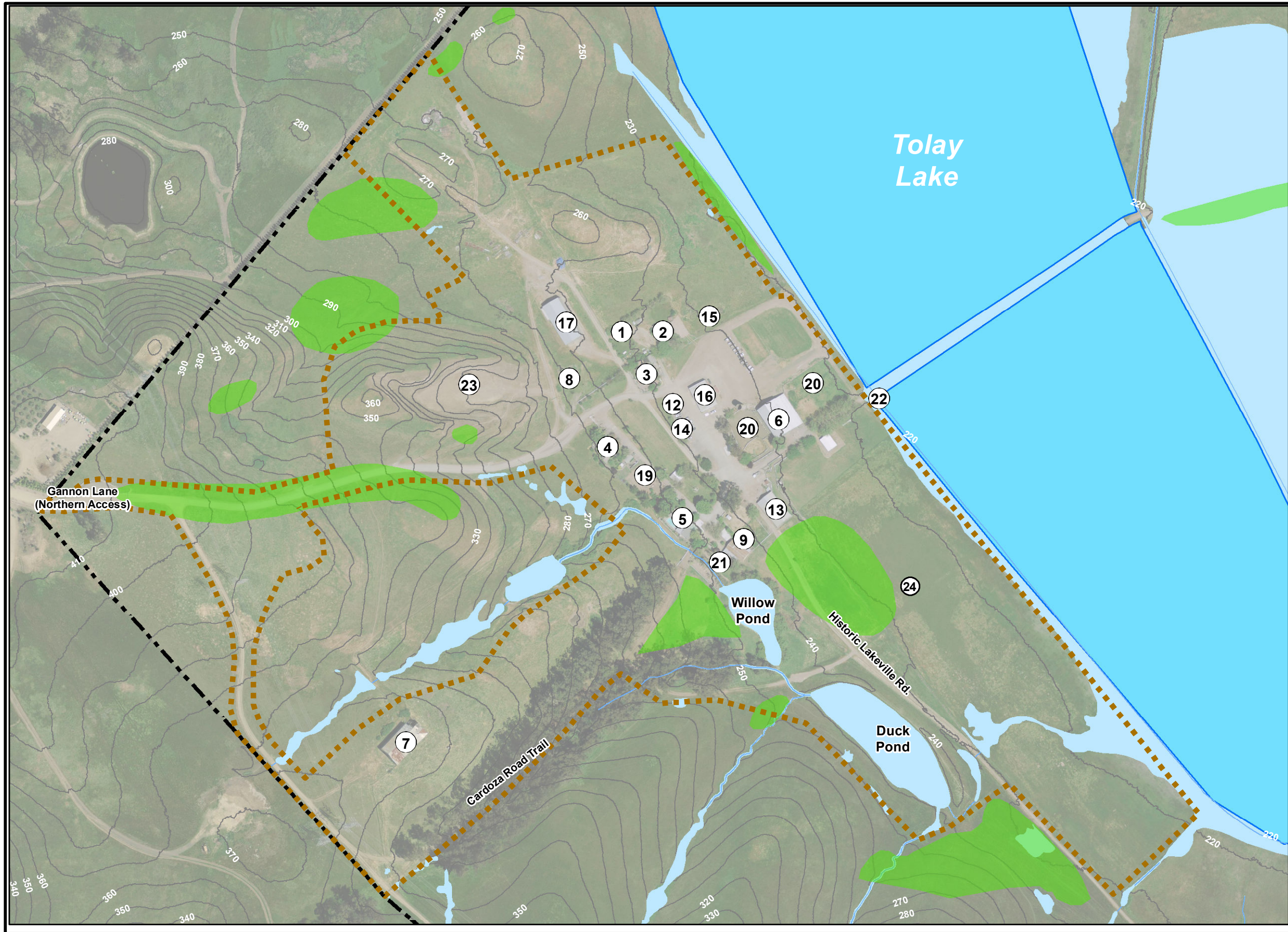


Figure 1-2  
Existing Project Site





- ### Feature Key
- 1 - Cottage / Julie's House / Little Green House
  - 2 - Bunkhouse / Ranger Residence
  - 3 - John Cardoza Sr. House / Ranger Residence
  - 4 - George & Vera Cardoza / Green House
  - 5 - John Jr. & Beatrice Cardoza / Yellow House
  - 6 - Hay Barn / Old Stone Floor Barn
  - 7 - Old Dairy Barn
  - 8 - Creamery / Wine Storage
  - 9 - Granary / Museum
  - 12 - Old Shop / Work Shop
  - 13 - Tractor Barn / Equipment Barn
  - 14 - Storage Shed / Equipment Shed
  - 15 - Slaughterhouse
  - 16 - Building has been removed
  - 17 - Modern Barn
  - 19 - Marvin's Garden
  - 20 - Corrals
  - 21 - Picnic Site / Group
  - 22 - Wildlife Viewing Platform
  - 23 - Quarry

- ### Legend
- 10' Contour
  - Project Boundary
  - Park Complex Area Boundary
  - Grasslands and Wildflower Fields
  - Wetlands
  - Water Feature

0 250 500 Feet

Sources: Esri Digital Basemap  
Sonoma County Regional Park

N

Figure 1-3  
Existing Park Complex



## History of the Park

### Natural History

The Tolay Lake Master Plan project area consists of approximately 3,400 acres of upland habitat and riparian corridors that are characteristic of bayside Sonoma County. The Park contains most of the historic Tolay Lakebed and 4.5 miles of Tolay Creek. Sweeping views from the Park include Mt. Tamalpais, Mt. Diablo, Mt. Burdell, Mt. St. Helena, the Petaluma River basin, San Pablo Bay, San Francisco Bay, the Golden Gate Bridge, the San Francisco-Oakland Bay Bridge, and the skylines of many cities surrounding the bay.

Several thousand acres of conserved lands, either through ownership or easement, are adjacent to or within the vicinity of the Park. The Park provides habitat linkages and wildlife corridors between the Petaluma and Sonoma-Napa Marshes and between Cougar Mountain and the greater Mayacama Mountains region. Its relative size, geologic diversity, and topographic range help support a diversity of plant and wildlife species, which contributes to regional genetic diversity and overall species resiliency.

The dominant feature of the Park is Tolay Lake, which is a naturally occurring lakebed. When unaltered, this lake floods in the wet season, followed by a draw-down in spring and early summer. The lake accumulates water since it is situated on heavy clay soils (which causes slow permeability), and there was an earthen barrier that prevented rapid outflow. Tolay Creek runs through the valley and is connected to numerous tributaries from both the West and East Ridge. The banks and historic floodplains of the creek support intermittent riparian woodland and herbaceous riparian species. The Park offers a rare opportunity to preserve and restore a large portion of the Tolay Creek watershed.

The availability of year-round water and riparian cover provide wildlife with critical resources. Mammals and birds rely on water in the deeper pools of Tolay Creek and tributaries, utilizing the creek for breeding and foraging habitat. The lake, creek, and various water bodies support a number of wildlife species and populations. This includes waterfowl, mammals, amphibians, and reptiles; some special status species include western pond turtle and California red-legged frog.

The large area, shallow depth, and extensive vegetation of Tolay Lake attracts ducks and other waterfowl. The lake supports egret rookeries observed in large eucalyptus along Lakeville Highway and downtown Petaluma. The seasonal drawdown of the lake provides insect hatches in the spring, which is an important food resource for bats, swallows, and other insectivores.

The Park woodlands and groves provide acorns, seed, fruit, and cover for nesting for a variety of bird and mammal species. Mature trees and snags provide roost sites for bat and birds species. Dozens of birds are dependent upon oak woodlands for survival including raptors. Particularly, golden eagle species have been observed within and around the Park in addition to frequently nesting in oak or blue gum trees adjacent to the Park.

The once extensive native grasslands and wildflower fields that dominated the Park diminished rapidly in the 19th century in part due to overgrazing. Now non-native grasses are the dominant remaining vegetation communities. Native communities are located on slopes, ridgelines, and in serpentine soils within the park. These conditions support purple needlegrass and associated native grasses and wildflowers that are uniquely adapted to these soils and out-compete the non-native grasses in these areas. The grasslands provide the largest, most contiguous habitat for wildlife, which includes dozens of common bird species that forage and nest in the Park. Additionally, grasslands provide foraging and hunting grounds for mammals and raptors.

Natural rock outcrops are located throughout the Park, particularly on the West Ridge. Historic rock walls function similarly to rock outcrops, and are located on the East Ridge. Rock outcrops and rock walls features provide cover and nesting habitat for wildlife such as ground squirrels, burrowing owls, and western fence lizards. The dense wildflowers in and around rock outcrops provide nectaring and larval host support for a variety of butterflies and moths. The presence of Dutchman's pipe, a native

plant, in more shaded positions around coast live oak woodlands, provides larval food for the pipevine swallowtail.

## GEOLOGY/GEOMORPHOLOGY

Sonoma County is immediately east of the San Andreas Fault zone, which is the junction between two crustal plates: the North American plate which forms the land mass to the east, and the Pacific plate which is mostly under water in the vicinity of the region. The land masses west of Tomales Bay and along the Sonoma coast north of Fort Ross are part of the Pacific plate. The Pacific plate on the west side of the San Andreas Fault is moving northerly relative to the North American plate. The movement between these two plates has produced the northwest trending ridges and valleys present in Sonoma County during the past millions of years. The plate boundary is defined by many subparallel faults, which, together with the San Andreas Fault, dominate the seismic activity in the project region. The Tolay fault runs northwest through the park. The fault is inactive, but due to its proximity (about 1 mile southwest) to the active Rogers Creek fault, some sympathetic movement could occur.

The Tolay Valley is underlain by the Petaluma Formation (claystone and sandstone), Sonoma Volcanics (andesite, basalt, rhyolite, and ash flow tuff), and Franciscan Complex. The Franciscan Complex consists of mélangé, a mixture of intact masses of sandstone, greenstone, chert, and blue schist in a sheared shaley and clayey matrix; it is the oldest geologic unit in the park, dating back to the Jurassic and Cretaceous age.

The Park also has areas of serpentine rocks and soils, a soil formation that harbors unique vegetation. Due to its low calcium-to-magnesium ratio, serpentine soils create a harsh growing environment for most plants. This environment can lead to increased specialization in plant species, creating rare and often endemic sub-species.

Regionally, Tolay Lake valley is an elevated valley bounded by the Sonoma Mountains to the northeast and low line hillsides that border the valley to the southwest. These serve as a natural barrier from Petaluma Valley directly to the west. The lake basin results from an elevated depression within Tolay Creek. A natural earthen barrier formed Tolay Lake itself, existing about 14 feet higher than the lakebed (RUST Environment and Infrastructure 1996).

## HYDROLOGY

Surface hydrology in the park includes Tolay Lake, Tolay Creek, artificial ponds, and irrigation ditches. Tolay Creek empties into San Pablo Bay, joining with Petaluma River and Sonoma Creek in the Napa-Sonoma Marsh in the southernmost tip of Sonoma County. The site is also home to several seeps and springs representing localized groundwater, old landslide deposits, and local sandstone beds within the Petaluma Formation.

Median annual precipitation — based on 50-plus year records from nearby Petaluma Fire Station — is approximately 24 inches. Most precipitation, nearly 80 percent of the total annual rainfall, occurs between November and March, with little to no rainfall in the other months. Rainfall replenishes the surface and underground water supply, and abundant spring and seep sources from surrounding hillsides also serve as a water source.

Both Tolay Lake and Creek have experienced periods of drought and heavy inundation from precipitation, with minimum and maximum annual precipitation varying considerably (9.7 and 49.8 inches, respectively). Most surface water runoff infiltrates the dry ground supply, contributing to little runoff, with median annual runoff estimated at 6.1 inches, with drier years only producing 1.8 inches of median annual runoff per year. These estimates are based on a total watershed area around Tolay Lake, measured at 3,084 acres (RUST Environment and Infrastructure 1996).

## CLIMATE

Tolay Lake Regional Park is located in the Cotati and Petaluma Valley climatic sub-region. Weather patterns here are strongly influenced by the Petaluma Gap, a geographical expanse between the Pacific Ocean and the San Pablo Bay. The western edge of the gap is located in the coastal lowlands of Bodega and Tomales Bays, while the eastern edge is located in San Pablo Bay. The physical characteristic of this landform, combined with two, large marine bodies, create a microclimate within the sub-region characterized by robust wind patterns. The predominant wind pattern is created through the movement of marine air toward the east of the Petaluma Gap, with additional flow northward into the Cotati and Petaluma Valleys, and southward toward the Carquinez Straits in San Pablo Bay. Winds near the park are primarily out of the northwest, with occasional bay breezes.

Because of the consistent movement of air through the Petaluma Gap, air pollution is relatively low in the Petaluma Valley vicinity. There is some potential for stagnant air and elevated levels of pollution, primarily during morning hours, when there is minimal ocean flow and a weak bay breeze.

Rainfall for nearby Petaluma averages around 24 inches annually. Average wind speeds at Petaluma airport are around 7 mph, and seasonal weather patterns are marked by mild, wet winters and dry, warm summers, consistent with California's Mediterranean climate. Based on data from the Petaluma Fire Station, summertime highs are generally in the low to mid 80s (°F), averaging around 70°F, with temperatures dropping to 50-51°F. Winter minimum temperatures are generally 36°F - 40°F, with highs in the low 60s (°F). Extreme weather patterns, such as snow, are a rare occurrence, with the only snowfall in the area occurring twice (2002 and 1916) in the last century (3 and 1.5 inches, respectively).

## Cultural History

### COAST MIWOK PEOPLES

Prior to European contact, Tolay Valley consisted of open grassland with extensive stands of shrubs and oak groves on hilltops and in ravines. This is based on tribal oral history, ethnography, ethnohistory, archaeological studies, and biological studies.

Tolay Lake Regional Park is located within the area identified as Coast Miwok territory. The Federated Indians of Graton Rancheria (Tribe), a federally recognized tribe, is made up of families from both the Coast Miwok and Southern Pomo territories. Coast Miwok territory contained large stretches of coast and bay-shore with beaches, cliffs, extensive bays, lagoons, sloughs, marshes, interior valleys, and foothills (Kelly 1978:415). Settlements were commonly located near water sources with abundant resources; examples include bays and estuaries or along perennial interior watercourses (Kroeber).





## Tribal Organization

Within each tribal territory were several semi-permanent settlements, along with campsites in outlying areas that were used on a seasonal basis. Settlement locations were chosen based on access water, fire wood, food resources, and well-drained soils. Smaller occupation sites were often clustered around the tribe's principal village, which was the location of the ceremonial roundhouse. Traditionally, the tribe's principal village was central to camps distributed throughout the territory and in outlying areas near seasonal water and resources.

A large village typically contained conical grass-covered dwellings, each accommodating six to ten persons, and a semi-subterranean earth-roofed sweathouse, which served as a social and work center for the men. Major settlements also had a dance house that served as a "secret society" ceremonial center. The dance house was of similar construction to that of the sweathouse. A secret society that included both sexes had a ceremonial chamber excavated about two feet into the ground and about 15 feet in diameter. If there was a separate female society, their chamber was smaller and roofed with grass or tule (Kelly 1978).

A large village had a male chief who cared for the people, gave advice, and addressed the people daily. A chief and female elder tutored the future headman; when the successor was ready, the incumbent was replaced. Two important females were in charge of organizing and providing the supplies for various ceremonies and new dance house construction. One of these women was the head of the women's ceremonial house (Kelly 1978).

## Alaguali Environmental Practices

The Alaguali living in the Tolay Valley were integral to the land for many thousands of years. The Alaguali valued their place within the greater environment of flora and fauna, and there is evidence from archaeological data and tribal oral knowledge that the Alaguali actively managed the land. One example includes controlled burning, which is supported by Jose Altimira's journal notes, dated 1823. He documents burned/blackened hillsides through the Petaluma and Sonoma area. Other tribal management practices included tending, weeding, pruning, and seed broadcasting to regenerate native vegetation.

Photo credit: Regional Parks staff



## Hunting, Gathering, and Diet

The Coast Miwok can be characterized as "collectors" who engaged in hunting and plant gathering. Collectors had a complex economy and settlement organization in order to address the high variability in the quantity and seasonal distribution of resources (Bettinger 1991). In such an economy, "logistically organized collectors supply themselves with specific resources through specially organized task groups characterized by the storage of food for at least part of the year" (Binford 1980).

The seasonal round involved traveling to and residing in differing environmental zones during various



seasons to take advantage of resources that were locally unavailable or were available only at certain times of the year. This resulted in a more varied and plentiful diet that drew from different environmental zones and allowed for rejuvenation of resources. During the winter, people would concentrate in the main villages, while during the summer, much of the population would disperse among smaller village and camp sites, occupying them for a few days to many weeks while resources were collected and processed. During these times, the elderly, ill, specialists, and/or those that so desired stayed at the main villages.

The acorn was an important part of the Coast Miwok diet. After roasting, the nuts were cracked and eaten or were ground and shaped into cakes to be baked as bread (Balls 1962). These nuts could be stored for long periods of time and processed when needed. The Coast Miwok animal diet was varied and included deer and crab year-round, seasonal salmon runs, geese in the winter, clams, rabbit, elk, squirrels, birds, and a wide assortment of fish. Fish were caught with various methods and tools, which included a circular dip net, a seine strung between two tule balsas, on line, in weirs, and spears (Kelly 1978). Despite their availability in the coastal environment, sea mammals were not eaten.

A variety of technologies were used to hunt, trap, and fish. Fish and game were obtained through individual and communal efforts, which ranged from simple trapping with snares or hunting with the bow and arrow, to the construction of fish dams and weirs or building brush fences to direct deer during drives. The game not only provided food but also hides and furs, which were used for clothing, bedding, and fashioned into containers. Bone and antlers were made into a variety of tools, as well as ornamental and ceremonial items, such as ear spools and whistles.

Generally, land was not considered privately owned, but Coast Miwok villages would defend certain territories like oak/buckeye gathering grounds and hunting, fishing, and clam digging grounds against trespassers (Kelly 1978). Coast Miwok traded clams, clamshells, clam disc beads, and abalone shells. Beads from these shells served as a form of currency. The Coast Miwok would travel to Wappo territory to collect medicinal plants and used clamshell disc beads to purchase obsidian.

### Spiritual Practices

Tolay Lake supported Native American life and culture and has served as sacred place to gather and commune for thousands of years. Over the millennia, the lake was considered to be a spiritual center that drew Native Americans from across California (Goerke 2007). Tolay Lake is part of a chain of lakes located throughout Sonoma County; this chain begins north of Santa Rosa and ends at Tolay Lake, just above San Pablo Bay. Each of the lakes served a specific ceremonial purpose, as documented by tribal oral history. Tolay Lake, the southernmost lake, was for 'holding sicknesses and doctoring' (Nelson 2016). The lake and the valley also served as a place for prayer and reflection. Its geographical position at the top of San Pablo Bay provided views of mountains the Coast Miwok considered sacred: Cougar Mountain, Mt. Tamalpais, Mt. Diablo, Mt. Burdell, and Mt. St. Helena.

The Alaguali hosted gatherings and invited people that came from as far away as Oregon and Mexico for healing and ceremonies at Tolay Lake. Doctors from tribes throughout the greater region came to share, research, and learn from peers and in advancement of medicine. Tolay Lake was renowned and people traveled many hundreds of miles to seek the best medicine and knowledge of healing at the sacred lake.

Maps of the valley reflect abundant lake conditions until the 1860s. The first historical record of the greater area was by Franciscan missionaries in 1811. Historical maps depict the lake as open water with marshlands to the east and as much as 500 acres of surface area.

### EUROPEAN CONTACT AND SPANISH MISSIONARIES

The Alaguali tribe of the Coast Miwok inhabited the Tolay Lake area at the time of first contact. Other important Coast Miwok tribes in the vicinity include Petaluma (where Mariano Vallejo established the headquarters of his Petaluma Rancho to exploit laborers from the village), Kotati, and Olompali. Local

towns and Olompali State Park derived their names from these tribes.

The first baptisms of Alaguali people took place on August 21, 1811. Father Abella visited the Alaguali Rancheria or village of Cholequibit where he baptized two elders. He reached this village by boat and noted that it had a good disembarking spot. Since Father Abella did not describe this place any further, it cannot be determined where the exact location of this village was within the southern end of the Tolay Valley. However, this account confirms that at least some Alaguali people were living in villages near San Pablo Bay during the early years of contact between Spanish and Coast Miwok people. Other Alaguali people may have lived further north in the valley or possibly even to the east or west of the valley (Peter Nelson: 8) As was the case in other Coast Miwok communities, the Alaguali people probably lived in several smaller village sites around the main or central village. Diverse sites like villages, tool production areas, bedrock mortars for processing food, and boulders with special shapes carved in them for ceremonial purposes have been identified throughout the Tolay Valley and Alaguali territory (Nelson).

Around this time, Governor Luis Antonio Arguello advised Father Jose Altimira to establish a new mission at Sonoma and transfer the missions at San Francisco and San Rafael there due to the deteriorating health conditions of the Native Americans at these missions. Father Altimira, who arrived from Spain in 1819 to assist at Mission San Francisco de Asis, promptly traveled north to explore sites for the new mission. Altimira's June 27, 1823 diary entry noted his visit to Laguna de Tolay while en route to found the new mission. Altimira would establish the last of California's 21 missions, Mission San Francisco Solano, in Sonoma on July 4, 1823. The missions were secularized in 1834.

The Coast Miwok were rapidly incorporated into the mission system, with only a few individuals that escaped forced conversion. This occurred from the time that the missions were established at San Francisco (1776), San Rafael (1817), and Sonoma (1823), which dislocated indigenous populations and resulted in the destruction of life and traditional practices. European settlement of the region began in the early to mid-nineteenth century. Members of the Alaguali tribe were moved into the three closest missions: Mission San Francisco de Asis, Mission San Jose, and Mission San Francisco Solano. From 1811-1817, fifty Alaguali went to Mission San Francisco de Asis and another seventy went to Mission San Jose in 1816 and 1817. Most of the Alaguali survivors from these missions were eventually transferred to Mission San Francisco Solano (LSA 2009).

## VAQUEROS

In 1833, Lieutenant Mariano G. Vallejo was ordered by Governor Jose Figueroa to explore and settle the country north of Mission San Rafael, largely as a means to monitor the nearby Russian colony at Fort Ross. The Mexican government encouraged settlement of territories of California by the establishment of large land grants called ranchos.

American settlers began immigrating to the area in large numbers from 1840-1845 through obtained land grants, and life for Native Americans became difficult as tribes and people continued to be displaced. In 1840, Mariano G. Vallejo applied for and received a 44,000-acre land grant for Rancho Petaluma, which encompassed Tolay Lake, from the governor. In 1843, Rancho Petaluma's area increased by an additional 22,000 acres, which was another land grant given to Vallejo by Governor Manuel Micheltoarena. The Rancho Petaluma grant now included 66,000 acres, which encompassed the entire Tolay Creek Watershed.

This sprawling Rancho Petaluma, one of the largest in the state, stretched eastward from the Petaluma River to Sonoma Creek and from the bayshore north to approximately present-day Glen Ellen. The Rancho Petaluma was given the Coast Miwok name, which means hill backside, in reference to its position to Sonoma Mountain.

Vallejo's Rancho Petaluma operation relied on local tribal labor – many of them were former mission residents - to produce hides and tallow, agricultural products, blankets, candles, and shoes. Vaqueros,

the Spanish word for cowboy or rancher, managed the Tolay Lake margins and foothills which served as rangeland for the large herds of cattle, horses, and sheep owned by Vallejo. Vallejo was once one of the wealthiest men in the state; however, legal challenges to his land-holdings and issues related to squatters forced him to sell his Rancho adobe in 1857.

William Bihler eventually purchased the land in the 1860's and began draining the lake for agriculture. It is believed that Bihler dynamited the natural barrier during his ownership sometime between 1865-1885. Subsequently, the Tolay Creek channel is dredged to dry out the lake and prevent its reversion to historical lake conditions.

## AMERICAN SETTLERS

Granville P. Swift was a trapper and hunter and the great-nephew of trapper Daniel Boone. Swift lived in many areas throughout central and northern California - leading an adventurous life hunting, trapping, mining, and scouting. A map of Lakeville in 1850 denotes the Swift Line (boundary) near the southern end of Tolay Lake acquired from Vallejo's Rancho Petaluma (LeBaron 1987). He moved and built in the cities of Orland, Williams, Maxwell and in combined effort with John Sears in Sonoma. He used Native American labor to build his ranches and used "Indian Vaqueros" to manage the land. Swift left his mark in part due to his services to Sutter's campaign as one of the leaders of the "Bear Flag Party" in 1846, and the eventual formation of California as a part of the United States (Goerke-Shrode 2000).

## RANCHING AND VITICULTURE

William Bihler purchased the area that was to become the 1,737-acre Cardoza Ranch in 1865. He reputedly drained the lake to use it for farming, "The lake was drained by its present owner – a utilitarian – and is now a potato patch." (Robert Thompson History, 1877). In 1870, he undertook one of the area's first large-scale vineyard operations, starting as early as the late 1870's, preceding the viticultural boom of the 1880's. There is indication that the Bihler vineyard was the largest single ownership vineyard in the county for a time, and was one of the largest vineyards in the state by the time it was owned by James G. Fair.

Bihler sold the land to James G. Fair, who had amassed a fortune in the Comstock Lode and served as a United States senator. Between approximately 1885 and 1894, Fair raised thoroughbred horses and cattle, and operated a vast vineyard that produced prize-winning grapes and brandies, as well as operating the "first continuous brandy distillery on the Pacific Coast." The viticultural history at Tolay is of interest, not only in terms of current and regional agricultural priorities, but because the vineyard infrastructure may have been a primary reason Fair and later Arthur W. Foster decided to purchase the Tolay Lake property as an investment.

Arthur W. Foster purchased the ranch in 1905 and operated it for the next two decades. Foster, president of the San Francisco North Pacific Railroad, operated the ranch as the Lakeville Stock Farm. Foster eventually owned most of the land between Petaluma and Sonoma Creek, purchasing small homesteads and combining them into a large landholding located along his railroad line.

Foster also planted the eucalyptus trees along Lakeville Road, with hired men carrying barrels of water to irrigate them. The trees also line the Foster/Cardoza Road (a segment of the Sears Point-Lakeville Road), the original ranch entrance from Lakeville Road, as Foster reputedly did not like to ride in the full sun. Foster, his wife Louisiana, and their nine children never lived on the ranch; they resided instead at their home in San Rafael with numerous servants, in a house now occupied by the Marin Academy as Foster Hall.

Foster continued manipulating the lake for agricultural practices and it appears that the elaborate irrigation and drainage system at the ranch was constructed during his time, as the date "1907" is incised in some of the concrete work. The continued agricultural practice of draining the lakebed ultimately degrades the lake and diminishes ecosystem life support.



## PORTUGUESE FARMERS: CARDOZA RANCH

The ranch was deeded to the North Bay Farms Company in 1922, which retained ownership until 1943, the year that it was sold to John S. Cardoza, Sr., George S. Cardoza, and John S. Cardoza Jr., natives of the Azores, who acquired the property in co-partnership. John Cardoza Sr. was a dairyman who also raised sheep and Hereford cattle on the ranch.

The world-traveling Portuguese were the first Europeans to step on California soil as early as 1542. Their sailing skills were sought by many nations and exploration continued through the ensuing years. Whaling ships and trade ships brought many Portuguese with some deserting in California. By the 1880's California's north coast had over 200 Portuguese working in mining, lumber mills, and farming.

Immigration from Portugal to California peaked in the first years of the 20th century and again in the 1960's and 1970's. Limited land space, weak economy, and famine were some of the many reasons the Azoreans left and migrated to California. By 1919 there were approximately 300,000 people in the Azores while there were 100,000 Azoreans in the United States, drawn by economic opportunity. Additionally, many Portuguese came by way of Hawaii. In 1877, the Hawaiian government needed sugar cane workers. Many from the Azorean islands came to work but became discouraged by their poor treatment and low wages. Between 1890 and 1914, many Portuguese left Hawaii for California, primarily landing in the San Francisco Bay area (Santos 1995).

According to former land owner Marvin Cardoza, the ranch was in poor condition, undoubtedly due to absentee owners, when John Cardoza Sr., purchased the property. The old house on the property was demolished in 1950 and a new California ranch style home built for John Sr. on the site. Two other California Ranch style homes were built for other family members: one for George and Vera Cardoza in 1946, and another for John Jr. and Beatrice in 1947.

The large Dairy Barn on the hill west of the ranch complex was demolished and rebuilt in the late 1940s or early 1950s, with the milk taken to the stone creamery for processing. The creamery was later converted to a winery, and the dairy barn to a sheep shed. The workshop was evidently one of the few buildings untouched by the Cardozas except for regular maintenance. The hay barn and tractor barn were demolished and rebuilt in the early 1950s. A bunkhouse was built during the same period, as was and

equipment shed. Corrals, fencing, water troughs, and other amenities were added or improved.

Cattle were butchered in the slaughterhouse, with the offal fed to the hogs and chickens in pens and sheds located on the hillside below. Hereford cattle grazed the hills, and hay and grains were planted in the field. Grain was processed in the granary, which



Photo credit: Regional Parks staff

had a mill to chop the grain to feed the cattle. In 1979, George Sr. and Vera Cardoza deeded the property to Rita and Marvin Cardoza.

Rita and Marvin Cardoza soon began to produce pumpkins from the denuded lakebed for their annual pumpkin festival, bringing thousands of people and children to the ranch during the festival. The granary is converted to become a museum and event center for the annual Pumpkin Festival, displaying agricultural tools and practices and also some of the charmstones they had collected throughout the years from Tolay Lake (LSA 2006).

#### TOLAY LAKEBED CHARMSTONES

Charmstones are found throughout much of California, often as grave goods. The charmstones at Tolay Lake are unusual in terms of the quantity of charmstones recovered as well as the context in which they were deposited. A variety of charmstone types recovered from the ancient lakebed include phallic, plummet, squat-bodied, round, symmetric, asymmetric, spindle, longitudinally grooved, centrally perforated, and fish form types. Ethnographically, charmstones were used as hunting and fishing amulets, and suspended over water or at hunting areas (Kroeber 1925 and Yates 1890). The Yokuts' medicine man conducted rituals using charmstones to ward off war, sickness, drought, or famine (Latta 1977).

Early reports of Tolay Valley's archaeological resources – specifically, its charmstones, were produced by W. K. Moorehead (1910, 1917) and L. E. Ricksecker (1907). The first systematic archaeological research of the lake was done by U. C. Berkeley archaeologists in the 1950s, Albert Elsasser (1955), who published an article about the "Charmstone Site" located in the Tolay Valley drained lakebed, which was estimated to have covered several hundred acres. Large numbers of charmstones were exposed when the lake was drained, and "some hundreds" have been collected or sold to collectors. At the time, he suggested that the charmstones had been used as slingstones for killing or crippling waterfowl. Tolay Lake sites have yielded a variety of charmstone types, which does not support this



Photo credit: Regional Parks staff



strict utilitarian function, as suggested by Elsasser (Elsasser and Rhode 1996 and Phebus 1990).

Since being drained sometime between 1865 and 1885, the Tolay Lake bottom has yielded hundreds of charmstones that have been collected by visitors to and owners of the ranch. J.B. Lewis, an early settler of the region from the 1850s, collected several artifacts from the lake and surrounding region (Moorehead 1910). In the early 1850s Lewis noted that Native Americans used to stay a day or two at the lake after fishing in a creek by his ranch during the fall season. After William Bihler drained the lake, they did not return. Others, including L. E. Richsecker of Oakland and L. W. Stillwell, collected hundreds of charmstones from the site. Ricksecker donated about 500 charmstones, which he collected from the lake over several years, to the California Academy of Sciences in San Francisco around 1907, while Stillwell and Lewis donated their collections to the Smithsonian Institution (Elsasser and Rhode 1996).

Today, living members of the Tribe theorize that several uses and meanings may apply to the charmstones. For them, Tolay Lake is the healing place of their ancestors and has become an important communal gathering area, and a focal point of healing. By reconnecting to the land taken care of by their ancestors, they experience revitalization and re-engagement with the area now known as Tolay Lake Regional Park (Parrish 2016 and LSA 2008).

## Park History

The Tolay Lake Ranch property was purchased in 2005 and Regional Parks began operation as a park. Regional Parks has been operating the Tolay Lake Ranch property in limited capacity through the Day-Use Permit Program as outlined in the 2008 interim Plan. The Land Trust purchased the Tolay Creek Ranch (formerly a portion of the Roche Ranch) in 2008 and transferred the property to Regional Parks in 2017. The Master Plan includes both properties – Tolay Lake Ranch and Tolay Creek Ranch – which make up Tolay Lake Regional Park.

Today, several thousands of acres of conserved lands surround the Park. The Park is critical to providing habitat linkages and wildlife corridors between the Petaluma and Sonoma-Napa Marshes, and between Cougar Mountain and the greater Mayacama Mountain region. The rich biodiversity of flora and fauna contribute to the diversity and resiliency of species within the region. With the acquisition of the lands that make up Tolay Lake Regional Park, the bulk of the Tolay Creek watershed has been protected and preserved.

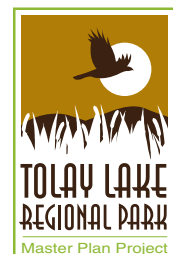
Agricultural practices remain integral to park management and interpretation and education of historical ranching uses and practices. Cattle grazing remains across the property and a fundamental and key component of parkland management, pumpkins are grown for the Tolay Fall Festival in the agricultural fields east of the lake (see figure 1-2), and no-til hay production west of the lake (see figure 1-3) for use throughout the park.

The Tribe and Regional Parks are fully committed to protecting the heritage and the archeological artifacts still remaining in the Park. Regional Parks is in full support of the Tribe working to return artifacts that rightfully belong to the Tolay Valley. The California Native American Historical Cultural and Sacred Sites Act apply to both state and private lands. Any person who removes, without authority of law, Native American artifacts or human remains from a Native American grave or cairn with the intent to sell or dissect is guilty of a felony punishable by imprisonment in the state prison as of January 1, 1988. The Tribe and Regional Parks are working together to continue implementing and improving protection of this sacred land.

Regional Parks will continue to work in partnership with the Tribe to manage the land and its important heritage. Lake restoration will return the lake to a “natural” system but will remain only a fraction of its former size. Tolay is a beautiful place of unique significance and will again become a place where native life and natural systems prosper, and where humans may gather in celebration of life and land.

---

# Purpose, Vision, and Goals



# Public Outreach







Photo credit: Regional Parks staff

## PUBLIC OUTREACH

Extensive community outreach was conducted by MIG Inc. and Regional Parks staff to solicit input from a diverse group of citizens, neighbors, stakeholders, and future users during the preparation of the Master Plan. The community was asked to help generate the goals and objectives, develop a list of appropriate uses, and comment regarding the concept designs for future improvements. The outreach was conducted so that the community would have meaningful influence on the Master Plan, which would guide the long-term vision for preservation, public use of the property, and management of natural and cultural resources.

### Background and Methodology

The Tolay Lake Regional Park master planning process is divided into three major phases: Phase 1: Discovery, Phase 2: Plan Development, and Phase 3: the Environmental Impact Report (EIR). The public outreach process was conducted during Phase 1 and Phase 2 and included a variety of public engagement activities designed to solicit stakeholder and community input regarding desired future activities in the Park. Input was solicited via three community workshops, a focus group on trail use and trail issues, a survey posted online and made available at the Fall Festival in 2012, and interviews with key stakeholders. MIG also facilitated multiple meetings with the Tribe. A summary of those meetings can be found in Appendix A.

Phase 1, Discovery, included Community Workshop #1. This workshop included a variety of public engagement activities designed to solicit stakeholder and community input regarding desired future activities.

During Phase 2: Plan Development, the project team developed the Master Plan conceptual plan alternatives based on the input, as well as evaluations made on the basis of consistency with existing Regional Parks' policies; impacts to natural and cultural resources; impacts on health and safety; impacts to neighbors; costs to build, operate, and maintain; and consistency with federal, state and local environmental laws.

Following the Plan Development tasks, Community Workshop #2 was held to solicit stakeholder and public feedback on the conceptual plan alternatives developed as part of those tasks. Feedback received at this workshop was factored into development of the Master Plan presented herein.

### Summary of Community Meetings

The community meetings included presentations and provided public input opportunities on the community's vision for the Park. Each meeting presented the public with new information, while referring to the results and direction from earlier meetings. Full reports on the Community Workshops, including participant comments, are located in Appendix A.

#### Community Workshop #1

Community Workshop #1 took place on June 15, 2013 at Tolay Lake Regional Park. The workshop was promoted and advertised through a variety of methods, including direct mail, email, posting on the Regional Parks' website, Regional Parks' Facebook page, and press release to local media.

Over 50 stakeholders and members of the public attended the workshop. The majority were Sonoma County residents, although there were also a number of attendees from the greater Bay Area. A variety of stakeholder groups were represented, including residents, local land owners, the Federated Indians of Graton Rancheria (Tribe), various public agencies, and representatives of specific user groups.



## WORKSHOP FORMAT

MIG and Regional Parks conducted the workshop with assistance from the Sonoma County Agricultural Preservation and Open Space District (SCAPOSD), and Master Plan project partners. Each participant received an agenda, a fact sheet, a copy of the community questionnaire, a handout on how the public can continue to be involved in the Master Plan process, and a comment card.

At the conclusion of the overview presentation, workshop attendees were directed to take part in the “walking workshop” that followed. This consisted of three different stations (Natural and Cultural Resources and Agricultural Practices, Recreation and Trails, and Education and Helping People Visit Tolay Lake Regional Park) where participants could view a map of the park, learn about different aspects of the master plan and contribute ideas relevant to each subject.

Participants were asked to submit comments prior to July 15th, when the next phase of planning begins, with additional workshops and other opportunities to participate. Participants were also encouraged to provide additional written comments via comment cards and to complete the Community Questionnaire if they had not already done so.

## Community Workshop #2

Community Workshop #2 took place on January 16, 2014, at the Petaluma Community Center. The Community Workshop #2 was noticed in a similar manner to Community Workshop #1, with the addition of advertisements in La Voz, a bilingual English-Spanish newspaper serving Sonoma and neighboring North Bay counties.

Over 40 stakeholders and members of the public attended the workshop. The majority were Sonoma County residents. A variety of stakeholder groups were represented, including residents, local land owners, the Tribe, various public agencies, and representatives of specific user groups.

## WORKSHOP FORMAT

The workshop was conducted by MIG and Regional Parks, and Master Plan project partners. Each participant received an agenda backed with information on how the public could continue to be involved in the Park Master Plan process; handouts on the Park Vision; conceptual plan alternatives and interpretive concepts; and comment form.

The evening began with a half-hour Open House, during which participants were encouraged to view displays depicting existing conditions and detailing conceptual plan options. Three alternatives were detailed, with Alternative Option A having the smallest development footprint and Alternative Options B and C having successively larger footprints. Potential interpretive concepts and “story zones” giving information about different aspects of the natural, cultural and agricultural history were also listed, with a map displaying where these zones might be located.

A “walking workshop” that included two stations was used to solicit feedback from participants. The two stations were as follows:



Photo credit: MIG

- Station 1: Alternatives for Planning Issues; Conceptual Plan Options for Overall Project Area; Proposed Interpretive Elements
- Station 2: Conceptual Plan Options for Northern Park Core Area; Proposed Interpretive Elements

Workshop attendees were split into two groups of approximately equal size and given approximately 25 minutes to participate in discussion at each station. During each session, facilitators and project staff answered participants' questions and recorded their feedback on flipchart paper.

At the conclusion of the "walking workshop" discussions, the larger group reconvened for a final question-and-answer and comment period.

### Community Workshop #3

Community Workshop #3 presented the Draft Master Plan to the public.

The Workshop held April 22, 2015, was the final development workshop for the Master Plan. The preferred elements of the Master Plan were presented, based on additional studies and public input from Workshop #2. Participants were invited to review the plans at three stations. Station One presented the North Park Core Area final preferred draft. Station Two presented the lake restoration alternatives, including the preferred alternative. Station Three presented interior and trails. At each station, project experts and Regional Park staff and members of the Tribe answered questions; public comments were recorded by meeting facilitators.

### Focus Group on Trail Users

The focus group was held in spring of 2013 at Tolay Lake Regional Park, and included 12 participants. Participants represented various organizations including: Sonoma County Trails Council; Regional Parks Mounted Assistance Unit; Sierra Club, Redwood Chapter; Empire Runners Association; Sonoma County Bike Coalition; Sonoma County Horse Council; Santa Rosa Junior College Disability; and the Tribe. Five topics were discussed with participants, which included:

- Ideal trail system
- Desires for trail infrastructure
- Seasonal trail closures
- Trail access and staging areas
- Special events and races

Key findings for these topics are summarized in the following sections.

### Ideal Trail System

Participants desired as many miles as possible, with a diversity of trail types. Trail types desired include backcountry trails, narrow trails, ADA-accessible trails, and stacked loops that include easy, moderate, and hard loops. There was a desire for hiker only trails for resource protection purposes, but also a desire for multi-use trails.

Participants raised concerns about illegal trails and illegal activities. Participants believed that single use trails must be patrolled, otherwise, illegal activities can occur. In regard to dogs, participants thought the current dogs on leash regulation should remain. One participant indicated there should be a major connecting trail through the park interior to Highway 121, and which should then connect to the San Francisco Bay Trail. Several participants thought it was important to establish a small centralized hiking area that was family oriented and met ADA accessibility requirements.

## Desires for Trail Infrastructure

It would be helpful on the centralized small trail area around the Cardoza Ranch buildings to have benches, and at scenic viewpoints. Trails should have good signage, but simple, easy to maintain and easy to replace. Trails should include interpretive signs so people can understand and know the Park. Trail maps should identify drinking water locations and have water for horses since the property is mostly dry. Picnic tables should be located at viewpoints.

The Master Plan should have trail design standards; for example, there should be a standard to maintain adequate lines of sight for user safety, especially if trails are located in heavily vegetated areas. There are multiple gates (16 currently) so they need to be equestrian friendly. One participant suggested installing water troughs, maybe at the “three bridges” location.

There was some discussion on cattle grazing in the Park. One participant stated that Regional Parks should consider use of old cow trails for new trails. One participant asked if Regional Parks can eliminate cattle grazing. However, another participant stated that grazing is good for ecological system maintenance.

## Seasonal Trail Closures

There is damage to trails in the bottom of Tolay Valley during the wet season. Regional Parks should supply online information on seasonal trail closures. Overall, participants did not express much concern about seasonal closures, participants overall accept that closures are necessary to protect trails.

## Access and Staging

There was some discussion about providing access and staging areas to support trail use. One participant asked if having an entrance from Highway 121 would be possible. One participant remarked that staging area from Cannon Lane is good as is, while another participant desired establishment of equestrian overnight areas.



Photo credit: MIG



## Special Events and Races

Participants believe there should not be races for bikes or equestrians, but a 10k run might be acceptable. Participants overall were open to the idea of encouraging youth events, high school events if they could be managed effectively. Overall, most participants did not support the idea of hosting large events.

### *Summary of Stakeholder Interviews*

During 2013, six stakeholder interviews were conducted with the following individuals: Lorelle Ross and Gene Buvelot from the Tribe; Nick Silva, from the Lakeville Fire Department; Steve Page, from Sonoma Raceway; Fred Cline, neighboring property owner; Nancy Lilly, neighboring property owner; and Dr. Lee Schaller and Ana Keller, neighboring property owners. Interview participants were asked a common set of questions, which included:

- What is your history or experience with the Tolay Lake property?
- What three words would you use to characterize the park land and property now?
- What are the most valuable features of the land and property?
- What are your biggest fears about what could happen to the Park?
- What are the major issues or challenges for the Master Plan from your perspective?

Specific responses from each party above have been kept confidential. However, some general comments can be made from the results of the six interviews. Neighboring property owners are concerned about potential nuisance activities and trespass issues. Enforcement of park regulations and respecting property boundaries will be a critical aspect of implementing the master plan. Several interview participants have had a 20-year+ history with the Park properties. One interview participant's family has lived nearby for more than 100 years. Most of the interview participants are concerned about the potential for over developing the Park. A few participants expressed concern about what is involved with lake restoration and the potential for flooding on neighboring properties. Some of the neighboring landowners would like additional trees planted. One interview participant believes one of the Park's purposes should be to demonstrate sustainable agriculture practices. One interview participant is concerned about Park access, and thinks access needs to be improved to provide better responses to emergencies.

*This page intentionally left blank.*





Photo credit: Regional Parks staff



## PURPOSE, XŪŪP, AND GOALS

### Purpose

As described in Chapter 1, the purpose of the Master Plan is to guide the development of Tolay Lake Regional Park (Park) and to address the creation of permanent improvements and increased public access in balance with pre-historic cultural and natural resources. The Master Plan includes an assessment of park resources, a summary of public visioning and input related to park usage and programming, park development alternatives, a Resource Management Plan, recommendations for educational and interpretive elements, a Trails Plan, and an Operations and Maintenance Plan.

### Vision

Based on public input received for the vision of the Park, the Master Plan vision is to create a:

- Thriving, ecologically rich and fully restored landscape.
- Park that is respectful of the sacred and deep spiritual significance of the land.
- Park that tells the story of the rich history of the Coast Miwok and Southern Pomo of the land and region.
- Park that tells the story of the region's long and storied heritage.
- Outdoor recreation destination that inspires all ages and cultures.
- Place for innovative and interactive education and experiences.
- Landscape to experience, learn, and connect people to local agricultural heritage.
- Space to find peace and respite.
- Premiere destination for Sonoma County residents and all park visitors.



Photo credit: Regional Parks staff

## Goals

Overall goals of the master plan reflect the vision for the Park. The following goals guide the use, development, and management of the park and preserve. These goals were developed with public input and are consistent with the original intent for protecting the property and with County policies. Each goal is supported by more focused objectives.

The Master Plan implements the following five goals associated with development and operation of Tolay Lake Regional Park

1. Habitat Restoration and Enhancement
2. Cultural Resource Conservation
3. Open Space Protection
4. Environmental, Cultural, and Agricultural Study and Education
5. Public Access for Passive Recreation

## Habitat Restoration and Enhancement

### LAKE RESTORATION

The following goals guide the restoration of Tolay Lake. Additional details on habitat restoration goals are found in the Resource Management Plan chapter of the Master Plan.

*Goal #H1: Enhance the frequency and duration of inundation*

- Maintain or enhance seasonal wetland hydrology within the lake
- Evaluate the feasibility of creating some perennially inundated areas within the lake

*Goal #H2: Identify and reduce artificial constrictions to flow within and to and from the lake.*

- Restore lake level baseline conditions
- Do not increase flooding on upstream neighbor.

*Goal #H3: Cost effectively minimize artificial water control structures including drainage ditches, culverts, levees, dams.*

- Central lakebed channel, central causeway culvert, and associated levees.
- North Creek drainage channel, North Creek bypass culvert, and associated levees.
- Drainage channel 2 & 3, west causeway culvert, and associated levees.
- Farm bridge and bridge abutments.
- Horse shoe culvert.

*Goal #H4: Enhance habitat for migratory water fowl as feasible.*

- Dabbling ducks: < 8" water depth; large area; diverse topography.
- Waterfowl: 12" - 18" water depth, large area, diverse topography.
- Shorebirds and wading birds: shallow shorelines.
- Diving ducks: 2' - 10' water depth.

Note: shallower water depths (< 8") will attract a larger diversity of duck species than deeper (<8").



Photo credit: Regional Parks staff

*Goal #H5: Cost effectively restore and improve quality of seasonal wet meadow habitat.*

- North creek drainage channel.
- Incorporate wet meadow and/or riparian vegetation as appropriate.

*Goal #H6: Cost effectively restore and improve quality habitat in upland drainages that direct water to the lake.*

- Incorporate wetland and /or riparian vegetation as appropriate.
- Potentially this includes the North Creek, Eagle Creek, Pumpkin Patch channel, east-west channel, and drainage channels #1, #2, #3.

*Goal #H7: Create habitat for red-legged frogs and western pond turtles.*

- Refer to Goals #H11 and #H12.

*Goal #H8: Maintain passive hydraulic systems with minimal to no reliance on pumping or other mechanized systems.*

*Goal #H9: Increase the amount and quality of habitat for small mammals – prey species for raptors and burrowing owls- such as ground squirrels, rabbits, voles, and mice.*

- Create thick, dense hedgerows.
- Create riparian habitat adjacent to lake, ponds, and creeks.
- Create an un-grazed or managed-grazed grassland buffer around Tolay Lake to provide foraging and cover for small mammals.

*Goal #H10: Enhance/restore/create habitat for raptors.*

- Promote habitat for small mammals – see Goal #H9.
- Increase the amount of riparian habitat adjacent to the lake and other breeding ponds.
- Protect existing raptor perches such as mature riparian trees.
- Protect nesting sites.
- Control public access to provide undisturbed nesting and foraging habitat.

*Goal #H11: Enhance/restore/create habitat for red-legged frogs as feasible.*

- Provide late season drawdown to ensure successful breeding–water through August.
- Increase the amount of riparian habitat adjacent to the lake and other breeding ponds.
- Ensure a perennial water source within a quarter mile of the lake.
- Develop strategies to minimize possible bull frog or largemouth bass populations within existing stock ponds and/or lake.
- Create new breeding ponds in areas with appropriate hydrology.

*Goal #H12: Enhance/restore/create habitat for western pond turtles as feasible.*

- Create winter-overage and nesting habitat by increasing the riparian habitat around Tolay Lake and ponds.
- Create new breeding ponds in areas with appropriate hydrology.

*Goal #H13: Enhance/restore/create habitat for burrowing owls as feasible.*

- Promote small mammal habitat – see Goal #H9.
- Develop grassland management plan to encourage active burrows – shorter grass height in spring when owls are selecting burrows.
- Protect existing burrows from public access.
- Create new burrow mounds as feasible.



*Goal #H14: Enhance/restore/create habitat for song birds.*

- Increase the amount of riparian habitat adjacent to the lake and other breeding ponds.
- Create dense hedgerows where possible.

## Cultural Resource Conservation

*Goal #C1: Collaborate and maintain working relationship with the Tribe and other interdisciplinary partnerships.*

- Regional Parks and the Tribe in partnership will develop a monitoring plan to be implemented in joint venture.
- Regional Parks and the Tribe will together develop protection and preservation strategies to assess potential direct or indirect impacts to cultural resources.
- Tribal park access for traditional use and ceremony, ethno-botanical gathering and practices, tribal community education, and general tribal meeting or celebration will be allowed as legally permitted by law.
- Tribal private use of facilities will be scheduled through Regional Parks offices; both parties working in coordination to accommodate public access and private Tribal cultural events.
- Regional Parks and the Tribe will conduct regularly scheduled consultation to see how avoidance and protection strategies are being carried out and to reassess the success/failures of policies and practices.
- Regional Parks and the Tribe will continue to work collaboratively to update as necessary the cultural resources data base and confidentially share collection information.
- Regional Parks and the Tribe will continue to develop strategies to mitigate any and all unforeseen impacts to cultural resources.
- Regional Parks and the Tribe will collaboratively work to nominate Tolay Lake Regional Park for listing in the National Register of Historical Places (NRHP) and to designate the Tolay watershed as a NRHP District, including resource specific NRHP evaluations as contributors to the District.
- Regional Parks and the Tribe will develop interdisciplinary strategies through education, volunteers, and resource professionals to restore and protect needed natural resources for traditional ethno-botanical practices.

*Goal #C2: Establish collecting protocol for cultural resources.*

- Artifact collection and curation protocols will be developed including site specific recommendations for each impact.
- Support Tribal efforts to have all artifacts (e.g. charmstones) that have been removed from the Park to the tribe for repatriation.

*Goal #C3: Avoid and minimize impacts.*

- Establish setback buffers in coordination with the Tribe to ensure the avoidance and protection of cultural resources (avoidance standards can be



Photo credit: Regional Parks staff



found in Resource Management Plan, Chapter 6).

- New park features are designed to avoid sensitive resources by distance, natural physical barriers, exclusionary fencing and/or capping of resources.
- Mitigation measures will be developed on a case by case basis and will include a clear process and set of protocols for inadvertent discoveries.

*Goal #C4: Implement monitoring and adaptive management program to ensure the continued preservation of cultural resources.*

- Work in partnership with an established set of values and guidelines still recognizing the need for adaptive management to best protect cultural resources in a dynamic environment.
- Conduct surveys and monitor after wild-land fires (prescribed burns) to identify cultural resources and to identify and record impacts.
- Develop adaptive management restoration enhancement activities to support Native American traditional ethno-botanical practices.
- Conduct site condition assessments for the documented cultural resources and incorporate new information gathered through any and all additional resource studies or inadvertent discoveries.
- Exclude livestock as needed and as feasible with exclusionary fencing from culturally sensitive areas.
- Exclude the public as needed and as feasible from culturally sensitive areas, with a variety of protection measures that may include but not be exclusive to: exclusionary fencing, planting, signage, etc.
- Ensure examination and thresholds for use of chemicals within the park; identify and restrict frequency and type of chemical to protect ethno-botanical and native plant gathering areas, animals, etc.
- Update ethno-historical documentation and studies as needed.
- Conserve, preserve, and restore native plants and habitat for traditional cultural gathering purposes.



Photo credit: Regional Parks staff

## Open Space Protection

*Goal #OS1: Protect views of San Pablo Bay, San Francisco, Mt. Tamalpais, Oakland, Mt. Diablo, Mt. St. Helena, and other scenic landscapes.*

- Provide visitors access to areas of the park that present outstanding viewing opportunities.
- Install interpretive signage of the region at vistas identifying places and land features of significance.
- Install seating, and/or shade structures, picnic facilities and interpretive signage at key park vistas.

*Goal #OS2: Protect opportunities to experience a working rural landscape.*

- Ensure that agricultural practices are compatible with natural resource protections.
- Ensure visitor programs and facilities are compatible with sustainable agricultural uses within the park.

*Goal #OS3: Protect opportunities to experience solitude.*

- Provide single use trails in designated areas of the park to enhance opportunities for solitude.
- Install park benches at location just off the trail to enhance opportunities for solitude and reflection.

## Environmental, Cultural, and Agricultural Study and Education

*Goal #ES1: Provide visitors diverse options to learn about the environmental and traditional cultural practices, and historical and current best management agricultural and land management practices.*

- Provide visitors with technology enabled options to learn about the park.
- Provide interpretive signage to educate and inform visitors.
- Provide interpretive built elements for visitors to experience.
- Provide visitors “hands on” options to learn about the park.

*Goal #ES2: Partner with subject matter experts to develop educational programs that are accurate and help visitors better understand the unique features of the park.*

- Maintain consultation with the Tribe to develop and maintain cultural resource programs.
- Develop a team of subject matter expert docent volunteers.



Photo credit: Regional Parks staff



## Public Access

The following goals relate to park access to provide park users a holistic experience while preserving and protecting the sites cultural and natural resources.

*Goal #P1: Provide visitors the opportunity to view and/or learn about wildlife in a manner that does not harm or disturb wildlife.*

- Provide limited quality physical and visual access to the lake.
- Provide clear delineation of public access near the lake.
- Provide small boat (canoe or kayak) access only for seasonal Ranger led open water tours.
- Stage docent staff or volunteers, equipped with binoculars and knowledge, at key locations along trails to give the general public opportunity to view and learn about local wildlife.
- Install interpretive signage integrated with park operations to help inform the general public on wildlife and how to respect, preserve and restore wild-lands/ best practices.
- Install interpretive/regulatory signage informing park users of public exclusionary zones for protection of restoration and cultural and natural resources.

*Goal #P2: Provide a minimum of one pedestrian/vehicular crossing of Tolay Lake and Creek.*

- Provide pedestrian crossings at a locations integrated with the overall trail plan.
- Provide vehicular crossing to accommodate emergency, park staff service vehicles and ranch operations.
- Provide emergency vehicular access to and from Stage Gulch Road.

*Goal #P3: Provide the Tribe access to the property and lake for ceremonial rituals, native habitat restoration and management, and plant gathering.*

- Provide pedestrian access to open water for Native American rituals.
- Provide small boat (canoe or kayak) access to open water for Native American rituals.
- Provide limited exclusive access for ceremonial rituals in the park:
  - » The Tribe will be required to schedule an exclusive special event with Park Operations Staff and the area of the event, use, time and day will be agreed upon by both parties prior to event.
  - » Regional Parks will accommodate as feasible exclusive tribal ceremonial events.
- Provide access for plant collection to predefined and legally permitted areas within the park.



Photo credit: Regional Parks staff

*This page intentionally left blank.*

DRAFT



# Regulatory Setting







PHOTO



## REGULATORY SETTING AND POLICY FRAMEWORK

The proposed Master Plan is a project of Sonoma County Regional Parks and will require approval by the Sonoma County Board of Supervisors. Additionally, Sonoma County will act as the lead agency under CEQA.

Implementing the Master Plan will require compliance with existing federal, State, County, and Sonoma County Regional Parks’ regulations related to cultural and natural resources. All activities will be conducted consistent with all applicable laws, regulations, and permit requirements. Various project components will be subject to permits from resource and regulatory agencies. The regulatory setting considered during development of the Master Plan is described below.

### Federal

Many of the resources at the Park are regulated by federal environmental regulations, including endangered species, migratory birds, and wetlands. Development of the Master Plan may require consultation or compliance with federal regulations. In addition, Regional Parks solicited input from the Tribe.

### Archaeological Resources Protection Act

The most-used enforcement tool for the protection of cultural resources is The Archaeological Resources Protection Act of 1979 and amended in 1988. The purpose is “to protect irreplaceable archaeological resources and sites on federal, public, and Indian lands.” The Act prohibits damaging or defacing archaeological resources; excavating or removing archaeological resources without a permit; selling, purchasing, or trafficking of Native American archeological resources.



### The Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 requires federal agencies and institutions that receive federal funding to return Native American “cultural items” to lineal descendants and culturally affiliated Indian tribes and Native Hawaiian organizations. Cultural items include human remains, funerary objects, sacred objects, and objects of cultural patrimony. A program of federal grants assists in the repatriation process and the Secretary of the Interior may assess civil penalties. NAGPRA makes it a criminal offense to obtain or traffic Native American human remains or cultural items without right of possession.



Photo credit: Regional Parks staff

### National Register of Historic Places (NRHP)

Cultural resources’ significance is determined using the National Register of Historic Places (NRHP) four Criteria for Evaluation (Criteria A-D) at 36 CFR 60.4, which state that a historic property is any district, site, building, structure, or object that:

- Is associated with events that made a significant contribution to the broad patterns of our history (Criterion A);
- Is associated with the lives of persons significant to our past (Criterion B);



- Embodies the distinctive characteristics of a type, period, or method of construction; or that represents the work of a master, or that possesses high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C); and/or
- Has yielded, or may be likely to yield, information important in prehistory or history (Criterion D).

If the State Historic Preservation Officer (SHPO) concurs that a cultural resource is eligible for inclusion to the NRHP, then it is automatically eligible for the California Register of Historical Resources (CRHR). If a resource does not have the level of integrity necessitated by the NRHP, it may still be eligible for the CRHR, which allows for a lower level of integrity.

Cultural resources' integrity is determined using the NRHP's seven aspects of integrity at 36 CFR 60.4, which state that a historic property must not only be shown to be significant under the NRHP criteria, but it also must retain historic integrity. The seven aspects of integrity include location, design, setting, materials, workmanship, feeling, and association. A property must meet one or more of the Criteria for Evaluation before a determination can be made about its integrity.

### Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973, as amended, provides the regulatory framework for the protection of plant and animal species (and their associated critical habitats), which are formally listed, proposed for listing, or candidates for listing as endangered or threatened under the FESA. The FESA also discusses recovery plans and the designation of critical habitat for listed species. Both the United State Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service share the responsibility for administration of the FESA.

Photo credit: Regional Parks staff



### The Migratory Bird Treaty Act

The Federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), Title 50 Code of Federal Regulations (CFR) Part 10, prohibits taking, killing, possessing, transporting, and importing of migratory birds, parts of migratory birds, and their eggs and nests, except when specifically authorized by the Department of the Interior. As used in the act, the term “take” is defined as meaning, “to pursue, hunt, capture, collect, kill or attempt to pursue, hunt, shoot, capture, collect or kill, unless the context otherwise requires.” With a few exceptions, most birds are considered migratory under the MBTA. Disturbances that causes nest abandonment and/or loss of reproductive effort or loss of habitat upon which these birds depend would be in violation of the MBTA.

### Clean Water Act Sections 404 and Section 401

The U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Section 404 of the Clean Water Act (CWA) (33 USC 1344). Waters of the United States are defined in Title 33 Code of Regulations CFR Part 328.3(a) and include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. Activities in waters of the United States regulated under Section 404 include fill for development, water resource projects (e.g., dams and levees), infrastructure developments (e.g., highways, rail lines, and airports) and mining projects. Section 404 of the CWA requires a federal permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404

regulation (e.g., certain farming and forestry activities).

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a water quality certification from the state in which the discharge originates. The discharge is required to comply with the applicable water quality standards. The responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWCRB) and its nine Regional Water Quality Control Boards (Water Boards).

## State

Development of some proposed Master Plan uses, including trail improvements, would require approval from the State, including the San Francisco Regional Water Quality Control Board and Caltrans.

## Assembly Bill 52

Assembly Bill 52 (AB 52) was passed in 2014 and initiated compliance on July 1, 2015. AB 52 amended CEQA to address California Native American tribal concerns regarding how cultural resources of importance to tribes are treated under CEQA. CEQA now specifies that a project that may cause a substantial adverse change in the significance of a “tribal cultural resource” [as defined in PRC 21074(a)] is a project that may have a significant effect on the environment. According to AB 52, tribes may have expertise in tribal history and “tribal knowledge about land and tribal cultural resources at issue should be included in environmental assessments for projects that may have a significant impact on those resources.”

The AB 52 process entails:

- The CEQA lead agency must begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project, if the tribe requested to the lead agency, in writing, to be informed by the lead agency of proposed projects in that geographic area and the tribe requests consultation.
- A proposed Negative Declaration, Mitigated Negative Declaration (MND), or a Draft EIR cannot be released for public review before the tribe(s) has had the opportunity to request consultation.
- If the tribe(s) requests formal consultation, a MND cannot be released for public review until consultation between the tribe(s) and the lead agency is completed and mitigation measures acceptable to the tribe(s) are incorporated into the MND and the related Mitigation Monitoring or Reporting Program (MMRP).

AB 52 further defines the following legislative terms:

- Tribal Cultural Resource: The passage of AB 52, created a new category of resource called a “tribal cultural resource” (TCR). The statute clearly identifies a TCR as a separate and distinct category of resource, separate from a historical resource. New PRC Section 21074 defines a “tribal cultural resource” as any of the following under its subsections (a) through (c):
  - (a) (1) Sites, features, places, and objects with cultural value to descendant communities or cultural landscapes that are any of the following:
    - » Included in the California Register of Historical Resources.
    - » Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
    - » Deemed to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1.

(a) (2) Sacred places, including, but not limited to, Native American sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines that meet either of the following criteria:

- » Listed on the California Native American Heritage Commission's Sacred Lands File pursuant to Section 5097.94 or 5097.96 and a California Native American tribe has submitted sufficient evidence to the lead agency demonstrating that the sacred places are of special religious or cultural significance to the California Native American tribe or contain known graves and cemeteries of California Native Americans.
- » Listed or determined pursuant to criteria set forth in subdivision (g) of Section 5024.1 to be eligible for listing in the California Register of Historical Resources.

(b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

(c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 also may be a tribal cultural resource if it conforms with the criteria of subdivision (a).

- California Native American Tribe: New PRC Section 21074 defines a "California Native American Tribe" to mean a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission (NAHC). This definition is broader than the concept of a "federally recognized tribe" that is typically used in implementing various federal laws, including the National Environmental Policy Act (NEPA).
- Formal Tribal Consultation: Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification notice that includes a brief description of the proposed project and its location as well as the lead agency contact information, and a notification statement that the federally recognized California Native American tribe has 30 days to request consultation.
- Treatment of Mitigation Measures and Alternatives: New PRC Section 21080.3.2 provides that as part of the consultation process, parties could propose mitigation measures. If the California Native American tribe requests consultation to include project alternatives, mitigation measures, or significant effects, the consultation would be required to cover those topics. New Section 21082.3 provides that any mitigation measures agreed upon during this consultation "shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring program" if determined to avoid or lessen a significant impact on a tribal cultural resource.

## California Register of Historical Resources

The CRHR is a listing of State of California resources that are significant within the context of California's history, and includes all resources listed in or formally determined eligible for the NRHP. The CRHR is a state-wide program of similar scope to the NRHP. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR. A historic resource must be significant at the local, state, or national level under one or more of the following four criteria defined in the CCR Title 14, Chapter 11.5, Section 4850:

1. It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States (Criterion 1);



2. It is associated with the lives of persons important to local, California, or national history (Criterion 2);
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values (Criterion 3); or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation (Criterion 4).

The CRHR criteria are similar to the NRHP criteria. Any resource that meets the above criteria is considered a historical resource under CEQA.

### California Endangered Species Act

The State of California enacted similar laws to the FESA, the California Native Plant Protection Act (“NPPA”) in 1977 and the California Endangered Species Act (“CESA”) in 1984. The CESA expanded upon the original NPPA and enhanced legal protection for plants. These laws provide the legal framework for protection of California-listed rare, threatened, and endangered plant and animal species. The California Department of Fish and Wildlife (CDFW) implements NPPA and CESA, and its Wildlife and Habitat Data Analysis Branch maintains the California Natural Diversity Database (“CNDDB”), a computerized inventory of information on the general location and status of California’s rarest plants, animals, and natural communities.

### Fully Protected Species and Species of Special Concern

The classification of “fully protected” was the CDFW’s initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibian and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or FESA. Species of special concern are broadly defined as animals not listed under the FESA or CESA, but which are nonetheless of concern to the CDFW because they are declining at a rate that could result in listing or historically occurred in low numbers and known threats to their persistence currently exist. This designation results in special consideration for these animals by the CDFW, land managers, consulting biologist, and others.



Credit: Regional Parks staff

### Other Sensitive Plants – California Native Plant Society

The California Native Plant Society (“CNPS”), a non-profit plant conservation organization, publishes and maintains an Inventory of Rare and Endangered Vascular Plants of California in both hard copy and electronic version ([www.cnps.org/rareplants/inventory/6thedition.htm](http://www.cnps.org/rareplants/inventory/6thedition.htm)). The Inventory assigns plants to categories and such species should be fully considered, as they meet the definition of threatened or endangered under the Native Plant Protection Act (NPPA) and Sections 2062 and 2067 of the California Fish and Game Code.

### Porter-Cologne Water Quality Control Act

Waters of the State are defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The State Water Board protects all waters in its regulatory scope, but has special responsibility for isolated wetlands and headwaters. These water bodies have high resource value, are vulnerable to filling, and may not be regulated by other programs, such as Section 404 of the Clean Water Act (CWA). Waters of the State are regulated by the Water Boards under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act.

## California Fish and Game Code Section 1600-1616

Streams, lakes, and riparian vegetation, as habitat for fish and other wildlife species, are subject to jurisdiction by the CDFW under Sections 1600-1616 of the California Fish and Game Code. Any activity that will do one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake generally require a 1602 Lake and Streambed Alteration Agreement. Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFW.

## Sensitive Vegetation Communities

Sensitive vegetation communities are natural communities and habitats that are either unique in constituent components, of relatively limited distribution in the region, or of particularly high wildlife value. These communities may or may not necessarily contain special-status species. Sensitive natural communities are usually identified in local or regional plans, policies or regulations, or by the CDFW (i.e., CNDDDB) or the USFWS.

## Caltrans

Designated State Route facilities are under the jurisdiction of the California Department of Transportation (Caltrans), except where facility management has been delegated to the county transportation authority. Roadway improvements and other work within state roads right-of-way would require coordination with and approval from Caltrans.

## County

### Sonoma County General Plan

California State Government Code Section 65300 requires each county and city, including charter cities, to adopt a comprehensive General Plan which is an integrated and internally consistent statement of goals, objectives, policies and programs to provide for future land use decisions. Goals, objectives and policies in each element of the General Plan reflect the future needs and desires of the community.

The Sonoma County 2020 General Plan Land Use map designates the Park as Diverse Agriculture. The site is zoned Land Extensive Agriculture District (LEA) and Land Intensive Agriculture District (LIA) with a Scenic Resource (SR) and Valley Oak Habitat (VOH) Combining District.

### Sonoma County Public Works

County roadways in the Master Plan area are under the jurisdiction of Sonoma County Public Works. Roadway improvements and other work within County roads right-of-way would require coordination with and approval from Sonoma County Public Works.

## Uc@!

Encumbrances summary can be found in Chapter 6 Resource Mangement Plan page 87.

# Conceptual Site Plan Options









# TOLAY LAKE MASTER PLAN CONCEPTUAL SITE PLAN OPTIONS

## Concept Plan Description

This chapter describes the overall spatial design of Tolay Lake Regional Park. As noted in Chapter 2, the goals and objectives for the Park emphasize the importance of protecting the natural, cultural, and scenic resources of the property while accommodating reasonable active and passive recreational access.

Chapter 5 describes and illustrates the concepts for development of trails and facilities to accommodate the allowable recreational and educational uses that may occur in various locations throughout the Park. Using stakeholder and community input as described in Chapter 3, design concepts for trails and facilities and habitat restoration were created. During the public outreach efforts, Regional Parks discussed goals and objectives with the project stakeholders to guide the selection of allowable uses and the quality and type of development required to accommodate reasonable public access to the Park.

Proposed project features depicted on the conceptual site plans pertain to parking and circulation improvements, restrooms, a new visitor center, trails and places for interpretation, viewpoints, overnight facilities, cultural gathering area, new administrative buildings, new potable and wastewater infrastructure, new equestrian parking, and habitat restoration, including restoration of Tolay Lake. Existing features are presented for the Park Complex, which includes the area of the Cardoza Ranch buildings (Figure 1-3). The remaining portions of the Park are referred to as the Park Interior (Figure 1-2). The Park Interior also includes the South entrance from Highway 121. The level of detail provided in the figures in this chapter provide an overall sense of what facilities are to be built, re-built, or left in their existing condition; where these facilities are located, and their approximate size. This level of detail is sufficient to complete the Environmental Impact Report (EIR) that will need to be completed for Regional Parks to adopt the Master Plan. Additional design details will be developed following Master Plan adoption to enable facilities to meet permitting requirements and be constructed.

## Interpretation Plan

The educational and interpretive elements (Chapter 7) includes both spatial and programming elements. Because of this spatial element, a brief overview is provided below. With community meeting input, and extensive input from the Tribe, Regional Parks has outlined potential interpretive concepts and story zones for the Park (Figure 7-1). These concepts and zones include:

- 1

**Park Entrance / Visitor Center**

Native American overview and significance | regional and site overview  
 Vaqueros' story | Portuguese farmers' story | present agricultural uses and practices | duck pond integrated waste water system
- 2

**Lake Vista**

Native American significance, life, history, and values | ethnobotany  
 living Tribe | story of the lake | hydrology | birds

Petaluma Marsh

Native American economy and life | values of prehistoric life, importance to living tribe | natural habitats and marsh/wetland | climate change and local effects | Lakeville town story | geology/geomorphology

3

Agriculture

Native American ethnobotanical uses, changes to the land pre to post euro-contact, ancient land management practices, living Tribe story | restoration agricultural ditching and diking | Portuguese ranchers' story | Vaqueros' story

4

Oak Woodland

Native American history - importance of oak trees to indigenous peoples living tribe restoration values | restoration of oak woodland

5

East Ridge View Point

Native American relationship of Tolay Lake to surrounding sacred mountains and communities | ancient place names | views with regional and park overview | geology/geomorphology.

6

Central Ponds

Native Americans' values and relationship with the land | comparison of Native American land management, European agricultural practices, and current BMPs | habitats and fresh water springs | historical route | birds

7

Middle Reach

Native Americans' relationship to the land and the living tribe | prehistoric cultural structure, ancient burning practices, and current traditional practices | native grasslands and wildflowers | BMPs for grazing | views | crash site memorial

8

Historical Route

Native American routes and local communities of the region | historic Lakeville Road | habitats and riparian corridors | restoration of riparian areas

9

Tolay Creek

Native American willow burning, basket weaving, economy, and village life grassland/wildflower habitat | riparian, bay, and oak woodlands | habitat and ecosystem restoration

10



## 11

## Bay View Point

Native Americans' cultural structure and communities | living Tribe's values natural resources and the effects of modern day culture on climate change regional points of interest and views | serpentine habitats | climate change

## 12

## South Entrance

Native American overview and story | regional and site overview

Additional details, including a map of the above referenced story zones, may be found in Chapter 7 of this Master Plan.

### Developing Conceptual Site Plan Options

Three site plan options were developed for the Park. Options included built features and access to the Park, features that provide visitor services (e.g., kitchen, overnight bunkhouse) and addressing park administration, operations, and maintenance needs (e.g., new ranger residence). Proposed features were located to avoid impacts to natural and cultural resources.

As concepts were developed, options were evaluated against six screening criteria that included: support of the Park Vision, support of public interest, most compatible with stakeholder concerns, protection of public health and safety, minimizing environmental impacts, and avoidance of prohibitively high costs. Site plan options were evaluated in a "pass/fail" manner; all options had to pass each of the six criteria referenced above. The three options provide a range of intensity of development and are summarized below.

#### Alternative Option A

- Smallest footprint
- Stone Floor Barn becomes the Visitor Center
- Improve existing "Miwok Village"
- New equestrian staging area
- Overnight use in Yellow House
- Single unit camping
- ADA upgrades to existing roads/trails
- Minimum new hiking trails in southern area

#### Alternative Option B

- Larger footprint
- Tractor Barn becomes Visitor Center
- New tribal focused gathering area
- Expanded equestrian staging
- Overnight use in all former residences
- Limited single unit & group walk in camping in backcountry valley floor
- Expand multi-use & hiking trails

Alternative Option C

- Largest footprint
- New Visitor Center constructed
- Tribal focused area and multi-cultural gathering area at “Miwok Village”
- Overnight uses in all former residences
- Expanded group walk-in sites in backcountry valley floor and single unit sites
- 

Appendix B shows the Preliminary Conceptual Site Plan Components and Options in greater detail.

**Preferred Site Plan Option**

During the second community meeting (held on January 16, 2014), meeting participants were asked to vote on which option they preferred for each portion of the Park (Table 5-1). For the northern core area, option A received the highest level of support, closely followed by option B; for the Park Interior, option B received the highest level of support; and the southern entrance of the Park, option C received the highest level of support.

| Table 5-1 Meeting Participant Voting Patterns on Site Plan Options |                  |         |        |                 |
|--|------------------|---------|--------|-----------------|
| PARK AREA: NORTHERN CORE   |                  |         |        |                 |
| Options  | Strongly Support | Support | Oppose | Strongly Oppose |
| A  | 4                | 11      | 0      | 2               |
| B  | 6                | 8       | 1      | 2               |
| C  | 2                | 5       | 2      | 7               |
| PARK AREA: INTERIOR  |                  |         |        |                 |
| Options  | Strongly Support | Support | Oppose | Strongly Oppose |
| A  | 5                | 2       | 3      | 4               |
| B  | 6                | 5       | 2      | 3               |
| C  | 3                | 2       | 6      | 4               |
| PARK AREA: SOUTHERN TIP  |                  |         |        |                 |
| Options  | Strongly Support | Support | Oppose | Strongly Oppose |
| A  | 4                | 4       | 1      | 6               |
| B  | 4                | 7       | 2      | 3               |
| C  | 5                | 6       | 3      | 4               |

Source: MIG 2015

Regional Parks and consultant staff used these voting preferences to develop a preferred site plan. The preferred option generally scaled back development in all 3 areas of the Park. Additional discussion with Park operations staff also influenced the preferred plan and resulted in retaining 2 working buildings (Buildings 12 and 14 from the Historic Structures Report, Appendix C) that will require some structural work. Administrative functions and visitor service functions will be separated to the extent feasible. For example, the equipment shed will be located to the north of the majority of ranch buildings and the North entrance. Additionally, an area was set aside for private Tribal ceremony that is separated from the visitor center and easy public access; the gathering area is located north east of the Park Complex overlooking Tolay Lake. Camping and trails in the Park Interior were substantially scaled back to address concerns about potential impacts on sensitive natural and cultural resources. The preferred site plan depicts two backcountry campsites (Figure 5-2) in the central portion of the Park interior and two overnight group camps one in the Park Complex and the other in the Park Interior at the Fish Pond. A list of quantities of the various

proposed features includes the following:

- Visitor Center  
Approximately 10,000 SF Visitor Center including restroom facilities
- Trails with benches  
Up to ~ 32 miles of trails<sup>1</sup> that consists of up to ~ 22 miles of Multi-Use trails (Hike, Bike, Equestrian) and up to ~ 10 miles of Hikers Only trails
- Viewpoints/Interpretive Vistas  
Up to 12 Viewpoint/Interpretive Vistas
- Camping/Overnight Areas  
Backcounty Sites—2 Single-family type site  
2 Group Sites—Approximately 50 people each site  
Group Bunkhouse—Potentially holding up to 60 guests (4,700 SF)
- Picnic Areas  
5 Picnic Areas with tables scattered in appropriate spots along trails  
Group Picnic Area - may include shade structures, trees, food prep facilities, and barbeques.
- Kitchen and Dining Area  
To accommodate educational program or special events  
2,400 SF indoor kitchen and 1,000 SF covered outdoor dining
- Auto Parking  
North Entrance Parking Area – Up to 80 spaces  
South Entrance – Up to 25 spaces  
Events Parking, additional at Tolay Lake – Up to 1,000 spaces  
Events Parking, additional north – Up to 300 spaces
- Equestrian Parking  
Main North Park Entrance – Up to 30 pull through spaces  
South Entrance – Up to 8 pull through spaces

## Utilities and Infrastructure

### POTABLE WATER AND WASTEWATER INFRASTRUCTURE

The existing Tolay Lake Regional Park currently includes two ranger residences and a park office utilized for Operations and Maintenance Staff, and Educational Programs. Park staff now uses water from an existing spring fed water system. The permitting requirement to utilize spring or surface water for public consumption is onerous, so potable water is not available for public use. With development of the Master Plan, a viable source of water for public use and consumption was needed to develop the Park to its full potential. Regional Parks and the consultant team concluded that a well would be needed for the visiting public.

A technical memorandum on groundwater availability for a potable water source is found in Appendix D. After three attempts to drill for water a source was found on the east side of the lake (Figure 5-3). The water system will pump water across the lake to the Park Complex. The well to be used for the visiting public will comply with all California State Water Resources Control Board legal requirements.

A technical memorandum on wastewater treatment options is found in Appendix E. The wastewater system (Figure 5-4) includes a dual chamber septic tank, a duplex pump system, grease trap, trickling filter, treatment wetland, and potential spray irrigation area. The septic tank and duplex

<sup>1</sup> Includes approximately 16 miles of new trails less ~ 8 miles of poorly designed decommissioned trails/ranch roads



pump system will be located within the Park Complex area, located northeast of the Old Stone Floor Barn and adjacent to the proposed new visitor center. The grease trap will be located near the proposed new kitchen building. The trickling filter, treatment wetland and irrigation area are located on the north and east sides of the Duck Pond

#### NORTHERN PARK ACCESS

Northern park access via Cannon Lane will be improved to serve the anticipated annual average daily vehicle traffic following build out of the Park. Currently, the paved width of Cannon Lane ranges from 14 to 24 feet, with degraded edges and potholes. Improvements include repaving, establishing uniform road width, and improved shoulders for bicycle use. To accommodate projected visitor increases as well as high traffic volumes during the Fall Festival, Cannon Lane will be expanded to a 22-foot standard pavement width as feasible, with two nine-foot travel lanes, two two-foot shoulders for bicycle travel, and a graded shoulder along both sides. These updates and components will apply to the entire roadway length (Figure 5-5).



- Building Key**
- 1 - Cottage / Julie's House / Little Green House
  - 2 - Bunkhouse / Ranger Residence
  - 3 - John Cardoza Sr. House / Ranger Residence
  - 4 - DEMO George & Vera Cardoza / Green House
  - 5 - John Jr. & Beatrice Cardoza / Yellow House
  - 6 - Hay Barn / Old Stone Floor Barn
  - 7 - Old Dairy Barn
  - 8 - Creamery / Wine Storage
  - 9 - Granary / Museum
  - 12 - Old Shop / Work Shop
  - 13 - Tractor Barn / Equipment Barn
  - 14 - Storage Shed / Equipment Shed
  - 15 - Slaughterhouse
  - 17 - Modern Barn
  - 19 - Marvin's Garden
  - 20 - Corrals
  - 21 - Picnic Site / Group
  - 22 - Wildlife Viewing Platform
  - 23 - Rock Quarry Site
  - 24 - No-til Hay Production

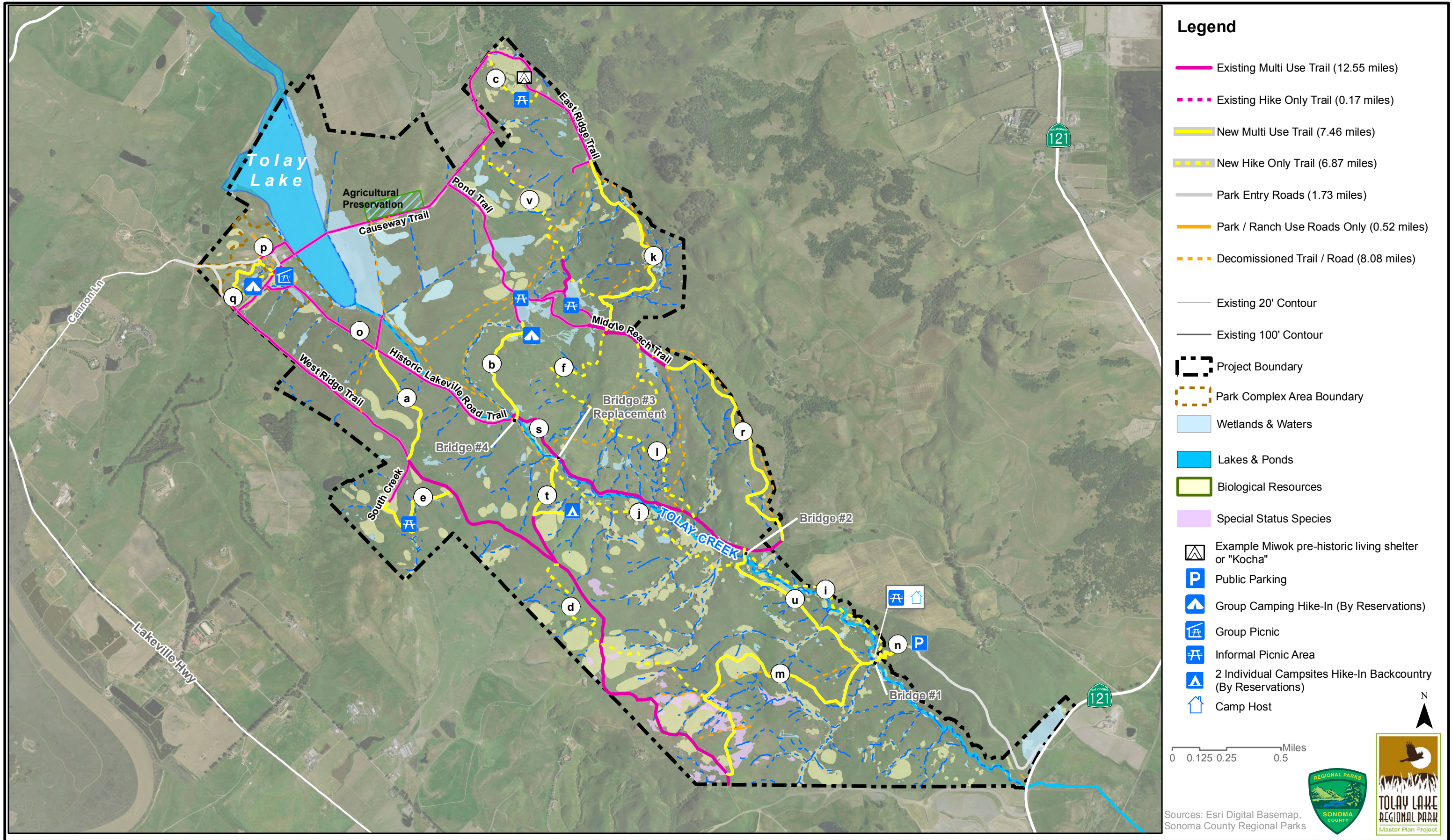
\*Building numbers correspond to Historic Structures Report

- Proposed Elements**
- A - Cultural Gathering Area
  - B - Viewpoint
  - C - New Equipment Shed
  - D - Screen Plantings
  - E - Ranch Manager Residence
  - F - Entry Road Improvements
  - G - Group Camping by Permit
  - H - Overflow Parking
  - I - Animal Pen
  - J - Move Historical Corral
  - K - Visitor Center
  - L - Preserve and Interpret
  - M - New Bunk House
  - N - Park Office
  - O - Group Picnic
  - P - Functioning Ranch Operations
  - Q - Culinary Ethno/Historic Garden-Formal Picnic
  - R - Temporary Residence (Artist, etc.)
  - S - Sales/Group Picnic Shelter
  - T - New Ranger Residence
  - U - Showers
  - V - Restroom
  - W - Riparian / Wetland Restoration
  - X - Kitchen and Dining
  - Y - Potential Spray Irrigation Area
  - Z - Equestrian Parking
  - AA - Boardwalk
  - BB - Outdoor Class / Stage

0 150 300 Feet

Sources: Esri Digital Basemap, Sonoma County Regional Parks



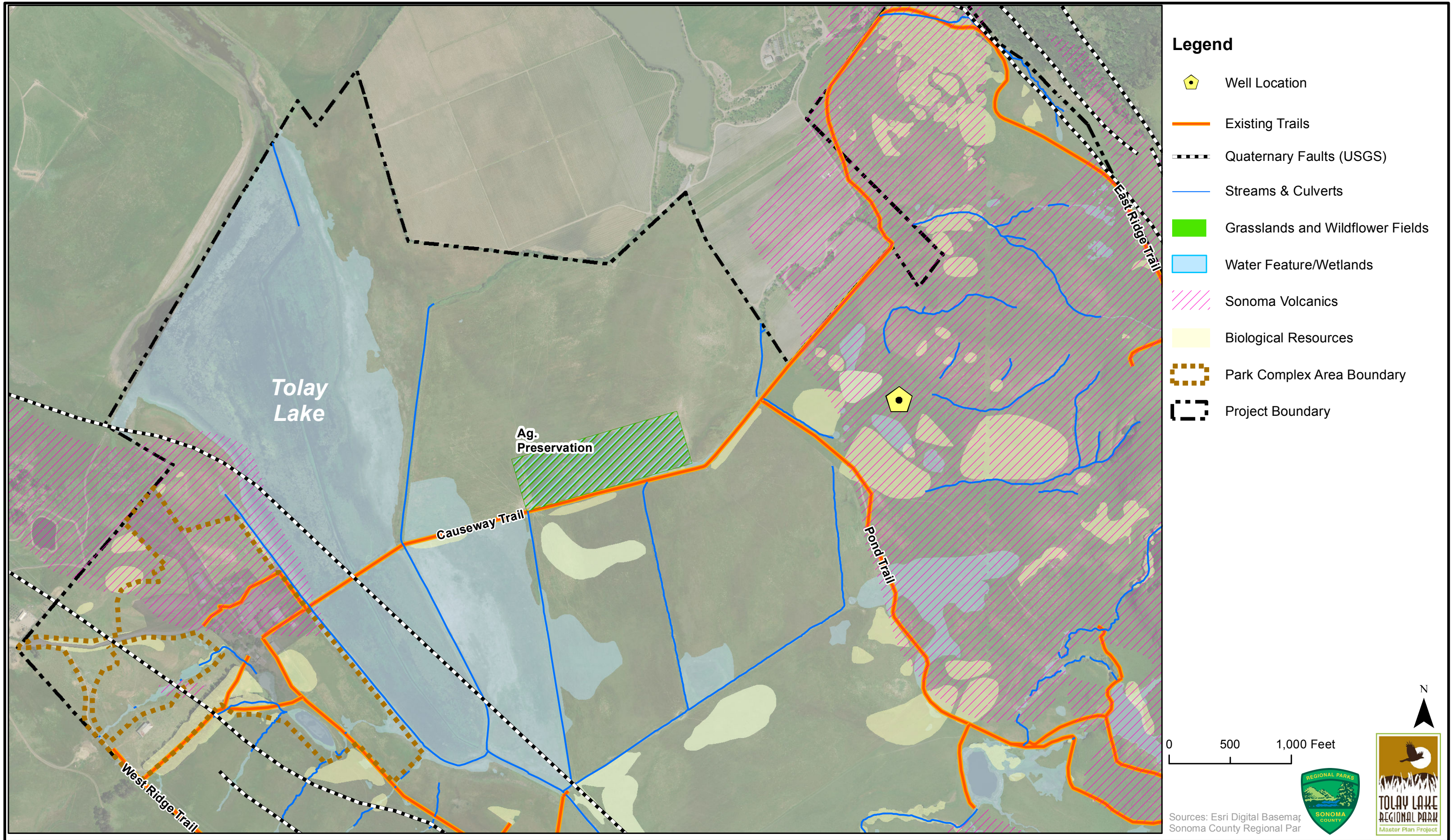


**NOTE: Letter labels correspond to DEIR Table 3.3**

Figure 5-2

Park Interior Preferred Conceptual Site Plan





- Legend**
- Well Location
  - Existing Trails
  - Quaternary Faults (USGS)
  - Streams & Culverts
  - Grasslands and Wildflower Fields
  - Water Feature/Wetlands
  - Sonoma Volcanics
  - Biological Resources
  - Park Complex Area Boundary
  - Project Boundary

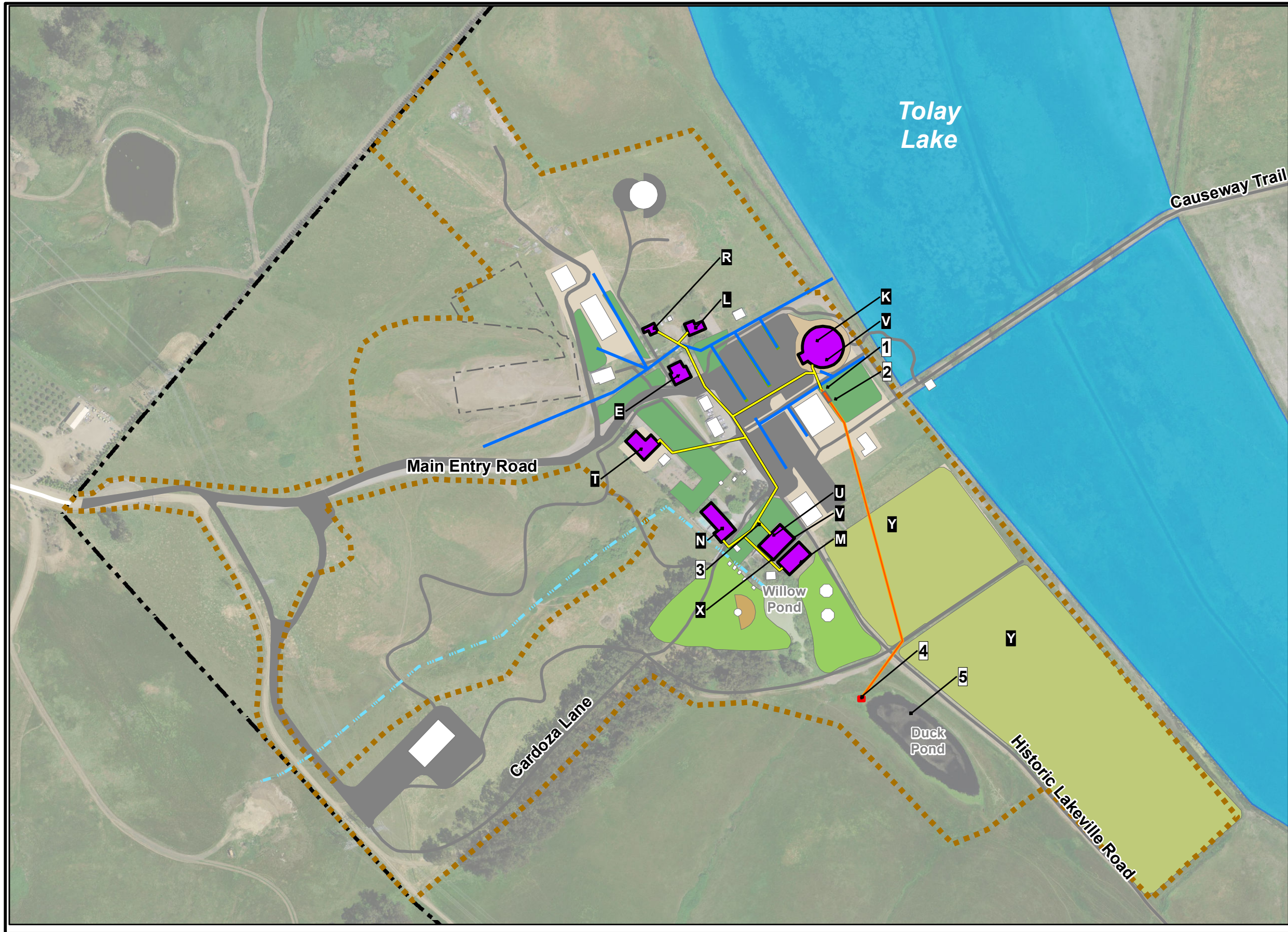
0 500 1,000 Feet

Sources: Esri Digital Basemap  
Sonoma County Regional Par

N

Figure 5-3  
Ground Water Availability





- Legend**
- Wastewater Collection System
  - Pipeline to Wastewater Treatment System
  - Storm Drainage
  - Creek
  - Building Connected to Wastewater System
  - Park Complex Area Boundary

- Proposed Wastewater Improvements**
- 1 - Dual Chamber Septic Tank
  - 2 - Duplex Pump System
  - 3 - Grease Trap
  - 4 - Trickling Filter
  - 5 - Potential Treatment Wetland Location

- Proposed Elements**
- E - Ranch Manager Residence
  - K - Visitor Center
  - L - Preserve and Interpret
  - M - New Bunk House
  - N - Park Office
  - R - Temporary Residence (Artist, etc.)
  - T - New Ranger Residence
  - U - Showers
  - V - Restroom
  - X - Kitchen and Dining
  - Y - Potential Spray Irrigation

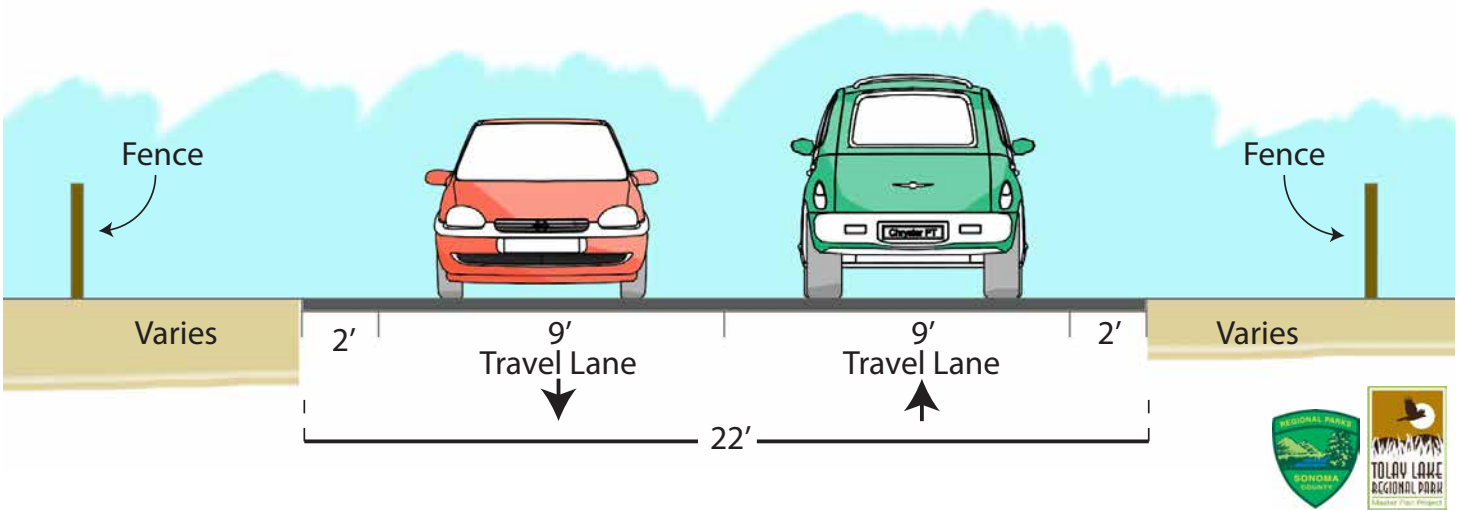
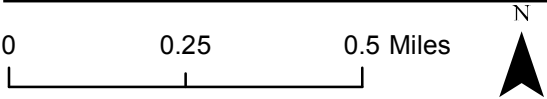
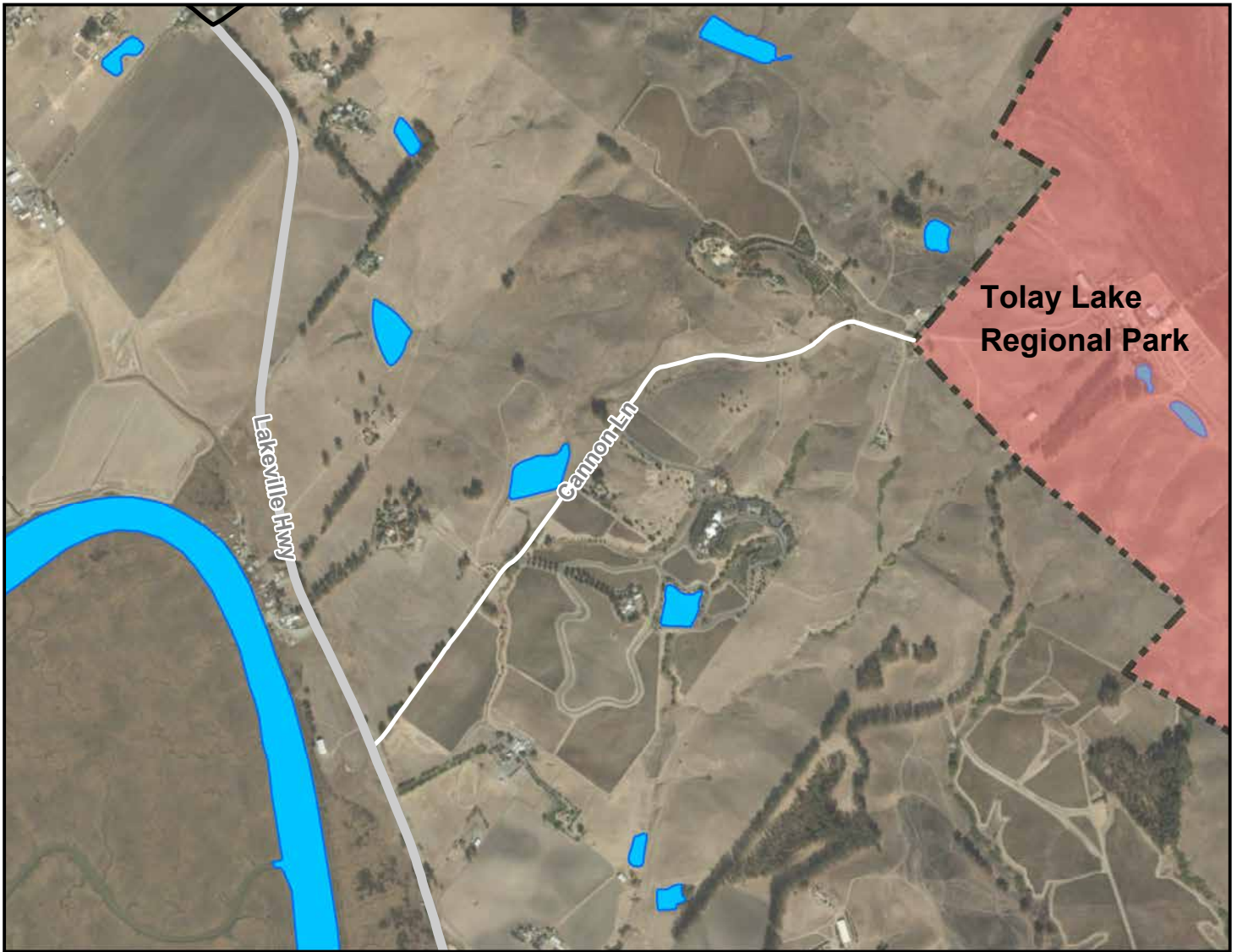
N

0 150 300 Feet

Sources: Esri Digital Basemap, Sonoma County Regional Parks

Figure 5-4  
Preferred Wastewater Treatment System







*This page intentionally left blank.*

## Trails

The trail system proposed in this Master Plan is the principal means for providing comprehensive public access to the Park. Access to nature provides the user with an opportunity to enjoy an increased awareness of the site’s natural and cultural treasures. Coupled with protecting cultural resources and enhancing the site’s natural resources, access for recreational and educational enjoyment was one of the primary reasons behind the acquisition of the properties that comprise the Park.

The Park has many scenic and interesting destinations for park visitors who will travel along the trail system by foot, bike, or horse. Points of interest along these trails can be found in Chapter 7, Education and Interpretive Elements. Trail users will be able to experience a mixture of settings and environments, including the many native plants and micro-climates found on the varied terrain throughout the Park. The trail system was conceived after extensive public input, intensive consultation with the Tribe, consultation with the Land Trust, District, and neighbors, and consideration of the site’s many unique opportunities and prehistoric cultural and natural resource constraints.

## Trail Types

The Park will include multi-use and pedestrian only trails, including educational nature trails and accessible trails. The majority of trails will be multi-use trails and are open to the general public for hiking, mountain biking, and equestrian use. Approximately one third of the trails will be pedestrian only trails to provide space for a more peaceful interaction with the land. Multimedia interpretation in many areas of the Park along trails will provide educational opportunities regarding the natural, historical and cultural resources of the Park. Trails will be designed to comply with ADA guidelines and will be accessible and utilized by people who are physically impaired, seniors, parents with strollers, and wheelchair users.

Proposed trails are described in greater detail in Chapter 8, Trails Plan.



Photo credit: Regional Parks staff





## Tolay Lake Restoration

This section describes the lake restoration strategy selected by Sonoma County Regional Parks to best meet:

1. Ecological and environmental conditions and potentials,
2. Master Plan goals, and
3. Public desires and interests

This section provides a brief discussion of historic and current lake conditions; the alternative lake restoration options considered; and the preferred restoration choice of Regional Parks: Lake Outlet at Elevation 215 feet (Alternative 1). The primary source material for this chapter is found in Appendix G - Water Budget Analysis, Tolay Lake Restoration Alternatives and Appendix H - Tolay Lake Conceptual Ecological Model for Restoration Goals.

### Background

Tolay Lake is a naturally occurring lakebed which when unaltered, flooded up in the wet season and was followed by a draw down in spring through summer. Tolay Creek is the dominant drainage within the Park, running 4.5 miles through the length of the property with numerous tributaries discharging into Tolay Creek from both West and East Ridge. Tolay Creek has been channelized within the lake approximately three-tenths of a mile, presumably to drain the lake for agriculture; dredge spoils are in several locations along the upper reach of Tolay Creek. The entire run of Tolay Creek below Tolay Lake is within a confined and incised channel with historic floodplain terraces present in the lower reach. The upper reach is approximately 4 to 10 feet deep, and 10 to 20 feet in width, while the lower reach is approximately 8 to 15 feet in width with similar depths.

Flows of Tolay Creek are seasonal with active, flowing water observed in late fall through spring months, but dry by summer, while the tributaries are ephemeral to intermittent with winter through spring flows. Deeper pools in the lower reaches of Tolay Creek typically remain wetted year-round, and pools in several tributaries remain into summer. The surface area of Tolay Lake varies throughout the year, depending on rainfall. Through the spring, as the water in Tolay Lake evaporates, the lake functions as a large vernal pool.

Currently, Tolay Lake is a relatively shallow lake, averaging between 4 – 8 feet in depth, filling in the winter, draining in the spring, with a surface area of approximately 200 acres during the rainy season. In the winter, Tolay Lake provides an important refuge for migrating waterfowl and lies within the Pacific Flyway. The lake's water surface elevation and size can vary greatly depending on annual rainfall, and can be thought of as an intermittent lake. This intermittent lake ecosystem is more like a vernal pool-freshwater marsh gradient than a perennial deep water lake ecosystem. Comparable lakes within Sonoma County include Ledson Marsh and Laguna Lake (refer



Photo credit: Regional Parks staff

to Section 5.4.3 below). Restoration goals are based on ecosystem dynamics and structure of an intermittent perennial/seasonal fishless lake, comparable to Ledson Marsh or Laguna Lake.

As discussed in Chapter 2, Purpose, Objectives, and Goals, the primary goals for lake restoration are:

- Enhance the frequency and duration of inundation to the extent feasible
- Identify and reduce artificial constrictions to flow
- Enhance the habitat for migratory waterfowl to the extent feasible
- Restore seasonal wet meadow habitat
- Enhance/restore/create habitat for red legged frogs to the extent feasible
- Enhance/restore/create habitat for western pond turtles to the extent feasible

Restoration of Tolay Lake is a key component of the master planning process. It also provides an opportunity to restore and improve quality seasonal wetland habitat in the region.

### Historic and Current Lake Conditions

During the late Holocene (within the last 11,000 years), droughts in the San Francisco Bay Area lasted from decades to centuries, punctuated by extreme floods and relatively benign, moderate climates relative to the historical period (Malamud-Roam et al. 2007). These alternating hydrologic states, driven by long and short-term climate cycles would have had Tolay Lake shifting between wet and dry phases; the lake environs would have lacked a balanced steady-state ecosystem. As a result, the lake environs' vegetation type, distribution, and abundance would be varied. Submerged aquatic vegetation and freshwater marsh would expand rapidly during wet cycles when perennial shallow water or soil saturation would occur for multiple consecutive years. During prolonged dry phases, vegetation communities would die back and become displaced or marginalized by seasonal marsh vegetation tolerant of dry soil conditions. Submerged aquatic vegetation would only survive in deepest depressions or local seeps and springs where freshwater marsh conditions could persist during extreme droughts. The nature of these aquatic ecosystems would have been highly fluctuating, with recurrent episodes of extreme wetness and dryness.

Historically, Tolay Lake was the largest natural freshwater lake in Sonoma County - in particularly wet years, Tolay Lake may have been a perennial lake. The cultural and historic resources at the lake have been determined to be of statewide and national importance. Numerous charm stones, which are carved rock objects used by Native Americans for both ritual and practical purposes, have been found in the lakebed. The charmstones are of various types, and thought to be of various ages, dating back 4,000 years.

Historical accounts indicate that the lake surface area reached between 300 – 450 acres when full in winter. In the mid-to-late 1800s, the natural dam that created the lake was removed to facilitate farming of the rich lakebed soils. Multiple diversion ditches (Figure 5-6) were created to remove water from the lakebed. The lake bottom was drained and used for agricultural purposes until the property was purchased by the District and Tribe in 2005. The primary use and visions changed to reflect the land's operation as a park. The land is now being managed to conserve cultural and natural resources.

Currently, Tolay Lake is prone to flooding during the rainy season – see photos below. Lake surface water elevation is controlled by the farm bridge, located on the downstream end of the lake. However, additional structures contribute to flooding including: the causeway, the causeway culverts, and the culvert at the downstream end of the lake (area known as the horseshoe). Ensuring that adequate water supply reaches the lake and that flooding upstream properties is minimized will be important features of the preferred lake restoration design.





*Left: Prior to Lake flood.*



*Right: Following Lake flood.*

## Ecological Processes of a Late Holocene Period Tolay Lake

In addition to the alternating, unsteady-state aquatic ecosystem likely to have occurred in the past, other ecological processes would have occurred during this period, including those influenced in part by native settlement (i.e., Coast Miwok or Paleoindian) burning and hunting practices.

### VARIATION IN WETLAND/AQUATIC SOIL BIOGEOCHEMICAL PROCESSES.

During wet phases, de-nitrification (net loss of available nitrogen) and carbon sequestration would be significant in lakebed and freshwater marsh soils. During droughts (increased frequency/duration wetland soil drainage), soil nitrogen would be nitrified (i.e., the process whereby organic nitrogen is changed into nitrate) and released from soil as available, elevated nutrients; soil carbon would be released by decomposition of vegetation.

### PERMANENT FISHLESS LAKE WITH DOMINANCE BY INVERTEBRATES AND AMPHIBIANS; AND WADING BIRDS AS TOP PREDATORS.

The episodic emergence of the lakebed during droughts, and the natural disconnection of the lake from potential fish dispersal habitat, indicate that the lake was normally fishless. Such a naturally fishless intermittent lake would be dominated by invertebrates (crustaceans, insects) and microzooplankton grazers of algae. Suppression of algae would maintain high water clarity and water quality, and promote primary productivity through vascular plants (submerged aquatic vegetation and emergent marsh vegetation). Absence of fish predators would promote high abundance of amphibians that can complete life-cycles in one season.

### HERBACEOUS VEGETATION DOMINANT ALONG THE INTERMITTENT LAKE MARGINS.

Woody riparian vegetation at lake margins would likely have been limited by frequent (annual) burning during Coast Miwok occupation. The Coast Miwok utilized prescribed burning for annual post-harvest (pinole) grassland management or for hunting drives. Frequent or recurrent burning would likely select for herbaceous vegetation, and limit riparian scrub to small groves and limit oak woodland to isolated mature trees. Sedge beds would likely occur in seeps of lower hillslopes bordering the lake and along some lake margins.

## VARIATION IN WATERFOWL AND WADING BIRD HABITATS.

Submerged aquatic vegetation habitat would become available both for diving ducks and dabbling ducks in deeper water areas during wet phases when vegetation canopies can reach the water surface and provide foraging habitat (seed, herbage, invertebrates) at all depths. Dabbling habitat would not be limited by water depth when these canopies were extensive. In dry phases (a seasonal marsh period), dabblers would be excluded in freshwater tall emergent marsh, and forage primarily in more extensive short wetland vegetation during submergence in winter-spring (seasonal marsh or vernal pool flats). Principal food items for dabbling ducks would shift with climate phases: chironomid midge larvae and seed and broadleaf forbs and spikerush from seasonal marsh; pondweed turion, tuber, and seed and smartweed seed). Sedge beds and tall continuous canopies of wet meadow fringing the lake could have provided nesting habitat for dabbling ducks. Tall emergent freshwater marsh, or (limited) riparian scrub such as California rose stands could have provided nesting habitat for tricolor blackbirds.

## VARIATION IN AMPHIBIAN AND REPTILE HABITATS.

A naturally fishless aquatic ecosystem would also have supported large populations of amphibians with larval stages lasting only one water year: Pacific chorus (tree) frog and California red-legged frog, California tiger salamander, and other salamander and newt species. Though breeding habitat quality and extent could vary with the extent of shallow-submerged marsh, western pond turtles would have likely re-colonized the intermittently perennial lake from channel pools in Tolay Creek during wet phases with deep perennial water.

## Comparable Aquatic Ecosystems

Peter Baye (Baye 2014) assessed the Tolay Lake ecosystem and found it to be comparable to two other aquatic ecosystems in Sonoma County: Ledson Marsh and Laguna Lake. According to Baye, the seasonal (winter-spring) lake hydrology of these two aquatic ecosystems in relation to their wetland vegetation in the 1970s, and their historical or active agricultural settings (ranching and farming), are similar to the current Tolay Lake ecosystem. The Tolay Lake ecosystem exhibits extensive wetland lake beds that grade from vernal pool-like summer-desiccated flats, to later-emerging, moister seasonal marsh, and core areas of perennial saturated or flooded freshwater marsh, which is comparable to Ledson Marsh, as described below:

The entire area of Ledson Marsh is normally flooded in winter, but in the summer, only central parts contain water, being surrounded by extensive marshy ground. Peripheral areas dry up completely, and they are the ones that exhibit a rich vernal pool flora. In some summers the entire lake dries up, but...[1974-1975] it still had much water even in late summer. (Baye 2014)

Laguna Lake was still being drained for corn farming (the operations ceased in 1991) when this description of the lake's hydrology was made:

Most of the area is a winter lake over 1 mile long and ½ mile wide. During the summer it dries up, exposing extensive muddy flats, but usually does not dry up completely until late summer, leaving just a strip of moist mud with a stand of tules in the middle. The area is under heavy agricultural use, being plowed regularly as water recedes and the exposed mud dries. Nevertheless, a vernal pool has time to develop before plowing. (Baye 2014)

Kamman's (2003) characterization of the pre-agricultural hydrology of Tolay Lake is consistent with these accounts of intermittent lakes and seasonal ponds in southern Sonoma County. Kamman determined that the original natural dam outlet was probably a bedrock feature at least in part and was 14 feet above the lowest lakebed elevation. This would indicate that the maximum potential depth of lake flooding in wet years prior to dam breaching for agricultural drainage in the late 19th century (Florsheim 2009).



## Habitat Values and Species

Vegetation within Tolay Lake varies spatially, seasonally, and annually; variation largely depends on the amount of rainfall and position of depth within the lake. Generally, soils around the perimeter or elevated areas on the lake are saturated throughout the wet season and start drying out in early summer. These areas are flooded only in above-normal water years. The lower lake margin experiences saturation throughout most of the year to year-round, and is frequently inundated. The lakebed experiences frequent and repeated inundation within the wet season, which may remain into the dry season depending on volume and timing of rainfall. As a result, a shift from meadow to freshwater marsh habitat is evident between the upper lake margin, the lower margin, and the lakebed, effectively dividing the lake into approximately three vegetation alliances: meadow barley patches, water smartweed marsh, and mixed-annual wetland forb patches.

Tolay Lake provides an important year-round or nearly year-round water source for a variety of wildlife, from large mammals to migratory birds. Black-tailed deer, raccoon, long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), and Virginia opossum are likely to water in and around the lake, and the occasional occurrence of beaver (*Castor canadensis*) and river otter (*Lontra canadensis*) wander up Tolay Creek to the lake.

Tolay Lake is also recognized as an important wintering area for migratory waterfowl. The spatial extent and relatively shallow depth of the lake attracts ducks and other water birds, while the extensive vegetation provides important forage for over-wintering waterfowl. Eleven duck species have been identified, eight of which are dabblers, and include gadwall (*Anas strepera*), American widgeon (*Anas americana*), mallard (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*), northern shoveler (*Anas clypeata*), northern pintail (*Anas acuta*), green-winged teal (*Anas cracca*), canvasback (*Aythya valisineria*), greater scaup (*Aythya marila*), bufflehead (*Bucephala albeola*), and ruddy duck (*Oxyura jamaicensis*) (LSA Associates, 2009). Other birds observed in and around Tolay Lake and associated water bodies include Canada goose (*Branta canadensis*), pied-billed grebe (*Podilymbus podiceps*), double-crested cormorant (*Phalacrocorax auritus*), American coot (*Fulica americana*), and Caspian tern (*Hydroprogne caspia*) (LSA Associates 2009).

The shallow water and productive vegetation provide forage and cover for wading birds such as great blue heron (*Ardea herodias*), great egret (*Ardea alba*), and snowy egret (*Egretta thula*), which forage along the lake edge. Egret rookeries have been observed in blue gum groves along Lakeville Highway and downtown Petaluma, which may utilize Tolay Lake among other waterbodies in southern Sonoma County. The shallower margins of the lake likely provide foraging habitat for wintering and migrating shorebirds such as killdeer (*Charadrius vociferous*), greater yellowlegs (*Tringa melanoleuca*), least sandpiper (*Calidris minutilla*), western sandpiper (*Calidris mauri*), and long-billed dowitcher (*Limnodromus scolopaceus*).

Though the importance of Tolay Lake as habitat for invertebrates would benefit from a more in-depth investigation, it is reasonable to conclude that the seasonal drawdown of the lake likely reduces macro-invertebrate diversity. Insect hatches are likely in spring and early summer, providing important forage resources for bats, swallows, and other insectivores. The lake provides suitable breeding habitat in most years for western toads and Sierran tree frogs, and California red-legged frog in protected areas when waters remain into early summer (LSA Associates, 2009). Although American bullfrogs utilize the lake for forage and cover, potential for breeding may be limited due to the depth and seasonal drawdown.

Following selection of the preferred lake restoration design, Regional Parks will coordinate with the appropriate resource agencies to verify appropriate species-specific goals.

## Opportunities and Constraints

The following is a partial list of opportunities related to restoring the lake.

- The static water line of the lake could be adjusted carefully, which would allow for more predictable, sustainable, and maintainable operations.
- Several flow constrictions could be removed or improved such as: the culvert at the causeway, the culvert at the horseshoe, and the channel cross section at the farm bridge. This would decrease the frequency, duration, and extent of flooding of the upstream adjacent properties.
- The drainage channels in the adjacent upland could be filled, which would restore the wet meadow habitat adjacent to the lake and direct more surface water runoff into the upper and lower section of the lake.
- The drainage channels within the lake can be removed, which would improve wetland habitat by reducing the extent of the summer draw down of the ground water table.
- The elevations along the property boundaries of the adjacent upstream properties include areas that are at the current static water line of the lake, which is 215 feet. If the lake water elevation was raised, then the lake would extend onto the upstream properties.
- The existing wetland habitat within the lake is under the jurisdiction of the US Army Corps and cannot be filled or impacted without permits. Impacts to jurisdictional wetlands in most cases require compensatory mitigation.
- The County has made an agreement with the Native American community to avoid significant excavation within the lake to prevent damage and/or disturbance of archeological artifacts within and adjacent to the lake.
- It is unlikely that there is enough surface water runoff from the watershed to support a significant increase in the area and surface volume storage of the lake.
- The existing wetland habitat requires consistent surface saturation or shallow inundation.
- The project should not increase the frequency, duration, and extent of flooding of the upstream adjacent properties without permission from the adjacent landowners.
- Any increase in flooding extent would also require an exception/exemption from the relevant regulatory agencies (i.e., Army Corps of Engineers, the County of Sonoma) in addition to private property owners.

## Lake Restoration Alternatives

Over the past several years, Regional Parks has considered several approaches to lake restoration based on the concept that a large lake would be beneficial to park visitors by providing recreational opportunities like boating, kayaking, or swimming, in addition to providing valuable habitat for wildlife.

One alternative was a lake configuration with a capacity of 2,550 acre-feet, which represented the maximum size based on downstream topography and the potential to raise the outlet elevation significantly. A second alternative was a smaller lake configuration with a capacity of 1,100 acre-feet, which from hydrologic studies appeared to fit within the hydraulic region of the current lakebed. Both alternatives were rejected because of insufficient water available to substantially increase the size of the lake from its current size and the infeasibility of creating a significant amount of area with perennial hydrology.

Original lake restoration concepts required a Water Right from the State Water Resource Control Board. An existing water right application (started by the previous landowner, the Cardoza's) was amended in 2006 by Regional Parks for a lake with 1,100 acre-feet of capacity for a conceptual restoration plan that called for a downstream dam to collect and store stream water. As a result of additional lake, biotic, and aquatic studies and the process of developing the restoration plan, the Master Plan staff developed a better understanding of the lake's natural systems. The final lake restoration design includes minimally built structures (new culverts for the causeway) and mostly relies on natural systems. The State Water Resources Control Board reviewed current lake restoration



design concepts and determined that Tolay Lake Alt #1 Conceptual Restoration Plan would not require a State Water Resources Control Board approved Water Right.

As part of this master planning process, Regional Parks considered five restoration alternatives with reduced surface areas and lake capacities. Under all alternatives habitat restoration would occur in the multiple drainage ditches that were constructed to drain the lake to facilitate agricultural use of the lakebed. Figure 5-6 depicts the drainage ditches and proposed habitat restoration actions. The five restoration design alternatives for the lake include the following:

- Alternative 1 – Lake Outlet at Elevation 215 feet;
- Alternative 2 – Lake Outlet at Elevation 218 feet without a Back-berm;
- Alternative 3 – Lake Outlet at Elevation 218 feet with a Back-berm;
- Alternative 4 – Mid-berm Alternative;
- Alternative 5 – Lake Outlet at Elevation 215 feet with Enhanced Southeast Basin.

Table 5-2 shows the estimated lake size and storage volume for each of the alternatives.

| Table 5-2 Size and Storage Volume for Each of the Restoration Alternatives |                   |                            |
|--|-------------------|----------------------------|
| Alternative  | Size (acres)      | Storage Volume (acre-feet) |
| Alternative 1  | 71.1              | 97.7                       |
| Alternative 2  | 171               | 439                        |
| Alternative 3  | 150 <sup>1</sup>  | 350 <sup>1</sup>           |
| Alternative 4  | 93.3 <sup>1</sup> | 115.5 <sup>1</sup>         |
| Alternative 5  | 93.3              | 115.5                      |

<sup>1</sup> Approximate measurement

Of these alternatives, Regional Parks chose Alternative 1, Alternative 2, and Alternative 5 for a water supply analysis to determine which alternative would be most feasible (see Appendix G, “Technical Memorandum – Water Budget Analysis, Tolay Lake Restoration Alternatives”; WRA, November 11, 2014). Regional Parks determined that Alternatives 3 and 4 were not feasible for several reasons, including the need for complex water control structures. These alternatives were not evaluated further. From Alternatives 1, 2, and 5, Regional Parks staff chose Alternative 1 as the preferred option. Alternative 1 is discussed in greater detail below, and shown in Figure 5-1 and Figure 5-2.

**ALTERNATIVE 1 – LAKE OUTLET AT ELEVATION 215 FEET.**

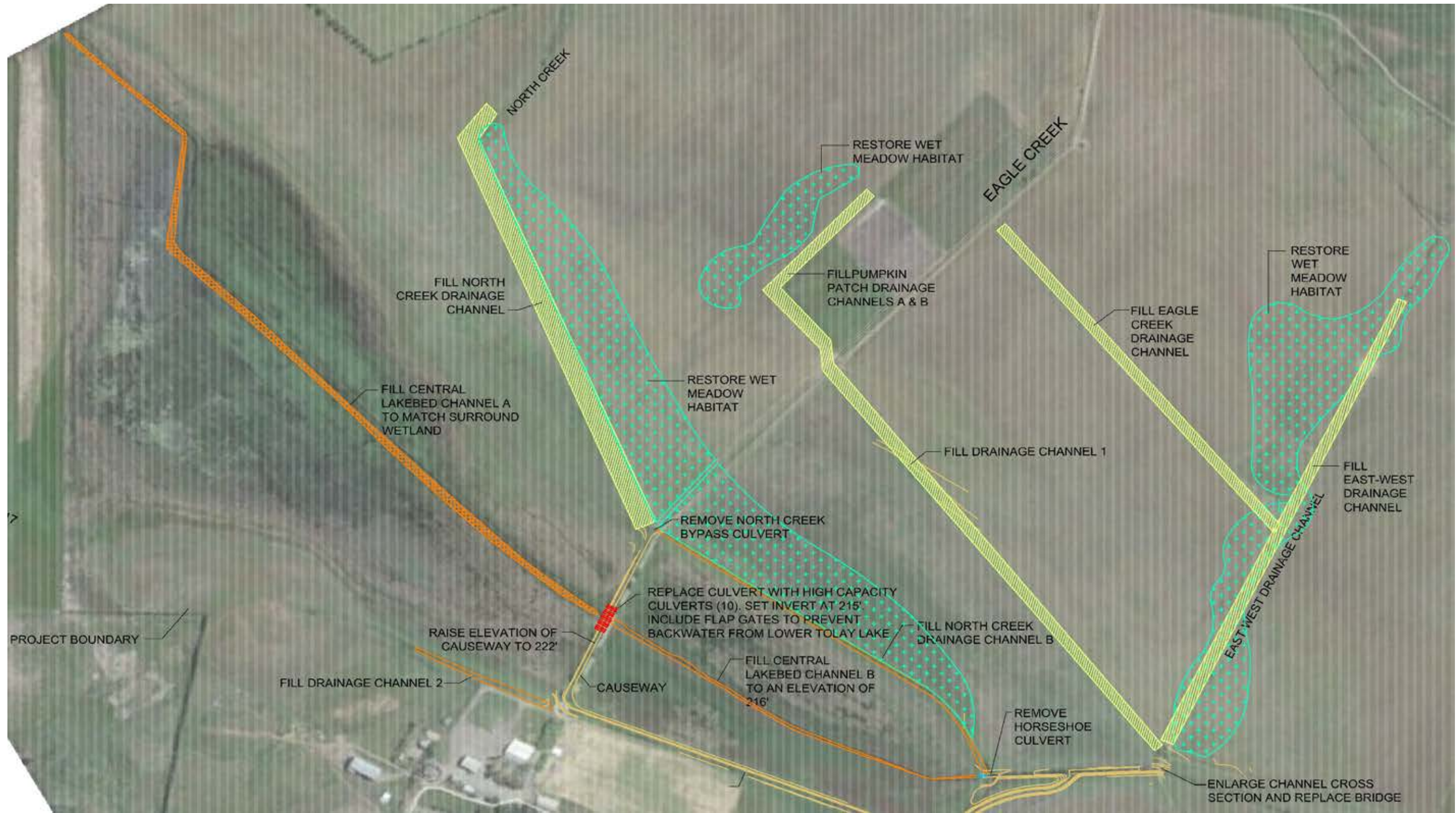
Alternative 1, as shown in Figure 5-7, was evaluated because previous analysis indicated that this wetland size is in balance with the available water from the watershed and this alternative would not increase flooding on the adjacent upstream properties.

This alternative would maintain the elevation of the lake outlet at 215 feet for both the northwestern and southeastern segments of the lake. It would include reducing the frequency and duration of flooding by increasing the flow capacity of the causeway culvert, eliminating the horseshoe culvert, and increasing the cross-sectional area at the farm bridge. This alternative would establish a stable water elevation and reduce flooding. This alternative would have a maximum lake size and storage volume of 71.1 acres and 97.7 acre-feet, respectively.

Based on the results of the water budget analysis and hydrologic and environmental considerations, Regional Parks has determined that “Lake Outlet at Elevation 215 feet” (Alternative 1) provides the best approach to restoration of Tolay Lake. This alternative provides the greatest diversity of habitat and is based on natural hydrological systems. Alternative 1 also protects cultural resources in the lake bed and is the most cost effective. See Figure 5-8.

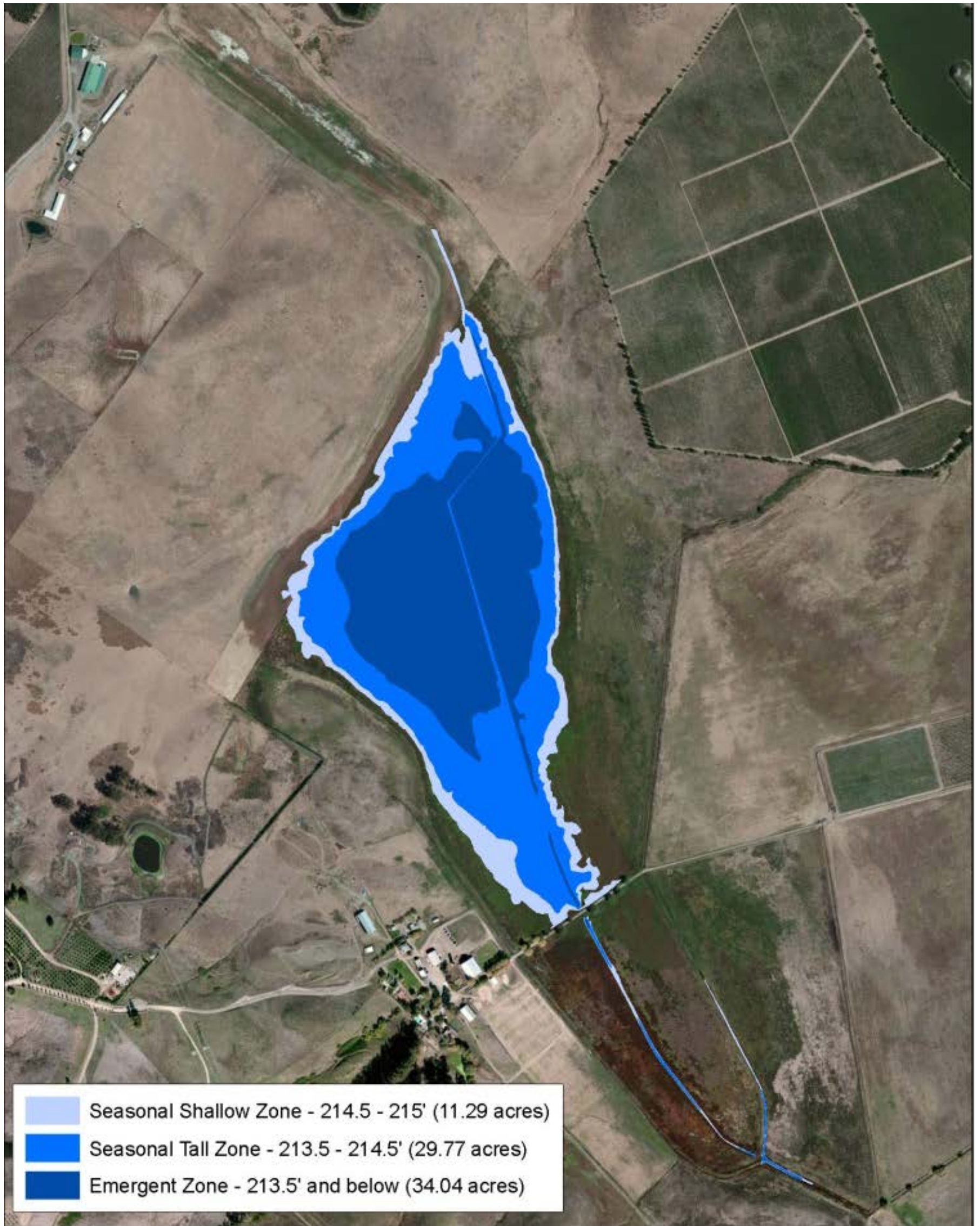
| Table 5-3 Specifications for the Preferred Lake Restoration Alternative |                            |              |                                  |  |  |
|---|----------------------------|--------------|----------------------------------|--|--|
| Restoration Alternative   | Storage Volume (acre-feet) | Area (acres) | Percent Year with Inundation (%) | Potential Adverse Impact on Existing Habitat | Potential Insufficient Hydrology on Proposed New Habitat |
| Lake Outlet at Elevation 215'   | 97.7                       | 71.1         |                                  |  |  |
| Shallow Seasonal Wetland  |                            | 11.3         | 42%                              | None   | None   |
| Deeper Seasonal Wetland   |                            | 29.8         | 100%                             | None   | None   |
| Emergent marsh  |                            | 34.0         | 100%                             | None   | None   |
| Open Water  |                            | None         | N/A                              | N/A  | N/A  |





**Figure 5-6**  
Diversion Ditch  
Restoration

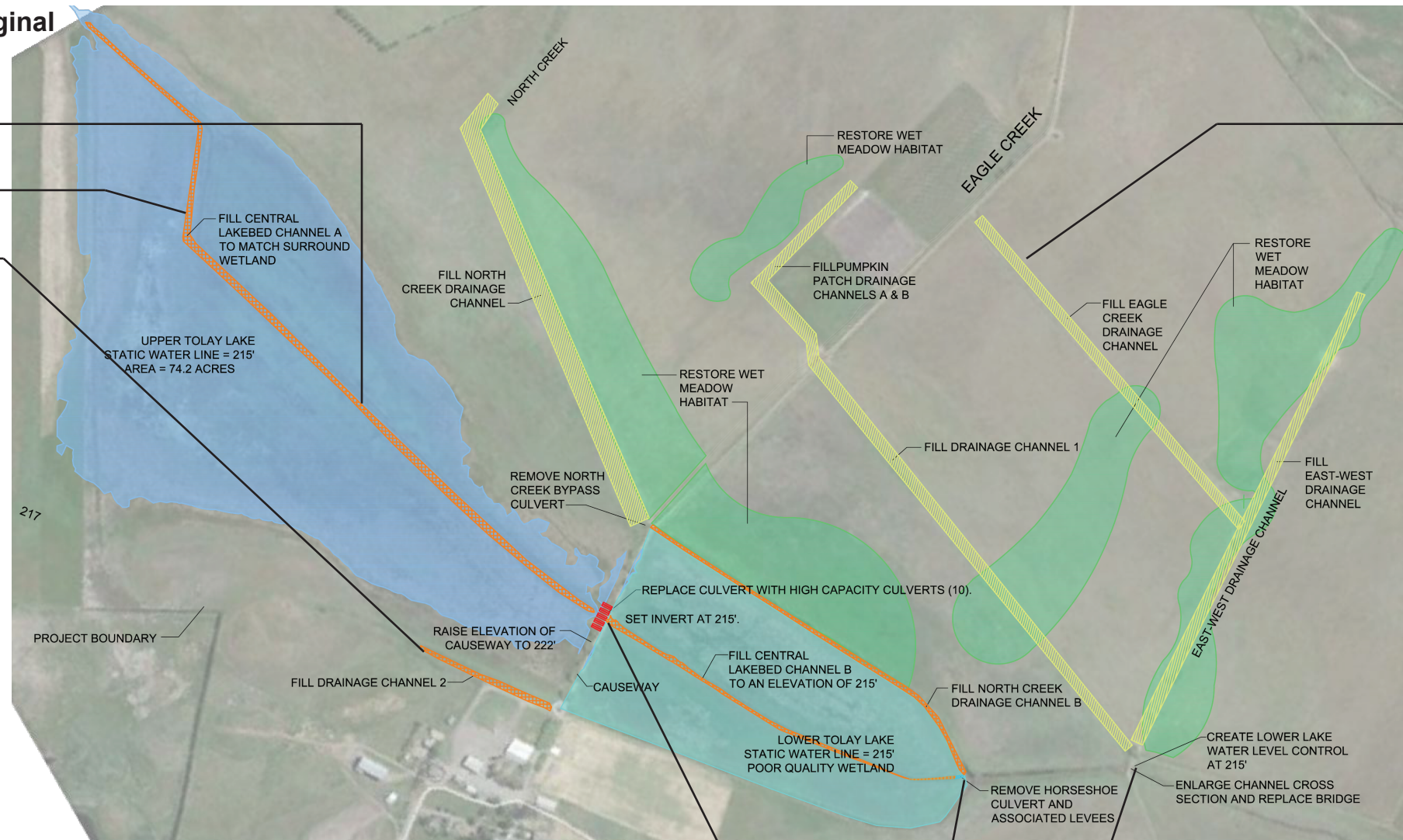






**Restoration Activities to Restore Original Hydrology Within the Lake:**

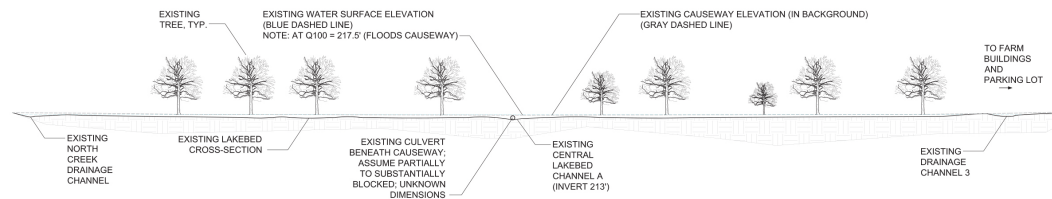
- Fill Central Lakebed Channel B
- Fill Central Lakebed Channel A
- Fill Drainage Channel 2



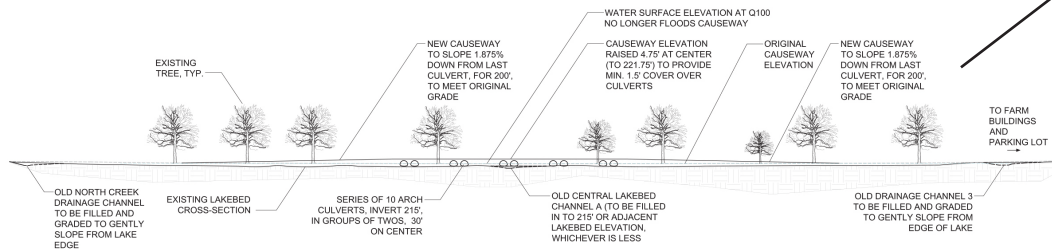
**Restoration Activities to Restore Wet Meadow:**

- Eliminate hillside drainage ditches as listed below, to keep water on-site; wet meadows will form where topography allows:
- Remove North Creek Drainage Channel and Culvert
  - Remove Eagle Creek Drainage Channel
  - Fill the East-West Drainage Channel
  - Fill Pumpkin Patch Drainage Channels A & B
  - Fill Drainage Channel 1

**Restoration Activities to Reduce Flooding of Upstream Properties:**



EXISTING CAUSEWAY CROSS SECTION & ELEVATION  
SCALE: 1" = 60'

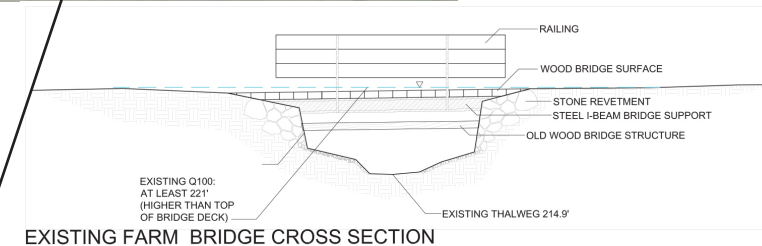


PROPOSED CAUSEWAY CROSS SECTION & ELEVATION  
SCALE: 1" = 60'

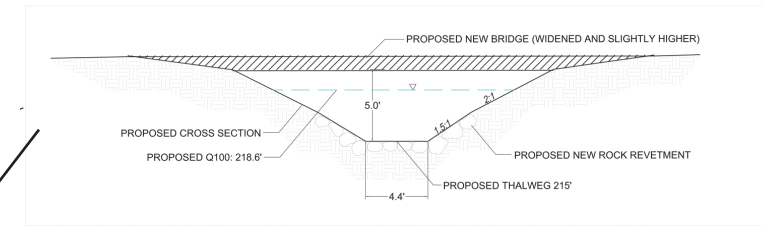
Replace Causeway Culvert (Raise Causeway to 222')

Remove Horseshoe Culvert

Increase outlet cross-sectional area at Farm Bridge



EXISTING FARM BRIDGE CROSS SECTION  
SCALE: 1" = 5'



PROPOSED FARM BRIDGE CROSS SECTION - FOR ALTERNATIVE 1  
SCALE: 1" = 5'



## Implementation and Phasing Strategy

### Project Types

The Park Master Plan has a number of distinct project areas that can be implemented in both the near and long term. Some of these improvements can be completed as stand-alone projects, while others are dependent on other projects or project areas being completed or constructed concurrently. The main project type categories, followed their respective examples, include:

- Trail Network, Camping and Picnic Areas: new trails construction, trail bridges for creek crossings, decommissioning trails, viewpoints, picnic areas and tent camping areas
- Buildings and Utilities: visitor center, wastewater treatment plant, spray irrigation, restrooms, showers, historic buildings (i.e., Creamery/wine storage building)
- Interpretive Features: story zone locations
- Traffic and Circulation Improvements: Cannon Lane improvements, traffic signal additions, parking facilities improvements
- Tribal Projects: cultural gathering area
- Environmental Restoration: Tolay Lake, native grassland, and riparian/wetland restoration

Various design requirements and permits will be required depending on the specific details of individual projects. Projects will be implemented in close coordination with relevant permitting agencies and in full compliance with permit conditions. Some of the relevant permitting agencies include:

- Army Corps of Engineers
- California Department of Fish and Wildlife
- Regional Water Quality Control Board
- Sonoma County Agricultural & Open Space District
- Sonoma County Permit and Resources Management Department
- Sonoma County Regional Parks
- Sonoma County Transportation and Public Works
- State Historic Preservation Office

### Implementation Phases

Development of any components identified in this Master Plan may be done as one project or in multiple sub-phases, based on numerous factors including but not limited to funding sources and availability, capital improvement plan priorities, available infrastructure, cultural and other environmental constraints, and community volunteerism and support. Table 5-4 summarizes the actions that will be implemented over the life of the Master Plan. The following sections identify some of the more significant phasing and priority considerations for some of the Master Plan components.

#### PHASING AND PRIORITY SETTING

Development of any project identified in the Master Plan is prioritized depending on whether these actions are dependent on the implementation of previous actions. For example, the wastewater plant needs to be in place before overnight facilities (including additional restrooms) at Tolay Lake are added. The Master Plan also prioritizes each project based on available funding, anticipated duration of the project, and permitting requirements.

#### POTENTIAL FUNDING SOURCES

Funding for projects in the Tolay Lake Regional Park will come from a variety of sources, including, but not limited to: donations of time and services, park in-lieu fees, development impact



fees, state-wide bond initiatives (e.g. Proposition 84), local bond measures, federal grants, and state grants. Preliminary statements of construction and maintenance costs for individual projects should be prepared to assist Regional Parks with priority setting.

Potential grant funds and state-wide bond initiatives are summarized below.

*The Foundation for Youth Investment* received a \$10.7 million grant in 2013 from the PG&E Stewardship Council. The Foundation will use these grant funds to provide greater resources to connect children, youth, and young adults in the PG&E service territory to nature, parks, open spaces, and the outdoors, and will particularly serve the needs of underserved youth.

*The Ford Foundation* makes grants in the categories of project planning and support; general support; and endowments. The Foundation receives about 40,000 proposals and makes about 1,400 grants. Requests range from a few thousand to millions of dollars.

*The National Trust for Historic Preservation* offers limited grants from their National Trust Preservation Funds program to encourage preservation at the local level by providing seed money for preservation projects. These grants help stimulate public discussion, enable local groups to gain the technical expertise needed for particular projects, introduce the public to preservation concepts and techniques, and encourage financial participation by the private sector. The National Trust is particularly interested in projects that relate to building sustainable communities, reimagining historic sites, promoting diversity and place, and protecting historic places on public lands. Grants generally start at \$2,500 and range up to \$5,000, though larger grants may be available. The application deadlines are February 1, June 1, and October 1.

*The San Francisco Foundation's Environment Program* seeks to improve the environmental health and well-being of the Bay Area's most vulnerable and impacted communities while protecting and preserving the region's natural environment. It supports organizations that shape policies and regulations at the local, regional, and state level to maximize equity, environmental justice, and environmental health outcomes for all communities and looks for opportunities to leverage funds and projects through public private partnerships and donor aligned giving.

*The Land and Water Conservation Fund* program (administered nationally by the National Park Service and California State Parks at the state level) provides matching funds to the states for statewide planning, and for acquiring and developing outdoor recreation areas and facilities. Priority development projects include trails, campgrounds, picnic areas, natural areas and cultural areas for recreational use. The National Park Service is currently reviewing California State Park's Statewide Comprehensive Outdoor Recreation Plan. The new Application Guide for local and state agencies will be available soon. The 2015 Statewide Comprehensive Outdoor Recreation Plan (SCORP) is being reviewed by the National Park Service. Upon SCORP approval, State Park's Office of Grants and Local Assistance (OGLA) will post a new draft Application Guide here. OGLA anticipates that the next application cycle due date for local agencies will be February 3, 2016. Land and Water Conservation Funds were used to purchase the Tolay Lake property.

*Proposition 40.* The State's Wildlife Conservation Board's website shows a remaining balance of \$89,000,000 for "Threatened Species, Wildlife Corridors & Landscapes, Public Access, and Land Management." The Board has received and is currently evaluating a substantial number of new projects to be funded with the remainder of these funds and will continue to accept and consider new project proposals until all funds are exhausted.

*Proposition 50.* Proposition 50 made \$940 million available to the Wildlife Conservation Board (WCB) for habitat protection (e.g. fee and conservation easements), restoration, and enhancement. The WCB's website shows a remaining balance of \$23,261,963 for the San Francisco Bay Area and notes that these funds are continuously appropriated. The website also states that the Board has received and is currently evaluating a substantial number of new projects to be funded with the remainder

of these funds, and will continue to accept and consider new project proposals until all funds are exhausted.

*Proposition 84.* The program focuses on safe drinking water and water quality and includes multiple programs, one of which is oriented towards projects that facilitate public access. The Nature Education Facilities Program provides funds to institutions that combine the study of natural science with preservation, demonstration and education programs that serve diverse populations, institutions that provide collections and programs related to the relationship of Native American cultures to the environment, and institutions for marine wildlife conservation research.

| Table 5-4 Tolay Lake Master Plan Phasing |                           |  |
|--|---------------------------|--|
| Phase                                    | Type of Project           | Project Name   |
| Phase 1<br>First 5 Years                 | Trails/Camping/Picnic     | TCR Entry to West Ridge (Multi-Use Trail)                                    |
|  |                           | Bridge #1 (Vehicle Bridge)   |
|  |                           | South Springs (Service Road)   |
|  |                           | Lake Vista (Story Zone 2)  |
|  |                           | Burrowing Owl (Multi-Use Trail)  |
|  |                           | Fish Pond (Multi-Use Trail)  |
|  |                           | Equestrian to Park Center (Multi-Use Trail)                                  |
|  |                           | Oak Knoll (Hiking Trail)   |
|  |                           | West Ridge Interpret (Hiking Trail)  |
|  |                           | South Creek (Multi-Use Trail)  |
|  |                           | Ghost Rock (Hiking Trail)  |
|  |                           | Picnic Tables and Benches  |
|  | Buildings and Utilities   | New Equipment Shed (Conceptual Site Plan Item C)                             |
|  |                           | Screen Plantings (Conceptual Site Plan Item D)                               |
|  |                           | Old Dairy Barn – Partial Preserve (Conceptual Site Plan #7)                  |
|  |                           | Park Center Landscape and Culinary Garden (Conceptual Site Plan #19, Item Q) |
|  |                           | Well and Water System  |
|  | Traffic and Circulation   | Maintain existing conditions for opening                                     |
|  |                           | Equestrian Parking (Conceptual Site Plan Item Z)                             |
|  |                           | Overflow Parking (Conceptual Site Plan Item H)                               |
|  |                           | Park Center Service Yard Road  |
|  |                           | Equestrian Entry Road and Viewpoint (gravel) (Conceptual Site Plan Item B)   |
|  |                           | Cannon Lane Improvements   |
|  |                           | Pave Park Center Entry Road (Conceptual Site Plan Item F)                    |
|  | Interpretive Features     | Park Center at Open  |
|  |                           | Lake Vista (Story Zone 2)  |
|  | Environmental Restoration | Various wetland restoration areas  |



| Table 5-4 Tolay Lake Master Plan Phasing                                   |   |  |
|--|---|--|
| Phase  | Type of Project                                       | Project Name                                       |
| Phase 2<br>5-10 years  | Trails/Camping/Picnic                                 | Middle Reach (Hiking Trail)                        |
|  |   | Middle Ridge (Multi-Use Trail)                     |
|  |   | Group Camping Park Center (Hiking Trail)           |
|  |   | Group Camping Park Center (Group Site Facility)    |
|  |   | Historic Lakeville Eastside Link (Multi-Use Trail) |
|  |   | Bridge #4 (Vehicle Bridge)                         |
|  |   | East Ridge Canyon (Multi-Use Trail)                |
|  | Trails/Camping/Picnic<br>(continued)                  | Coyote Camp (Multi-Use Trail)                      |
|  |   | Coyote Camping (Backpacking Individual Sites)      |
|  |   | Camping (Backpacking Individual Sites)             |
|  |   | Tolay Creek West Creek (Hiking Trail)              |
|  |   | Group Picnic (Hiking Trail)                        |
|  |   | Group Picnic (Facilities Park Center)              |
|  |   | Buildings and Utilities                            |
| Additional Overflow Parking (Conceptual Site Plan Item H)                  |   |  |
| Sales/Group Picnic Shelter (Conceptual Site Plan Item S)                   |   |  |
| Park Office (Conceptual Site Plan Item #5, Item N)                         |   |  |
| Vera/Green House Demolition (Conceptual Site Plan #4)                      |   |  |
| New Ranger Residence (Conceptual Site Plan Item T)                         |   |  |
| John Sr. House – Ranch Manager Residence (Conceptual Site Plan #3, Item E) |   |  |
| Traffic and Circulation  | South Entry Road – A/C Pave                           |  |
|  | South Parking Lot                                     |  |
|  | South Intersection Signal                             |  |
| Interpretive Features  | Comprehensive Plan                                    |  |
|  | Entry Road Vista                                      |  |
|  | East Ridge View Point (Story Zone 6)                  |  |
|  | Oak Woodland (Story Zone 5)                           |  |
|  | Park Center Interpretive Programs (Story Zone 1)      |  |
|  | Ghost Rock  |  |
|  | Agriculture (Story Zone 4)                            |  |
|  | Petaluma Marsh (Story Zone 3)                         |  |
| South Entrance   |   |  |
| Environmental Restoration  | Lake Restoration (Conceptual Site Plan Item W)        |  |
| FIGR Projects  | Cultural Gathering Area (Conceptual Site Plan Item A) |  |

| Table 5-4 Tolay Lake Master Plan Phasing                       |  |   |
|--|--|---|
| Phase  | Type of Project                                | Project Name  |
| Phase 3<br>10-20 Years   | Trails/Camping/Picnic                          | East Ridge Canyon (Hiking Trail)  |
|  |  | Bridge #2 – Near Mengel Road (Trail Bridge)                                   |
|  |  | Bridge #3 – Replacement (Trail Bridge)  |
|  |  | Meadow (Multi-Use Trail)  |
|  |  | Middle Reach Connect (Multi-Use Trail)  |
|  |  | Top of Slope (Hiking Trail)   |
|  |  | Group Camping Ponds   |
| Phase 3<br>10-20 Years (continued)                             | Buildings and Utilities                        | Waste Water Facility (Conceptual Site Plan Item Y, includes spray irrigation) |
|  |  | Visitor Center with Restroom (Conceptual Site Plan Item K & V)                |
|  |  | Boardwalk (Conceptual Site Plan Item AA)                                      |
|  |  | Visitor Center Parking and Stormwater/Drainage for Parking                    |
|  | Interpretive Features                          | Outdoor Class Stage (Conceptual Site Plan Item BB)                            |
|  |  | Central Ponds (Story Zone 7)  |
|  |  | Middle Reach(Story Zone 8)  |
| Environmental Restoration                                      | Historical Route (Story Zone 9)                |   |
|  | Tolay Creek (Story Zone 10)                    |   |
|  | Bayview Point (Story Zone 11)                  |   |
|  | Portable Interpretation Display                |   |
|  | Lake Restoration (Conceptual Site Plan Item W) |   |
| Phase 4<br>20-35 Years   | Trails/Camping/Picnic                          | Parkwide Assessment of Additional Trail Needs                                 |
|  |  | One Tree Knoll (Hiking Trail)   |
|  |  | Tolay Creek South (Hiking Trail)  |
|  |  | Middle Ridge Connect (Hiking Trail)   |
|  | Buildings and Utilities                        | Hay Barn/Stone Floor Barn – preserve (Conceptual Site Plan #6, Item L)        |
|  |  | Animal Pen (Conceptual Site Plan Item I)                                      |
|  |  | Temporary Residence/Artist Residence (Conceptual Site Plan #1, Item R)        |
|  |  | Kitchen and Dining (Conceptual Site Plan #9, Item X)                          |
|  |  | New Bunk House (Conceptual Site Plan Item M)                                  |
|  |  | Showers (Conceptual Site Plan Item U)   |
|  |  | Restroom (Conceptual Site Plan Item V, with Item U)                           |
|  |  | Creamery – preserve (Conceptual Site Plan #8, Item L)                         |
|  |  | Old shop – preserve (Conceptual Site Plan #12, Item P)                        |
|  |  | Equipment shed – preserve (Conceptual Site Plan #14, Item P)                  |
|  |  | Slaughter house – preserve (Conceptual Site Plan #15, Item L)                 |
| Bunkhouse – preserve (Conceptual Site Plan #2, Item L)         |  |   |
| Ranch Manager Residence (Conceptual Site Plan Item #3, Item E) |  |   |

Source: Tolay Lake Regional Park and MIG (2015)





# Resource Management Plan







Photo credit: Regional Parks staff



# RESOURCE MANAGEMENT PLAN

## Introduction

### Overview and Purpose

The purpose of the Resource Management Plan (RMP) is to guide conservation of natural and cultural resources in consideration of Park development, operation, and maintenance (O&M) actions. The RMP is based on the preferred conceptual site plan (Chapter 5), the Biological Resources Report (Appendix I), supporting technical studies (Appendices J – M), the Park’s various conservation easements (Appendices N – P), and interviews with Regional Parks staff, Land Trust staff, and the Tribe. The RMP contains five sections:

1. Introduction and broad goals for natural and cultural resource management;
2. Existing conditions and management practices;
3. Natural and cultural resource management objectives, guidelines, and standards;
4. A summary of proposed habitat improvements; and
5. Adaptive management and monitoring requirements.

### Management Goals

The goals of resource management within Tolay Lake Regional Park are to ensure the continued protection of natural and cultural resources and to enhance natural habitats and resources through restoration, preservation of native biodiversity, and protection of ecological processes. Implementing the resource management plan’s goals while providing for educational opportunities, public recreation, preservation of prehistoric, cultural, and historical values, and maintaining the site’s agricultural legacy poses significant challenges for park staff. Therefore, this management plan seeks to provide guidance for natural resource enhancement and restoration; avoidance and minimization standards for both project based activities as well as operations and maintenance of the park; detail monitoring and management activities to measure potential project-based and operations activities; and adaptive management techniques to ensure the mission is met.

The following objectives, guidelines, and standards are designed to meet the goals of the resource management plan. Objectives specific to each habitat type, special-status species, invasive species management, erosion and grazing management, native habitat enhancement and restoration, cultural resource protection, as well as buffering potential effects of climate change are outlined in this chapter. Guidelines and standards have been developed to clearly define actions and metrics to acknowledge if stated objectives are being met.

Guidelines are widely accepted natural resource management practices that should be followed where and when feasible. Standards are widely accepted natural resource management actions that should be followed more strictly than guidelines.

### Support Studies and Methodology

Several natural and cultural resource studies have been conducted within and in the general vicinity of the Park that form the foundation of this document. In addition to the numerous scientific, regulatory, and policy literature reviewed, the following studies were essential in developing this plan:

- *A Cultural Resources Study for the Tolay Lake Regional Park Project* (LSA 2008) Confidential
- *Rangeland Resources Study: Tolay Lake Regional Park* (LSA 2009a)
- *Tolay Creek Ranch Grazing Plan* (Bush 2010)
- *Biological Resources Study: Tolay Lake Regional Park* (LSA 2009b)



- *Biological Resources Study: Tolay Creek Ranch* (LSA 2009c)
- *Biological Resources Report: Tolay Lake Regional Park* (WRA 2013)
- *Feasibility Analysis for the Restoration of Tolay Lake* (Ducks Unlimited 2005)
- *Hydrologic Feasibility Analysis for The Tolay Lake Ranch Property* (Kamman 2003)
- *Technical Memorandum: Tolay Lake Restoration Alternatives* (WRA 2014)

## Existing Conditions

### Setting and Location

The Park is in the southern extent of the Sonoma Mountains, between Petaluma Valley/Marsh and Sonoma Valley. Stage Gulch Road/Highway 116 is located to the north, Lakeville Highway to the west, Arnold Drive/Highway 121 to the east, and Highway 37 to the south. The cities of Petaluma, Sonoma, and Novato are approximately five miles northwest, northeast, and southwest, respectively (Figure 1-1). The Park resides almost entirely within the Tolay Creek Watershed, with the exception of the western ridge west-face that is part of the Petaluma River Watershed. The headwaters of Tolay Creek emerge north of the Park boundary, very near Highway 116 (Stage Gulch Road).

The Park is composed of several parcels, with the northern portion currently open to permit holders under the approved Interim Plan as Tolay Lake Regional Park, and the southern portion (Tolay Creek Ranch) purchased by The Land Trust and transferred to Regional Parks in 2017 (see Figure 1-2).

Additionally, The Land Trust holds an easement on the undeveloped portion of the adjacent property to enhance the banks and riparian area of lower Tolay Creek. Public access to the Park is from Cannon Lane off Lakeville Highway in the northwest, with secondary and private access from Highway 121 in the south. The Park Complex (park office, visitor parking, historic ranch, etc.) is located at the former Cardoza residence in the northern portion of the Park (Figure 1-3).

The Sonoma Mountains are the southerly-most subset of ridgelines of the greater Mayacama Mountains, with Cougar Mountain being the most southern feature. To the west and east reside Petaluma and Sonoma-Napa marshes respectively. To the south is Cougar Mountain and beyond that, the tidal marshes and (formerly) diked baylands of Sears Point, which connect the Petaluma River estuary with that of Sonoma Creek. In its upper reach Tolay Creek is a freshwater perennial stream which flows southeastward onto the vast tidal plain of the Sonoma-Napa Marsh.

The Park and environs serve as a habitat core and provide several linkages, including from Cougar Mountain to Sonoma Mountain and onward north to the remainder of the Mayacama Mountains, and between the Petaluma and Sonoma-Napa marshes on an east-west plain (Merenlander et al. 2010). The Park, is within the Marin Coast to Blue Ridge Critical Linkage, which is inclusive of the Sonoma Valley Wildlife Corridor (BAOSC 2015, SLT 2014).

The seasonal wetlands particularly Tolay Lake, stock ponds, and streams provide important resting and foraging habitat for waterfowl on their north-south migratory patterns, providing critical functions between the Petaluma and Sonoma-Napa marshes. Being situated at the southern extent of the Mayacama Mountains, the Park and Cougar Mountain potentially provide a refuge for the region's peripheral plant populations where gene flow is increasingly limited and genetic variation is lower than core populations, and generally at a greater risk for extinction (Leppig and White 2006).



Photo credit: Regional Parks staff

### Land Use and Infrastructure

Historically the Tolay Creek Watershed was the territory of the Alaguali a Coast Miwok Native American Tribe. They lived, hunted, and gathered resources to sustain life, and the lake valley was a place of spiritual reverence and ceremony. European settlement of the valley caused the displacement and loss of native life-ways and land use shifted to ranching, farming, and rural residences. A variety of agricultural activities have occurred in Tolay Creek Watershed including grazing, and cropping included: potatoes, grapes, hay, and pumpkins (Thompson 1877, LSA 2008).

The dominant natural feature within Tolay Creek Watershed is Tolay Lake, a naturally occurring shallow water body, which when unaltered, flooded up in the wet season, followed by a draw down in spring and early summer. Presumably, the lake ponded water due to being situated on heavy clay soils (Clear Lake clay soil series) with very slow permeability combined with a natural earthen dam that prevented rapid outflow. It is likely that the lake experienced pronounced inter-annual variation during the wet season, with dryer years exposing the lakebed from complete draw down, while wetter years witnessed inundated conditions through the summer.

To increase arable land, Tolay Lake was drained by removal of the natural earthen dam and drainage ditches dug to reroute surface flows. Stock ponds have been constructed to capture water for summer irrigation and flood control within the Tolay Creek Watershed inadvertently creating wildlife habitat. The current Park Complex is a collection of former Cardoza family residences and farm buildings located in the northern portion of the Park. Several ranch roads traverse the Park, with Cannon Lane-Mangel Ranch Road running from Lakeville Highway to Highway 121 alongside the majority of Tolay Creek. Overhead power lines and associated access roads run the length of the northern section of West Ridge. The Park continues historic agricultural practices utilizing cattle grazing and no-till, row crop agriculture near the Park Complex.

### Climate and Watershed

The Park is within a mildly seasonal Mediterranean climate, with warm-hot dry summers and cool wet winters. The average annual maximum temperatures for Petaluma and Sonoma are 70.4 degrees and 73.7 degrees Fahrenheit, respectively while the average annual minimum temperature is 44.9 degrees Fahrenheit. For both Petaluma and Sonoma, the warmest months are June through September, while the coolest months are December through February (WRCC 2014).

Predominantly, precipitation falls as rainfall with an annual average of 24.93 inches. Precipitation bearing weather systems are predominantly from the west and south with the majority of rain falls between November and March, with a combined average of 20.94 inches (WRCC 2014). Fog is common in the Park, with late spring and summer westerly / southerly advection fog arising from the Pacific Ocean flowing over the Marin Hills and north across San Pablo Bay in early evening and typically receding by midday. Low-lying fall and winter convection fog is common, particularly with the presence of the lake. Very rarely winter precipitation falls as snow, but typically is less than one inch and does not regularly remain for a period greater than 24 hours.



Photo credit: Regional Parks staff



## Geology and Soils

The geology within the vicinity of the Park consists of several geologic formations, faults, landslides, and contact zones (CDC 2002a, CDC 2002a). Several faults are present throughout the Park, with the Lakeville, Roche-Cardoza, and Rogers Creek faults being the most prominent. The Lakeville and Rogers Creek faults run the length of the West Ridge and East Ridge, respectively, each periodically entering the Park. The Roche-Cardoza fault breaks from the Rogers Creek Fault, entering the southern portion of the Park (Koenig 1963, CDC 2002a, CDC 2002b).

The northern park area including the lake bed, is underlain primarily by Holocene basin deposits composed of fine-grained alluvium. The central-eastern area is underlain primarily by the Donnell Ranch Volcanics composed of basalt and basaltic andesite, breccia, scoria, and rhyolite flows and tuffs. The southeastern park area is underlain primarily by the Petaluma Formation composed of predominantly of lacustrine and fluvial deposits of siltstone, sandstone, shale, conglomerate, with minor inclusions of silicified tuff, chert, and limestone. The southwestern area is underlain primarily by Jurassic period serpentinized ultramafic rock. The central-west and northwestern park area is underlain primarily by the Franciscan complex composed of sandstone, altered mafic volcanics, chert, gabbro, and schist and semischist (CDC 2002a, CDC 2002b).

The regional complex geology contributes to the formation of a diversity of soil structures, textures, chemistry, and depths contributing to the often pronounced and diverse vegetation communities within the Park. The Soil Survey of Sonoma County (USDA 1977) indicates the presence of 13 soil mapping units composed of seven soil series, and Table 6-1 summarizes the soil mapping units and relevant characteristics. Figure 6-1 depicts the distribution of soil types within the planning area boundaries. The predominant soil types are Clear Lake Clay Loam, 0-2 percent slopes, and Diablo Clay, 15 to 30 percent slopes.

Generally, clay-rich soils with low slope gradients (e.g. Clear Lake clay loam) have a much higher potential to support wetland habitat than well drained, coarser textured soils, particularly on higher gradient slopes (e.g., Laniger loam). However, seep wetlands are frequently associated with a diversity of soil textures on high gradient slopes where shallow lithic contact and/or rock outcrops are present.

Vegetation communities and plant species are often closely associated with the physical characteristics of soils including parent material (i.e., serpentinite), soil chemistry (i.e., alkaline), and soil texture (i.e., clay). Therefore, the complex geology and diversity of soil types within the Park, along with microclimate conditions are directly correlated with the potential for the presence of special-status plant species and sensitive vegetation communities.



Photo credit: Regional Parks staff

Table 6-1 Soil Mapping Units and Characteristics

| Soil Map Unit (map code)       | Slope Class | Hydric (Sonoma County) | Parent Material & Chemistry                               | Drainage, Runoff, & Permeability  | Ecological Notes  |
|--------------------------------|-------------|------------------------|---|---|---|
| Clear Lake clay loam (CcA)     | 0-2%        | Yes                    | Alluvium, sandstone & shale; Moderately alkaline (pH 8.0) | Poorly drained; Negligible to high runoff; Slow to very slow permeability | May support clay associated rare plants; High potential to support wetlands (clays, shrink-swell); Native grasses and forbs, non-native annual grasses; Low erosion potential (neutral slopes); |
| Diablo clay (DbC)              | 2-9%        | Yes                    |   |   | May support clay associated rare plants;  |
| Diablo clay (DbD)              | 9-15%       |                        | Residuum, sedimentary rock;                               | Well drained; Slow runoff (dry), medium to rapid (wet);                   | May support wetlands (clay-rich and shrink-swell); Annual grasses and forbs;  |
| Diablo clay (DbE)              | 15-30%      | No                     | Moderately alkaline (pH 8.0)                              | Slow permeability   | Moderate-high erosion potential (slopes)  |
| Diablo clay, eroded (DbF2)     | 30-50%      |                        |   |   |   |
| Goulding cobbly clay loam      | 5-15%       | No                     | Residuum, tuff breccia, basalt, andesite;                 | Well-somewhat excessively drained;  | May support volcanic associated rare plants; May support seep wetlands;   |
| Goulding-Toomes complex (GoF)  | 9-50%       | No                     | Slightly acid (pH 6.0)                                    | Medium-rapid runoff; Moderate permeability                                | Oaks, scrub, grasses and forbs; Moderate-high erosion potential (slopes)  |
| Haire clay loam (HcD)          | 9-15%       | No                     | Alluvium, sedimentary rock; Slightly acid (pH 6.0)        | Moderately well drained; Slow-rapid runoff; Very slow permeability        | May support sandstone associated rare plants; May support seasonal wetlands (low slopes); Annual grasses and forbs; Low-moderate erosion potential  |
| Laniger loam (LaC)             | 5-9%        |                        |   |   | May support volcanic associated rare plants; May support seep wetlands;   |
| Laniger loam (LaD)             | 9-15%       | No                     | Residuum, rhyolite; Medium to slightly (pH 6.0-6.5)       | Well-somewhat excessively drained; Medium-rapid runoff;                   | Oaks, manzanita, ceanothus, and grasses   |
| Laniger loam, eroded (LaE2)    | 15-30%      |                        |   | Moderate-rapid permeability   | Moderate-high erosion potential (slopes)  |
| Montara cobbly clay loam (MoE) | 2-30%       | No                     | Residuum, serpentinite; Moderately alkaline (pH 8.0)      | Well drained; Medium-high runoff; Moderately slow permeability            | May support serpentine associated rare plants; May support seep wetlands; Native grasses and forbs; Low-moderate erosion potential (slopes)   |
| Gullied Land                   | varies      | No                     | mixed   | Well drained  | Unlikely to support rare plants (disturbance); May support swale wetlands and non-wetland waters; Non-native and ruderal plants; High-extreme erosion potential                                 |



## Biological Resources

The following section summarizes Tolay Lake Regional Park documented biological resources. Specific descriptions of the biological communities, special-status species, invasive species, and other management considerations are found in the Biological Resources Report (WRA 2013) (Appendix I).

### NON-SENSITIVE BIOLOGICAL COMMUNITIES

Non-sensitive biological communities are those habitats that are not accorded special protection under CEQA, and other state, federal, and local laws, regulations, and ordinances. However, these communities may provide suitable habitat for some special-status plant or wildlife species and frequently provide buffering for adjacent sensitive biological communities.

Non-sensitive biological communities mapped within the Park include:

- Developed and Disturbed Areas
- Blue Gum and Monterey Cypress Groves
- Non-native Grasslands

### SENSITIVE BIOLOGICAL COMMUNITIES

Sensitive biological communities are defined as those habitats that are given special protection under CEQA and other applicable federal, state, and local laws, regulations and ordinances (Figure 6-2).

Sensitive biological communities mapped within the Park include:

- Non-wetland Waters
- Tolay Lake and Other Wetlands
- Red Willow Riparian Scrub
- Coast Live Oak, Valley Oak, and California Buckeye Woodlands
- Native Grasslands and Wildflower Fields
- Rock Outcrops and Scrubs

### SPECIAL-STATUS PLANT AND WILDLIFE SPECIES

Several surveys for special-status plant and wildlife species, as well as incidental observations of special-status wildlife have occurred in the Park. The following section, titled Natural Resources - Special Status Plants and Wildlife, details those species present or assumed to be present within the Park.

### INVASIVE PLANT AND WILDLIFE SPECIES

Invasive plant species were documented within the Park concurrent with plant surveys and vegetation mapping. These species (Figure 6-3) along with invasive wildlife present or assumed to be present within the Park are detailed in the following section titled Natural Resources - Invasive Wildlife Species and Invasive Plant Species.



Photo credit: Regional Parks staff

## Cultural Resources

The following section summarizes documented cultural resources including: pre-historic archeological resource sites, buildings and structures, circulation, land use, natural systems and features, small-scale features, vegetation, views and vistas, and water features. Specific descriptions of agricultural resources and historical resources are found in Appendix C – Historic Structures Report, and the Cultural Landscape Inventory Report (MIG 2013). The Cultural Landscape Inventory Report is not included in the Appendices due to the sensitive nature of its contents.

### ARCHEOLOGICAL RESOURCES

Archaeological resources pertain to structures, artifacts, and sites associated with the indigenous Coast Miwok Tribe population that previously inhabited the Tolay Creek watershed environs. Federal law prohibits the disclosure of the description and location of sensitive cultural resources, and they are not included in this document.

### AGRICULTURAL RESOURCES

Agricultural resources include features that relate to park grazing and farming operations and may include buildings and structures, circulation, land use, and small-scale features. Some examples from the Cultural Landscape Inventory Report include cattle scales, corrals, and water troughs. Historic documentation of agricultural practices in this area date from 1834–1966). The beginning date corresponds to the first documented agricultural euro-settlement of the area. The end date of the period of significance corresponds to the 50 year cut off for evaluating historical resource that is established by the National Historic Preservation Act (as amended) (MIG 2013).

### HISTORICAL RESOURCES

Historical resources encompass the remaining features not covered under cultural or agricultural resources; for example, dwelling units for the area’s inhabitants from 1834–1966.

## Encumbrances

The following section summarizes the encumbrances documented within and adjacent to the Park. Appendices N – R contains the legal definitions, responsible parties, and the details of the encumbrance.

### ZONING

The zoning designations of the Assessor Parcel Numbers (APN) are:

- LIA60 & LEA 60 APN 068-060-057, 068-070-004, 068-070-005, 068-080-001
- LEA 100 APN 068-060-058, 068-080-007, 068-090-024, 068-090-022

The LEA land use designation stands for ‘Land Extensive Agriculture District’ while LIA stands for ‘Land Intensive Agriculture District.’ Below is a summary of purpose and permitted uses for these districts, as per Sonoma County’s zoning regulations.

#### Land Extensive Agriculture District

- Purpose: To enhance and protect lands best suited for permanent agricultural use and capable of relatively low production per acre of land; and to implement the provisions of the Land Extensive Agriculture land use category of the General Plan and the policies of the Agricultural Resources Element.
- Permitted Uses: Various (e.g. public parks, management of land for watershed, for fish and wildlife habitat, animal husbandry, beekeeping, agriculture, farmworker camps, etc).



## Land Intensive Agriculture District

- Purpose: to enhance and protect lands best suited for permanent agricultural use and capable of relatively high production per acre of land; and to implement the provisions of the land intensive agriculture land use category of the General Plan and the policies of the agricultural resources element.
- Permitted Uses: Various (e.g. public parks, management of land for watershed for fish and wildlife habitat, animal husbandry, beekeeping, agriculture, farmworker camps, minor timberland conversions, small-scale ag. processing etc).

## CONSERVATION EASEMENTS

A Conservation Easement (“CE”) is an agreement recorded with a property deed that restricts uses and activities on a subject property in order to ensure the preservation and protection of identified “Conservation Values” and to prevent any use of the Property that will impair or interfere with those values. The various CEs and a summary description are included here. For CE details refer to Appendices N through P.

### Wildlife Conservation Board Easement (Appendix N)

#### CE 2005144636

- Grantor is the sole owner in fee APN 068-060-057, 068-070-004, and 068-070-005.
- The Property possesses, or will possess in the future, wildlife and habitat values “conservation values” of great importance to Grantee and the people of the State of California;
- The property provides, or will provide, high quality wetland and aquatic habitats in the form of a large seasonal lake that supports diverse biotic life.
- The Department of Fish and Game (now California Department of Fish and Wildlife) has jurisdiction, over the conservation, protection, and management of fish, wildlife, plants and habitat for biologically sustainable populations.
- The Sonoma County Agricultural Preservation Open Space District acquired (and transferred to Regional Parks) the larger Cardoza Ranch property in part with funds provided by the Department of Fish and Wildlife and Wildlife Conservation Board for the purposes of protecting its natural and historic open space values and providing for recreational use compatible with those open space values.
- As a condition of the grant the District has agreed to provide the easement to the California Department of Fish and Wildlife and to prepare a Restoration and Management Plan for Tolay Lake (Plan). To restore the lake to a seasonal, shallow water lake primarily to benefit wildlife.

Purposes – The purposes of the Conservation Easement are to ensure the Property will be retained forever in its natural condition and to prevent any use of the Property that will impair or interfere with the conservation values of the Property; to preserve, restore and enhance native species and their habitats.



Photo credit: Regional Parks staff

Grantee's (District) Rights – To accomplish the purpose of the CE rights are given to the Grantee to ensure that purpose. An example of what is included: enter the property to monitor compliance, prevent activity on the Property that is inconsistent with CE purpose; mineral, air and water rights necessary to sustain biological resources.

Prohibited Uses – Any activity on or use of the Property inconsistent with the purpose of the CE.

#### Sonoma County Agricultural Preservation and Open Space District (Appendix O)

##### Tolay Lake Ranch

Grantor (Regional Parks) grants to the District a CE in the Property in perpetuity. Property as described in Exhibit A of the CE.

Purpose – To conserve, protect, enhance and restore habitat for diverse populations of species, while providing low-intensity public outdoor recreation compatible with the 'Conservation Values' of the Property, and to prevent any uses of the Property that would significantly impair or interfere with these Conservation Values.

Grantee Rights – Rights granted to the District include: the right to identify, preserve and protect the Conservation Values of the Property, the right to inspect the Property for compliance with the CE, and the right to review and approve certain uses and activities.

Prohibited Uses – Prohibits any activity on the Property or use of the Property which is inconsistent with the Conservation Purpose of the CE and includes several specific prohibitions. See CE Exhibit B for Reserved and Restricted Uses of the Property.

Grantor (Regional Parks) Rights – use of the Property for:

- low-intensity, recreational and/or educational purposes, consistent with the "Conservation Purpose"
- habitat enhancement
- fire management (i.e. Prescriptive burning, limited brush removal, grazing consistent with Rangeland Management Plan)
- Plant Collection for cultural interpretive uses so long as it is compatible with the Conservation Purpose of the CE.
- See CE Exhibit B for specific Reserved and Restricted Uses of the Property.

Only allowable commercial uses are:

- Recreational – concessions or short-term special events
- Park Complex/Visitor Center – development of visitor-serving uses within the Park Complex Area (Figure 6-4).
- Agricultural – engage in limited agricultural uses of the Property

#### Sonoma County Agricultural Preservation and Open Space District (Appendix P)

##### Tolay Creek Ranch

Grantor (Land Trust) grants a CE to District in perpetuity (the CE is binding on Parks as a successor land owner)

Grantor, grants to the District a CE in the Property in perpetuity. The Property as described in Exhibit A of the CE.

Purpose – To preserve the open space, scenic, and natural resource values of the Property; and to prevent any uses that will significantly impair or interfere with those values. The Property possesses natural scenic, open space, wildlife and watershed values including:

- Tolay Creek and Watershed
- Habitat for native plant and animal species
- Connectivity – protect viable habitat linkages, conserve contiguous areas of high quality



riparian habitat, and provide connections between natural areas through the county.

- Open Space and Scenic Resources

Grantee Rights – Rights granted to the District include: the right to identify, preserve and protect the Conservation Values of the Property, the right to inspect the Property for compliance with the CE; and the right to review and approve certain uses.

Prohibited Uses - Prohibits any activity on the Property or use of the Property which is inconsistent with the Conservation Purpose of the CE. See CE Exhibit B for specific reserved and Restricted Uses of the Property.

Grantor Rights – use of the Property for:

- Habitat management, restoration and management,
- Management and conservation of natural resources
- Low-intensity outdoor public educational and recreational activities
- Residential uses within a 5-acre Residential Envelope, which placement is subject to District approval
- See CE Exhibit B for specific Reserved and Restricted Uses of the Property.

#### Sonoma Land Trust/Roche Easement (Appendix Q)

The southern portion of the Park known as Tolay Creek Ranch was once formerly a portion of the Roche Ranch. The Tolay Creek Ranch property was sold to the Land Trust (transferred to Regional Parks) and the remaining property became Roche Ranch retained lands. Those remaining lands are now under new ownership and are referenced by the new owners as Tolay Springs.

There are two access easements on these neighboring lands for southern Parks access and public entrance. The easement over neighboring land is for public access, operations and maintenance, and emergency purposes on the parks southern end off of Hwy 121.

The Land Trust retains a riparian easement on Tolay Creek corridor (as defined in the Riparian Easement). The riparian easement will provide for periodic riparian corridor inspection, development of public access for recreational purposes, riparian management, restoration and enhancement, and the construction of livestock exclusionary fencing.

Further, the entire former Roche Ranch Property is under a Land Conservation Contract (Williamson Act), an agreement between the County and property owner to limit the use of the property to agricultural uses in order to discourage the premature and unnecessary conversion of the property from agricultural use. A notice of non-renewal was filed in 2006 initiating the ten-year phase-out of Williamson Act on the Property.

#### WATER AND ACCESS EASEMENT

##### Public Roadway, Parking and Trail Easement Agreement

The owner of the retained lands of Roche Ranch (adjacent southeast park) retain access and signage easement over a portion of the southern property for public access and advertising should the owners construct a winery on the lands.

##### Water Delivery System Easement Agreement

The adjacent property owner retains a water easement granting them the right to use and deliver



Photo credit: Regional Parks staff

a portion of the water from developed springs on Park lands in association with the reservoir and vineyard on their lands.

## RIGHT OF WAYS

### Cannon Lane Easement

Cannon Lane is dedicated as a County road, with a right of way easement for road and utility purposes generally 30 feet wide. Cannon Lane is defined as “that portion of the Parcels commencing at the center line of the Lakeville Road and running northeast for approximately 1.16 miles.” The specifically identified areas at the entrance of Cannon Lane from Lakeville Road will have right-of-way easements greater than 30 feet for road improvements and areas that are needed for drainage maintenance. Described in exhibit B and C in Cannon Lane Easement.

### Cardoza Road Easement

A right-of-way easement for non-routine Parks Operations and Maintenance Staff or emergency vehicle use.

### Right-of-way Across Martinelli and Gilardi (Appendix O)

A right-of-way easement across the lands as described in the easement Exhibit A.

## Existing Resource Management Practices

This section discusses the existing resource management practices and habitat restoration projects

### TOLAY LAKE REGIONAL PARK INTERIM ACCESS & RESOURCE MANAGEMENT PLAN 2008

- East Ridge Area Oak Restoration and Enhancement oak restoration includes caging volunteer oak seedlings for protection from grazing activities.
- Tolay Creek Area general habitat enhancement and restoration includes: caging shrubs and trees, invasive plant eradication, and new native plantings. Please see the restoration section for a description of the general habitat enhancement and restoration program.
- Developed Springs used as watering troughs for livestock will include restoration of fencing the spring source, spring box, and the areas receiving the majority of the spring’s runoff.
- STRAW Restoration Program by the Bay Institute began sponsorship of Students and Teachers Restoring a Watershed (STRAW), an ongoing project to restore and enhance riparian vegetation and habitat. Protect and enhance existing projects on Cardoza Creek and South Creek and collaboratively identify and restore additional wildlife riparian habitat.

### SONOMA LAND TRUST

Sonoma Land Trust has focused significant attention and resources on enhancing and restoring the riparian corridor with the goal of improving the ecological functioning of the system. The enhancement strategy, more completely detailed in the Tolay Creek Riparian Enhancement Plan, is to replicate a natural riparian ecosystem and floodplain riparian oak woodland. When completed, the project will have helped reestablish a diversity of native tree and shrub species in the riparian area, enhancing the native biodiversity, as well as reducing the erosion and sediment inputs to the aquatic and wetland systems.

The Land Trust efforts have focused largely on planting and maintaining native plant species found in the watershed. Since 2009 thousands of native oaks, willows, and other native riparian plants commonly found in riparian zones have been planted along the banks of Tolay Creek and tributaries. The native plantings are irrigated, protected from animal browsing, and protected from exotic weedy species until they are established (for 3-5 years). Wildlife friendly exclusionary fencing was installed



along the Creek corridor to protect new plantings and manage livestock in the riparian zone. Once seedlings are established and vigorous enough to handle incidental livestock grazing the riparian areas will be open for quick flash grazing to reduce exotic weedy species and promote a more natural assemblage of shrubs, trees and grasses.

In several tributaries to Tolay Creek active down-cutting and erosion were serious problems. The down-cutting or incision destabilizes the stream banks, which increases erosion, sedimentation, ultimately strips vegetation from the banks which further increases erosion. Stream stabilization projects have been constructed on these tributaries to stabilize the system. When possible, “bioengineering” was used for bank stabilization using native willows or using willows woven together as wattles or willow walls. This supports the stream banks in addition to promoting the growth of willows in areas that have been denuded. In other areas rock structures have been installed in the stream channels to prevent head-cutting (e.g., the formation of a steep vertical drop from erosion) and stabilize stream banks. The project also reconnected areas of seasonal tributaries to the flood plain, helping to restore natural stream processes making the tributaries more resilient.

Thousands of native sedges, shrubs, and trees have been planted by youth from local elementary schools, Boy Scout troops, high schools, Santa Rosa JC, Americorps, and North Bay Conservation Corps. Often working through partner organizations such as the Students and Teachers Restoring a Watershed (STRAW), this community based conservation helps educate and connect our future citizenry to these important natural landscapes, recreating a local land ethic that will help ensure that our open spaces and Regional Parks will be valued for generations to come.

#### CARDOZA CREEK RESTORATION

The Cardoza Creek Restoration project in the summer of 2013 re-stabilized the existing creek spillway to a more natural setting and included removal of discarded auto bodies, concrete, and other items historically used to reduce erosion within the creek. The Creek below the spillway was re-graded and armored, and the length of the creek below the ponds re-vegetated with over 800 native plants and irrigated by solar powered water system using water from nearby stock pond.



restoration planting at Tolay Creek Ranch



Left and right image photo credit: Sonoma Land Trust

**GRAZING**

Regional Parks and Land Trust have continued on-going grazing by contracting with a rangeland manager. Grazing will continue to be utilized by park staff as a land management tool. Grazing related infrastructure is depicted in Figure 6-5. Elements of the Rangeland Resource Study for Tolay Lake Ranch (Appendix L) and Grazing Plan for Tolay Creek Ranch (Appendix M) include: fencing, exclusion areas, rotation, animal type, number of animals, frequency and other patterns for grazing, and developed springs and watering holes, mineral/salt licks, corrals, and other grazing infrastructure.

**VEGETATION MANAGEMENT AND NOXIOUS WEED CONTROL**

There are several invasive species in the park that the Baseline Documentation Report recommended for removal. Noxious weeds present in the grassland areas include medusahead, Harding grass, Mediterranean linseed, and a variety of thistle species. In seasonal drainages and riparian area on slopes invasive species include Himalayan blackberry, Fuller’s teasel, and poison hemlock. In the Fresh Emergent Wetland area invasive species include pennyroyal, Fuller’s teasel, and swamp smartweed. Swamp smartweed is a native plant and provides food for waterfowl but is behaving as an abundant invasive in the lakebed. The Wet Meadow area contains spiny cocklebur, Himalayan blackberry, Fuller’s teasel, and pennyroyal. The Tolay Creek riparian area at the south edge of the property has an infestation of Himalayan blackberry, and a small area of Acacia (Circuit Rider Productions 2006).

Regional Parks will practice adaptive land management to minimize and/or eradicate noxious weeds as feasible. In consideration of this pursuit, park staff may modify the grazing regimes, experimenting with sheep/goat grazing, utilizing volunteers to hand remove, and partner with other conservation agencies to address noxious weed eradication.

**ROADS AND TRAILS**

Existing road and trail restoration programs address and remediate trail erosion problems. Road and trail restoration methods may include: bio-engineering, puncheons, armored crossings, drainage lenses, rolling dips, swale modifications, swale creation, headwall modifications, headwall installations, and the installation of rip-rap.



**TOLAY LAKE**

Maintenance activities of the lake include invasive species management, mosquito abatement, and causeway road maintenance.



## Natural and Cultural Resources Management

### Natural Resources

#### DEVELOPED AND DISTURBED AREAS

Although developed and disturbed areas around the Park Complex do not currently support native plant communities, these areas commonly provide critical habitats for birds and bats. But they also provide a conduit for the spread of invasive plant species, erosion, and contaminants as a result of Park operation and maintenance actions. It is critical to manage the unintended consequences associated with park use in order to protect the sensitive natural resources adjacent to the developed and disturbed areas.

#### Developed and Disturbed Area

- RMP-O1** Prevent the spread of non-native plant species from developed and disturbed areas into natural areas of the Park.  
 Non-native plants intended for aesthetics or agricultural purposes can escape and come to out-compete native species and invasive plants are highly adaptable to disturbed areas of human development. To ensure that the ornamentals, agricultural plants, and invasive species in and around developed and disturbed areas do not escape into natural areas, monitoring and control should be implemented.
- RMP-O2** Prevent erosion, sediment migration, and migration of pollutants from developed and disturbed areas into natural areas.  
 The storage and use of potential contaminants (e.g., gasoline, oil, solvents) is a necessary function for operations and maintenance in and around the Park Complex. The compacted and impervious substrates in and around the Park Complex, roads, trails, and other infrastructure provide a conduit for water and sediment runoff and pose an erosion hazard. Measures to prevent water and sediment migration, erosion, and potential contaminants will be implemented in and around the Park Complex as well as during construction of infrastructure and regular park maintenance operations.
- RMP-G1** Periodic monitoring will be conducted in and around the Park Complex to document and repair point-source erosion and pollutant hazards.
- RMP-G2** Landscape planting in the Park Complex should be preferentially native species, particularly species native to the Park. A preferred native plant species list will be developed and species from the list will be used for new and replacement plantings. Where non-native and non-regional plants are selected for landscaping or agricultural uses, they will be drought tolerant. Plants likely to escape into the natural areas of the Park will not be used.
- RMP-S1** Monitoring will be conducted monthly through the dry season and spot treatment of invasive plants will be conducted to eradicate them before they escape into natural areas.
- RMP-S2** Point-source erosion or pollution will be halted immediately, and any remedial actions will occur as soon as feasible.

#### BLUE GUM AND MONTEREY CYPRESS GROVES

Blue gum (*Eucalyptus globulus*) and Monterey cypress (*Hesperocyparis macrocarpa*) groves are common in southern and western Sonoma County where trees were planted for screening, aesthetics, shelterbelts, and woodlots (Holland 1996, Sawyer et al. 2009). The Park contains several groves of planted blue gum, with the largest located immediately west of the Park Complex. One small grove of Monterey cypress is present along the banks of lower Tolay Creek, which may be indicative of an old homestead. These introduced species are typically present in monotypic stands, can spread to other areas, and in the case of blue gum, pose a high fire risk. However, both trees offer cover, breeding, and foraging habitat for native wildlife. Therefore, these groves are included in the management of the Park's natural resources.

Blue Gum and Monterey Cypress Groves

- RMP-O3** Prevent the spread of blue gum and Monterey cypress into natural areas. The fast-growing blue gum can reach heights of upwards of 200 feet under prime conditions, over-topping shorter native vegetation. Additionally, blue gum may have allelopathic chemicals that hinder the viability of understory vegetation. Blue gum in particular poses a more distinct threat because it reproduces rapidly, spreads into natural habitats and quickly over-tops shorter shrub and herbaceous native communities.
- RMP-O4** Reduce fuel loading in blue gum groves, particularly near the Park Complex. Fallen leaves, branches, and shredded bark accumulate in the understory and bole forks of blue gum. Without manually removing this downed woody debris, the understory of blue gum groves poses a fire hazard. Therefore, periodic reduction of fuel loading in these groves will reduce fire hazard.
- RMP-G3** Unless otherwise containing historical values, blue gum and Monterey cypress groves should be eradicated, through either direct action or abeyance. Direct action is mechanical removal of trees followed by herbicide treatment of stumps. Blue gum is a prodigious stump-sprouter which can continue to set seed following felling. Seedlings should be mechanically removed until the seed bank is exhausted. Should abeyance be the chosen course, caution should be taken to ensure that naturally dying and fallen trees do not pose a hazard to the public, park staff, park infrastructure, and/or livestock. Similarly, seedlings and saplings should be eradicated.
- RMP-S3** Monitoring of blue gum and Monterey cypress will be conducted throughout the Park, particularly in areas of these non-native groves. Seedlings and saplings will be eradicated by mechanical removal, possibly followed by herbicide treatment. Monitoring for blue gum and Monterey cypress will occur at a minimum of every five years.

STREAMS, PONDS, AND RIPARIAN HABITATS

The Park contains several miles of ephemeral to perennial streams including the named drainages of Tolay Creek, Cardoza Creek, and the Oak Grove Fork of Eagle Creek, and their unnamed tributaries. There are several constructed ponds including Vista Pond, Fish Pond, Duck Pond, and Willow Pond, as well as unnamed seasonal ponds/vernal marshes in the southern portion of the Park.

Woody riparian cover confers many benefits to their associated streams including cooling, bank stabilization, increased infiltration of runoff into the soil, nutrient input, improved water quality, and buffering from flood events.

Riparian areas act as migratory corridors for wildlife by providing cover, foraging, and, in the case of aquatic organisms, reliable clean water. Riparian habitats include willow thickets along Tolay and Cardoza creeks, and oak and bay over-stories in the lower reaches of Tolay Creek. The under-stories near the drainages contain moisture dependent species not found in upland settings such as grasslands and rock outcrops. Park plant diversity near streams is high; but native plant diversity is threatened from invasive plants throughout the park. Stock ponds provide potential California red-legged frog breeding and non-breeding aquatic habitat and streams provide dispersal habitat for the frog.

Because streams are considered Waters of the U.S. and Waters of the State, special consideration needs to be made when conducting ground disturbing activity within or near these features, including restoration projects. Permitting with the U.S. Army Corps of Engineers and Regional Water Quality Control Board is required for any activities within the streambed. Streams and their associated riparian habitats are also jurisdictional under Section 1600 of the California Fish and Game Code and would require



Photo credit: Regional Parks staff



permitting with the California Department of Fish and Wildlife.

### Streams, Ponds, and Riparian Habitats

- RMP-O5** Monitor and reduce head-cutting in upper reaches and down-cutting in lower-gradient streams. Head-cuts are prevalent in the upper reaches of streams, particularly near roads, trails, culverts, and cattle-loafing areas. Down-cuts are ubiquitous on the lower-gradient streams, increasing water velocity and temperatures, increasing erosion and sediment inputs, and contributing to the loss of riparian habitat. Reducing head-cuts will improve water quality, reduce sediment migration, and provide cooler, cleaner waters downstream.
- RMP-O6** Enhance native plants in existing riparian areas and expand riparian vegetation in areas where it is absent. Typical riparian vegetation is absent along many seasonal streams where ordinarily it might be expected. The loss of riparian vegetation can be contributed to head-cuts and down cuts, the lowering of the water table, and impacts from grazing and other anthropogenic disturbances. Supplemental planting of native species in existing riparian habitats can increase species diversity and provide additional forage and cover for wildlife. Restorative riparian plantings along streams will contribute to bank stabilization, decrease water velocity, and lower water temperature.
- RMP-O7** Monitor, remove, and control invasive species that threaten habitat quality in riparian areas. Invasive species can out-compete the native flora in riparian habitats. Himalayan blackberry (*Rubus armeniacus*) is common throughout the Park, frequently covering both banks of the upper reaches of streams, excluding native shrubs and herbs. Water primrose (*Ludwigia* sp.) is a particular problem in the stock ponds where it forms extensive mats on the water's surface. This species can displace native plants, lower oxygen in the water column, and reduce water quality. Aggressive removal and control efforts should be administered for water primrose to improve water quality of the stock ponds and increase the quality of habitat for California Red Legged Frog (CRLF). Himalayan blackberry should be controlled to prevent its spread, and when feasible targeted for complete removal.
- RMP-G4** Livestock troughs, feeding areas, and loafing areas should be discouraged near head-cuts.
- RMP-G5** Head-cuts and down-cuts should be monitored to gauge rate and volume of increase. Monitoring should consist of annual documented photo-points and indicator markers (e.g. steel stakes) to measure the rate of increase.
- RMP-G6** A targeted restoration plan to halt the continued advance of head-cuts will be developed. Check dams of stone and native brush cuttings may be used as an effective means to trap sediment migration and rebuild the soil surface. Livestock exclusion fencing may be used as necessary to reduce continued impacts from grazing animals.
- RMP-S5** Minimum setbacks from the top of bank and outer extent of the riparian canopy dripline will be maintained to the greatest extent feasible.
- RMP-S6** Trails, roads, and other Park infrastructure will avoid streams, stock ponds, and riparian habitats to the greatest extent feasible.
- RMP-S7** Where roads and trails must intersect with ponds, streams, and riparian habitats ground disturbing activities will be accompanied by best management practices to avoid unnecessary soil erosion, soil compaction, and invasive species encroachment. A restoration plan for any proposed trail within riparian habitat, near or across streams will be developed and implemented.
- RMP-S8** Erosion prone areas, bridges, and stream and culvert crossings will be evaluated to determine if repair and/or restoration are necessary. Areas where concentrated flow is occurring will be repaired by re-grading slopes, re-vegetating, and/or installing flow dispersal devices.
- RMP-S9** In areas of new or recent erosion, a restoration and prevention plan should be developed in consultation with a qualified ecologist and civil engineer or landscape architect. Treatments may include willow walls, check dams of native natural materials (e.g., cut brush, limbs, stone), and/or re-grading and shaping of the erosion feature followed by native species plantings.

Streams, Ponds, and Riparian Habitats

**RMP-S10** High priority invasive plants will be eradicated or controlled in riparian habitats and along stream corridors to the greatest extent feasible. The spread of invasive plant populations into riparian habitats will be prevented to the greatest extent feasible. Currently, Himalayan blackberry (*Rubus armeniacus*) and poison hemlock (*Conium maculatum*) pose the greatest threat to riparian habitats.

TOLAY LAKE AND OTHER WETLANDS

Tolay Lake is the dominant wetland feature within the Park. It is a natural lake/seasonal wetland which has been substantially altered over the past century. To drain the lake for agricultural practices the natural earthen dam was removed, Tolay Creek widened and deepened, and North Creek diverted to enter the creek below the lake. Consequently, the extent and duration of ponding has been reduced, altering the biological functions of the lake. Tolay Lake is currently a large, shallow basin segmented into agricultural checks divided by drainage ditches. The lake becomes inundated in the winter months and begins to draw down through early spring.

Photo credit: Regional Parks staff



The vegetation within Tolay Lake varies spatially, seasonally, and annually, largely depending on the amount of rainfall and topographic position. A shift from meadow to freshwater marsh habitat is evident between the upper and lower lake margin and the lakebed, effectively dividing the lake into approximately three vegetation alliances: meadow barley patches, water smartweed marsh, and mixed-annual wetland forb patches. Other wetlands within the Park include marshes, vernal pool-like habitats, meadows, and seeps. These wetlands are not as extensive as Tolay Lake, but similarly the vegetation varies temporally and spatially depending on climate, topographic position, and soil type.

Wetlands provide valuable ecosystem functions through capturing stormwater runoff, reducing sediment migration, and filtering nutrients and pollutants. Wildlife and grazing

animals frequently depend on wetlands for late season forage and watering, and amphibians utilize wetlands for breeding and non-breeding habitat. Many of the Park’s wetlands are degraded from agricultural and other human uses, changes in their hydric regime, invasive species colonization, and upstream erosion. Restoration and enhancement activities along with targeted exclusions can protect water quality, native floral diversity, and this essential wildlife resource.



## Tolay Lake and Other Wetlands

- RMP-O8** Monitor and reduce head-cutting in drainages upstream from wetlands; monitor for and protect from sediment migration, nutrient runoff, and other contaminants into wetlands. Head-cuts can deliver large sediment loads and increase the velocity of flowing waters contributing to erosion or filling in downstream wetlands. Increased soil volume and flow velocity can create incisions in wetlands channelizing the wetland and eventually converting it to upland habitat. Reducing head-cuts at upstream locations and within wetlands can prevent habitat type conversion and retain the ecologic and hydrologic function and integrity of the parks wetland habitats. Roads, cattle loafing areas, trails, and other sites with shallow or easily lifted soils are particularly susceptible to runoff during the wet season, and soil migration into adjacent wetland areas can threaten wetlands ability to perform water and habitat quality functions. Preventing or reducing excessive soil, water, nutrient, and contaminant runoff can be achieved through physical or temporal restrictions, grazing rotations, and/or road and trail design.
- RMP-O9** Monitor, remove, and control invasive species that threaten habitat and water quality in wetlands. The species composition of wetlands varies with their location, soil chemistry and texture, slope gradient, hydro-period, and distance to repeated disturbance, but most are dominated by or have substantial cover of native hydrophytes. These species are specially adapted to saturated and/or inundated conditions of the wetlands. However, several invasive plant species occur within wetlands, and in some instances dominate the native species cover, including: Himalayan blackberry (*Rubus armeniacus*), poison hemlock (*Conium maculatum*), Fuller's teasel (*Dipsacus fullonum*), bristly ox-tongue (*Helminthotheca echioides*), harding grass (*Phalaris aquatic*), curly dock (*Rumex crispus*), and several non-native annual grasses tolerant of seasonally saturated conditions. While it is not possible to completely remove these annual grasses, controlling the spread of them and other invasive species into wetlands will maintain native floral and habitat diversity. See [98] for specific actions.
- RMP-O10** Re-vegetate wetlands with native hydrophytes. While the wetlands contain a prevalence of native perennial hydrophytes, enhancing with planting of additional native plants can bestow several benefits to habitat quality. In contrast to the shallow and short-lived root systems of non-native annual grasses, native perennial rushes, sedges, bulrushes, and grasses typically have deep and complex root systems that maintain soil integrity, buffer wetlands from erosion, and assist in filtering nutrients and sediment. Wetland areas dominated by non-native annual grasses and areas of invasive species removal should be targeted for planting with native perennial hydrophytes.
- RMP-G7** Livestock troughs, feeding areas, and loafing areas will be located away from wetlands a minimum of 100 feet.
- RMP-G8** Head-cuts and down-cuts will be monitored periodically to gauge rate and volume of increase. Monitoring should consist of documented photo-points and indicator markers (e.g. steel stakes) to measure the rate of increase.
- RMP-G9** Targeted restoration will be developed to halt the continued advance of head-cuts that affect wetlands. The plan will prioritize areas for restoration and will consider measures such as exclusionary fencing, vegetation and check dams of stone or native brush cuttings and will be used as possible effective means to trap sediment migration and rebuild the soil surface.
- RMP-G10** Monitoring and assessment on effectiveness of livestock grazing on wetlands will be conducted periodically. If livestock grazing is contributing to a decline in native species, compromising water quality, causing erosion, or other deleterious effects on the wetland, techniques to deter livestock from entering wetlands will be implemented. Deterrence may include relocation of troughs, mineral supplements and supplemental feeding areas away from wetlands, and possibly exclusionary fencing around wetlands. Monitoring will then be done where livestock has been excluded to assess changes in non-native and native plants in the wetland.

Tolay Lake and Other Wetlands

- RMP-G11** Prioritize wetland areas for enhancement. Enhancement sites should be in or around areas where impacts from infrastructure building has occurred or in areas of targeted invasive plant removal. Informational signage or pamphlets should highlight these restorative actions and educate the public on the function and values of wetlands.
- RMP-S11** Trails, roads, and other Park infrastructure will avoid wetland habitats to the greatest extent feasible. Where infeasible, ground disturbing activities will be accompanied by best management practices to avoid unnecessary soil erosion, soil compaction, and invasive species encroachment. Trails that bisect wetlands will be designed for minimal impact by using features such as boardwalks and viewing platforms.
- RMP-S12** A restoration plan will be developed for any proposed road, trail, or other ground-breaking project within wetland habitats. This may include salvaging native perennial hydrophytes, collecting live seed, purchasing genetically (i.e., local) appropriate seed, and/or top soil to be relocated at or near the project area.
- RMP-S13** Should wetland habitat be considered jurisdictional by federal or state agencies, the appropriate permits will be acquired. Impacts to jurisdictional wetlands will likely require a habitat mitigation and monitoring plan along with mitigation for wetland losses. Mitigation ratios will depend upon the type, functional value, and extent of wetland impacted, and will be arranged during the permitting process.

OAK AND BUCKEYE WOODLANDS

Park woodlands are dominated by coast live oak, California bay, with individuals of Pacific madrone and California black oak. Stands of valley oak are situated on the banks of the lower reach of Tolay Creek, and California buckeye groves are located on rock outcrops and interspersed with coast live oak woodland. The woodlands in the southern park area have a higher floral and structural diversity in the understory than those in the northern portion. Collectively, these woodlands provide valuable cover and forage for a suite of wildlife species, including small mammals (e.g. bats), birds, amphibians, and reptiles. With deep and extensive root structures, woodland trees maintain soil integrity and water quality through the prevention of erosion and filtration.



Photo credit: Regional Parks staff

Currently, invasive species are not a dominant feature in the Park’s woodlands, but Italian thistle is prevalent at the drip line of trees, particularly where cattle gather. Native plant regeneration, including oak saplings, is much reduced in these areas. Sudden oak death (SOD), which is caused by a water mold (*Phytophthora ramorum*), is a threat to oaks in the red oak subfamily (*Lobatae*) including both coast live oak and California black oak, and can be readily transferred throughout the Park from human and wildlife visitation.



## Oak and Buckeye Woodlands

- RMP-O11** Maintain healthy woodland habitat by preventing or reducing impacts from habitat fragmentation. Woodlands provide important cover and migratory habitat for wildlife, but existing roads and trails can diminish this essential function. Minimizing the number of roads and trails through the woodlands, and maintaining the existing roads and trails for erosion and invasive species conduits will maintain healthy woodland habitat.
- RMP-O12** Monitor and facilitate the natural regeneration of native woodland species, particularly trees and shrubs. Healthy native woodlands contain both species and structural diversity. Multiple vegetation strata provide habitat for several species of woodland birds that utilize specific elevations in the canopy. Herbaceous strata provide forage and browse for mammals while offering cover. Maintaining and enhancing a diverse understory and facilitating regeneration of overstory species will ensure that vertical structure remains a healthy component of wildlife habitat.
- RMP-O13** Monitor and implement pathogen controls to minimize the spread of Sudden Oak Death. Sudden oak death has not been formally documented in the Park, but the prevalence of *Phytophthora ramorum* in coastal California, the extensive stands of coast live oak, and the repeat visitation within the park woodlands, suggest that this pathogen is a likely threat. Implement monitoring and pathogen controls to reduce the incursion and spread of sudden oak death into woodlands.
- RMP-O14** Monitor invasive species, prevent colonization of invasive species, and remove or control existing invasive species populations. Currently, woodlands are relatively free of invasive plant species. Isolated populations of Himalayan blackberry and Italian thistle are present and pose a threat to the native understory flora. Other invasive species documented can pose a threat to park woodlands; therefore, monitoring the woodlands for invasive species, and preventing their colonization will help maintain the integrity of woodland habitat.
- RMP-G12** Young trees, particularly oak species, should be encouraged in the understory and on the fringe of existing woodlands. Openings within woodlands provide habitat complexity and therefore may not be a desired location for targeted oak woodland restoration. A historical and cultural records study may reveal the extent of park woodlands, which would help guide any restoration efforts.
- RMP-G13** Should oak and other woodland tree regeneration become a desired goal, fostering vegetation succession could be the chosen approach. Planting or seeding open scrub species such as coyote brush (*Baccharis pilularis*), California coffeeberry (*Frangula californica*), and toyon (*Heteromeles arbutifolia*), and raising these species to maturity provides a “nursery” for young oaks and other woodland trees. Protect these shrubs from grazing livestock and wildlife until established. Planting woodland trees directly into grasslands should protect new plantings from grazing wildlife. Protections include exclusion fencing or plastic tree shelters, weed mats, mulching, and possibly supplemental irrigation to stimulate robust root development.
- RMP-S14** New trail, road, and other Park infrastructure will avoid woodland habitats to the greatest extent feasible. Where infeasible, ground disturbing activities will be accompanied by best management practices to avoid unnecessary soil erosion, soil compaction, and invasive species encroachment.
- RMP-S15** Removal of individual woodland trees will be avoided to the greatest extent feasible with the exception of diseased or hazardous trees. Replacement planting of like species for native woodland trees will be encouraged; replacement ratio should be at least 3:1. Removal of native woodland shrubs will be replaced with like species.
- RMP-S16** Park staff, visitors, and other guests will receive educational materials regarding the prevention and spread of sudden oak death. Current best management practices for pathogen prevention controls will be in place for all who work within the Park.

### Oak and Buckeye Woodlands

- RMP-S17** Prevent the spread and establishment of invasive plant species within woodland habitats to the greatest extent feasible by physically eradicating exotic species and with installation of exclusionary fencing.
- RMP-S18** Limited populations of high and medium priority invasive plants will be eradicated or controlled to the greatest extent feasible. In particular, seedlings and saplings of blue gum or Monterey cypress will be eradicated, while mature trees may be left standing.

### GRASSLANDS AND WILDFLOWER FIELDS

The majority of the Park is composed of grassland habitats including non-native annual grasslands, native grasslands, and mixed wildflower fields. These herbaceous communities serve valuable habitat functions for native plants and wildlife, as well as provide forage for livestock grazing. Once a prevalent community type throughout cismontane California, native perennial grasslands have declined sharply since the 19<sup>th</sup> Century, and converted to non-native annual grassland (McNaughton 1968, Jackson 1985). Park grasslands have been used for grazing for over a century, which have dramatically altered the grasslands' species composition and soil characteristics from its native state. Although remnant patches of native dominated grasslands persist, these contain non-native, frequently invasive, species. Native grass species are typically comprised of perennial species, versus non-native annual grasses. Since perennial grasses have deeper and more extensive roots than annual grasses, this provides greater rainfall infiltration as well as greater soil and nutrient retention. Grasslands also buffer erosion in waterways and wetlands and provide valuable resources (e.g. food, forage, dispersal habitat) for several grassland specialist bird species, invertebrates, and other mammals.

Because grasslands are particularly susceptible to infestation by non-native plants, management of native grasslands, non-native grasslands, and wildflower fields are of utmost importance in order to retain the suite of beneficial services derived from these communities.

### Grasslands and Wildflower Fields

- RMP-O15** Protect native grasslands and wildflower fields during construction of infrastructure. The fragmentation of native grasslands and wildflower fields with trails and roads threatens the integrity of these vegetation communities. Trails and roads can provide pathways for invasive plants as well as erosion, sediment migration, and soil compaction that can further threaten native species.
- RMP-O16** Monitor and maintain stands of native grasses and wildflowers. Minimize soil erosion from park development activities and visitation. Despite being long-lived and resilient, perennial native grasses, ground disturbance can diminish their viability and provide a pathway for competitive non-native annual grasses. Non-native grasses frequently respond positively to disturbance such as road and trail building activities, and once established they produce dense mats of thatch that stymie or prevent the establishment/re-establishment of native grasses and annual wildflowers. The loss of perennial native grasses with their deep and extensive rooting systems can lead to soil erosion, while the loss of both native grasses and wildflowers diminish valuable forage resources for native mammals, birds, and invertebrates.
- RMP-O17** Monitor and establish native grasses and wildflowers in targeted locations. Complete restoration of native grasslands and wildflower fields is infeasible given the extent of non-native grasslands in the Park. However, targeted locations with favorable conditions (e.g., serpentine soil, prevalent native herbaceous cover) offer the potential to increase native grass and wildflower cover that may establish and expand into native dominated habitat. Planting and seeding of native species in coordination with invasive species eradication and controlled grazing will be implemented in these areas.



## Grasslands and Wildflower Fields

- RMP-O18** Monitor and prevent invasive species incursion into native grasslands and wildflower fields, and eradicate dense infestations of invasive species. The majority of the invasive species documented is within grassland habitats and/or pose the greatest threat to these habitats. These species can form monotypic stands that out-compete native herbs and less aggressive non-native species, resulting in increased fire hazard, diminished wildlife resources, and reduced species diversity and habitat complexity. Additionally, Medusahead (*Elymus caput-medusae*) and purple and yellow star thistles (*Centaurea calcitrapa*, *C. solstitialis*), severely diminish the quality of forage for grazing livestock. See [102] for specific actions.
- RMP-O19** Manage the beneficial effects of grazing on native grassland and wildflower field habitat. Managed grazing can confer benefits to native habitats through the reduction of non-native annual thatch, nutrient cycling, fire hazard prevention, and creation or maintenance of bare areas. However, when not managed properly, these same effects can become deleterious on native habitats contributing to erosion, nutrient runoff, invasive species spread, soil compaction, and wildlife browsing of tree and shrub saplings. Grazing timing, intensity, duration, and rotation are essential factors in the successful management of natural habitats with livestock, as well as the vegetation composition and density in areas where livestock loaf, travel, water, and graze. Creating and maintaining structural complexity in herbaceous communities (e.g., bare areas, varying grass heights) is important for wildlife and native flora habitat, and can be achieved through well managed grazing.
- RMP-G14** Where invasive species are removed from grasslands, native grasses and wildflowers will be planted and/or seeded.
- RMP-G15** Select native grassland and wildflower field areas for restoration. Restoration sites will be located in or around areas where impacts from infrastructure building has occurred or in areas of targeted invasive plant removal. Informational signage or pamphlets will highlight these restorative actions and educate the public on the function and values of native habitats.
- RMP-S19** Trail, roads, and other infrastructure will avoid native grassland and wildflower habitats to the greatest extent feasible. When avoidance is infeasible, ground disturbing activities will be accompanied by best management practices to avoid unnecessary soil erosion, soil compaction, and invasive species encroachment.
- RMP-S20** A restoration plan will be developed for any proposed road, trail, or other ground-breaking project within native grasslands and mixed wildflower fields. Restoration measures may include salvaging perennial grasses, collecting live seed, purchasing genetically (i.e., local) appropriate seed, and/or top soil to be relocated at or near the project area.
- RMP-S21** Develop a long-term management plan evaluating the effects of livestock grazing on grasslands, with results intended to guide and alter grazing management. Evaluation of livestock animals alternative to cattle (i.e., sheep), and no grazing alternatives.
- RMP-S22** Livestock will be rotated throughout the park, and as-well distributed as feasible. Supplemental feeding locales will be relocated periodically to discourage long-term loafing areas. Long-term loafing areas at water troughs will be monitored at least every two years to assess damage to native grasslands. Consideration will be given to moving trough locations to protect resources at that time..
- RMP-S23** Invasive plant species in supplemental feeding (weed free hay) will be minimized in coordination with the grazing lessee to the greatest extent feasible.
- RMP-S24** The introduction and spread of invasive plants within grasslands and wildflower fields will be prevented to the greatest extent feasible with adaptive land management including: adaptive grazing plan, exclusionary (temporary) fencing, native seed propagation, and manual removal of invasive species.

Grasslands and Wildflower Fields

- RMP-S25** Limited populations of high and medium priority invasive plants will be eradicated or controlled to the greatest extent feasible with adaptive land management including: adaptive grazing plan, exclusionary (temporary) fencing, native seed propagation, and manual removal of invasive species.
- RMP-S26** Widely distributed populations of high and medium priority invasive plants will be controlled to the greatest extent feasible with adaptive land management including: adaptive grazing plan, exclusionary (temporary) fencing, native seed propagation, and manual removal of invasive species.

ROCK OUTCROPS AND SCRUB

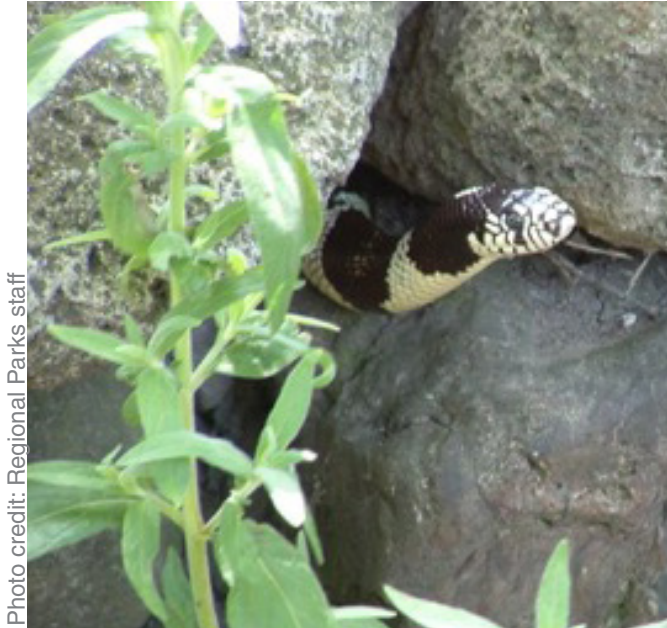


Photo credit: Regional Parks staff

Rock outcrops in the Park consist of boulder fields, large emergent rocks, and constructed rock walls that function similar to these natural geologic formations. Organic debris combines with mineral soil in rock fissures to provide a rooting matrix for many shrubs and native forbs. These features provide valuable habitat for a variety of fossorial mammals and bird species, unique soil substrate for plants, and aesthetic value for people. Some observed species include California ground squirrels (*Spermophilus beechyi*), burrowing owls (*Athene cunicularia*), and Western fence lizards (*Scleropus occidentalis*), and a variety of butterflies and moths. Rock outcrops and rock walls are potential cultural resources and visible reminders of the history of southern Sonoma landscapes. They frequently attract human visitation that can have deleterious effects on native vegetation and wildlife function. Therefore, protection and enhancement of these features is essential to the preservation of the natural resource and cultural values they support.

Rock Outcrops and Scrub

- RMP-O20** Monitor rock outcrops for graffiti, trampling, erosion, and other negative effects of visitation.
- RMP-G16** In rock outcrops where native species exhibit a lower diversity and/or non-native species dominate, native species plantings should be accompanied with non-native species removal.
- RMP-S27** Trails, roads, and other developed infrastructure will be located away from rock outcrops and walls, and their associated scrub, where feasible. Where ground-breaking disturbance is unavoidable, best management practices should be implemented to avoid soil erosion, soil compaction, rock loss, and incursion of invasive species.
- RMP-S28** The spread and establishment of invasive plants into rock outcrop and wall, and their associated scrub habitat will be prevented to the greatest extent feasible with adaptive land management including: adaptive grazing plan, native seed propagation, and manual removal of invasive species.
- RMP-S29** When opportunities allow for trails to intersect with historical walls and/or natural rock outcrops that do not contain sensitive habitats, best management practices will be implemented to avoid soil erosion, soil compaction, rock loss, and incursion of invasive species. Educational opportunities at these locations will be monitored and managed on a needs basis. Interpretive signage may be installed at these locations, as feasible.

## Rock Outcrops and Scrub

**RMP-S30** Limited populations of high priority invasive plants will be eradicated from rock outcrops to the greatest extent feasible with adaptive land management including: adaptive grazing plan, native seed propagation, and manual removal of invasive species.

### SPECIAL-STATUS PLANTS

The Park has the potential to support several dozen special-status plant species; protocol-level rare plant surveys conducted between 2006 and 2008 resulted in the positive identification of three species, and a possible fourth. The three special-status plant species positively documented include fragrant fritillary (*Fritillaria liliacea*), Lobb's aquatic buttercup (*Ranunculus lobbii*), and marsh death zigadene (*Toxicoscordion fontanum*). Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*) may have been observed within the Park, but this species is very difficult to distinguish from the more prevalent, Kellogg's yampah (*Perideridia kelloggii*), and positive identification has not been confirmed.

In addition to the three (four) special-status plants, three regionally/ecologically significant plant species have been documented within the Park, California western flax (*Hesperolinon californicum*), cream cups (*Platystemon californicus*), and Johnny jump-up (*Viola pedunculata*). All seven species are described below.

Fragrant fritillary (*Fritillaria liliacea*). CNPS Rank 1B. High Potential (Present): Fragrant fritillary is a low-growing, bulbiferous perennial forb in the lily family (Liliaceae) that blooms from February to April. It typically occurs in open, grassy areas in valley and foothill grassland, coastal scrub, and coastal prairie habitat underlain by volcanic or serpentine clay soils at elevations ranging from 10 to 1,345 feet (CDFW 2014, CNPS 2014). Observed associated species include soap plant (*Chlorogalum pomeridianum*), coyote brush (*Baccharis pilularis*), purple needlegrass (*Stipa pulchra*), California oat grass (*Danthonia californica*), large-flowered star tulip (*Calochortus uniflorus*), California buttercup (*Ranunculus californicus*), sun cups (*Taraxia ovata*), shooting stars (*Dodecatheon hendersonii*), needleleaf pincushion plant (*Navarretia intertexta*), one-sided bluegrass (*Poa secunda*), and Greene's popcornflower (*Plagiobothrys greenei*) (CDFW 2014, WRA observations).



Photo credit: Regional Parks staff

Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*). CNPS Rank 4. Moderate Potential (Possibly Present): Gairdner's yampah is a perennial forb in the carrot family (*Apiaceae*) that blooms from June to October. It typically occurs in vernal mesic areas within broadleaf upland forest, chaparral, coastal prairie, valley and foothill grassland, and vernal pool habitat at elevations ranging from 0 to 1,985 feet (CNPS 2014, Baldwin et al. 2012). Because it is necessary to gather rooting structures, thereby killing the plant, to identify this species, positive identification has not been made to date. According to the CNPS, threats include agriculture, grazing, non-native plants, habitat alteration, and urbanization (CNPS 2014).

Lobb's aquatic buttercup (*Ranunculus lobbii*). CNPS Rank 4. High Potential (Present): Lobb's aquatic buttercup is an annual aquatic forb in the buttercup family (*Ranunculaceae*) that blooms from February to May. It typically occurs in vernal inundated areas within cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and vernal pool habitat at elevations ranging from 45 to 1,530 feet (CNPS 2014). Observed associated species include mosquito fern (*Azolla filiculoides*), western mannagrass (*Glyceria occidentalis*), pale spike-rush (*Eleocharis macrostachya*), iris-leaf rush (*Juncus xiphioides*), common monkeyflower, calico flowers (*Downingia* spp.), perennial rye grass (*Festuca perennis*), meadow barley (*Hordeum brachyantherum*), and Mediterranean barley (*H. marinum*) (WRA observations).

Marsh zigadene (*Toxicoscordion fontanum*). CNPS Rank 4. High Potential (Present): Marsh zigadene



is a bulbiferous perennial forb in the false-helleborine family (*Melanthiaceae*) that blooms from April to July. It typically occurs in vernal mesic areas underlain by clay substrate derived from serpentine in chaparral, cismontane woodland, lower montane coniferous forest, meadow and seep, and marsh and swamp habitat at elevations ranging from 45 to 3,250 feet (CNPS 2014, CDFW 2014). Observed associated species include non-native annual grasses (e.g., soft chess, Mediterranean barley, Italian rye grass, meadow barley, western manna grass, California oat grass, and fragrant fritillary (WRA observations).

Cream cups (*Platystemon californicus*). No Rank – Opler’s longhorn moth larval host plant. High Potential (Present): Cream cup is an annual forb in the poppy family (*Papaveraceae*) that blooms from February to May (Baldwin et al. 2012). It typically occurs on a variety of substrate, including volcanics and serpentine, in valley and foothill grassland, as well as open woodlands, chaparral, and coastal scrub habitat at elevations ranging from 0 to 3,000 feet (Baldwin et al. 2012, Calflora 2014, WRA observations). Observed associated species include California poppy, bluehead gilia, bird’s-eye gilia, owl’s clovers, tidy tips, goldfields, lupines, needlegrasses, small fescue (*Festuca microstachys*), Idaho fescue (*Festuca idahoensis*), California onion grass, and a suite of non-native annual grasses (WRA observations). Cream cups are the host plant for Opler’s longhorn moth.

Johnny jump-up (*Viola pedunculata*). No Rank – Silverspot larval and nectar host plant. High Potential (Present): Johnny jump-up is a perennial forb in the violet family (*Violaceae*) that blooms from February to April (Baldwin et al. 2012). It typically occurs on a variety of well-drained substrates located on hillsides and ridgelines in full sun within valley and foothill grassland, and open cismontane woodland and chaparral habitat at elevations ranging from 0 to 5,000 feet (Baldwin et al. 2012). Observed associated species include oaks, needlegrasses, checkerblooms (*Sidalcea* spp.), lupines, blue-eyed grass, blue dicks, California poppy, purple sanicle, and a suite of non-native annual grasses (WRA observations). Johnny jump-up is the host plant for silverspot butterfly.

California western flax (*Hesperolinon californicum*). No Rank – Regionally Significant. High Potential (Present): California western flax is an annual forb in the flax family (*Linaceae*) that blooms from May through June. It typically occurs on serpentine substrate in valley and foothill grassland, chaparral, and cismontane woodland at elevations ranging between 0 to 2,000 feet (Baldwin et al. 2012, CCH 2014). Observed associated species include bluehead gilia (*Gilia capitata* ssp. *capitata*), needlegrasses (*Stipa* spp.), California onion grass (*Melica californica*), Torrey’s onion grass (*M. torreyana*), June grass (*Koeleria californica*), Idaho fescue (*Festuca idahoensis*), and small fescue (*Festuca microstachya*) (WRA observations).

### Special-Status Plants

- RMP-O21** Protect existing and potential occurring special-status plant species during Park development activities. Although several protocol-level surveys and incidental site visits have resulted in the observations of special-status plant populations, other populations may occur within the Park. Locating new or overlooked populations would be a positive sign for the overall health special-status species, and would merit further protection.
- RMP-O22** Periodically monitor and census existing special-status plant populations and their habitats, including potential effects from grazing, human visitation, and park development. Grazing, human visitation, development, drought stress, and other physical environmental factors can affect the health, number, vigor, and reproductive potential of plant species. Inter-annual variation in the number of individuals within populations of special-status species is common. Periodic observation and documentation of the special-status plant populations can form the basis for understanding these species’ response to their physical and biologic environment, and can result in successful management of their habitats to ensure their populations are sustained.

## Special-Status Plants

- RMP-O23** Monitor, control, and eradicate invasive plants that threaten special-status plant populations. Frequently, non-native invasive species out-compete special-status plants for water and nutrients, over-top natives eventually shading them out, and increase the fire risk that can kill desirable native species. Monitoring and controlling aggressive invasive species in the vicinity of special-status plant species populations will eliminate the threat of their loss from invasive species. See page 154 for specific actions for invasive species management.
- RMP-G17** Propagules from the Park's special-status plant species should be collected, propagated, and redistributed in analogous habitats within the Park where these species are absent. This should be conducted under guidance of local experts and may incorporate volunteer networks.
- RMP-G18** Regional Parks will encourage botanical subject matter experts to conduct research about the distribution and ecology of special-status species.
- RMP-S31** Trails, roads, and other developed infrastructure will be located away from special-status plant species. Where ground-breaking disturbance in the general vicinity of special-status plant species is unavoidable, best management practices will be implemented to avoid soil erosion, soil compaction, and incursion of invasive species. Protocol-level rare plant surveys will be conducted along the course of proposed trails, roads, and other development projects to ensure that such species are not present.
- RMP-S32** Should translocation efforts occur (see Guidelines above), CDFW will be consulted for said translocation, permitting requirements, and a review of the status of nearby special-status plant populations.

## SPECIAL-STATUS WILDLIFE

### Invertebrates

Opler's longhorn moth (*Adella oplerella*). No Status (Special Animals List). High Potential (Present): Opler's longhorn moth is endemic to grasslands where its larval food plant, cream cups, grows. Descriptions of the life history and early stages of this moth are incomplete, but it is known that the moth completes the active portions of its life cycle during the winter-spring wet season (Powell 1969). Eggs are deposited directly into the unopened flowers of the host plant, and larvae emerge after they have consumed the developing seeds. The larvae may enter diapause during the summer and re-emerge after the winter rains to continue feeding until they are large enough to pupate. The adult host plant is not known, though it appears that the adults may feed on the nectar of cream cups, and other native forbs. Therefore, this species is typically associated with low fertility soils that support a sufficient density of host plants. One individual was observed within the Park in native grassland habitat underlain by serpentine substrate in the southwest.

Zerene silverspot butterfly subspecies (*Speyeria zerene*). No Status (Special Animals List). High Potential: An unnamed subspecies of Zerene silverspot butterfly has been documented from the Cougar Mountain property located immediately south of the Park. Currently, this subspecies has not been formally described in the taxonomic literature, and therefore has no official legal protection. However, this subspecies appears to be highly restricted to the Cougar Mountain area, and therefore, following formal description is likely to receive protective status. Other silverspot butterfly larva host on native violets (*Viola* spp.), and it is assumed the unnamed subspecies documented from Cougar Mountain does so as well. Due to the relative location of documented occurrences of this subspecies of silverspot butterfly and the presence of large Johnny jump-up colonies on the East and West ridges, this subspecies has a high potential to occur in the Park.

### Special-Status Wildlife: Invertebrates

- RMP-O24** Monitor and enhance significant patches of cream cups and Johnny jump-up, which both serve as host and nectar wildflowers. Lepidoptera are closely associated with host and nectar wildflowers, requiring these resources through certain periods of the year. A decline in the population of their host plants would threaten these special-status invertebrates. Enhancing and expanding cream cups and Johnny jump-up populations will help sustain the populations of these special-status invertebrates.
- RMP-G19** Monitor any develop baseline survey methodology to determine the presence and extent of special-status invertebrates in the Park. Partner with subject matter experts to establish the extent and utilization of species.
- RMP-G20** Lepidoptera experts should be consulted and partnered with to determine the taxonomic status of the silverspot butterfly in the Cougar Mountain/Tolay Valley region.
- RMP-S33** Trails, roads, and other developed infrastructure will be located to the greatest extent feasible away from cream cup, Johnny jump-up, and other dense wildflower populations. If ground disturbing activities in the general vicinity of dense wildflowers are unavoidable, best management practices will be implemented to avoid soil erosion, soil compaction, trampling, and incursion of invasive species. Surveys for wildflowers will be conducted along the course of proposed trails, roads, or other Park development projects to ensure that such species are not present.
- RMP-S34** If Park development has the potential to cause adverse impacts to cream cups, Johnny jump-ups, and/or other potential nectar resources for special-status invertebrates, a management and monitoring plan will be developed. Seeding and/or planting of such species may need to be conducted, as well as monitoring of success criteria following restoration efforts.

### Amphibians and Reptiles

California red-legged frog (*Rana draytonii*). Federal Threatened, CDFW Species of Special Concern. High Potential (Present): California Red-legged Frog (CRLF) was listed as Federally Threatened May 23, 1996 (61 FR 25813-25833). Critical Habitat for CRLF was designated on March 17, 2010 (75 FR 12815 12959). A Recovery Plan for CRLF was published by the USFWS on May 28, 2002. The Park falls within the Petaluma Creek-Sonoma Creek Core Recovery Area. There are four Primary Constituent Elements (PCEs) that are considered to be essential for the conservation or survival of this species. The PCEs for California red-legged frog include: (1) aquatic breeding habitat; (2) non-breeding aquatic habitat; (3) upland habitat; and (4) dispersal habitat (USFWS 2006).

Aquatic breeding habitat consists of low-gradient fresh water bodies including natural and manmade (e.g., stock) ponds and pools in perennial streams, marshes, lagoons, and dune ponds with still or slow-moving water, and dense shrubby riparian vegetation (Hayes and Jennings 1986, Jennings 1988, Jennings and Hayes 1994). Aquatic breeding habitat must hold water for a minimum of 20 weeks in most years to allow for egg, larvae, and tadpole development (USFWS 2006). Aquatic non-breeding habitat may or may not hold water long enough for this species to hatch and complete its aquatic life cycle, but it provides shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult CRLF. These waterbodies include plunge pools within intermittent creeks, seeps, quiet water refugia during high water flows, and springs of sufficient flow to withstand the summer dry period. CRLF can use large cracks in the bottom of dried ponds as refugia to maintain moisture and avoid heat and solar exposure (Alvarez 2004).

Upland habitats (e.g., grasslands, woodlands) provide shelter, forage, and cover, and include areas within 200 to 300 feet of aquatic habitats. Upland habitat can include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter (USFWS 2006). Dispersal habitat includes accessible upland or riparian habitats between occupied locations within 0.7 mile of each other that allow for movement between these sites, but dispersal of up to 1.8 miles has been documented (USFWS 2002, Fellers and Kleeman 2007). Moderate to high density urban or industrial developments, large reservoirs and heavily traveled



roads without bridges or culverts are considered barriers to dispersal (USFWS 2006). Short-distance dispersal movements are generally straight-line movements, and dispersal typically occurs at night during wet weather (Bulger et al. 2003, USFWS 2002, Bulger et al. 2003, Fellers and Kleeman 2007). CRLF tend to remain very close to a water source during dry weather; however, overland dispersal may occur in response to receding water (USFWS 2002).

CRLF is known from northern Baja California to southern Mendocino County, where it has been extirpated from approximately 70 percent of its habitat. According to the CNDDDB, there are 201 documented occurrences from Marin, Napa, and Sonoma counties, with the majority from Point Reyes Peninsula (CDFW 2014). Documented occurrences are universally from perennial aquatic or near perennial aquatic features.

Several documented occurrences are from the southern extent of the Mayacamas in very low density in or near the Tolay Valley (CDFW 2014). Numerous surveys with consistently few findings between 2001 and 2003, CRLF were observed within a stock pond located on the property immediately north of the Park. In 2002 and 2004, CRLF were positively identified at the Sonoma County Waste Management Agency Transfer Station on Stage Gulch Road, approximately 1.5 aerial miles north of the Park. CRLF have been documented on several surveys from the Sears Point-Sonoma Raceway property immediately adjacent to the south of the Park. Likewise, the CNDDDB reports CRLF from private property between SCAPOSD and Land Trust lands on Lakeville Highway. Finally, as part of the Sears Point Restoration project, the Land Trust has conducted an approximately 15-acre restoration and habitat enhancement for CRLF on an unnamed intermittent drainage of the western flank of Cougar Mountain, approximately one mile south of the Park (SLT 2012).

In addition to numerous documented occurrences from areas within the immediate vicinity of the Park, CRLF have been observed within and adjacent to the Park on several occasions in the past twenty years (Parsons 1996). The Park's stock ponds, as well as Tolay Lake and Tolay Creek provide aquatic breeding and non-breeding habitat for CRLF. The intermittent and ephemeral streams, seasonal wetlands, and mesic portions of woodlands within the Park provide dispersal and estivation habitat for CRLF. Because there is extensive documentation from the vicinity of Cougar Mountain, and there are virtually no barriers to dispersal between these populations and the Park, it is assumed that the CRLF continues to be present within the Park. Additionally, the Park provides a potential crucial linkage between these populations, particularly that the Park shall be protected in perpetuity while some of the neighboring lands' future use and/or management are unknown.

Foothill yellow-legged frog (*Rana boylei*) CDFW Species of Special Concern. Moderate Potential: This species is typically located in forested and woodland habitats, occurring in shaded, shallow streams and riffles with a rocky substrate. Egg masses are attached to the rock substrate, and at least some cobble-sized stones are necessary. Tadpoles require at least 15 weeks to metamorphose into juvenile form. Foothill yellow-legged frog does not estivate and is rarely found far from a source of permanent water. Historically, this species was known to occur in most Pacific drainages from Oregon to Los Angeles (Jennings and Hayes 1994). Populations have declined due to siltation and the introduction of American bullfrogs and exotic fish. Tolay Creek and its tributaries contain suitable breeding, foraging, and dispersal habitat for foothill yellow-legged frog; however, this species was not observed during site visits in 2006-2008.

Western pond turtle (*Actinemys marmorata*). CDFW Species of Special Concern. High Potential: Western pond turtle is the only freshwater aquatic turtle native to most of California, associated with rivers, creeks, lakes, and ponds throughout much of the state. Typical aquatic habitat features stagnant or low gradient water, aquatic vegetation, and aerial basking sites such as logs, rocks, and mud-banks. Adult females excavate nests in riparian and upland areas in the spring or early summer. Nest sites are generally located on sunlit slopes, and require friable soil that



Credit: Regional Parks staff

is sufficiently dry to promote successful egg development (Holland 1994). The young generally hatch and overwinter in the nest (Jennings and Hayes 1994, Reese and Welsh 1997). At least under some ecological conditions, pond turtles may regularly utilize terrestrial habitats (Reese and Welsh 1997). Western pond turtle is a dietary generalist, subsisting principally on invertebrates as well as plant material and carrion. Formalized surveys for this species have not been conducted, but anecdotal observations and high quality habitat suggest that it occurs within the Park.

### Special-Status Wildlife: Amphibians and Reptiles

- RMP-O25** Protect potentially occurring amphibian and reptiles, and their habitat during construction of park infrastructure, trail building, and regular maintenance. These species require protective measures to ensure that they are not impacted during construction or normal maintenance activities.
- RMP-O26** Monitor, remove, and control invasive plant species that threaten special-status herpetofauna habitat. Prevent the establishment of and control the existing populations of predatory wildlife. Invasive plant species, particularly water primrose, negatively affects the quality of CRLF and other wildlife dependent on aquatic environments. Aquatic invasive plants can alter water chemistry and de-oxygenate the water column. Although they can provide strata for egg masses, they also provide shelter for predators, such as the introduced American bullfrog and warm water fish. Bullfrogs and fish have been implicated in exacerbating the decline in CRLF. See Section titled Natural Resources: Invasive Wildlife Species for specific actions for invasive wildlife species management.
- RMP-O27** Protect special-status herpetofauna from parasites, pathogens, and chemical pollutants. Pathogens such as the fungus chytrid (*Batrachochytrium dendrobatidis*) have been implicated in the decline of CRLF and other native amphibians, as well as chemical pollutants. To protect CRLF and other wildlife in the Park, measures to prevent the introduction and spread of pathogens and chemical pollutants will be implemented. See Section titled Natural Resources: Invasive Wildlife Species for specific actions for invasive wildlife species management.
- RMP-O28** Conduct protocol-level surveys to determine the presence of special-status herpetofauna in the Park in areas where new development is planned. Periodically monitor population trends of these species. Possibly introduce CRLF into the Park.
- RMP-G21** For any ground disturbing activities Protocol-level baseline surveys will be conducted determine the presence and extent of CRLF and other special-status herpetofauna in the Park.
- RMP-G22** If determined to be on-site, continued monitoring will be conducted to determine population trends, potential relationship with off-site populations, migratory patterns, and the effects of grazing and other management activities on CRLF and/or other special-status herpetofauna.
- RMP-G23** Develop a management plan specifically for CRLF and/or other special-status herpetofauna. The plan will monitor the interaction between amphibian populations and Park use, livestock grazing, and infrastructure development. Targeted eradication and/or control of invasive species will be accompanied with specific pathogen, such as chytrid, should they become established. If constituent elements exist, a plan will be developed to reintroduce CRLF to the Park. Reintroduction would require extensive consultation with the USFWS and CDFW.
- RMP-S35** Trails, roads, and other developed infrastructure will be located away from special-status herpetofauna species to the greatest extent feasible. Where ground-breaking disturbance in the general vicinity of special-status herpetofauna is unavoidable, best management practices will be implemented to avoid soil erosion, spread of pathogens, and incursion of invasive species. Protocol level surveys for special-status herpetofauna will be conducted along the course of proposed trails, roads, or other park development projects to ensure that such species are not present. Biological monitors may need to be on-site during activities if there is the potential to directly impact special-status herpetofauna.
- RMP-S36** Effects of foot traffic and other visitor uses near stock ponds and other potential special-status herpetofauna habitat will be monitored periodically. Excessive native vegetation trampling, soil compaction, sediment migration, and/or other deleterious effects on habitat will be corrected immediately.
- RMP-S37** Dogs will be excluded from stock ponds and other potential special-status herpetofauna habitat. Dogs will be confined to approved trails on no longer than 6' lead at all times.

### Special-Status Wildlife: Amphibians and Reptiles

- RMP-S38** Educational materials, either through brochures or signage, will be provided to park visitors, staff, volunteers, and contractors to clearly convey the importance of minimizing impacts and visitation to CRLF and other special-status herpetofauna habitats.
- RMP-S39** CDFW and USFWS will be consulted during project development to identify and implement any additional measures to avoid and minimize direct and indirect impacts to CRLF and/or other special-status herpetofauna.
- RMP-S40** Any alteration of vegetation within 500 feet of the stock ponds and/or other potential special-status herpetofauna habitat will occur outside of these species' dispersal periods.

### Common and Special-status Birds

White-tailed kite (*Elanus leucurus*). CDFW Fully Protected Species. High Potential (Present): White-tailed kite is resident in a variety of open habitats, including agricultural areas, grasslands, scrub and open chaparral habitats, meadows, and emergent wetlands throughout the lower elevations of California. Nests are constructed mostly of twigs and placed in small to large trees, often at habitat edges or in isolated groves (Dunk 1995). This species preys upon a variety of small mammals and other vertebrates. The Park provides open habitats for foraging and suitable trees for nesting, as well as contiguous high-quality foraging habitat adjacent to the Park. White-tailed kites have been observed by LSA foraging within the Park. Although no nesting location has been documented to date, suitable nesting habitat is present within the Park.

Golden eagle (*Aquila chrysaetos*). CDFW Fully Protected Species, USFWS Bird of Conservation Concern. High Potential (Present): A fully protected species, the golden eagle is largely resident in open and semi-open areas from sea level to 11,500 feet elevation. Occupied habitats include shrublands, grasslands, desert, mixed woodlands, and coniferous forests. This species is usually found in mountainous areas, but it may also nest in wetland, riparian, and estuarine habitats at lower elevations (Kochert et al. 2002). Golden eagles typically build or maintain multiple nests prior to selecting one nest for a given year; however, they do not exhibit strict site fidelity, often moving nesting locations between years, and may not nest each year (Peeters and Peeters 2005). Nests are large and typically built on cliff ledges or in large, relatively isolated trees; therefore, many of the blue gum and possibly larger coast live oak trees in the Park provide potential nesting locations.

Golden eagles forage over wide areas, most frequently above open canopied shrub or woodland, or grassland habitat, and feed primarily on ground squirrels, rabbits, large birds, and carrion. The expansive grassland habitat is optimal for foraging, and the mix of riparian, woodland, and minor shrub elements provide cover for many of the prey animals of the golden eagle.

Golden eagles have been repeatedly observed in and immediately adjacent to the Park, and the Tolay Lake area is thought to host five active golden eagle nests (Janet Thiessen pers. comm. in LSA 2009b), likely lending to the frequent observations. Optimal nesting location is at the midslope position of north- and east-facing ridges gaining maximum protection from strong winds (Peeters and Peeters 2005). Golden eagles have been observed soaring, foraging, and perching over the site and the Park provides suitable nesting habitat.

Burrowing owl (*Athene cunicularia*). CDFW Species of Special Concern. High Potential (Present): Burrowing owl is a state protected species, but does not have any federal listing. These birds prefer short grass-grasslands with burrow networks, and frequently with boulder fields or rock outcrops. Burrows of small mammals, such as ground squirrels, are utilized for year-round shelter and nesting, and are often modified by burrowing owls. Constructed burrows are readily occupied by burrowing

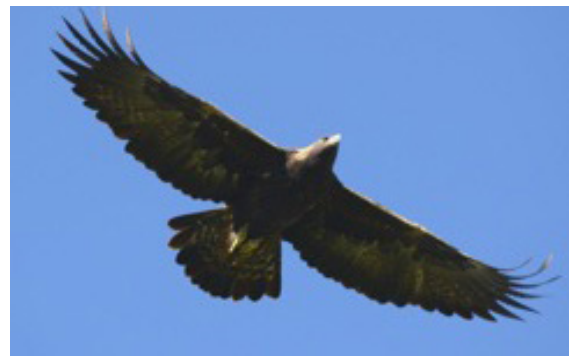


Photo Credit: Regional Parks staff



owls, and have been constructed for habitat enhancement and mitigation in several sites in California.

Burrowing owls have been observed within park grasslands, particularly in areas of burrow activity and rock outcrops. Single individuals have been repeatedly observed at rock outcrops and boulder fields in winter and spring, though infrequently in summer, suggesting dispersing juveniles or overwintering birds. Breeding burrowing owls have not been observed in Sonoma County since 1987, and breeding colonies are considered extirpated from the county (Burrige 1995).

Short-eared owl (*Asio flammeus*), CDFW Species of Special Concern, High Potential (Present): Short-eared owl is a state protected species, but does not have any federal listing. These owls are ground-nesting, and therefore require tall herbaceous vegetation to conceal their nests. Typically located in grasslands and emergent wetlands (Holt and Leasure 1993), within California short-eared owls are concentrated on the Modoc Plateau, Great Basin, western Sacramento Valley, and southern Coast Ranges, with isolated populations around the state (Shuford and Gardali 2008).

A short-eared owl was observed within grassland habitat on the West Ridge on November 18, 2005 (Jake Newell, pers. comm.). Short-eared owls do not typically breed in Sonoma or Marin counties, but fledged young have been observed in Point Reyes National Seashore and Annadel State Park in 1979 (Shuford and Gardali 2008). The Park provides suitable foraging and overwintering habitat, but regular nesting is unlikely due to the presence of grazing. There has been very limited observation of breeding in the North Bay.



Photo credit: Geard Moore

Grasshopper sparrow (*Ammodramus savannarum*). CDFW Species of Special Concern. High Potential (Present): A second priority species of special concern (Unitt 2008), grasshopper sparrow generally prefers moderately open grasslands and prairies with patchy bare ground. They select different components of vegetation depending on grassland ecosystem. This sparrow typically avoids grasslands with extensive shrub cover, although some level of shrub cover is important for birds in western regions (Vickery 1996). Grasshopper sparrows are ground nesting birds, creating cupped nests domed with overhanging and eggs are usually laid in early to mid-June and hatch within 14 days. Both males and females provide care to the young, and second broods are common. This species primarily feeds on insects (Vickery 1996). Suitable foraging and breeding habitat for this species is widely present, where open shrubs and grasslands with bare ground create a habitat mosaic.

Tricolored blackbird (*Agelaius tricolor*), CDFW Species of Special Concern, USFWS Bird of Conservation Concern. High Potential: The tricolored blackbird is a locally common resident in the Central Valley and along coastal California. This species breeds adjacent to freshwater, preferably in emergent wetlands with tall, dense cattails (*Typha* spp.) or tules (*Schoenoplectus* spp.), thickets of willow (*Salix* spp.), blackberry and/or tall herbs, as well as flooded agricultural fields with dense

vegetation (Shuford and Gardali 2008). Insects are the primary food source. The species is highly colonial; nesting habitat must be large enough to support a minimum of 30 pairs, and colonies are commonly substantially larger, ranging from 100 to tens of thousands of individuals. Several confirmed and probable breeding locations have been observed in southern Sonoma County (Burrige 1995). Tricolored blackbirds have been observed within the Park, and have a high potential to nest within the Park due to relative documented nesting locations observations in southern Sonoma County and the presence of emergent freshwater marsh vegetation.

Nesting birds (various spp.). MBTA, CFGC. High Potential (Present):

Despite no federal or state listing, all native birds are protected either by the Migratory Bird Treaty Act (MBTA) or the California Fish and Game Code (CFGC). The MBTA protects active nests of all birds including migratory species. Upland game and waterfowl birds are allowed to be taken, but strict seasons have been developed around the life cycle of these birds. Breeding bird season may vary dependent upon species, site condition, annual weather and legal agreement (e.g., mitigation plans), but generally runs from February 1 to August 31 in a given year. Red-tailed hawk and western meadowlark have been observed nesting on site by LSA (LSA 2009b), and several other species undoubtedly nest each year within the Park's boundaries.

#### Special-Status Wildlife: Common and Special Status Birds

- RMP-O29** Protect and enhance nesting, foraging, cover, and migratory bird habitat in the Park. Species diversity is correlated with habitat diversity and complexity, with healthier and richer ecosystems supporting diverse species populations. Managing the several different habitats of the Park will benefit and sustain diverse bird populations.
- RMP-O30** Prevent impacts to individual birds, nests, and eggs during construction of infrastructure, trail building, and routine maintenance. Under the federal Migratory Bird Treaty Act (MBTA) it is unlawful to take, kill, and/or possess migratory birds, as well as their nests, eggs, and young in the nests. The California Fish and Game Code protect nests, eggs, and birds as well. Special-status birds are protected under a variety of federal and state codes. Therefore, birds and their nests require protection during construction and Park operations.
- RMP-O31** Continue monitoring migratory activity and census to evaluate long-term trends of birds in the Park. The Park is a popular attractant for bird watchers and ornithologists. The Petaluma Wetland Alliance (PWA) has performed numerous bird surveys in the Park, and LSA summarized their observations in a report to Regional Parks (LSA 2009b). Updated observations and analysis will be synthesized and then utilized as a baseline for overall bird diversity and population health.
- RMP-G24** Nesting boxes will be manufactured and installed on the edge of seasonal wetlands and grasslands near trails and other high visibility areas. Educational materials either through signage or brochures to inform the Park's visitors and volunteers of the efforts to provide nesting habitat for birds. Owl boxes will be installed in the Park Complex. Should these boxes be installed, preventative measures will be necessary to prevent invasive species from colonization and annual monitoring and maintenance outside of the active nesting season to reduce pathogens.
- RMP-G25** Non-native birds (e.g., European starlings) and feral cats that pose a potential threat to native birds will be monitored and managed.
- RMP-G26** Continued coordination with bird-watching and volunteer groups such as PWA and Audubon Society to perform regular monitoring of the avian fauna of the Park. A comprehensive monitoring program will be developed, and incorporative of volunteer work, to collect information on species abundance, species composition, habitat use, population distribution, population size, breeding status, and inter-annual variation.

### Special-Status Wildlife: Common and Special Status Birds

- RMP-G27** Develop a management plan for common and special-status bird species to account for park activities and uses, grazing management, infrastructure development, and the potential eradication and/or control of invasive species and pathogens if they become established and pose a deleterious effect on nesting bird populations.
- RMP-S41** During the nesting season (approximately February 1 through August 31), breeding bird surveys will be conducted prior to the construction of trails, roads, and all other park infrastructure with the potential to impact nesting birds. Should breeding birds be detected, a qualified avian biologist will make recommendations to park staff to avoid impacts to breeding birds.
- RMP-S42** Dogs will be confined to approved trails only and on no longer the 6' lead at all times.
- RMP-S43** Educational materials, either through brochures or signage, will be provided to park visitors, staff, volunteers, and contractors to clearly convey the importance of avoiding breeding birds and bird nests.
- RMP-S44** CDFW and USFWS will be consulted during project development to identify and implement any additional measures to avoid and minimize direct and indirect impacts to common and special-status birds within the Park.

#### Common and Special-status Bats

Townsend's big-eared bat (*Corynorhinus townsendii townsendii*). CDFW Species of Special Concern, WBWG High Priority Species. Moderate Potential: This species ranges throughout western North America, from British Columbia to the central Mexico. It is typically associated with caves, but also found in man-made structures, including mines and buildings (CDFW 2013a). While many bats wedge themselves into tight cracks and crevices, big-eared bats hang from walls and ceilings in the open. Males roost singly during the spring and summer months while females aggregate in the spring at maternity roosts to give birth. Females roost with their young until late summer or early fall, until young become independent and can fly and forage on their own. Hibernation roosts tend to be made up of small aggregations of individuals in central and southern California (Pierson and Rainey 1998). Although there are no documented roost sites within the Park or its immediate vicinity, the presence of old farm buildings offers the potential for suitable roost sites. Townsend big-eared bats roosting elsewhere in the area may forage in the park at night.

Pallid bat (*Antrozous pallidus*). CDFW Species of Special Concern, WBWG High Priority Species. Moderate Potential: Pallid bats are distributed from southern British Columbia and Montana to central Mexico, and east to Texas, Oklahoma, and Kansas. This species occurs in a number of habitats ranging from rocky arid deserts to grasslands, and into higher-elevation coniferous forests. Pallid bats are most abundant in the arid Sonoran life zones below 6,000 feet, but have been found up to 10,000 feet in the Sierra Nevada. They often roost in colonies of between 20 and several hundred individuals. Roosts are typically in cliffs, rock crevices, tree hollows, mines, caves, and a variety of man-made structures, including vacant and occupied buildings, bridges, and bird boxes (Jameson and Peeters 2004). Tree roosting has been documented in large conifer snags (e.g., ponderosa pine [*Pinus ponderosa*]), inside basal hollows of giant sequoias (*Sequoiadendron giganteum*), and within bole cavities in oak (*Quercus* spp.) trees. They have also been reported roosting in stacks of burlap sacks and stone piles. Pallid bats are primarily insectivorous, feeding on large prey that is taken on the ground, or sometimes in flight (Texas Parks and Wildlife 1997). Prey items include arthropods such as scorpions, ground crickets, and cicadas (WBWG 2013). Pallid bats have a moderate potential to occur due to the presence of several documented roost sites in the general vicinity of the Park (CDFW 2013a) and the presence of suitable roosting habitat (e.g., old farm buildings).



### Common and Special-Status Bats

- RMP-O32** Prevent impacts to individual bats and their roosting habitat during construction of infrastructure, trails, and routine maintenance. Bats are particularly susceptible to perturbations from human activities which have contributed to the decline in several species. Disturbance during hibernation and rearing can result in roost abandonment and mortality, particularly to young bats. Light pollution can alter foraging behavior and compromise bat populations. Many bat species exhibit high site fidelity and the removal or damage to roosts can lead to roost abandonment or exposure. Therefore, avoidance and minimization measures will be required when conducting potentially impacting activities in areas of bat roosts.
- RMP-O33** Protect and enhance roosting and foraging habitat in the Park. Similar to birds, habitat complexity supports healthier and more diverse populations of bats. Bats forage at night for night-flying insects, many of which are agricultural and human health pests (e.g., mosquitos). The preservation of existing roosts, the creation of roosts, protecting the Park's diverse habitats, and minimizing the use of chemical insecticides will contribute the enhancement and protection of bat populations.
- RMP-G28** Roosting boxes will be manufactured and installed on the edge of seasonal wetlands, grasslands, and Park Complex. The boxes will be regularly monitored to determine their use and if special-status bat species have taken residency.
- RMP-G29** Livestock troughs will be reviewed and modified to accommodate access and safety for bat species and other wildlife, including escape structures, water-level management, and removal of hazardous obstacles.
- RMP-S45** During the roosting season, bat surveys will be conducted prior to the construction of trails, roads, and all other park infrastructure with the potential to impact roosting bats. Should roosting bats be detected, a qualified biologist will make recommendations to park staff to avoid impacts to bats.
- RMP-S46** If active roosts are located, impacts will be postponed or cancelled. Avoidance measures may include postponing removal of trees, snags, buildings, bridges, or other structures supporting bats; establishing buffers around roost sites; or construction of replacement roosting habitat.
- RMP-S47** CDFW will be consulted during project development to identify and implement any additional protection measures specific to special-status bat species.

### American Badger

American badger (*Taxidea taxus*). CDFW Species of Special Concern. Moderate Potential: The American badger is a semifossorial mammal in the weasel family (Mustelidae). Macrohabitat includes dry, open woodlands, extensive forest meadows, open scrub, and grasslands. Microhabitat conditions require loose friable soils for burrow creation and foraging potential. Badgers are typically solitary, nocturnal, and construct burrows for refuge during daylight hours. Badger burrows are usually elliptical, with only one entrance, and are located in areas with plentiful prey sources. The primary prey is composed of ground squirrels and pocket gophers, which are typically pursued by digging into their burrows (Jameson and Peeters 2004). Alternative prey resources include mice, rats, reptiles, amphibians, and bird eggs. Young are born in the spring and independent by the end of summer.

Badgers have very large home ranges, depending on available habitat. Males can forage across a range of approximately one square mile to 25 square miles in patchier habitat, while females can range from one-half square mile to 15 square miles (Messick and Hornocker 1981, Newhouse and Kinley 2000). However, in general, densities are one badger per square mile in occupied, prime habitat (Long 1973). Badgers have not been recorded in the Park or immediate vicinity, but suitable habitat is present on hillsides (i.e., East and West ridges) away from heavy clay soils, soil disturbance, and frequent human visitation in Tolay Valley. Several large holes have been observed in the Park that may have been constructed by American badger (Steve Ehret pers. comm.)

American Badger

- RMP-O34** Prevent impacts to individual American badger during construction of Park infrastructure, trail building, and regular operations. Minimize impacts to woodland and grassland habitat. American badgers are sensitive to repeated human activities, particularly actions that alter soil integrity. Repeated human visitation may affect routine behavior of American badger, resulting in burrow abandonment and relocation. Therefore, park activities should avoid extensive burrow network that may potentially support American badger.
- RMP-O35** Protect and enhance open foraging and range habitat in open woodlands and grasslands for American badger. American badgers have extensive ranges in open habitat and require robust prey populations of smaller fossorial mammals. Boom and bust cycles of ground squirrels (i.e., prey) are expected, but unnecessary controls of American badger prey should be avoided.
- RMP-G30** Surveys for the presence of American badger should be conducted. If located within the Park, periodic monitoring should occur to determine the population size, health, migratory patterns, utilization of the site, and interactions with grazing livestock.
- RMP-S48** Pre-construction surveys by a qualified mammal biologist will be conducted prior to ground-breaking activities that have the potential to impact American badger dens.
- RMP-S49** Trails, roads, and other developed infrastructure will be located away from potential American badger dens. Where ground-breaking disturbance in the general vicinity of potential dens is unavoidable, best management practices should be implemented to avoid direct and indirect impacts to American badger.

Photo credit: Regional Parks staff



INVASIVE PLANT SPECIES

Invasive plant infestations can have a profound negative impact on native vegetation communities by altering wildlife patterns and breeding, increasing fire hazard and frequency, increasing sedimentation and erosion, reducing livestock forage capacity, among other threats to healthy ecosystems. Invasive species are typically non-native in origin and out-compete locally native plant species through several advantages: resistance to predation, lack of natural predators, high recruitment rates, and high adaptation to disturbance.

Invasive Plant Management focuses on prevention of new infestations, either from species not previously reported from existing, isolated populations within the Park to other areas, as well as managing (controlling, eradicating) existing populations within the Park. The following objectives will curb new infestations of invasive plant species both from on and off-site locations.

Invasive Plant Prevention and Management

- RMP-O36** Prevent the establishment of invasive plant species within the Park. Invasive plant species pose a significant challenge to land managers because of their competitive advantage over native species, prodigious reproduction, and rapid dispersal mechanisms.

### Invasive Plant Prevention and Management

- RMP-O37** Control the spread of invasive plants and eradicate populations of targeted invasive plants within the Park.
- RMP-G31** High and medium priority invasive species with limited distributions should be eradicated, with exception of blue gum.
- RMP-G32** High and medium priority invasive species with extensive distributions as well as blue gum should be controlled to prevent new infestations and weaken existing populations.
- RMP-G33** If eradicating and/or controlling all of the Park’s invasive species proves infeasible, then the following prioritization should be followed:
  - Recently established or young infestations;
  - Infestations within high quality and sensitive native habitats;
  - Edges of existing infestations, working inward.
- RMP-G34** Annual monitoring of the Park for invasive species, existing infestations, and treated areas. The invasive plant map should be updated annually, and copies provided to staff, volunteers, and visitors soliciting any new observations be logged with park staff.
- RMP-G35** Notes and observations should be recorded regarding control and eradication techniques, results, labor and financial costs, timing, etc. to develop an internal methodology for best treatment outcomes for each invasive plant species.
- RMP-S50** Prioritization and management of invasive plants will follow the standards specified below.
- RMP-S51** A licensed Pest Control Advisor will be consulted prior to implementation of control and eradication methods to refine appropriate quantities and methods of herbicide application. Licensed Pesticide Applicators will conduct any herbicide treatment within the Park.
- RMP-S52** Herbicide treatment will be confined to limited uses for spot treatments; extensive infestations of invasive plants will be controlled by mechanical or other means.
- RMP-S53** Mechanically removed invasive plants will be either burned on-site or hauled off-site in a manner to prevent propagule (i.e., seed, rhizome) escape. Every feasible attempt will be made to remove all vegetative propagules; repeat and spot treatment may be necessary.
- RMP-S54** Native species will be immediately planted and/or seeded into treated areas once it is confirmed that the infestation has been eradicated. Back-planting will reduce the potential for secondary invasion.

| Species   | Life Form                         | High Priority                                |  |
|---|-----------------------------------|--|--|
|   |                                   | Distribution                                 | Management Approach  |
| Himalayan blackberry<br><i>Rubus armeniacus</i> | Evergreen shrub                   | Common; Tolay Creek and other stream courses | CONTROL.   |
| Tamarisk<br><i>Tamarix</i> sp.                  | Evergreen shrub                   | Limited; lower Tolay Creek                   | ERADICATE. Cut stem to near ground, apply herbicide (triclopyr). Repeat treatment.   |
| Water primrose<br><i>Ludwigia</i> sp.           | Herbaceous perennial, aquatic     | Limited; stock ponds                         | ERADICATE. Drain ponds, mechanical removal. Application of herbicide (triclopyr) may be necessary, followed by mechanical removal.                                   |
| Fennel<br><i>Foeniculum vulgare</i>             | Herbaceous perennial, taproot     | Limited; Park Complex, roads                 | ERADICATE. Mechanical removal of entire root system, dispose off-site. Herbicide (triclopyr or glyphosate) treatment and/or mechanical removal for spring seedlings. |
| Harding grass<br><i>Phalaris aquatica</i>       | Herbaceous perennial, rhizomatous | Common; grasslands                           | CONTROL. Intensive grazing in dense stands, grazing in thin stands. Herbicide (glyphosate) for small stands. Prescribed fire for extensive stands.                   |



| Invasive Plant Prevention and Management                 |                                     |  |  |
|--|-------------------------------------|--|--|
| Purple star thistle<br><i>Centaurea calcitrapa</i>       | Herbaceous<br>annual                | Common;<br>disturbed<br>grasslands,<br>roads, livestock<br>loafing areas | CONTROL. Cut root for small stands,<br>herbicide (2,4-D; clopyralid) for large<br>stands. Avoid disturbing soil to discourage<br>new populations.                |
| Yellow star thistle<br><i>Centaurea solstitialis</i>     | Herbaceous<br>annual                | Common;<br>grasslands  | CONTROL. Intensive grazing in early<br>spring; mowing, weed whipping in early<br>spring; prescribed fire in late spring.   |
| Medusa head<br><i>Elymus caput-medusae</i>               | Herbaceous<br>annual                | Common;<br>grasslands  | CONTROL. Intensive grazing in mid-<br>spring, fall mowing to reduce thatch;<br>prescribed fire in spring.  |
| Medium Priority  |                                     |  |  |
| Species  | Life Form                           | Distribution   | Management Approach  |
| Blue gum<br><i>Eucalyptus globulus</i>                   | Evergreen<br>tree                   | Limited;<br>groves near<br>Headquarters<br>and West Ridge                | CONTROL. Mechanical removal of<br>seedling; cut and apply herbicide (triclopyr<br>or glyphosate) to cut stem for saplings.<br>Allow groves to senesce naturally. |
| Poison hemlock<br><i>Conium maculatum</i>                | Herbaceous<br>perennial,<br>taproot | Common; Tolay<br>Lake edge,<br>stream courses                            | CONTROL. Mechanical removal for small<br>stands. Weed whipping in spring, with<br>repeated whipping in summer for large<br>stands.                               |
| Fuller's teasel<br><i>Dipsacus fullonum</i>              | Herbaceous<br>perennial,<br>taproot | Common;<br>wetlands  | CONTROL. Mechanical removal for small<br>stands. Weed whipping in spring, with<br>repeated whipping in summer for large<br>stands.                               |
| Bristly ox-tongue<br><i>Helminthotheca<br/>echioides</i> | Herbaceous<br>perennial,<br>taproot | Common; upper<br>margins wetlands  | CONTROL. Weed whipping for small<br>stands. Mowing for large stands.   |
| Curly dock<br><i>Rumex crispus</i>                       | Herbaceous<br>perennial,<br>taproot | Common;<br>wetlands  | CONTROL. Weed whipping for small<br>stands. Mowing for large stands.   |
| Italian thistle<br><i>Carduus pycnocephalus</i>          | Herbaceous<br>annual                | Common;<br>grasslands,<br>woodland edges,<br>livestock loafing<br>areas  | CONTROL. Weed whipping and/or<br>mowing for large stands in spring. Repeat<br>treatments necessary to exhaust seed<br>bank.                                      |
| Black mustard<br><i>Brassica nigra</i>                   | Herbaceous<br>annual                | Limited; disturbed<br>grasslands,<br>Headquarters                        | ERADICATE. Weed whipping and/or<br>mowing for large stands in spring. Repeat<br>treatments necessary to exhaust seed<br>bank.                                    |

The table above summarizes the medium and high priority invasive species targeted within the Park. Invasive species ranked by the California Invasive Plant Council (Cal-IPC) as “assessed” and “limited” were evaluated and determined that only two, bristly ox-tongue and curly dock, appeared to pose a substantial future threat to certain habitats or species within the Park. All four invasive species with a rank “high” and seven of the 29 species ranked “moderate” were determined to pose a current or future threat to substantially alter the native habitat or management regime. In general, non-native grasses (e.g., soft chess) constitute their own vegetation alliances or are characteristic species within other vegetation alliances and are nearly impossible to eradicate; therefore, these species are not addressed as potential threats to the existing habitats and species within the Park. Additionally, these species, although competitive with native grasses and forbs, often provide habitat for native wildlife and valuable forage for livestock which are a potentially vital component of overall management of the Park.

## INVASIVE WILDLIFE SPECIES

Similar to invasive plants, invasive wildlife species can alter the normal function of a region's fauna. These species can displace, prey upon, compete with, and exchange disease and pathogens with native wildlife. Hybridization between related organisms from separate parts of the world can diminish local genetics. Forage resources can be destroyed or diminished by non-native wildlife, and agricultural enterprises can be compromised. Comprehensive studies to understand the relationship between invasive and native wildlife have not been conducted within the Park, but it does not appear that there currently are non-native species causing deleterious effects on native wildlife.

Several non-native wildlife species have been documented within or have a high potential to occur in the Park. Although CRLF and American bullfrog co-occur and have breeding cycles separated by up to ten weeks (Cook and Jennings 2007), predation by American bullfrogs has been documented (Cook and Jennings 2001, Wilcox 2011). Several of the stock ponds support suitable breeding habitat for both of these amphibians, and therefore, American bullfrog could pose a localized threat to the existing or established populations of CRLF. Wild turkeys are present within the Park; however, it is unclear if this species has deleterious effects on oak regeneration and small invertebrates. Studies from Annadel State Park suggest that the diet of wild turkey is predominantly non-native plants supplemented by insects and small vertebrates (Barrett and Kucera 2005), and wild turkeys have very little overlap with California quail (Lau 2006).

Of greater concern may be feral pigs which are frequent migratory residents in the Sonoma Mountains. Feral pigs cause excessive damage to soil through rooting and wallowing, increasing erosion and providing a pathway for invasive species. Invasive brooms (*Genista* spp., *Cytisus* spp.), and other soil disturbance adapted invasive plant species may spread more rapidly and form dense thickets precluding native vegetation where feral pigs frequent (Sheppard and Hosking 1998, WRA observation 2010). No broom species have been reported in the Park, and continued exclusion of these species will rely on proper management of human visitation as well as non-native wildlife, such as feral pigs.

Downed trees, which are evidence of beaver (*Castor canadensis*) activity, have recently been reported from the Park (Ehret pers. comm. 2014). Historical evidence of beaver from the Sonoma Creek watershed suggests that this species is native to the region, and possibly ranged in the Tolay Creek watershed (Lanman et al. 2013). Beaver convey several benefits to a healthy ecosystem including creating habitat for aquatic organisms, contributing to accretion and sediment storage, and reducing the energy of storm pulses (Rosell et al. 2005, Gurnell 1998). Conversely, in areas within a built environment, beaver dams can lead to flooding and mortality of desirable trees and shrubs (Pollock et al. 2003).

### Invasive Wildlife Species

- RMP-O38** Prevent the establishment of and control existing populations of non-native wildlife species such as feral pig and wild turkey.
- RMP-O39** Reduce the potential impact of beaver on the Park's built environment and Tolay Lake restoration areas; otherwise, allow for natural functioning of this species in the natural areas of the Park.
- RMP-G36** Wild turkey populations should be monitored for size, range extent, seasonal patterns, and any adverse effects on native wildlife or native vegetation communities.
- RMP-G37** Monitoring for feral pigs should be conducted routinely. Coordination with neighbors regarding feral pig observations should be logged by park staff. Should feral pigs invade the Park, an aggressive eradication program should be implemented.

### Invasive Wildlife Species

- RMP-G38** Tolay Lake, stock ponds, and other aquatic resources with the potential to support CRLF should be monitored annually for American bullfrogs, warm water fishes (e.g., bass), crayfish, and invasive plants. If these invasive species become established and diminish the habitat for CRLF, a detailed management program should be developed to eradicate or control the species.
- RMP-G39** The presence of European starling should be monitored. Unlike most other birds, the European starling is not protected under the federal Migratory Bird Treaty Act and their nests can be removed.
- RMP-G40** An education program should be implemented informing volunteers and visitors about the accidental and intentional introduction of non-native plant and wildlife species, and the potential negative effects on native natural resources.
- RMP-S55** Agricultural demonstration and enterprise(s) within the Park involving animals with the potential to escape will be tightly monitored to prevent impacts to the natural areas of the Park (e.g., pigs).
- RMP-S56** Should feral pigs enter the Park, a detailed eradication program will be developed. A depredation permit issued by the CDFW will be acquired to eradicate the feral pigs.
- RMP-S57** Should wild turkey negatively affect wildlife or native vegetation communities, a detailed control program will be developed. A depredation permit issued by the CDFW will be acquired to take wild turkey.
- RMP-S58** Should beaver pose a deleterious effect on the built environment, desirable/historical landscaping, restoration efforts, and/or are creating flood damage, preventive and relocation efforts should be implemented to discourage continued beaver use in these areas. Practices may include trapping and relocation, and shielding trees with wire mesh or electric fencing (VFWS 2004).

### GRAZING

Despite the complex interactions between grazing and natural biota, some beneficial and deleterious effects from grazing are well understood and measurable. Primarily, grazing affects vegetation through direct herbivory, trampling, changes in the nutrient cycle, soil and hydrologic disturbance through compaction and erosion (Bush 2006). These effects favor plants adapted to or tolerant of disturbance, which are often non-native annual grasses and invasive species. Additionally, shrubs, saplings, and even large trees can be browsed or impacted in areas where cattle gather thereby reducing regeneration of woodlands and shrublands, contributing to type conversion (Bartolome et al. 2007). Sensitive habitats including riparian areas, wetlands, and plant species with a high susceptibility to direct herbivory can quickly be negatively impacted (Fleischner 1994, Painter 1995, Belsky et al. 1999). A history of grazing may be contributing to stream bank incision, head-cuts, reduced shrub understory, and browsed tree limbs.

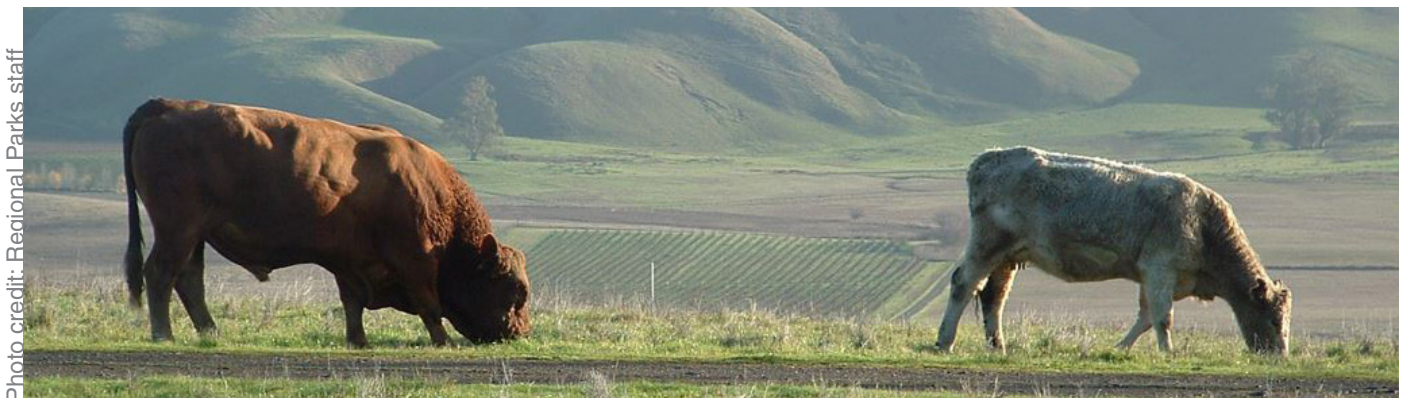


Photo credit: Regional Parks staff



When managed properly, livestock grazing confers several benefits, including thatch reduction, floral diversity, reduced fuel load, and the maintenance of wildlife habitat. Non-native annual grasslands develop excessive thatch accumulation that can inhibit seed germination of other species and increase fire hazard (Kyser et al. 2007). Properly timed grazing can promote native plant species growth through reduced competition for space and nutrients, thatch reduction, and a long-term reduction of non-native species in the seed bank (D'Antonio et al. 2001, Hayes and Holl 2003, Huntsinger et al. 2007). In turn, native wildlife dependent upon specific plants gain benefits, and perhaps continued survival, through grazing, such as the Bay checkerspot butterfly and Callippe silverspot butterfly whose host plants can readily become out-competed by non-native grasses (Weiss 1999, Weiss et al. 2007). The deleterious and beneficial effects of grazing on wildlife are well documented. However, grazing is an effective tool for wildlife and vegetation management when adaptive management principles guide the grazing regime and monitoring results are used to adjust practices as needed. In 2009 and 2010 rangeland resources studies were conducted independently for the northern and southern portions of the Park (LSA 2009a, Bush 2010). The grazing management plan should be update to synthesize these works to include the entirety of the Park boundary and incorporate any infrastructure changes that have occurred since 2009 and 2010.

### Grazing Management

- RMP-O40** Maintain the agricultural heritage of the Park through a livestock grazing program. Incorporate livestock grazing into the overall natural resources management of the Park.
- RMP-O41** Ensure that livestock grazing confers maximum benefit while minimizing impacts to natural and cultural resources.
- RMP-G41** Residual dry matter (RDM) levels should average approximately 1,200 pounds per acre across the Park. There may be spatial and temporal variability in this number with lower RDM targets in gentler terrain, in drier years, and/or where high intensity grazing confers particular enhancement benefits for natural resources (e.g., bare ground creation).
- RMP-G42** Grass height and density should exhibit patchiness rather than heterogeneity to provide wildlife habitat and floristic diversity.
- RMP-G43** Pasture infrastructure should remain intact and updated when necessary to provide rotational grazing and location specific management such as high intensity grazing if needed.
- RMP-G44** Livestock movement should be encouraged to reduce trampling effects. The strategic location of supplemental feeding, watering, and mineral supplements can encourage livestock to distribute more broadly across a pasture.
- RMP-G45** Livestock attractants such as troughs and mineral supplements should be located away from known pre-historic archaeological sites, wetlands, riparian habitats, oak regeneration sites, etc. to prevent or reduce grazing and trampling on or near sensitive resources.
- RMP-G46** RDM values below the recommended minimum level in two or more consecutive years should be avoided by destocking, rotation, or supplemental feeding. Process for stocking rates, rotations, and supplemental feeding should be identified within the grazing lease agreement.
- RMP-G47** Targeted exclusion fencing should be considered for existing sensitive resources, such as riparian, wetlands and prehistoric cultural resources.
- RMP-G48** Stream crossings and extensive wetland use by livestock should be evaluated and if deemed an impact or impairment to these features, corrective measures should be adopted.
- RMP-G49** Educational materials and signage should be developed and provided to park visitors to inform the public of the historical legacy of grazing, the management benefits it confers, and safe behavior around livestock.
- RMP-S59** Livestock grazing will be maintained to management natural resources as well as to preserve its historical legacy. Livestock grazing will be managed to protect pre-historic cultural resources.

## Grazing Management

- RMP-S60** Stocking rates will be calculated for individual pastures or grazing units based on forage productivity, topography, vegetation type, presence of special-status species and sensitive habitats, distance to water and mineral supplements, and soil type and erosion potential. Because year to year increases or decreases in stocking rates will be necessary based on market and climatic conditions, stocking rates will be expressed in a range of values.
- RMP-S61** Downed or damaged fences will be replaced as soon as practically possible. Boundary fences will be regularly maintained to prevent incursion of neighboring livestock and out-migration of park livestock.
- RMP-S62** Exclusion fencing may be erected as needed to protect pre-historic cultural resources from cattle, and restoration and enhancement areas to allow for the establishment of native vegetation. In some cases the fencing may act as enclosures for flash or high intensity grazing as part of the enhancement activity (e.g., reduction of non-native grass thatch, reduction of invasive species).

## FIRE

Much of California including Tolay Lake Regional Park lands, vegetation has evolved with fire as a major component of its disturbance and renewal process. Plant species and vegetation communities are frequently dependent upon fire, which can contribute to patchiness and floral diversity. Fire has been used as a tool to reduce vegetation cover for visibility and movement, provide favored wildlife habitat, and increase abundance of desirable food sources.

The most prevalent non-native grasses of California are overwhelmingly annual and from the Mediterranean and these species are not particularly well adapted to fire. Fire has been utilized to control and reverse the spread of these species with varying success (Jackson 1985).

Prior to European contact, Coast Miwok used fire as a tool to manage the land. Periodic fires in grasslands after seed collection removed thatch and encouraged healthy new growth and seed. Fires kept coyote brush and scrub in check and the intensity of fires appears to have been such to create type conversion from shrubland and woodland to open savannah and grassland (Keely 2001, Anderson 2005). The arrival of the colonial powers from Spain brought major changes in the fire regime in California. In 1793, Governor Arrillaga outlawed all deliberate fires set by Indians in California, citing “widespread damage which results to the public from the burning of fields.” Unknown is whether this negative assessment derived from a fear of grass fires spreading into towns, or a misunderstanding of natural fire dynamics, or simple racism. (Geoffrey Coffey, Getting Burned Bay Nature July 2005)

The Tribe values the use of small setting, prescribed fires not only for restoring the land but also for its value to bring back cultural burning. The historical management of the land was not, as is often assumed, an untouched Eden but a practically human-made landscape, a series of habitat patches that were deliberately ecologically managed. From this cultivated landscape issued not just a year-round supply of food, but the basis upon which Native Americans constructed their material culture. For example, they burned to promote uniform, straight, and flexible deer grass, willow, and other plant stalks with which they made their basketry (and still do). (Mary Ellen Hannibal, Lighting Cultural Fires, Boom Fall 2014)

Prescribed fire can enhance soil carbon sequestration and nutrient-cycling. Frequent, low-intensity fires in scrub habitat can increase the below-ground biomass of native shrubs, and sequestered carbon (Norton and Howarth 2006). In grasslands, fast-moving low intensity fires are less likely to volatilize soil carbon and nitrogen, while having the potential to control annual grasses and assist the re-colonization of native perennials which, generally, sequester more carbon in soil (DiTomaso et al. 2006, Reiner 2007). Of course, fires themselves contribute to the release of greenhouse gases, but generally, the benefits conveyed by appropriate fire management suggest that this release would be absorbed with increased vegetative vigor and conversion to perennial and woody species (Delonge et al. 2014).

There are ecological risks associated with prescribed fire. Fire can promote some invasive species, such as filarees (*Erodium* spp.) and mustards (*Brassica* spp.), posing a risk to native habitats and restoration goals (D'Antonio and Dudley 2010). It is important to determine an appropriate fire return interval to avoid undesirable type conversion, soil-nutrient loss, exposure of bare ground, all of which can contribute to continued invasive species and loss of biodiversity (DiTomaso et al. 2006, Keeley 2006, Brooks et al. 2004). Chaparral and scrublands are particularly susceptible to type conversion and post-fire infestations of invasive plants from frequent, short-interval fires (Keeley 2006, Lippitt et al. 2013). Therefore, if prescribed fire is used to manage the Park's scrub species, caution should be taken to ensure that the return-interval and intensity is such that native shrubs survive the fire to continue to provide cover and buffer effects of invasive species.

In general, fire is an effective tool for land management when applied in conjunction with other management techniques (e.g., grazing, soil grubbing, herbicide treatment). For instance, control of yellow star thistle is most effective when repeated fires are conducted or with a follow-up treatment with herbicide (DiTomaso et al. 1999). Similar to grazing, fire can be a cost-effective management technique over broad areas where herbicide, mechanical removal, and other treatments for invasive species are impracticable. However, public health and safety are associated concerns with both the intentional use of fire as a management tool as well as unintentional wildfire. Therefore, the Park's fire management should account for both the risk of wildfire and the potential use of fire for land management and traditional cultural practices.

### Fire Management

- RMP-O42** Protect the natural resources, cultural resources, public safety, and park infrastructure from wildfire.
- RMP-O43** Prescribed burning should be a consideration for native resources management including native grassland restoration, invasive species management, and wildlife habitat enhancement. And consideration should be given to bring back cultural fire burning.
- RMP-G50** A fire management, prevention and suppression plan should be developed for both the prevention of damage to cultural resources, Park infrastructure and public safety as well as restoration and/or enhancement of natural resources particularly grasslands and wildflower fields, to protect Park resources as feasible in the event of a fire, from firefighting crew tactics (i.e. excavation & other heavy equipment).
- RMP-S63** Provision of multiple access points to prevent and control wildfire. Access should include from Lakeville Road and Highway 121, as well as designated helipads for air landings. See Figure 9-1 and 9-2, Emergency Access Plans for the Park.
- RMP-S64** Off-road vehicles operated by the Park, their contractors, and volunteers will have spark arrestors. Operators of street vehicles will park vehicles in low fire risk areas (e.g., low-growing vegetation, bare ground). During high and very high fire hazard days, the use of power tools for regular maintenance and vehicle access to undeveloped areas will be prohibited unless in the case of emergencies.
- RMP-S65** Smoking will be prohibited in the Park to reduce fire risk and per Sonoma County Ordinances 5947 and 5953. Signage clearly designating the Park as a No Smoking environment will be posted at all entry points, campsites, Park Complex, and informational brochures.
- RMP-S66** Fixed barbecues, fire rings, and visitor open air cooking equipment will only be located or allowed in designated campsites and picnic areas.
- RMP-S67** Vegetation management for fire protection will consider native dominated habitats and all feasible protections for native plants will be considered. Where it is essential to remove native species, replacement and/or translocation planting of native plants should be conducted elsewhere in the Park.



### Fire Management

- RMP-S68** Livestock grazing and mowing will be the preferred methods for herbaceous fuel reduction around park infrastructure. Disking will be kept to a minimum to reduce the potential for invasive species establishment.
- RMP-S69** Monitoring and reduction of fuel loads throughout the Park will be implemented on a regular basis (see Section titled Blue Gum and Monterey Cypress Groves). Particular attention should be paid in areas of high thatch accumulation (i.e., ungrazed grasslands), downed woody debris (i.e. blue gum groves, oak woodlands), and areas of downed trees from SOD or other pathogens. RDM monitoring results should be used to target potential areas of high thatch accumulation in grasslands (see Section titled Grazing).

### AVOIDANCE AND MINIMIZATION OF POTENTIAL IMPACTS

Development and improvement activities pose potential impacts to the cultural and natural resources within the Park, precipitating the need to provide objectives, guidelines, and standards to avoid, minimize, or mitigate these impacts. In some cases, minimum setbacks are sufficient to prevent direct and indirect impacts to natural resources. Where development and improvements cannot be setback from resources, several localized biological studies, archaeological resource studies, surveys, and assessments may be necessary to determine if sensitive resources are present, to delineate these resources, and then provide permitting or other management measures to avoid and minimize impacts.

### Avoidance and Minimization of Potential Impacts

- RMP-O44** Prevent direct and indirect impacts to sensitive cultural and natural resources by placing setbacks on these resources. In the instance where direct impacts to sensitive resources result, surveys or assessments need to be conducted to analyze the extent of the impact and determine appropriate minimization and mitigation to offset the impact. Furthermore, potential impacts from contaminants and pathogens to the resources should be minimized.
- RMP-O45** Habitat restoration and enhancement areas should serve as the primary locations for mitigation for unavoidable impacts associated with park development and maintenance. Identified prehistoric archaeological resource sites should serve as primary locations for protection management and monitoring activities.



Photo credit: Regional Parks staff

**Setback Guidelines and Standards**

The following guidelines and standards will assist Park Staff and volunteers with establishing and maintaining buffers sufficient to protect sensitive natural and pre-historic archaeological resources. Activities set back from sensitive resources provides buffering protection to the resource through the capture of sediments; slowing water runoff and erosion that might enhance the likeliness of exposing archaeological resources; and retards invasive species advancement allowing for the continuation of healthy ecological processes to occur within the adjacent sensitive resource. Generally, the narrower the buffer, the less the buffering effect; however, sufficient buffer width is determined on a case by case basis. A narrow buffer in recreational settings can allow visitors to experience natural and cultural resources while discouraging informal trail creation through these sensitive areas.

**Natural Resource Setback Guidelines and Standards**

**RMP-G51** A qualified biologist, ecologist, and/or wetland scientist should be consulted when improvements and/or development are within the established setback buffers.

**RMP-S70** To protect sensitive natural resources, minimum setback standards will be adhered to where feasible. The following standards summarize the suggested minimum vegetated buffer from the Park’s natural resources.

| Habitat Type                        | Potential Development Intensity  | Min. Buffer                 | Rationale  |
|-------------------------------------|--|-----------------------------|--|
| Wetland / Stream / Riparian Habitat | Low-medium: Trails, picnic tables, viewing platforms                                       | 50’<br>Centerline of stream | Allows space for natural stream channel change<br>Buffers erosion into stream channel<br>Allows for natural and assisted regeneration<br>Maintains integrity of wildlife corridor                              |
|                                     | High: Built infrastructure   | 100’<br>Top of bank         | Buffers sediment and nutrient runoff<br>Allows for natural and assisted regeneration of trees and large shrubs<br>Buffers water temperature<br>Maintains connectivity between aquatic and terrestrial habitats |
| Native Grassland                    | Low-medium: Trails, picnic tables, gathering (e.g., docent led hikes, large hiking groups) | 25’                         | Reduces potential for invasive species establishment<br>Allow for natural and assisted regeneration  |
|                                     | High: Built infrastructure   | 50’                         | Buffer from trampling/foot traffic<br>Buffer potential changes in local hydrology<br>Buffer potential shade/sun impacts  |
| Rock Outcrop                        | Low-medium: Trails, picnic tables, viewing   | 25’                         | Reduces potential for invasive species establishment<br>Reduces potential disturbance to wildlife  |
| Special-status Plants               | Low-medium: Trails, picnic tables  | 25’                         | Reduces potential for invasive species establishment<br>Allow for natural regeneration and recruitment   |
|                                     | High: Built infrastructure   | 50’                         | Buffer from trampling/foot traffic<br>Buffer potential changes in local hydrology<br>Buffer potential shade/sun impacts  |
| Bat Roost                           | Low-medium: Trails, picnic tables  | species dependent           | Reduces roost abandonment  |
|                                     | High: Built infrastructure   | species dependent           | Reduces roost abandonment  |
| Bird Nest                           | Low-medium: Trails, picnic tables  | species dependent           | Reduces nest abandonment   |
|                                     | High: Built infrastructure   | species dependent           | Reduces nest abandonment   |

**Cultural Resource Setback Guidelines and Standards**

**RMP-G52** Development within the established setback buffers will be conducted in coordination and collaboration with the Tribe.

**RMP-S71** To protect sensitive cultural resources, minimum setback standards will be adhered to the greatest extent feasible. The following standards summarize the suggested minimum buffer from cultural resources.

| Type   | Potential Development Intensity   | Min. Buffer           | Rationale   |
|--|---|-----------------------|---|
| Existing known prehistoric archaeological sites or Tribal Cultural Resources (TCR's) | Low-medium: New trails, picnic tables, viewing platforms  | 150'                  | In avoidance of casual unknowing disturbance of cultural resources by the visiting public. All ground disturbing construction activities will be coordinated for monitoring by the Tribe.   |
|  | Natural habitat restoration; Including Lake and wetlands, woodland, and native grass and wildflower | Project Specific      | Project level development of any of the sites natural habitat restoration will be done in coordination and collaboration with the tribe. With the Tribe's understanding of the need to balance natural resource enhancement with the protection of pre-historic cultural resources. All ground disturbing construction activities will be coordinated for monitoring by the Tribe.  |
|  | High: New southern parking lot and other associated park access infrastructure                      | 500'                  | Coordinate with the tribe to have Tribal Monitors present during all ground disturbing construction activities.   |
|  | High: New infrastructure within the Park Complex  | Project specific      | Setbacks within the Park Complex are unfeasible due to Conservation Easement restricting new building development within the defined Park Complex/Visitor Center Area and the known cultural sensitivity of the Park Complex. Pre-historic resources will be avoided to the greatest extent feasible. Projects within the Park Complex will be constructed in coordination and collaboration of the Tribe and as laid out within the approved Master Plan. All ground disturbing construction activities will be coordinated for monitoring by the Tribe. |
| In the case of new pre-historic archaeological finds                                 | Low-medium: Benches, picnic tables, gathering areas   | Site Specific         | Established tables, benches and gathering areas will be moved as possible recognizing that other land constraints may also dictate location. Assessment and mitigation will be in coordinated with the Tribe.   |
|  | Low-medium: Trails  | Site Specific         | If a newly discovered site is within the area of an established trail Regional Parks will work collaboratively with the Tribe to assess and prescribe protective solutions. Protective solutions might include but not be exclusive to trail re-alignment, site resource capping, and/or site exclusionary fencing.   |
|  | High: Built infrastructure  | Site/Project Specific | Methodologies and practices in coordination with the Tribe will define actions for newly discovered artifacts.  |



### General Biological Survey Guidelines and Standards

The Park supports numerous sensitive biological resources that are protected through several federal, state, and/or local codes and ordinances. Frequently, resource agencies have provided guidance and protocols for surveying or delineating the extent of these resources. Where agencies have not provided specific methods for determining the presence and/or extent of sensitive natural resources, it may be acceptable to the governing agency for a qualified biologist or ecologist to propose methods to do so. In most cases, the surveying for sensitive natural resources must be conducted by a qualified biologist, but only in a few instances will these qualifications and the biologist explicitly need to gain permission from a governing agency. The following guidelines and standards are those that would be necessary to implement when development and improvements are proposed near documented or suspected sensitive natural resources including wetlands, streams, stock ponds, native grasslands and wildflower fields, special-status plant species, special-status wildlife species and their habitat, nesting birds protected under the Migratory Bird Treaty Act, and/or roosting bats and roosting habitat.

#### General Biological Survey Guidelines and Standards

- RMP-G53** Park staff, contractors, and volunteers should review the Biological Resources Report (WRA 2013) to become familiar with the various sensitive natural resources within the Park. Any proposed development or improvement that is located near (see Setbacks above) a suspected or documented sensitive natural resource should be avoided the maximum extent feasible.
- RMP-S72** Where it is not feasible to avoid the proposed setbacks, qualified biologists, ecologists, and/or wetland scientists will be consulted to determine the extent of the resource and if the proposed activities will pose a direct or indirect impact.
- RMP-S73** If the qualified biologist, ecologist, and/or wetland scientist determines that an impact is unavoidable, the appropriate permit application must be submitted to the governing agency. In some cases, it may be necessary to apply for multiple permits to multiple agencies for a singular impact.
- RMP-S74** Preconstruction Training: Before the construction, demolition, and/or decommission of trails, roads, fences, buildings, parking areas, and other infrastructural development and improvements, a qualified biologist will conduct a training session for all construction and/or volunteer crews working on the project. The training will include a description of sensitive habitats (e.g., wetlands), special-status species' habitats, and special-status species; basic identification will be part of the training. Protection and avoidance measures will be thoroughly arranged prior to construction and clearly conveyed to all crews working on the project, and contingency/contact information will be provided to all construction crew members to ensure that incidental impacts are swiftly reported and mitigated.
- RMP-S75** Preconstruction Wetland Delineation: Prior to construction in areas within or near wetlands, a qualified wetland scientist will perform a wetland delineation sufficient to determine the extent of Waters of the U.S., Waters of the State, and stream and riparian habitat potentially jurisdictional under Section 404 of the Clean Water Act, Porter-Cologne Act, and Section 1600 of the California Fish and Game Code. Should impacts not occur due to the project, it is at the discretion of the Regional Parks to formally submit documentation to the governing resource agencies. Should impacts be unavoidable, formal submission of the delineation along with the necessary permit application. In this situation a Habitat Mitigation and Monitoring Plan will likely be required by the agencies.
- RMP-S76** Preconstruction Sensitive Natural Communities and Special-status Plant Surveys: Prior to construction in natural habitats, a protocol-level rare plant and sensitive natural communities will be performed. Although the extent of sensitive natural communities and special-status plants have been documented within the Park, new populations may occur within or near proposed project activities. If these resources are observed, they will be avoided by the project to the greatest extent feasible, and if impacts are unavoidable, then a mitigation and monitoring plan will be developed and implemented.

### General Biological Survey Guidelines and Standards

- RMP-S77** Preconstruction Special-status Wildlife Surveys: Prior to construction in all natural habitats, surveys for CRLF and other potentially occurring special-status wildlife will be performed by a qualified biologist. If a wildlife species is observed within or near the proposed project activities, these areas must be avoided until the animal(s) has vacated and/or upon approval from the governing agency, the animal will be relocated away from the potential impact by an approved biologist.
- RMP-S78** Preconstruction Breeding Bird Surveys: Construction, demolition, and maintenance that require vegetation removal or ground-breaking will occur outside of the breeding bird season (February 1 through August 31) where feasible. Prior to construction and routine maintenance a qualified avian biologist will conduct a breeding bird survey. If active bird nests are located near the proposed activity, then the activity will be halted until young birds have fledged or upon approval by a qualified biologist. A buffer of 50 feet will be applied to nesting songbirds, and a buffer of 250 for raptors and large birds will be applied. If work areas are left unattended for greater than seven days during the breeding bird season following the initial survey, then a second breeding bird survey will be necessary.
- RMP-S79** Preconstruction Roosting Bat Surveys: Prior to construction or demolition in areas with the potential to support bat roosts (e.g., barns, snags, large overhanging rock outcrops, and bridges), a roosting bat survey will be conducted by a qualified bat biologist.
- RMP-S80** Exclusionary Fencing: During construction, temporary exclusionary fencing will be installed around sensitive natural resources to prevent construction crews from incidentally entering the natural resource area and its established buffer. Temporary exclusionary wildlife fencing will be erected around work areas to prevent wildlife from entering the work area. Fencing should have one-way routes to allow wildlife to exit the work area and prevent wildlife from entering/re-entering the work area.

### Pathogen and Contaminant Control Guidelines and Standards

The use of chemicals is unavoidable in the development and maintenance of the Park. Gasoline, motor oil, herbicides, solvents, paints, and numerous other compounds can pose significant health hazards for humans as well as to prehistoric cultural resources and the natural environment. Proper handling and containment are essential to preventing these from migrating into park soils, waterways and natural habitats. Controlling the spread of pathogens that pose significant threats to habitat and species is critical to maintaining their health. The following guidelines and standards should be followed to minimize the spread contaminants and pathogens within and from outside of the Park.

### Pathogen and Contaminant Control Guidelines and Standards

- RMP-G54** Park Staff will be aware of potentially hazardous chemicals and be familiar with their material safety datasheets. Training in spill prevention and containment should be conducted for Park Staff that will handle potential contaminants, particularly near wetlands and other sensitive natural resources.
- RMP-G55** Volunteers, and visitors should be educated about the spread of pathogens and prevention measures. Educational materials should be posted at trailheads as well as provided in Park brochures, and should contain information about sudden oak death and chytrid (fungus associated with aquatic environments and amphibians). Emphasis should be placed on the modes of pathogen spread, consequences of infestations, and the role that visitors can play in assisting the prevention of these pathogens.
- RMP-G56** Areas of documented or suspected infestation should be closed to the public and any staff, volunteers, and contractors should take preventative measures before entering and upon leaving the infected area. Exclusions may include temporary fencing, signage, brush fences, or other physical barriers.

### Pathogen and Contaminant Control Guidelines and Standards

- RMP-S81** Pesticides, herbicides, and other potentially hazardous chemicals will be used by qualified persons, and will be utilized for spot treatments only. Large infestations of invasive plant species will be treated by non-chemical means. Spill prevention measures should be exercised at all times that these products are used.
- RMP-S82** Fueling equipment will occur within Park Complex on impermeable surfaces where spill prevention measures can be deployed immediately. Refueling of equipment will occur at least 100 feet away from sensitive cultural and natural resources and will be on tarps, truck beds, or other impermeable surfaces where spill prevention measures can be deployed immediately in the event of a spill.
- RMP-S83** Park staff and contractors working within woodlands will be trained about sudden oak death host species, disease transmission, and preventative measures necessary to minimize the spread of the pathogen, *Phytophthora ramorum*. The following best management practices will be exercised to the greatest extent feasible:
- Equipment will be cleaned in a 10 percent bleach solution, or similar inoculant, before working in oak woodlands. All equipment that will contact the ground and/or plants will be cleaned, such as boots, tires, saws, shovels, etc.
  - Pruning oaks and other host plants will be avoided or minimized in wet weather, and work within oak woodlands will occur in the dry season to the greatest extent feasible.
  - Infected trees within a broader infected area that are downed or pose a safety hazard can be left on site. Removal of a tree should only occur if it is the only infected individual in an otherwise uninfected area. Removal will occur in dry weather only, personnel will take all preventative measures to prevent the spread within and outside of the Park, and the removed tree will be off-sited to an approved dump site.
- RMP-S84** Nursery stock for restoration plantings will be inspected at the point of purchase for symptoms of sudden oak death and other *Phytophthora* pathogens. Should large-scale restoration efforts be conducted, it may be beneficial to test the nursery stock for a range *Phytophthora* species that can pose significant risks to the restoration efforts and their surrounding habitats (Natesen et al. 2014).
- RMP-S85** Park staff, biologists, and contractors working within aquatic habitat will be trained about chytrid and other fungal diseases impacting amphibian populations to prevent the introduction and/or spread of pathogens throughout the Park. Decontamination protocols in accordance with the California/Nevada Amphibian Populations Task Force will be followed immediately following work within aquatic features in the Park.

## Cultural Resources

The Toley Creek watershed and its surrounding landscape represent a long continuum of significant cultural history and traditional Native American practices, as well as diverse and numerous archaeological sites within the Park. The following objectives and standards have been developed to manage and protect cultural and tribal resources within the Park.

See previous section for cultural resource avoidance and minimization objectives, guidelines and standards.



Credit: Regional Parks staff

### Cultural Resources

- RMP-O46** In coordination of the Tribe protect cultural and tribal resources within the Park to ensure that they are not impacted to the extent feasible during construction of infrastructure, trail building, habitat restoration, and routine maintenance. Under the California Public Resources Code (PRC) 5097.5a it is unlawful to knowingly or willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, or archaeological sites on public lands, except with the express permission of the public agency having jurisdiction over said lands.



## Cultural Resources

- RMP-O47** Maintain the cultural landscape of the Park in such a manner that will not degrade the landscape condition or threaten cultural resources, and that, considers impacts from restoration and enhancement activities as part of the management and development of the Park.  
The cultural landscape of the Tolay Creek watershed represents a breadth of natural and cultural significance and exemplifies the relationship between people and the environment. Paramount is the protection of the prehistoric cultural resources and of their sacred place in the Tolay Creek watershed.  
Protect and maintain historic ranch structures as feasible and historical aesthetic congruency with new infrastructure within the Park Complex.
- RMP-O48** Maintain consultation and collaboration between Park staff and the Tribe to ensure the protection of tribal resources and sacred sites during the construction of buildings and infrastructure, trails; habitat restoration efforts, public use, and routine maintenance.  
The Tolay Creek watershed is revered by the Tribe as a place of spiritual health, healing, and gathering. Tribal resources within the Park include both tangible and intangible resources. Government-to-government consultation with the Tribe shall be carried out during all phases of Park management and development.
- RMP-O49** Actively and adaptively manage through collaboration with the Tribe avoidance guidelines for cultural resources from park activities. This collaboration will guide management and development review of cultural resources within the Park.
- RMP-O50** Conduct surveys, or other special studies within the Park when necessary to evaluate, record, and preserve prehistoric and historic archaeological sites and tribal resources within the Park. Based on each specific project activity proposed in the Park, tribal representatives and professional archaeologists will conduct site specific archaeological and ethnographic analysis to assess potential impacts to cultural and tribal resources and address those potential impacts as necessary.
- RMP-O51** Enhance public awareness and appreciation of the Parks cultural and tribal resources and highlight preservation activities.  
The Park will collaborate with the Tribe to develop appropriate interpretive materials and to best adaptively manage established preservation methods.
- RMP-O52** Provide information on the use of native plants and habitat by the Tribe and incorporate ethnobotanical and traditional cultural knowledge into park restoration efforts.  
Archaeological and ethnobotanical studies have been conducted within the Park that have identified culturally significant plant and gathering areas. Possible culturally significant plants that occur, or could be planted include: Sedges, Soaproot, Mugwort, Clovers, Loamtium, Snowberry, Toyon Berry, Currants/Gooseberry, Wild Rose, Blue elderberry, Native Grapes and Willows.
- RMP-S86** Park staff will consult regularly with the Tribe to ensure that collaboration and cooperation occurs in the management and development of the Park and its cultural and tribal resources. An advisory committee and Monitoring Plan with park staff and tribal citizens will be created to oversee and monitor park activities especially how they are affecting (or not) sensitive sites, and to identify additional resources and protective measures.
- RMP-S87** In collaboration with the Tribe, natural resource management plans regarding grazing, erosion, fire, remediation, and restoration and habitat efforts will be developed. It is often the case that natural management activities pose direct and indirect impacts to cultural and tribal resources.
- RMP-S88** Educational materials and interpretive signage will be developed to inform the public of the cultural landscape, archaeological sites, tribal resources, California Public Resource Code (PRC) 5097, and ongoing preservation measures within the Park.

## Cultural Resources

- RMP-S89** Areas of documented cultural and tribal resources sensitivity or confidentiality will be closed to the public. New trails, roads, and other infrastructure will be located to avoid sensitive resources by distance, natural physical barriers, exclusionary fencing and capping of the resource. Existing park infrastructure located near archeological resource will be monitored and existing barriers will remain in place or be enhanced to protect the resource as necessary. A sensitive sites Monitoring Plan will be developed in collaboration with the Tribe and additional measures of protection maybe considered as necessary including enhancement of exclusionary fencing, field camera monitoring, and capping (covering with soil or gravel) for protection of sensitive sites.
- RMP-S90** Avoidance or setback standards for cultural and tribal resources will be maintained and adapted as necessary to best protect from park activities potential direct and indirect impacts. To protect resources, minimum setback standards shall be adhered to where feasible. The Setback Standards and Guidelines Table on page 164 summarizes the suggested minimum setbacks for the Park’s cultural and tribal resources.
- RMP-S91** Avoidance measures, such as distance from resource, physical barriers (fencing and signage), capping of archaeological sites, and onsite monitoring including the use of field cameras, will be implemented for cultural and tribal resources and include temporary and long-term measures.
- RMP-S92** In collaboration with the Tribe project-specific development will be reviewed and assessed on a case-by-case basis for impacts to cultural and tribal resources. If deemed an impact to resources, avoidance or mitigation measures will be adopted. This review process may include surveys prior to and following construction, vegetation clearance, demolition, and fire in areas with known resources in the vicinity of cultural sensitivity.
- RMP-S93** Park staff, volunteers, and contractors will be aware of the potential for encountering cultural and tribal resources within the Park and will be trained on the appropriate communication and discovery protocols.
- RMP-S94** Chemicals and contaminants such as gasoline, motor oil, herbicides, solvents, and paints to the greatest extent feasible will not be used within native plant gathering areas or traditional gathering areas.
- RMP-S95** Define and provide access for the Tribe to sacred sites, plant gathering areas, and tribal resources within the Park and develop a policy to support native traditional gathering areas and management of those areas for culturally important plants.
- RMP-S96** Collection and curation policies shall clearly define procedures for identifying, handling, and storing archaeological materials, artifacts, human remains, and/or items of cultural significance, including final disposition and repatriation.

## Proposed Habitat Restoration and Enhancement Activities

### Overview

Restoration and enhancement activities will provide increased habitat quality, reduce sediment and nutrient runoff, maintain and increase water quality, and possibly buffer effects from climate change. Additionally, habitat restoration and enhancement activities are intended to meet mitigation requirements for impacts associated with infrastructure development and maintenance. Any park implementation actions affecting stream crossings with require Streambed Alteration Agreements, and will most likely require mitigation actions for approval; restoration and enhancement areas will most likely serve for such mitigation.

Several areas have been targeted within the Park that offer potential restoration and enhancement

opportunities; however, specific restoration and habitat plans will be developed to include localized conditions. Restoration and enhancement activities proposed here focus on wetlands, streams and associated riparian habitats, oak woodlands, and native grasslands and wildflower fields. Table 6-2 summarizes the acreage of restoration areas, which are illustrated in Figure 6-6. Potential impacts vary with habitat type and potential restoration activity and will be analyzed to comply with CEQA.

| Table 6-2 Summary of Proposed Habitat Restoration and Enhancement Areas |          |
|---|----------|
| Restoration and Enhancement Areas                                       | Acreage* |
| Wetland and Tolay Lake  | 584      |
| Stream and Riparian Habitat & Oak Woodland Habitat                      | 335      |
| Native Grassland and Wildflower Fields                                  | 190      |

*\*The restoration and enhancement activities will occur within these areas, but the entire area will not be restored/enhanced.*

### Wetland and Tolay Lake

Restoration and enhancement activities are proposed for Tolay Lake, the dominant aquatic feature of the Park. Several alternative restoration scenarios have been developed for the lake, resulting in 215-foot elevation static water line alternative being the preferred (WRA 2014). The restoration calls for the removal or replacement of four culverts located at the Causeway, Horseshoe, West Causeway, and North Creek Bypass that are undersized, and/or severely damaged and are contributing to flooding. The channel at the Farm Bridge is to be widened with removal and/or replacement of a free span bridge (WRA 2014). To accommodate new culverts, the Causeway will need to be elevated by five feet.

In addition to culvert and channel improvements, the drainage channels within and adjacent to the lake should be filled to more naturally mimic the historic lake system. The grassland east of the lake would be restored to wet meadow (seasonal wetland), largely from the filling of the drainage channel thereby increasing the localized hydrology of the area.

Potential wetland restoration and enhancement activities include reshaping upstream head-cuts, invasive and non-native species control, and native species plantings. Areas targeted for head-cut restoration would include laying back the active cut by mechanical means. For relatively small head-cuts, hand tools can be used to re-contour the cut to more closely match the overall run of the slope, whereas for larger head-cuts heavy equipment will be necessary to re-contouring. Concurrent with the re-contouring could be the inclusion of check dams built of stone and native brush, and/or willow stakes to slow the velocity of flowing water, capture sediment and nutrients, and rebuild soil. Invasive and non-native species would be managed and native species planted in the re-contoured head-cut.

Because the re-contouring of head-cuts would likely occur at the head of wetlands or ephemeral streams, this restoration activity would be considered an impact to potentially jurisdictional features and therefore would require wetland delineation and appropriate permits. Indirect impacts could include increased invasive species, sediment migration, and nutrient runoff; therefore, efforts to establish vegetation and soil stability are critical for success.

Wetland restoration and enhancement plans for specific areas within the Park have not been developed. Developing additional more detailed habitat mitigation and monitoring plans will be necessary to conduct restoration activities that involve direct impacts to wetland habitat.

### Stream and Riparian

Potential stream and riparian habitat restoration and enhancement activities will include reshaping the banks of upstream head-cuts, reshaping stream banks, in-stream woody debris, check dams on



ephemeral streams, native riparian species plantings, and invasive species eradication and control. Head-cut restoration and check dams will be the same as that for wetland habitat. In deeply incised channels, particularly along stretches of Tolay Creek, laying back the banks to create floodplain terraces will effectively raise the channel and slow waters. The floodplain terraces would provide surfaces for native riparian species planting. The installation of large woody debris in-channels is intended to reduce the energy of flowing waters and provide pools and shading for aquatic organisms. In areas of dense Himalayan blackberry infestations, concerted efforts to eradicate this invasive species should occur, followed by planting with native riparian species.

All in-channel work would be considered an impact under the Clean Water Act and California Fish and Game Code, and would therefore require a delineation of wetlands and non-wetland waters along with appropriate permit applications. Other direct and indirect impacts could include increased invasive species, sediment migration, nutrient runoff, and nesting birds.

Stream and riparian habitat restoration and enhancement plans for specific areas within the Park have not been developed. Detailed engineering plans and site specific investigation, along with habitat mitigation and monitoring plans, would be necessary to conduct restoration activities that involve direct impacts to stream and riparian habitat.

### Native Grassland and Wildflower Field

Potential native grassland and wildflower field restoration and enhancement activities will include mechanical removal of invasive species, native species seeding and planting, grazing enclosures and exclusions, and possibly prescribed fire. Ground-breaking activities are unforeseeable in restoration activities in these herbaceous habitats. Specific invasive species management depends upon the location, extent, and species of the infestation.

The land will be adaptively managed to best provide native species protection and enhancement. Areas may be targeted for grazing enclosures, where livestock are “penned” in relatively small areas for specified periods in the year for high intensity grazing to reduce invasive and non-native species thatch. Livestock will be excluded as needed from targeted areas to allow for the establishment of native species plantings and seedlings.

Prescribed fire should be considered as a restoration and enhancement tool for these herbaceous communities. Fire can dramatically reduce thatch build up from non-native annual grasses and provide an immediate pulse of macronutrients. The creation of bare ground in post-fire event provides a ready seed bed for native species seeding and planting.

Direct impacts to sensitive resources should be readily avoidable with these enhancement activities. However, indirect impacts may result from restoration of native grasslands and wildflower fields. High intensity grazing can exacerbate soil compaction decreasing soil fertility and increase soil erosion potential. Opening areas of bare ground from prescribed burning can lead to soil erosion and provide a ready site for invasive species infestations.

## Adaptive Management

### Adaptive Monitoring and Management

Species population, distribution, and the natural communities upon which they depend will change over time with inter-annual variation in climate, wildfire, regional population dynamics, management and use of the Park, among other natural perturbations. Changes in visitor use, livestock management, fiscal constraints, and other human decisions will affect the prehistoric archeological sites and natural resources within the Park. Monitoring will be critical to inform when and how impacts, restoration efforts, and local effects of larger ecological processes are affecting the health and quality of natural

resources; and how public access and park land management uses might adversely be affecting cultural resources. Narrowing the scope of what resources to monitor, when, and how often is necessary to control costs and to accomplish the most critical park management goals. Table 6-3 outlines the monitoring guidelines that are the most informative to Tolay Park managers, allowing them to make crucial decisions. Labor and fiscal resources may dictate which monitoring tasks are prioritized. Schedules and success criteria are included where appropriate. Table 6-4 provides an annual monitoring timeline.

### Adaptive Monitoring and Management

- RMP-O53** Monitor park visitation effects on pre-historic archaeological sites and natural communities and adjust management activities to meet new use demands, reinforce cultural resource protections, changes in habitat, discovery of new species, and other unpredictable changes within the Park.
- RMP-G57** Monitoring resources should occur at regular intervals, varying by resource type. Monitoring results should be analyzed to determine if management strategies are performing well or if changes are necessary.
- RMP-S97** Monitoring schedules for natural and cultural resources are outlined in Table 6-3 and 6-4.

### Effects of Climate Change

It is universally accepted throughout the scientific community that climate change is being exacerbated by human activity. Probable effects of climate change include increased heat waves, extended drought, and less frequent, higher intensity storms (Pew 2013). Modeling for California suggests that climate change effects will decrease Sierran and Cascadian snowpacks, cause a rise in sea level, increase the duration and intensity of heat waves, increase critically dry years (annual drought), and increase wildfires (Karl et al. 2009, Luers et al. 2006). Rises in ocean temperature may affect fog and precipitation, but it's unclear if precipitation will increase, decrease, or remain overall the same but with changes in timing.

In addition to changes in the physical environment, changes in species distribution and phenology have been repeatedly reported throughout the world. It is uncertain how climate change will impact Sonoma County's vegetation communities, wildlife species, hydrologic cycle, nutrient cycle, and other elements of the ecosystem. Therefore, it is important for land managers to plan for conservation benefits that will provide habitats with the resiliency to buffer the effects of climate change uncertainty. (Malcolm and Pitelka 2000, Walther et al. 2002)

Today the pace of environmental change may detrimentally affect cultural resources. The soil disturbing effects of erosion, rainfall, droughts, sea level rise, rise in sea temperatures and extreme weather patterns may destroy sacred sites. Traditional ceremonies and ways of interacting with nature may be prevented because of industrial society's intervention in the climate process possibly causing artifacts to become exposed providing additional opportunity for the general public to find, remove sacred items exposed by more extreme 'natural' events. Adaptive management strategies will be employed to protect cultural resources to the greatest extent feasible.

Regional Parks in collaboration with the Tribe understands the importance of these resources to the long-term health of Tribal members and will work to develop policies and methods for their preservation and for future generations of Tribal members. The formation of new public and Tribal policies for the protection of cultural resources from destruction due to climate change is of critical importance to the Tribe.

Due to the uncertainty of climate change, developing monitoring and management strategies to measure and evaluate changes within the Park will provide land managers the ability to respond effectively. Park staff will integrate best management practices, grazing techniques, natural resource

enhancement, and cultural resource protections to cost effectively manage the land. Adaptive management encourages the continual incorporation of the most recent research and strategies for land management, and the general principles of adaptive management should be incorporated into the resource management plan.

### Climate Change Objectives, Guidelines, and Standards

- RMP-O54** Preserve and enhance habitat connectivity and wildlife corridors.  
The Park provides a valuable pathway for the movement of terrestrial wildlife between the Petaluma and Sonoma valleys. Tolay Lake and other large seasonal wetlands and stock ponds provide foraging and cover habitat for migratory birds including several species of waterfowl. The elevation gradient from nearly sea level to over 700 feet may provide available niches for vegetation communities. Riparian areas and woodlands provide shading, cover, and corridors for wildlife movement.
- RMP-O55** Protect native biodiversity.  
Plant and wildlife populations with higher genetic diversity tend to be more resilient to disturbance and habitat modifications. In the face of potential climate change, protecting the genetic diversity of the park's existing native populations from inbreeding depression and maladaptation will maintain or increase these species' ability to successfully adapt to the effects of a changing climate.
- RMP-O56** Protect water resources.  
Water resources for wildlife, plants, livestock, and human uses will likely be stressed with the projected increase in high temperatures, frequency of drought, and fewer storms to replenish surface and near surface waters. Amphibians, fish, and other aquatic organisms dependent upon cool surface waters for successful completion of their life-cycle may be negatively affected by increased water temperature. The protection and enhancement of riparian vegetation should assist in cooling waters through greater infiltration and direct shading.
- RMP-O57** Protect prehistoric archaeological sites.  
Collaborative with the Tribe to monitor and maintain a developed protection plan to protect the park's sacred sites. Periodically review and evaluate approaches, monitoring and management methods in the protection of cultural resources.
- RMP-O58** Manage adaptively and collaboratively.  
It is impossible to determine the effects that climate change will have on resources, and therefore it will be necessary to periodically review and evaluate the monitoring approaches and management methods including the guidelines and standards. The continued collaboration between Regional Parks and the Tribe and developing partnerships and working relationships with neighbors, resource agencies, and other municipal departments will be essential to effective management of the Park.
- RMP-G58** All natural habitats should be preserved and enhanced within the Park to provide potential refugia for native species, maintain the diversity of plant functional groups (i.e., hydrophytes, annuals, perennials), and rely on diverse planting/seeding plants to achieve a higher native diversity and avoid native monocultures.
- RMP-G59** Wetlands and their native vegetation should be preserved and enhanced to maintain their water quality, and water and soil retention functions.
- RMP-G60** Prehistoric archaeological sites will be protected to the greatest extent feasible. Protection practices and monitoring will be evaluated and assessed at regular intervals and adapted as necessary to most effectively protect sacred cultural resources.
- RMP-G61** Native species restoration and enhancement should be from locally sourced seed and plant propagules from a variety of elevations, topographic gradients, and hydrologic regimes to maintain local genetic diversity while providing for robust populations potentially adaptable to changing conditions in the physical environment.
- RMP-G62** Natural habitat extent and species composition should be monitored over time to detect changes. The use of LIDAR, aerial imagery, and ground surveys can serve as a useful method to determine these changes. Keystone species such as oaks and native perennial hydrophytes should be a focus of monitoring to determine their regeneration rate and health.



Climate Change Objectives, Guidelines, and Standards

- RMP-G63** The Park will engage with a variety of partners, including: the Tribe, neighboring landowners, other County departments, resource agencies, conservation districts, and the scientific community to share information and develop cooperative management strategies for mitigating effects of climate change at local and regional scales.
- RMP-S98** Habitat fragmentation will be minimized to allow for the exchange and migration of species and maintain genetic diversity. Trails and roads will be planned to minimize the impacts of fragmentation on species and habitats.
- RMP-S99** Riparian buffers and stream channel integrity will be maintained to ensure water quality, reduce erosion, and water cooling.
- RMP-S100** Avoidance and protection measures of sacred sites will be included throughout park development and park operations.

Monitoring Methods

Several monitoring tasks will be essential to assessing and measuring the effectiveness of Park management during and following the initial development phase of the Park. Monitoring will allow park staff to detect changes in natural and cultural resources in a period sufficient to adapt management strategies to successfully preserve these resources. Monitoring methods should be developed specifically for the type of resource that is being monitored to cost effectively capture detailed information to make necessary resource management changes. The following are guidelines and standards for the monitoring of the several resources and project activities associated with the Park.

Monitoring Methods Guidelines and Standards

- RMP-G64** A series of photographs from fixed location can be a cost effective and simple method for monitoring phenomena through time such as the progress of restoration efforts, protective strategies, expansion/contraction of invasive species, erosion, or migration of a head-cut. Pre-selected photo-points should be established throughout the Park to document natural and cultural resource sites through time.
- RMP-S101** Multiple photo-points will be established throughout the park (e.g., non-native grassland, rare plants). The multiple points will capture different landscape positions, aspects, elevations, etc. for the cultural sites and various natural resource locations (e.g., a point each for non-native grasslands situated on ridgelines, situated on downslopes, and situated on the valley bottom). Each point will have a unique identifier which would summarize the date of establishment, resource type, and direction of photo. For instance, a photo-point representing non-native grassland (NNG), shot in the direction of 90 degrees, and established in 2015 could read, "PP1-NNG-90-2015". Photo-points will have a GPS point or other survey indicator and placed on a map for future reference.
- RMP-S102** Photo-points will be established for new discoveries or management activities, such a new discovery of prehistoric artifacts, special-status plant population, infestation of invasive species, and restoration projects.

NATURAL RESOURCES

Each of the Park’s existing sensitive natural resources should be monitored periodically to evaluate the effectiveness of park management.

Natural Resources Monitoring Guidelines and Standards

- RMP-G65** Monitoring plans for the Park’s natural resources should be developed to evaluate the health of each of the Park’s natural resources. Monitoring should rely on quantitative sampling techniques, but in some cases, qualitative metrics may be sufficient.

### Natural Resources Monitoring Guidelines and Standards

- RMP-G66** Monitoring methods should be thorough enough to gather the data necessary to evaluate park management and effects on natural resources, rapid enough to be cost effective, and accessible to trained volunteers.
- RMP-G67** Trained volunteers can cost effectively assist park staff with monitoring requirements. Volunteers should be trained by a qualified biologist through a developed training program.
- RMP-S103** Monitoring will be repeatable, and, when appropriate, quantitative.
- RMP-S104** Monitoring will be performed on a scheduled basis (Table 6-3).
- RMP-S105** Monitoring methods will follow or be adapted from published guidelines established by regulatory agencies, land managers, and/or the academic community. Examples include:
  - Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines (Corps 2015).
  - California Native Plant Society Relevé Protocol (CNPS 2003).
  - CNPS / CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling Field Form (CDFW 2014).
  - Monitoring Annual Grassland Residual Dry Matter (Guenther and Hayes 2008).
- RMP-S106** Monitoring locations will be fixed, documented with GPS or other survey, and placed on maps. Should monitoring locations be moved, the relocation efforts will be documented and assigned a new designation.
- RMP-S107** Monitoring will be seasonally appropriate to capture the necessary information (e.g., bloom time, nesting/roosting season) to evaluate management and make adjustments (if necessary).

### CULTURAL RESOURCES

Existing cultural resources within the Park should be monitored periodically to evaluate the effectiveness of park management.

### Cultural Resources Monitoring Guidelines and Standards

- RMP-O59** Monitor cultural and tribal resources on a regular and/or periodic basis to assess site conditions and prevent impacts to sacred sites within the Park.  
The Park is a popular attraction for recreationalists and ongoing restoration efforts. Archaeological surveys and studies have been performed in the Park that have identified a rich diversity and quantity of cultural resources situated near waterways, vegetated areas, and existing trails. Updated site observations and detailed documentation will be synthesized into a summary that includes recommendations and further actions, as necessary.
- RMP-S108** A monitoring program will be developed and implemented for both the condition assessment of cultural and tribal resources within the Park and the prevention of damage to resources. Depending on the location, sensitivity, and existing conditions, monitoring will occur on an annual or periodic basis and include photo documentation and detailed notes (i.e., monitoring assessment forms and maps). Motion sensor cameras may be used as part of the monitoring program. Adaptive management policy using this tool may be employed. This information will serve as baseline data and continue to be updated by tribal and archaeological monitors and managed by the Park on a regular basis.
- RMP-S109** A comprehensive inventory of cultural and tribal resources located within the Park, including maps depicting site boundaries and sensitive areas will be updated and maintained by park staff in collaboration with the Tribe to effectively manage and protect these resources.

### HABITAT RESTORATION AND ENHANCEMENT ACTIVITIES

The habitat restoration and enhancement areas should be monitored on a periodic basis to evaluate the success the restoration and enhancement efforts.

### Habitat Restoration and Enhancement Activities Monitoring Guidelines and Standards

- RMP-G68** Monitoring methods should be thorough enough to gather the data necessary to evaluate cost effective park management. Because restoration and enhancement monitoring may be tied to performance criteria agreed upon with regulatory agencies, qualified biologists should perform the monitoring.
- RMP-S110** Monitoring will be repeatable, and, typically, quantitative.
- RMP-S111** Monitoring will be performed on a scheduled basis. If the monitoring is tied to a permitted activity, it is likely that it will be required annually.
- RMP-S112** For permitted activities, monitoring methods will follow regulatory guidelines or as set forth in the permit. For instance, wetland mitigation monitoring will likely require the following:
- Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines (Corps 2015).
- RMP-S113** Monitoring locations will be fixed, documented with GPS or other survey, and placed on maps. Should monitoring locations be moved, the relocation efforts will be documented and assigned a new designation.
- RMP-S114** Monitoring will be seasonally appropriate to capture the necessary information (e.g., bloom time, nesting/roosting season) to evaluate the success of restoration.

#### Performance Criteria

Performance or success criteria are metrics through which management effectiveness is evaluated. For non-permitted monitoring activities, performance criteria should be evaluated through the objectives outlined in this plan for the given natural or cultural resource. For permitted monitoring activities (e.g., wetland mitigation), success criteria will likely be written into the conditions of the regulatory permit, and will have a term limit in which the mitigated resource will have to meet an agreed upon threshold of success.

If any of the criteria are not met or are underperforming, in-depth monitoring or studies may be necessary to reevaluate management techniques and contingency measures implemented. It may be determined that the monitoring methods are insufficient to evaluate management effectiveness, and may need to be amended to better evaluate performance. Many of the objectives for resources are overlapping and as such do not require separate monitoring methods and timing; however, performance criteria for given resource may vary.

#### Reference Sites

Reference sites are areas that contain similar physical site conditions (e.g., elevation, slope, aspect) as the monitoring site, but have higher functionality, more complex structure, and/or greater diversity. To gauge the performance of restoration and enhancement areas as well as provide a template for restoration, reference sites should be established within the Park. Reference sites should be of relatively high quality habitat and be positioned on similar soils, topographic positions, and location within the watershed to be an appropriate indicator of the restoration's success. Reference sites should be established during baseline monitoring for the given restoration and/or enhancement project. Selecting reference sites at the time of restoration activities will allow the monitors to select sites that are relatively close to the restoration area to capture analogous physical conditions and reduce time spent travelling between the reference sites and restoration areas. In the instance of scheduled temporary impacts to a resource, the pre-project condition may serve as the reference site.

#### Monitoring Schedule

Timing and frequency of monitoring is dependent upon the resource or management. Some resources will be monitored on an annual basis (e.g., effects and effectiveness of livestock grazing), while others may need only be monitored every few years (e.g., blue gum and Monterey cypress seedlings). Table 6-3 is the monitoring schedule for the Park with resource to be monitored, seasonal timing, annual frequency, and responsible parties.



### Reporting

An annual report summarizing monitoring results and recommendations will be drafted and recorded with the Sonoma County Regional Parks. Because monitoring of certain resources will not occur each year, reporting may not include information regarding all of the resources in a given year. However, the report should be standardized with chapter headings for each of the resources and management activities monitored irrespective if they were scheduled to be monitored that year. The report should review the resource management plan success criteria outlined for each of that year's monitoring obligation and evaluate if they are being met. Should the results suggest that the success criteria are not being met or if a particular resource is faltering, recommendations for changing the management should be determined and implemented. If the monitoring proves insufficient to properly evaluate a resource with the established success criteria, then the monitoring methods may need to be altered to more effectively assess the health/protection of the resources.

In the instance that monitoring is conducted for permitted activities (e.g., wetland mitigation), annual reporting will be required for the permit-issuing regulatory agency (-ies). Typically, monitoring and reporting will be annual for a five-year term, but may be more or less depending on the condition of approval.

Table 6-3 Long-Term Monitoring of Natural Resources Tasks

| Focus                    | Monitoring Task  | Questions to Address   | Monitoring Method   | Frequency*  | Recommended Response  | Notes |
|--------------------------|--|--|---|---|---|-------|
|                          | Erosion and contaminant drift  | Is Park infrastructure creating erosion or other deleterious effects? Are herbicides, other chemicals, migrating from storage locations or approved handling?  | <u>Qualitative:</u> Routine patrols should be able to capture this information. Particular focus around Park Complex and immediately adjacent habitats, as well as areas of Park maintenance.   | Annual  | If erosion is posing deleterious effects, remediate erosion source. Permitting may be necessary in wetlands or other sensitive habitats. If habitats are negatively affected by exposure to chemical contaminants, remediate damage and prevent point-source pollution. If not a point-source or source off-site, immediately develop a plan and strategy to evaluate and remediate activities. |       |
|                          | Head-cut monitoring  | Is the head-cut moving? Is sediment migrating into channel? Is it threatening cultural resources, habitat, species, roads, trails, or other park infrastructure? Is it likely to cause deleterious downstream effects? | <u>Qualitative &amp; Quantitative:</u> Install markers on upslope side of head-cuts, measure distance. Visually survey head-cut and immediate downstream channel, repeat photographs and tracking datasheets.   | Annual; pre- and post-wet season                    | If head-cuts are migrating upslope, develop and implement prevent plan with qualified restoration professionals.  |       |
| Habitats & Native Plants | Fuel-load monitoring & reduction   | Does the volume of downed woody debris pose a fire hazard?   | <u>Qualitative:</u> Walk-through blue gum groves visually estimating downed woody debris and leaf litter. Removal shall be conducted by hand, hand-mechanized tools, and medium equipment.  | Every 5 years                                       | If downed woody debris and leaf litter approach dangerous levels, hand remove debris.   |       |
|                          | Natural regeneration of native plants  | Are native species regenerating, particularly oaks and shrub saplings?   | <u>Quantitative:</u> Tree counts by age class in selected areas of woodland. Comparison of areas on the basis of factors such as high and low grazing pressure, high and low native species dominance, may be useful. For larger populations, mapping by GPS or aerial photographs to track the extent of regeneration. | Every 5 years                                       | If regeneration is low or non-existent, analysis to understand cause (e.g., SOD, trampling, grazing, browsing, Park use). Develop plan to protect existing regeneration and provide for targeted regeneration areas.  |       |
|                          | Regeneration of native plants integral to Native American traditional cultural practices | Are species significant to traditional Native American practices regenerating?   | <u>Quantitative:</u> Tree counts, vegetation sampling, GPS mapping and photographic tracking. Compare and contrast species and area regeneration and the pressures of grazing, disease, public access, collection practices, etc.   | Every 5 years                                       | If regeneration is low or non-existent, analysis to understand cause (e.g. grazing, browsing, public access, disease). Develop plan to protect existing populations and regeneration and target regeneration areas and land management strategies.  |       |
|                          | Restoration actions of native plants   | Are restoration efforts successful? What additional efforts are needed?  | <u>Quantitative:</u> As given in specified restoration plans: survival counts, cover estimates, plant health, species composition, and photo monitoring.  | Annual; up to 5 years following restoration actions | If success is low, follow with analysis; contingency measures should be built into restoration plans. Implement contingency measures; further actions (e.g., irrigation, change of species plantings) may be warranted.   |       |

Table 6-3 Long-Term Monitoring of Natural Resources Tasks

| Focus           | Monitoring Task                     | Questions to Address   | Monitoring Method   | Frequency*                      | Recommended Response   | Notes   |
|-----------------|-------------------------------------|--|---|---------------------------------|--|---|
| Native Wildlife | Population trend monitoring (Birds) | Are bird populations changing in the Park? Are there previously undocumented species observations? Do management actions need to occur to assist bird populations / habitat?                                   | Qualitative & Quantitative: Update baseline information on bird relative abundance, species composition, habitat use, population size, and breeding status. Standardize area searches and point count protocols can be used for spatial and temporal comparisons. Monitoring efforts should be in coordination with volunteer groups (i.e., PWA, Audubon Society). Monitor trends in habitat condition.   | Annual; 3-4 times a year        | Inter-annual variations in species composition and populations to be expected. If populations appear to be in decline, analyze to determine if Park use or other management activities are contributing. Alter use within Park.  | Continue collaboration with PWS for bird observations. Collaboration with Point Blue Conservation Science, Audubon Society and/or others for bird monitoring. |
|                 | Population trend monitoring (CRLF)  | Is CRLF present in the Park? In which locations have they been detected? If so, is the population increasing, decreasing, or static? Do management actions need to occur to assist CRLF populations / habitat? | Qualitative & Quantitative: Baseline information should be collected to determine if species is present. If not, continued absence / presence surveys on regular basis. If located, information on population size, age class, reproductive rates, and survival. Monitor trends, habitat condition, impacts from Park use and livestock grazing. Assess effects of grazing and restoration activities on wetland and surrounding upland vegetation. | Annual; 2 survey windows a year | If CRLF are present, development specified management plan for occupied habitat. Pursue opportunities of reintroduction to Park. If negative impacts are detected, develop a CRLF adaptive management plan to allow for adjustments in Park uses and/or livestock exclusion in known habitats and other high quality frog habitat. |   |
|                 | Population trend monitoring (Bats)  | Are built bat roosts occupied?   | Qualitative: Visual surveys of built bat roosts for occupation and use.   | Annual                          | If built roosts are occupied, they should be considered success. If they are not occupied, continued monitoring and/or relocation to encourage occupation.   | Only required if bats are impacted during Park infrastructural development.   |



Table 6-3 Long-Term Monitoring of Natural Resources Tasks

| Focus                        | Monitoring Task  | Questions to Address  | Monitoring Method  | Frequency*   | Recommended Response  | Notes   |
|------------------------------|--|---|--|--|---|---|
| Invasive Species & Pathogens | Invasive Plant Monitoring  | Are there new populations of invasive plants? Are existing populations expanding, contracting, or static? Do management actions need to occur to control invasive plant spread?                           | <u>Quantitative:</u> Collect baseline data using GPS and hand-mapping of all target invasive plants' populations. (Alternatively use LSA 2009 mapped invasive plants as a baseline). Repeat annual mapping efforts to determine changes in population. | Annual; spring-summer  | If existing populations expand or if new populations are documented, control and/or eradication methods implemented.  | Last mapping effort occurred in 2009. Increases in invasive species populations should be accounted for in a new baseline.      |
|                              | Invasive Plant Control/Eradication   | Are invasive control or eradication methods successful? If not, what alternative control methods might be successful?   | <u>Quantitative:</u> Focused monitoring in treatment areas pre- and post-treatment including density, abundance, and species composition. Evaluate treatment methods and refine or adapt.  | Annual; spring-summer, as needed   | If control and/or eradication methods have failed, try alternative methods. For new infestations, implemented new strategies based on best available information.   |   |
|                              | Invasive Aquatic Wildlife  | Are invasive aquatic wildlife species occurring or overly abundant in the Park? Do management actions need to occur to control or eradicate invasive aquatic wildlife?                                    | <u>Qualitative:</u> Visual surveys of potential CRLF habitats. Focus on American bullfrog and warm water fishes.   | Annual; twice, June & July   | In areas of occupied CRLF habitat (if CRLF are detected), removal of American bullfrog egg masses and/or warm water fishes.   |   |
|                              | Invasive Terrestrial Wildlife  | Are invasive wildlife species occurring in the Park (e.g., feral pigs) or overly abundant (e.g., wild turkey)? Do management actions need to occur to control or eradicate invasive terrestrial wildlife? | <u>Qualitative:</u> Visual surveys throughout the Park. Documented observations of Park visitors and volunteers. Documented observations of neighbors.   | Annual; every available opportunity when engaging with neighbors or Park visitors  | If feral pigs enter the Park, apply for depredation permit with CDFW and develop eradication program. If wild turkey is deemed a deleterious to native habitats or species, a depredation permit with CDFW and removal may be warranted. A regional program with participating partner organizations and neighbors may be necessary for complete eradication. | Public relations will be important factor to educate public and ensure public safety should eradication methods be implemented. |
| Sudden oak death monitoring  | Is SOD present in the Park? If so, is SOD spreading? Is SOD posing a threat to existing oak trees and woodlands? Are there hazard trees from SOD kill? | <u>Quantitative:</u> Map trees with SOD symptoms. If necessary, laboratory analysis of samples to confirm presence of <i>Phytophthora ramorum</i> .   | Every 5 years  | If SOD is present and spreading, stricter sanitation methods may be necessary. "Quarantine" of SOD infected stands may be necessary with livestock and visitor exclusions. | Collaboration with UCANR Oak Woodland Management for recent information and management activities.  |   |

Table 6-3 Long-Term Monitoring of Natural Resources Tasks

| Focus              | Monitoring Task                      | Questions to Address  | Monitoring Method   | Frequency*  | Recommended Response  | Notes |
|--------------------|--------------------------------------|---|---|---|---|-------|
| Grazing & Park Use | Grazing monitoring                   | Is forage quality being sustained over time? Is grazing intensity too high or too low in native habitats?<br><br>Are cultural resources surfacing or being damaged? | <u>Qualitative</u> & <u>Quantitative</u> : Observations by rancher and Park Staff of erosion, heavy use, infrastructure condition, and invasive plant spread. Collection of vegetation data from wetlands and grasslands.   | Annual; ongoing   | If grazing-tolerant or grazing-resistant species increase, altering grazing regime (i.e., intensity, timing) may be warranted. If native species cover and richness is declining in heavy to moderately grazed areas, over those in lightly grazed areas, changes in grazing regime may be warranted. |       |
|                    | Residual Dry Matter (RDM) monitoring | Is RDM value within target range? If not, do management actions need to occur?  | <u>Quantitative</u> & <u>Qualitative</u> : Standardized RDM methods, recommended visual estimates with a robel pole (Guenther and Hayes 2008) rather than clip-weight method.   | Annual; end of growing season before first rains (September or October) | If RDM levels are much higher than target, consider increased grazing, conversely for low RDM levels, consider reducing grazing. Pasture rotation and management should be considered to provide discrete management units.   |       |
|                    | Park use monitoring                  | Are park uses negatively affecting cultural and natural resources? If so, do management actions need to occur?  | <u>Quantitative</u> & <u>Qualitative</u> : Observations by Park Staff, the Tribe, visitors, and volunteers on an ongoing basis throughout the Park. Methods may vary according to the resource and the Park use effect to be monitored (see Cultural & Natural Resources Guidelines and Standards). | Annual; ongoing; in conjunction with other monitoring efforts.          | Dependent upon impact type and resources being impacted. Alter Park use, trail decommissioning or realignment. Create potential (temporary) exclusion zones.  |       |

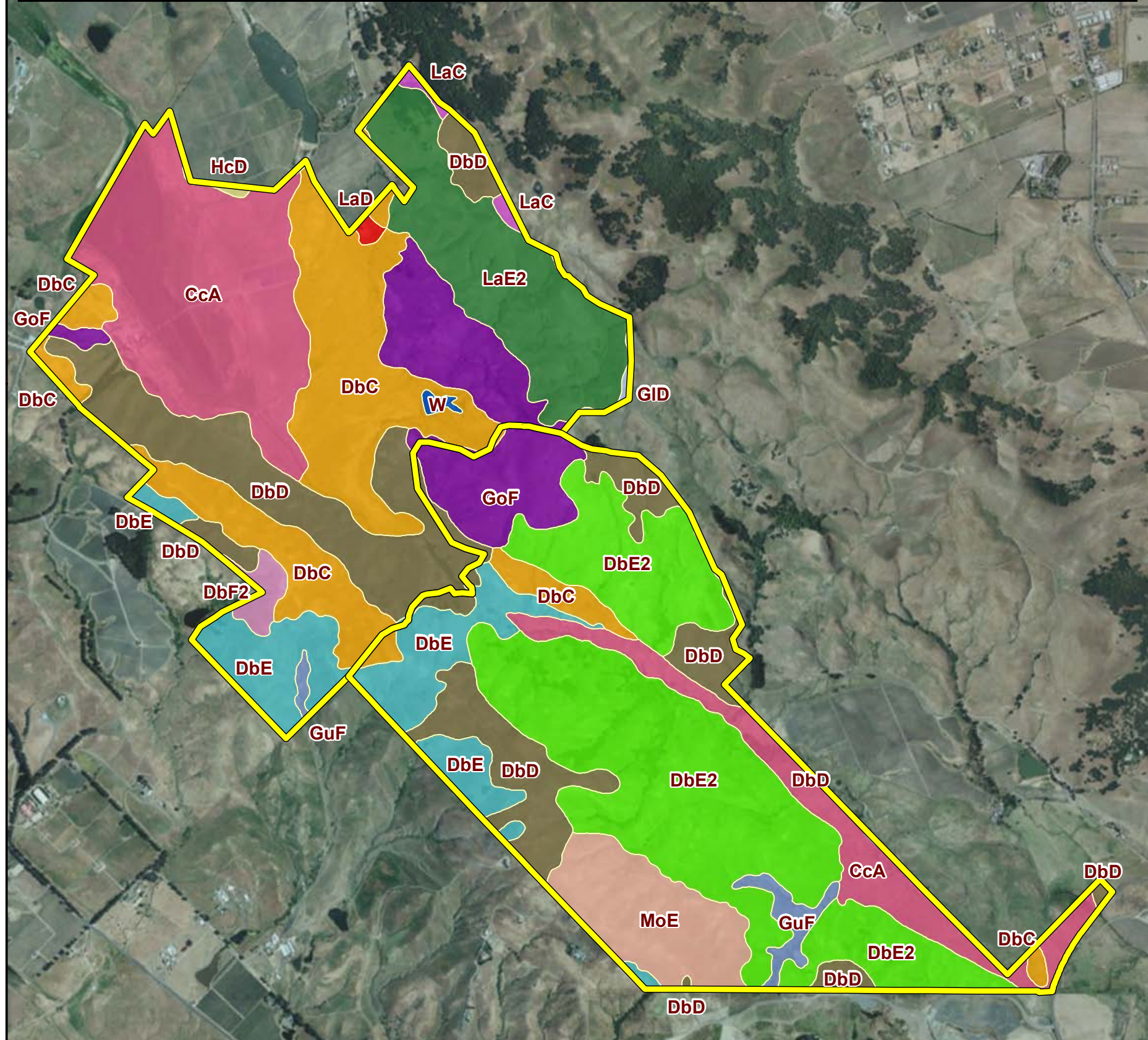
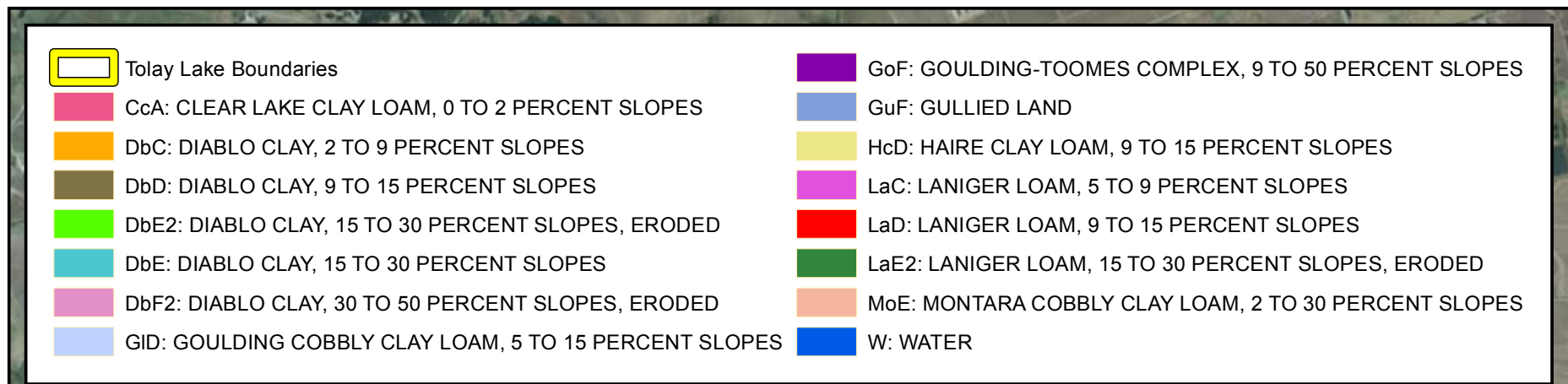
\*Refer to Table 6-4 for Monitoring Frequency

| Table 6-4 Schedule for Long-Term Natural Resources Monitoring |   |   |   |   |     |     |     |     |     |     |     |     |     |     |     |   |   |
|---|---|---|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|
| Focus   | Monitoring Task   | Resource Type   | Timing  | Month (X's denote recommended monitoring) |     |     |     |     |     |     |     |     |     |     |     |   |   |
|   |   |   |   | Jan                                       | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |   |   |
| Habitats & Native Plants                                      | Erosion, contaminant drift, litter, other anthropogenic effects | Developed & Disturbed Areas; areas of infrastructure improvements | Annual; as appropriate per management activity  | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X |   |
|   | Head-cut monitoring   | Streams & Riparian; Toley Lake & Wetlands                         | Annual; beginning & end of wet season   |   |     |     |     |     | X   |     |     |     |     |     |     |   |   |
|   | Fuel-load monitoring & reduction                                | Blue Gum & Monterey Cypress Groves                                | Every 5 years   |   |     |     |     |     |     | X   |     |     |     |     |     | X |   |
|   | Natural regeneration of native plants                           | Woodlands; wetlands; native grasslands; wildflower fields         | Every 5 years; during growing season  |   |     |     | X   | X   | X   | X   | X   | X   |     |     |     |   |   |
| Native Wildlife   | Restoration actions of native plants                            | All habitats where restoration activities have occurred           | Annual; for 5 years (or more) following planting  |   |     | X   | X   | X   | X   | X   | X   |     |     |     |     |   |   |
|   | Population trend monitoring                                     | Birds   | Annual, 3-4 times; incorporative of volunteer efforts                                   |   |     | X   |     |     | X   |     |     |     |     |     |     | X |   |
|   |   | CRLF  | Annual; 2-4 week intervals December-March; larval survey in May; evaluate after 5 years |   | X   | X   |     |     |     | X   | X   | X   |     |     |     |   | X |
|   |   | Bats  | Annual  |   |     |     |     |     | X   | X   | X   | X   |     |     |     |   |   |
| Invasive Species & Pathogens                                  | Invasive Plant Monitoring                                       | All habitats  | Annual; during appropriate blooming period  |   |     | X   | X   | X   | X   | X   | X   |     |     |     |     |   |   |
|   | Invasive Plant Control/ Eradication                             | All habitats; areas of control efforts                            | Annual  |   |     | X   | X   | X   | X   | X   | X   |     |     |     |     |   |   |
|   | Invasive Aquatic Wildlife                                       | All aquatic habitats  | Annual  |   |     |     |     |     | X   |     |     |     |     |     |     |   |   |
|   | Invasive Terrestrial Wildlife                                   | All terrestrial habitats  | Annual  |   |     | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X |   |
| Grazing & Park Use  | Sudden oak death monitoring                                     | Woodlands   | Every 5 years   |   |     |     |     |     |     | X   | X   | X   |     |     |     |   |   |
|   | Grazing effects monitoring                                      | All habitats  | Annual; ongoing   |   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X |   |
|   | RDM monitoring  | Grasslands, Wetlands  | Annual; end of the growing season before the onset of rains                             |   |     |     |     |     |     |     |     |     |     |     | X   |   |   |
|   | Park use effects monitoring                                     | All habitats; areas of infrastructure improvements & maintenance  | Annual; with other monitoring efforts and during routine patrols; ongoing               |   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X | X |

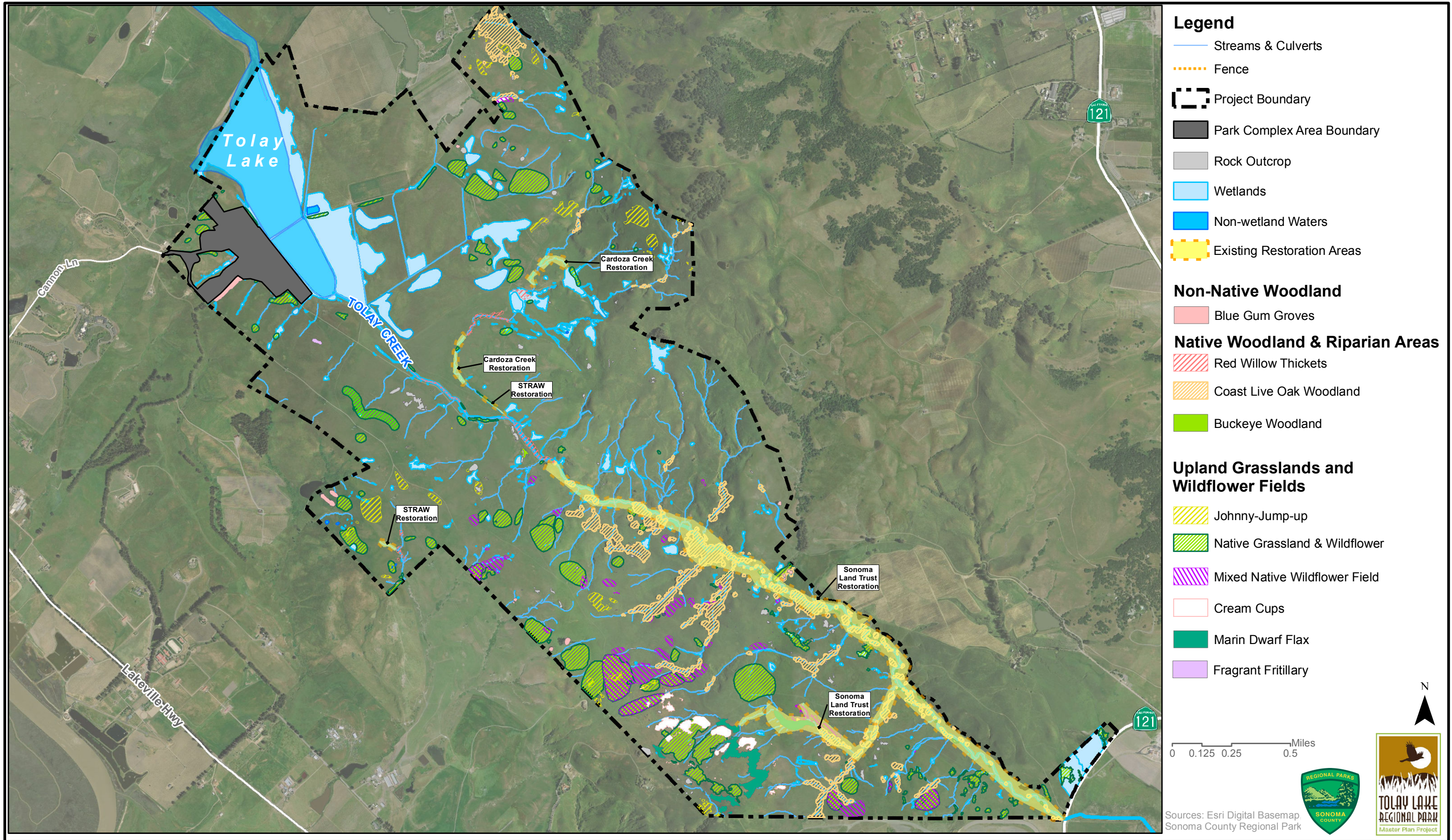


**Table 6-5 Schedule for Long-Term Cultural Resource Monitoring**  
 Month (X's denote recommended monitoring)

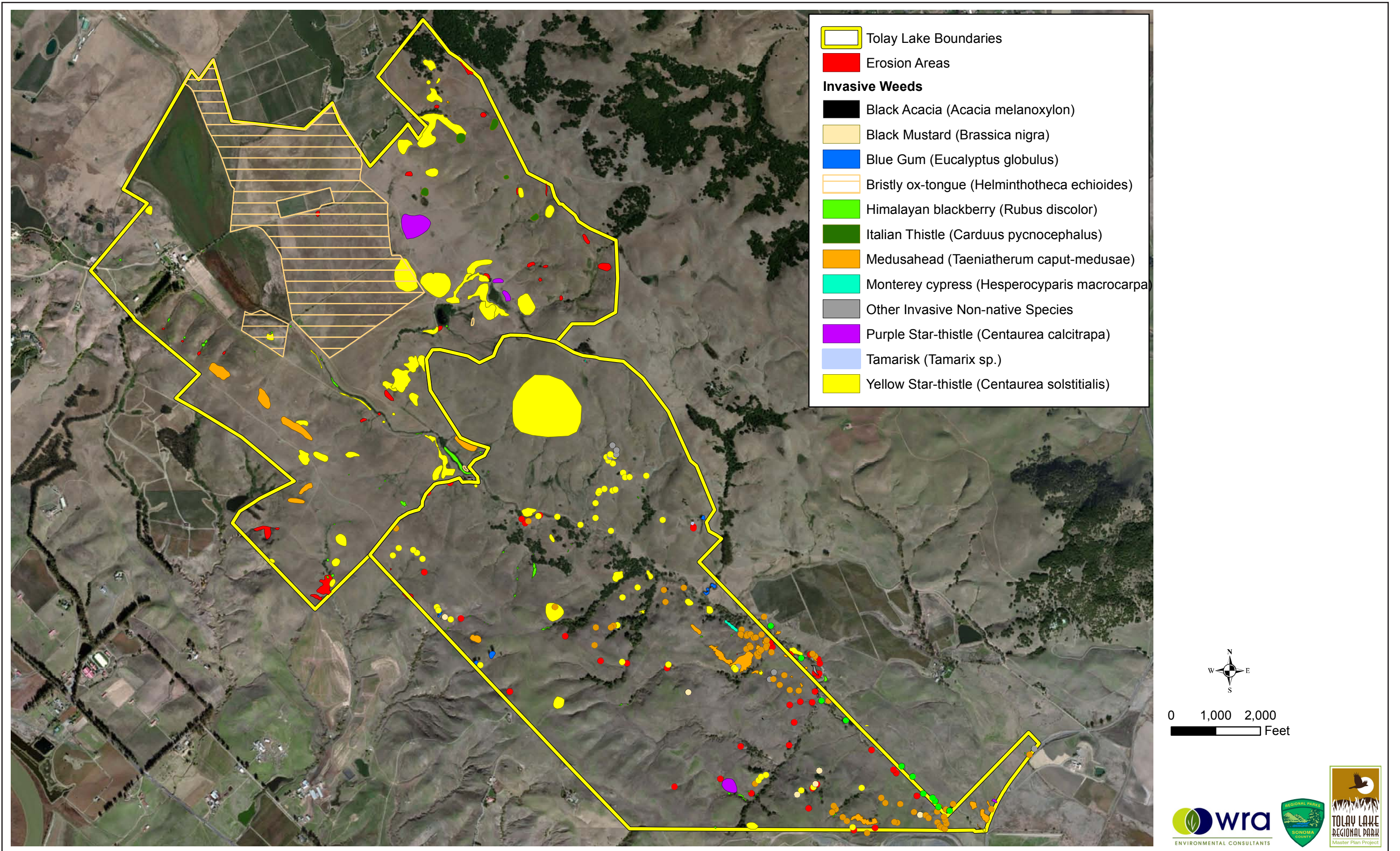
| Focus                                  | Monitoring Task   | Resource Type   | Timing                                 | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--|---|---|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|  | Erosion, contaminant drift, litter, other anthropogenic effects                               | Project level Developed & Disturbance; areas of infrastructure improvements     | as appropriate per management activity | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   |
| Known Prehistoric Archaeological Sites | Erosion and 'naturally' caused exposure of cultural resources                                 | At sites near drainages, streams & riparian areas; Tolay Lake, Creek & Wetlands | Annual; end of wet season              |     |     |     | X   |     |     |     |     |     |     |     |     |
|  | Grazing practice caused exposure and damage of cultural resources                             | Site specific monitoring  | Bi-annually                            |     |     |     | X   |     |     |     |     | X   |     |     |     |
|  | Public park use and access and possible collecting, damage, or exposure of cultural resources | Site specific monitoring  | Bi-annually                            |     |     |     | X   |     |     |     |     | X   |     |     |     |



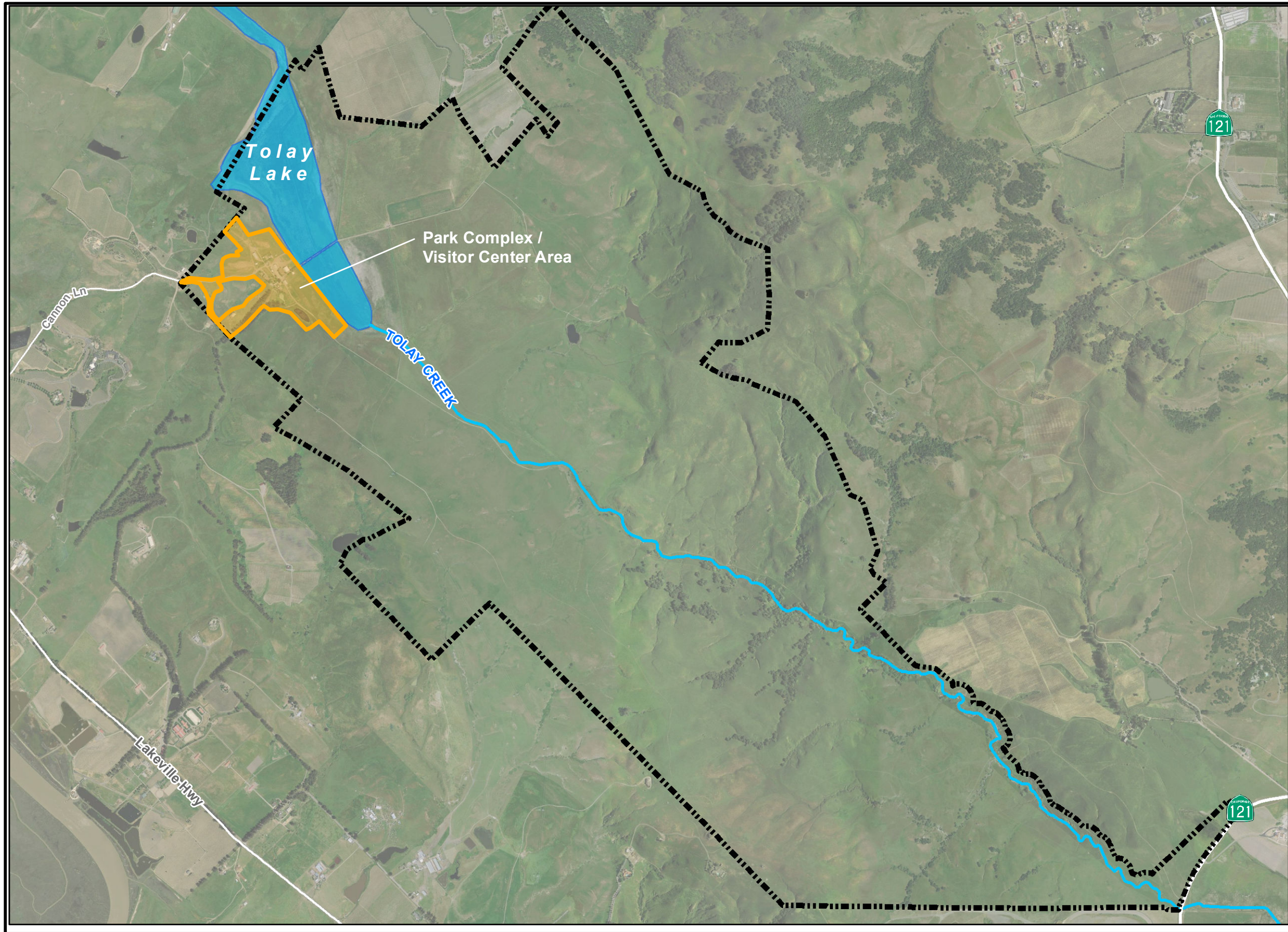




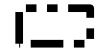









**Legend**

-  Project Boundary
-  Park Complex Area Boundary

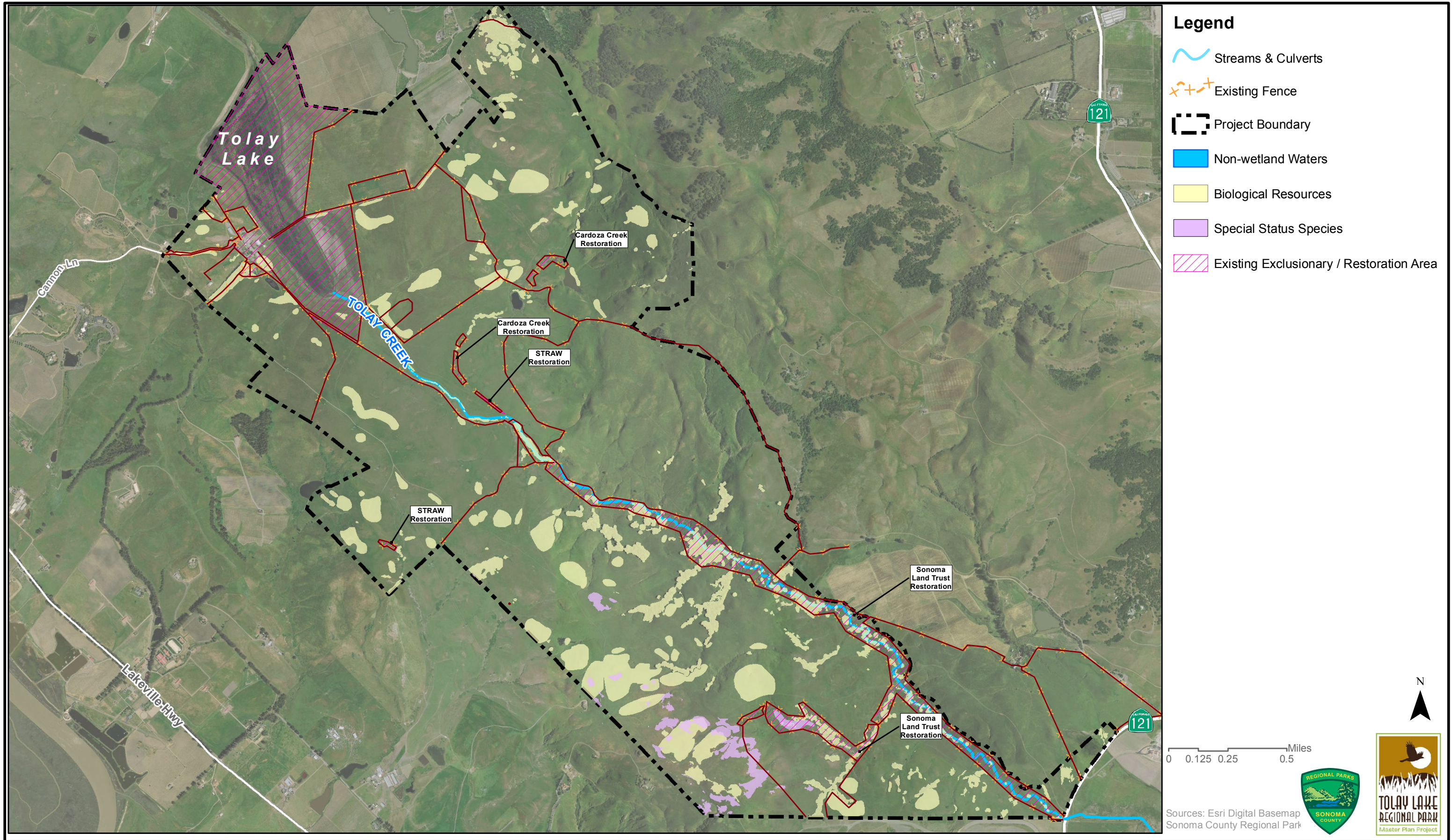


Sources: Esri Digital Basemap, Sonoma County Regional Parks



Figure 6-4  
Park Complex/Visitor Center Area











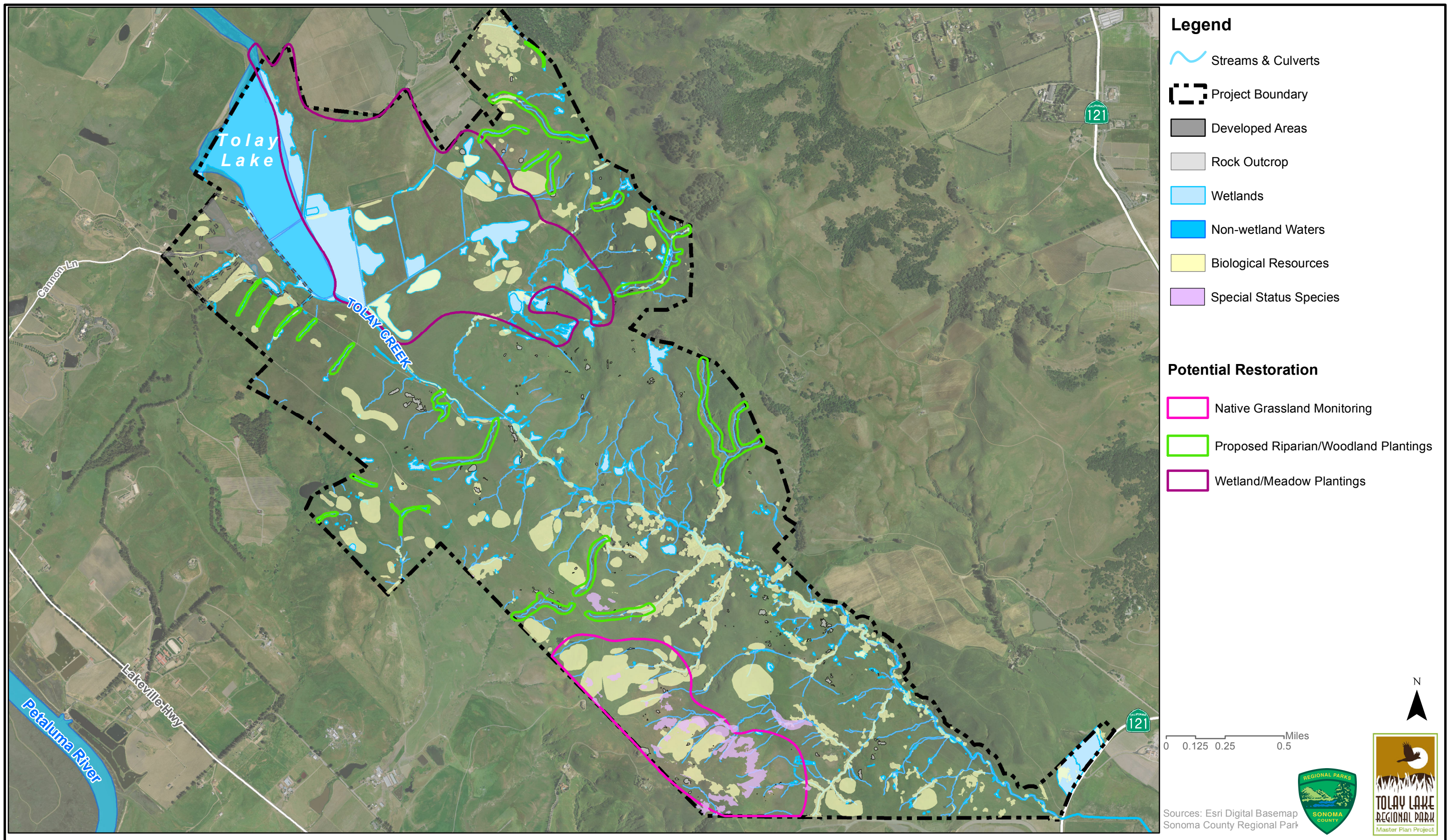
- ### Legend
-  Streams & Culverts
  -  Existing Fence
  -  Project Boundary
  -  Non-wetland Waters
  -  Biological Resources
  -  Special Status Species
  -  Existing Exclusionary / Restoration Area

Figure 6-5  
Existing Grazing Infrastructure







*This page intentionally left blank.*

# Education and Interpretive Elements

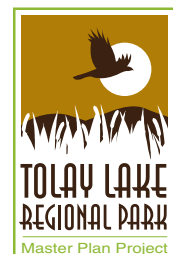






Photo credit: Regional Parks staff



## EDUCATION AND INTERPRETIVE ELEMENTS

### Introduction

“Interpretation is a communication process, designed to reveal meanings and relationships of our cultural and natural heritage, through involvement with objects, artifacts, landscapes and sites.”

This definition was developed by a Canadian task force in 1976 and is used by many institutions throughout the world, including universities. Interpretive communications is a specific communication strategy that is used to best translate information to diverse audience members - from technical experts to young park visitors. Comprehensive interpretation uses a mix of professional communication principles, which includes: journalism, marketing, psychology, educational theory and presentation, business management, recreation and tourism planning/principles, and media planning/design principles.

Interpretation at Tolay Lake Regional Park balances the need to relay information natural and cultural resources to park visitors, while protecting those same resources. In other words, interpretation strategies need to maximize the Park’s positive impact on visitors by impressing thoughts, feelings, and behaviors while avoiding structures, mechanisms, and activities that might negatively affect the Park’s pre-historic and historic cultural resources, ecology, aesthetic, and values. This goal of this chapter is to give people:

- a connection to place and self,
- excitement at seeing and learning something new,
- relation of past with future,
- to provoke, relate, reveal, and remember.

### Purpose and Significance of the Interpretive Master Plan

The Interpretive Master Plan is an element of the Tolay Lake Regional Park Master Plan (Park Master Plan). The Park Master Plan develops a framework to provide outdoor recreation, environmental education, cultural resource protection, and sensitive habitat protection. The Interpretive Master Plan supports that purpose by identifying and prioritizing opportunities to interpret cultural and natural elements of Tolay Lake Regional Park for park visitors.

Tolay Lake and its surrounding landscape symbolize balance and the continuum of human history. For thousands of years, people have gathered here for spiritual and healing purposes. Today, Tolay Lake Regional Park unites cultural, agricultural, ecological, and communal aspects in order to revive the spirit of human gathering and discovery. Its value is reflected in these aspects, and park visitors can better understand these values through education and interpretation.

This chapter helps Park staff focus on overarching themes and on how and where these messages would best be told. The plan aims to guide decisions by identifying challenges and providing solutions to balance interpretation with protection of cultural and natural resources; broaden and deepen our understanding of the audience; and evaluate interpretive media and techniques and identify those that best fit the Park.

Regional Parks’ vision is to:

- Preserve and protect Sonoma County’s most important natural resources and scenic beauty to enhance our quality of life and sustain our county’s ecology and economy;
- Access for all people, across generations and cultures, to experience the wonder of nature through our parks and trails, to engage their hearts and minds and engender a lifelong love of

- parks for physical, psychological, ecological, and spiritual well-being;
- Recreation that inspires personal growth, healthy lifestyles, connection to nature, and sense of community.
- Knowledge through programs that connect visitors and youth, to nature through joyful, hands-on, place-based environmental education experiences.

Tolay Lake Regional Park unites ecological conservation, pre-historic and historic cultural preservation, historic agricultural practices, and the story of human interaction with the land. The park preserves the remaining stories of Native Americans' relationship with the land through the preservation of pre-historic archaeological sites. For thousands of years, Native Americans respected and cherished this land. The ranch and agricultural remnants tell the story of people and land management practices for the past one hundred fifty years; many of those practices continue in the Park today as part of the working ranch. The Park's primary goals are:

- Habitat Restoration and Enhancement
- Cultural Resource Conservation and Protection
- Open Space Preservation and Protection (i.e. protecting values related to aesthetic and ecological resources)
- Ecological, Cultural, and Agricultural Education
- An awe-inspiring destination for passive recreation and public access provided in appreciation of the diverse culture of the region, and made accessible and inviting to people of all ages and abilities

The goals are used to guide development and management of the Park in order to:

- develop and manage the land for enhancement and sustainability of resilient ecological systems;
- focus restoration of Tolay Lake to a more historic condition and riparian restoration throughout the entire watershed to better meet habitat needs for native wildlife;
- protect and preserve sensitive species;
- adaptively manage agricultural and rangeland management practices, and public recreation in a balance that will sustain and protect native wildlife habitat pre-historic, historic, and cultural resources.

Park Values are to return Tolay Lake Regional Park to a place that revives the spirit of human gathering and discovery; a reflection of people as part of the natural world, protecting, restoring and preserving the Tolay Lake Valley for all native wildlife, and in celebration and inspiration of all that it preserves.

## Context for Interpretation

Tolay Lake Regional Park is a:

- natural treasure;
- significant pre-historical site;
- place for passive recreation;
- place for outdoor education and scientific research; and
- historic site, which remains in part a working ranch.

The site provides an opportunity to adapt, learn, and expand Regional Parks' existing knowledge pertaining to land management. The Tribe and Regional Parks will collaborate to find new ways to excite and educate the public about the Park's natural



Photo credit: Regional Parks staff



and cultural history. The expected result is that visitors will feel a connection to the land, and hopefully inspire park visitors to become stewards of the land.

## Definition

Information, education, and interpretation are interrelated principles within communications. Together, these principles will be used to provide an insightful and gratifying experience at the Park. The definitions of these communication principles are as follows:

- **Information**  
Facts, figures, dates, direction, rules, etc. This is often linked directly to decision-making, i.e., “Where am I? Is this use allowed? Is it too far?”. The information audience usually consists of individuals or small groups, and information is effectively used on signs at park entrances or accessed remotely on the park website. For the purposes of this document, “information” will be confined primarily to complimenting education and interpretation.
- **Education**  
Promote the acquisition of knowledge through learning and instruction. Education is usually structured and undertaken in formal groups to achieve knowledge-based objectives. Many techniques may be applied to education, including interpretation.
- **Interpretation**  
Free-choice learning where knowledge, emotional connection, and behavioral outcomes are objectives. Interpretation is most effective when it is first-hand, and related directly to a site or object. Feeling a sense of place may be linked changes to behavior (e.g. increased empathy for the environment)



Photo credit: Regional Parks staff

Through the communication process, the primary focus of interpretation is on the Park values listed above. Interpretative development will focus on determining which stories best provide the visiting audience with a sense of place. Our intention is to inspire the public to uphold Park values and to journey with us into the future as we protect and restore the Tolay Lake Valley with respect and reverence of its past.

## Resources for Interpretation

Park features provide an abundance of interpretive material for Parks staff. This section documents the natural and cultural features that form the interpretive resources for the Park. The interpretive features listed below are intrinsically interrelated. For example, the Coast Miwok and Tolay Lake connect to almost every feature of park interpretation in some way. A guiding principle for interpretation is to highlight these connections in order to tell a holistic and rich story.

## Natural Features

- Wildlife Corridors and Habitat Linkages are preserved because thousands of acres of land have been conserved through ownership and easement adjacent to the Park. Habitat and linkages are protected between Petaluma and Sonoma-Napa Marshes, to Cougar Mountain and the greater Mayacamas Mountains region. Almost the entire Tolay Valley Watershed has been protected with the acquisition of the property as a Regional Park.
- Tolay Lake is the dominant water feature of the Park, and was at one time the largest natural lake in Sonoma County. Tolay Lake formed on the valley’s heavy clay soils behind a natural earthen barrier. Floodplain terraces and seasonal streams support open grassland and

riparian woodland habitat, which provide riparian cover and resources for wildlife to forage and breed. The lake and riparian corridor provide cover and sustenance for local wildlife and for migratory birds that travel along the Pacific Flyway.

- Birds are in abundance at the Park. The Park is a birder's paradise, where the golden eagle, white-tailed kite, and burrowing owl are just a tiny fraction of bird species that may be observed. The Park is a haven for raptors - harriers, kites, kestrels, and red-tailed hawks are numerous.
- Serpentine Soils and rocks harbor unique vegetation. These soils are found along slopes primarily in the southwest region of the Park. Due to the soil's low calcium-to-magnesium ratio, serpentine soils create a harsh growing environment for plants. This environment has led to increased specialization of plant species which out-compete many of the exotic grassland species. These serpentine soils produce fantastic wildflower displays in the spring.
- The San Andreas Fault Zone is the junction between two crustal plates in the region. The movement between these two plates has produced the northwest trending ridges and valleys present in Sonoma County during the past millions of years. The Tolay fault runs northwest through the Park, and some sympathetic movement could occur due to its proximity to the active Rogers Creek fault.
- Hydrological impacts of the site's agricultural heritage can be still be seen on the land. The natural hydrological regime that filled Tolay Lake was altered; Tolay Creek was channelized to dry fields for crop production. Tolay Lake itself is a notable remnant of these practices. The natural earthen dam was removed in the mid to late 1800's, and seasonal drainages were turned into irrigation ditches that enter the system below the lake. This was a boon for ranchers because crops grown on the lake did not require irrigation during the summer.
- Upland Ponds are man-made ponds created before the 1970s on Cardoza Creek, near the center of the Park. These ponds provide habitat for a variety of species and clean water for aquatic organisms. Most notably, the ponds provide habitat for the California red-legged frog and the western pond turtle. The California red-legged frog is listed by the U.S. Fish & Wildlife Service as federally threatened, and both the California red-legged frog and the western pond turtle are listed by the California Department of Fish and Wildlife as species of special concern.
- The Petaluma Gap is a geographical expanse between the Pacific Ocean and San Pablo Bay. The physical characteristic of this landform combines with large marine bodies to create a microclimate within the sub-region characterized by robust wind patterns primarily out of the northwest. Vineyards have been prevalent in the Petaluma Gap since the 1880s and the area is now a designated American Viticultural Area.
- Restoration efforts can be viewed throughout the Park along seasonal drainages. Most notably, along the lower three miles of Tolay Creek. This is the location of mitigation for the Caltrans U.S. 101 Marin-Sonoma Narrows HOV Widening Project. Exclusionary fencing protects thousands of newly planted trees. Bio-engineered structures, both in-stream and on creek banks, are used to stabilize the severely eroded stream tributary.
- The Tolay Lake Restoration project focuses on returning the lake to a more natural system that is designed to function closer to its historic condition to benefit native wildlife flora and fauna.
- Panoramic Vistas provide views from many locations on ridgelines in the park. The Bay Area's prominent peaks, bridges, and cities are all on display. The West Ridge provides picturesque views of the Petaluma River Valley.



## Cultural Heritage Features

Tolay Lake Regional Park's history provides the public with an incredible opportunity to learn about the history of the region. Within this watershed, there are extensive stories about the human experience: the shift in relationships between people and the land; changes in the region's cultures; and interactions between different cultures within this region. By learning about the Park's rich historical background, the objective would be to inspire Park staff and visitors to protect, preserve, and sustain the cultural resources found within the Park.

- Native Americans have inhabited the region for roughly 8,000 years. The Tolay Lake Valley is within the tribal territory of the Coast Miwok, who lived and prospered for millennia, managing the land to stimulate productive hunting and gathering and creating an economy based on sustainable ecological practices.
- The Coast Miwok social structure was organized by tribes with land-holding units throughout California. Within each tribal territory, there were several semi-permanent villages, with campsites in outlying areas that were used seasonally. Hunting and gathering territory was defended against trespassers; these territories typically contained oak and buckeye trees and populations of fish and game for hunting, fishing, clam digging. Except for these resource-rich territories, land was not considered privately owned.
- Village structures included conical grass-covered family dwellings, and semi-subterranean earth-roofed sweathouse which served as the social and work center for men. Larger villages included a dance house that served as a "secret society" ceremonial center and was made similarly to the sweathouse.
- Societal Structure was led by the Chief who cared for the people, gave advice, and addressed the people daily. Female elders would oversee the organization and equipping of dance-house construction and various ceremonies. This was led by the leader of the woman's ceremonial house.
- Economically, Coast Miwok are described as "collectors" that engaged in hunting and plant gathering. Their complex economy included organizing villages and camps to address the variability in the quantity and seasonal distribution of resources. Special task groups would travel to and reside in different environmental zones throughout various seasons. This strategy provided a varied and plentiful diet. Food was stored for winter, where people would concentrate in the main village.
  - » Acorn was an important part of the Coast Miwok diet. Nuts were roasted and eaten or ground and shaped into cakes to be baked as bread. The acorn nut could be stored for long periods of time. The Coast Miwok animal diet was varied and included deer and crab year-round, seasonal salmon runs, geese in the winter, clams, rabbit, elk, squirrels, birds, and a wide assortment of fish.
  - » Coast Miwok traded clams, clamshells, clam disc beads, and abalone shells. Beads from these shells served as a form of currency. The Coast Miwok would travel to Wappo territory to collect medicinal plants and used clamshell disc beads to purchase obsidian.
- The Alaguai Tribe inhabited the Tolay Lake area at the time of first recorded European contact. Father Jose Altimira was sent out by the California Governor to establish a new mission. Altimira noted his visit to the Tolay Valley on June 27, 1823 with the following entry "... Laguna de Tolay [was] so named after the coast Miwok man who was chief of the tribe from this area."
- Tolay Valley is a place of prayer and reflection for the Coast Miwok. Various locations throughout the valley showcase the mountains that are sacred to Coast Miwok. Mount Diablo is perfectly framed by the south end of the valley when looking out from the east shore of the ancient lakebed. Four mountains, Mount Diablo, Mount Burdell, Mount Tamalpais, and Mount Saint Helena, are all visible from one point on the eastern ridge. Seeing these high points incites feelings of awe and reverence.
- Tolay Lake is the final lake in a chain of lakes from Parson's Meadows above Santa Rosa to San Pablo Bay. Each of these lakes served a specific ceremonial purpose; Tolay Lake was



for holding sicknesses and healing. Over the millennia, Tolay Lake was considered to be a spiritual center that drew Native Americans from across California and from Oregon to Mexico. With the permission of the Alaguali tribe, people received treatment at the lake.

- » It was the responsibility of the Alaguali tribe to invite people from abroad to their territory to participate in ceremonies and healing activities.
- » As a result of doctoring at the Lake, knowledge was shared between invited guest doctors from other areas. Tolay was renowned by many communities in much the same way as the Stanford University Medical Center is renowned for their practice and research in the medical profession today.
- » Charmstones were used by doctors to extract sicknesses from patients and then placed into the lake to contain the sicknesses and keep them from infecting other people. Thousands of charmstones were placed in Tolay Lake by many generations of doctors.
- Living Tribe - In the effort to preserve their ancestral lands, the Tribe has been in full support of the property being acquired as a Regional Park. The Tribe has worked in partnership with Regional Parks providing funding and leadership in development of the Park.
  - » The Tribe has staged active programs during the Fall Festival each year since the property became a Regional Park.
  - » The Tribe monitors all construction and maintenance projects in the Park, which includes overseeing all ground disturbing activities.
  - » A Tribal citizen (and at the time a UC Berkeley post-graduate doctoral student) has conducted several archeological research projects on the property.
  - » The Tribe is working to have artifacts that were removed from the site over the last 150 years returned to them. Artifacts are still in the possession of the Smithsonian Institution and former land owners.
- Future interests and programs that are developed may lead to interpretive opportunities such as:
  - » Ethno-botanical plant gathering and uses
  - » Restoration projects
  - » Ceremonial and celebratory uses
  - » Children's educational programs
- Spanish Missions were established throughout the area beginning in 1776. The Governor advised Father Jose Altimira to establish a new mission at Sonoma. Existing conditions of missions in San Francisco and San Jose were deteriorating along with the health of Native Americans in these facilities. The mission in Sonoma was the last of California's 21 missions, and was established just a few days after Father Jose Altimira visited the Tolay Lake Valley.
- Coast Miwok were rapidly incorporated into the mission system with only a few individuals escaping enforced conversion. From the late 1700s to early 1800's members of the Alaguali tribe were moved into three missions that were closest to Tolay Lake Valley. Those that survived ending up mostly at Mission San Francisco Solano, located in downtown Sonoma.
- Vaqueros translates to cowboy or rancher. In 1833 the Mexican Governor ordered General Mariano G. Vallejo to explore and settle the area, largely to monitor the nearby Russian colony at Fort Ross. Vallejo applied for and received a 44,000-acre land grant, which was increased by 22,000-acres a few years later, making it one of the largest in the state.
- Petaluma originally referred to a Coast Miwok village. General Vallejo borrowed the name and his translation of Petaluma as "Oh Fair Vale" is of doubtful authenticity. Tom Smith, a Miwok elder who was interviewed in the 1930s, said petaluma meant "back" or "flat back" which is an assumed reference to the shape of the hills in the area – particularly, Sonoma Mountain.
- The rancho relied on local tribal labor, many of them former mission residents. They produced products like hides, tallow, blankets, candles, clothes and shoes and managed large herds of cattle, horses, and sheep.
- American Settlers began immigrating to the area in approximately 1840, and received land

- grants that displaced Native Americans and consumed land.
- William Bihler eventually purchased the land around Tolay Lake in the 1860s and began draining the lake for agriculture.
  - Granville P. Swift acquired the Tolay Lake area from Vallejo before 1850. Swift was a trapper and hunter and the great-nephew of trapper Daniel Boone. He also utilized “Indian Vaqueros” to build his ranch and manage the land. Swift was also one of the leaders of the Bear Flag Party in 1846, which was part of Sutter’s campaign that led to the formation of California as a state.
  - Portuguese immigration peaked in the first years of the 20th century and again in the 1960s and 70s. Some of the reasons for immigration were limited space, weak economy, and famine in their country.
  - Many came by way of Hawaii where they worked in the sugar mills until they became discouraged by their poor treatment and low wages. In the late 1800s to early 1900s many left for California.

### Agricultural Features

Tolay Lake Regional Park is a “limited” working ranch. Ranching operations are continued at the Park to preserve its agricultural heritage and to manage the vast grasslands.

- In 1865 William Bihler purchased the area that eventually became the 1,737-acre Cardoza Ranch – which is now a Regional Park property. Besides growing crops on the drained lakebed, Bihler had one of the area’s first large-scale vineyard operations, preceding the viticultural boom of the 1880’s.
- James G. Fair acquired the land after Bihler. He amassed his fortune in the Comstock Lode and served as a United States senator. At the ranch, he raised thoroughbred horses and cattle; operated a vineyard producing wines and brandies; and operated the “first continuous brandy distillery on the Pacific Coast.”
- The vineyard was most likely the largest single ownership vineyard in the county at the time.
- Arthur W. Foster purchased the ranch in 1905 and operated it for two decades. Foster was president of the San Francisco North Pacific Railroad and operated the ranch as the Lakeville Stock Farm.
- Foster purchased most of the land between Petaluma and Sonoma Creek and combined the properties into a large landholding unit located along his railroad line.
- Foster planted the eucalyptus trees along Lakeville Road, with hired labor carrying barrels of water to irrigate them.
- Foster, his wife, and their nine children never lived on the ranch; they resided at their home in San Rafael.
- Foster continued manipulating the lake for agricultural practices. The elaborate irrigation and drainage system at the ranch may have been constructed during his time.
- Tolay Lake’s natural barrier was believed to have been dynamited sometime between 1865-1885 by William Bihler, and Tolay Creek was channelized through the lakebed to dry out the lake and prevent its reversion to historical lake conditions.
- Various crops were grown on the lake and the water table was so high that crops did not need additional summer water.
- The Coast Miwok people believe that draining the lake meant all the stored sickness and poison was now spilling as pollutants into the San Pablo Bay. This was a sign that



Photo credit: Regional Parks staff

the world was out of balance and possibly ending.

- Agriculture in the lakebed continued to be practiced until the purchase of Tolay Lake as a Regional Park in 2005.
- What was once a 500 acre-foot lake diminished to approximately 120 acre-feet in approximately 170 years.
- The Cardoza Family were Portuguese farmers and purchased the ranch in 1943. Many of the existing ranch buildings were built in 1940s and 50s by the Cardoza family. The Cardozas continued historical European ranching and agricultural practices.
- Marvin and Rita Cardoza were deeded the majority property interest in 1979, with seven percent deeded to other family members.
- They began to produce pumpkins on the lakebed for their annual pumpkin festival.
- Thousands of people and school children came to the ranch during the festival.
- They converted the granary to a museum and event center for the Pumpkin Festival.

## Site Analysis

### EXISTING EVENTS & INTERPRETIVE PROGRAMS

- **Healthy Earth, Healthy Bodies** - Nationwide, communities have faced a drastic increase in obesity, especially among children. The increase in obesity is characterized by both poor nutrition and a lack of exercise. Poor lifestyle choices as individuals and communities lead to personal health problems and a strain on public resources. Healthy Earth, Healthy Bodies is an elementary school field trip program run by Sonoma County Regional Parks at Tolay Lake Regional Park, which focuses on connecting students with where their food comes from and showing how that affects both their own health and the health of the environment. Local classroom teachers seek resources for science-based interdisciplinary lessons in the field. While attending Healthy Earth, Healthy Bodies, students learn about farming, stewardship, biology, natural and cultural resources, nutrition, and healthy recreational choices such as hiking and through participating in age-appropriate activities that exceed the California State Science and Health Standards.
- **Acorns to Oaks** - Have you ever touched history? Have you felt your connection to a place deepen as you made beads, wove a basket, or watched a golden eagle soar over land where people stood thousands of years before you? Local classroom teachers struggle with a lack of hands-on cultural programs that truly make history come alive. California students visit Missions, but rarely have opportunities to tangibly experience Native American cultural history. Acorns to Oaks is an elementary school field trip program run by Sonoma County Regional Parks, which engages students with the rich heritage and culture of local Native communities. Students take a half-day hike, explore replicated Coast Miwok houses, learn ethnobotany, and participate in traditional storytelling and crafts. Hands-on activities include bead-making, basket-weaving, and acorn grinding. While attending Acorns to Oaks, students learn about stewardship, biology, natural and cultural resources, and healthy recreational choices such as hiking. They participate in age-appropriate activities that exceed the California State Science, Social Studies and Health Standards. The program has been offered since 2012 at Tolay Lake Regional Park. The demand for Acorns to Oaks has been tremendous; it has sold out every year.
- **Tolay Fall Festival** - The Tolay Fall Festival offers two weeks of old-fashioned, nature-based fun each October at the Park. The public is invited to attend on the weekends and school groups attend throughout the week. The festival is a seasonal celebration that connects visitors with the beauty and history of the Park. Festival activities are low-key, hands-on, and educational by design. Festival activities may include:
  - » Exploring of the “Nighttime Creatures Barn” with its exhibits of native and exotic snakes, birds of prey, tide pool animals, and taxidermized wildlife.



- » Venturing into the “Creepy Crawly Room”, where tarantulas and scorpions glow under black lights.
- » Taking a hayride to a pumpkin patch in the park and find the perfect Halloween pumpkin.
- » Visiting a replica of a Native American village and try farm activities like wool carding and candle dipping.
- » Entering the World-Record Pumpkin-Seed Spitting Contest for a chance to win a year of bragging rights
- » Joining experts for hands-on demonstrations.
- » Participating in gunnysack races or finding your way through a straw maze, and petting barnyard animals.
- » Enjoying food and desserts from local vendors or bringing a picnic to enjoy at the park.

Children attend the Tolay Fall Festival over the five school field trip days that are offered. Students make farm- and environment-themed crafts, learn about local wildlife through live displays in a historic barn, and play old-fashioned games. The special field trip introduces students to the role of agriculture and farming in healthy communities.

The Preferred Interpretive Plan Map is shown in Figure 7-1, Proposed Conceptual Interpretive Plan. This map shows the story fields and themes that were developed based on the Park’s resources. The analysis addresses opportunities for proposed interpretation-related uses of the Park.

#### OTHER POTENTIAL INTERPRETIVE RESOURCES

- Proposed Visitor Center, located in the Park Complex, provides an opportunity to welcome visitors and give them an overview of the property. Varying degrees of interpretation will provide visitors with the information they need to understand their surroundings, from basic orientation and broad context of the Park, to focused and in-depth interactive displays.
- Trails, existing and proposed, provide the principle means of comprehensive public access to the Park. Much of park trails are multi-use trails, meaning they are designed for hikers, equestrians, and mountain bikes. A wide range of interpretive strategies will be used to inform trail users of their surroundings. They include: interpretive signage, self-guided cultural and nature tours, docents staged at points of interest or seasonal displays, and smartphone story-telling apps.
- Picnic areas are provided in various spots and places within the Park Complex and along trails for informal use by park visitors. Group picnicking facilities, through reservation, will be available at the Park Complex for visitors looking to host a more organized outing.



- Camping, by reservation only, is proposed as a hike-in opportunity near the center of the park and group camping is provided both at the Park Complex and near the upland ponds. Group sites, designed for a certain capacity, will be utilized by school programs and other youth or outdoor groups.
- Proposed recreational activities and organized events may include, but is not limited to: running/race events, bird counts, equestrian trail rides, ranger led boat paddles open water tour (kayak/canoe), camping, overnight stay for school and/or scouting programs, Native American cultural events/celebrations, Tribal interpretive space, and backcountry camping classes.  
Tours will include: docent/ranger led hikes and self-guided brochure or smart-phone app led hikes.
- The Tolay Fall Festival now includes wagon rides. Horse-drawn hayrides could be expanded during other Park events or throughout the summer months.
- The Tribe may sponsor events, in coordination with Parks. These events may be open to the public as the Tribe deems appropriate. The Cultural Gathering Area may be used for celebration, interpretation, or other occasions.
- Special events will be limited to the Park Complex and trails.



Photo credit: Regional Parks staff

## Audience Evaluation

### Capacity Analysis

In order to preserve open space, wildlife, and cultural resources, built facilities are concentrated at the Park Complex. New building footprints are minimized and are located in areas that are already developed.

Trails are designed to use existing ranch roads on stable alignments, when feasible. New trail alignments are limited to the shortest distance required to navigate the property and various points of interest, which includes locations with panoramic views. Trail alignments are designed to stay outside fenced restoration zones in order to minimize human disturbance in riparian zones.

Tolay Lake is, in large part, protected from human interaction. The existing causeway trail, the boardwalk from the causeway trail, and the existing access at the southern end of the lake will continue to provide visitors with views and interaction at the lake, but the north end and the east side of the lake have been preserved for traditional cultural practices and wildlife, with no public access provided.

Picnicking facilities will be focused around the Park Complex. Both single tables for informal uses, and group facilities by reservation, will be available for more formal visitor events. The most intense picnic footprint is located at the Park Complex. Informal picnic table sites are made available at a handful of areas throughout the Park. Tables will be located at points of interest, providing areas to enjoy a hike-in picnic while capturing a bit of solitude with stunning views.

There are two group campsites in the Park: one in the Park Complex and one near the upland ponds. In part, these group campsites were designed to support school groups. There will be two single-family hike-in camp sites. The sights, sounds, wildlife, night sky, sunsets, and sunrises at these campsites help park visitors feel a sense of place within the region.

## Audience

Tolay Lake Regional Park is located approximately five miles southeast of the City of Petaluma, within 30 minutes of Santa Rosa and Sonoma Valley, and within 60 minutes of approximately 1.2 million residents in the adjacent counties of Marin, Napa, and Solano. Sonoma County has become a popular destination for millions of travelers outside of the region. Tax revenue from tourism within the County is nearly \$150 million per year and the city of Petaluma reports approximately 10% of those tax receipts.

The Tolay Lake Ranch property has been operating as a Regional Park through the approved Day-Use Permit Program since 2009. The approved Tolay Lake Regional Park Interim Access Plan 2008, as outlined, allows weekend access to the Park's approximately 4,500 permit holders. The Park now is of interest to birders, equestrians, and hikers. School and non-school programs at the Park attended by residents from Sonoma County and surrounding areas include:

- Healthy Earth, Healthy Bodies offered since 2009 with an estimated annual attendance of 2,200 participants;
- Acorns to Oaks Program offered since 2012 with an estimated 2,500 students attending annually.
- Tolay Fall Festival has been operating since 2006, with approximately 6,500 school children and another 12,000 members of the visiting public attending annually.

The Park will continue to provide place-based and culturally sensitive interpretive educational opportunities for school children and the greater visiting public. The Park's pre-historic resources and the stories they preserve are of regional and state importance. The beauty of the Tolay Lake Valley and panoramic views of the region from the Park will inspire more users once the Park is fully open. Passive and active recreational users like bird enthusiasts, equestrians, mountain bikers, and make up the bulk of the Park visitors. The Park will provide an opportunity for educational interpretive events, activity-based events, and visitor celebrations.

### ACTIVITIES PROVIDED IN THE PARK

- Passive Recreation - people coming to seek out experiences based on their needs and interests:
  - » Static use – e.g., birders, artists, fishers, etc.
  - » Active use – e.g., hikers, backpackers, equestrians, mountain bikers, etc.
  - » Educational interest – e.g., local community, tourists, etc.
  - » Celebration – e.g., Tribal citizens, families, tour groups, etc.
  - » Casual curious – e.g., opportunistic travelers
  - » Pursuits of Traditional Practices
  - » Tribal citizens
  - » Education and skills development – generally group events
  - » School groups
  - » Scouting groups
  - » Natural resource management groups
  - » Research
  - » Equestrian outings
  - » Services on Site
  - » Staff
  - » Volunteers
  - » Volunteer Docents
  - » Park Experience



- » Solitude
- » Share with family and friends
- » Organized groups – tours, classroom, scout troops, etc.
- » Subject experts - ranger/subject expert led tours/events (ig. nature hike, bird study, wildflower study, open water boat paddle)
- » Group camping
- » Single family hike-in camping

## VISITOR PROFILE

The existing resource descriptions, along with interest of existing Park visitors, school programs, and out of region visitors provide ideas on potential Park visitors.

- **Drive By**  
The Park entrance is on Cannon Lane off of Lakeville Highway, a route used by thousands to and from the area. Park signage near the intersection of Cannon Lane and Lakeville Highway will generate use by visitors that are curious about the Park. Travelers from out of the area may visit as a place to get out and stretch or people in need of a place to picnic during travel.
- **Family Outings**  
This group is most likely to visit during school breaks and weekends. They will be interested in the array of recreation and interpretive opportunities.
- **Tribal Citizen visitors**  
Both as individuals and/or as a part of organized celebration for ceremonial or traditional cultural Tribal use or event.
- **School Groups**  
These groups expect a level of interpretation that is educational, experiential, and focused. Users' focus in the Park now is K-12, which most likely will remain the dominant focus. The Park provides opportunity for school groups of all ages and interests. A variety of interpretive elements focused on both younger and older students should be considered.
- **English as a Second Language**  
Hispanic population in Sonoma County in 2013, per the U.S. Census data, consisted of approximately 26% of the County's population. Interpretive programs, graphic, and audio components should be developed with Spanish language speakers in mind. Companion guides, audio programs, and other supplemental materials should provide Spanish language options.
- **Visitors Seeking Solitude**  
The 3,400-acre Park provides opportunity for users to find solitude and space seeking a workout or just a great place to sit and enjoy birds, wildlife, or the view.
- **Campers for Hike-in Overnight Stays**  
The two sites near the center of the Park provide an opportunity for families seeking a backpacking outing with young children or beginners to this type of outing.
- **Group Campers for Overnight Stay**  
These users are more likely to be school groups or scouting groups with some focus on experiential learning. Other use groups could include equestrian groups, research groups, outdoor/restoration related conference/trainings, etc.



Photo credit: Regional Parks staff

## Thematic Structure

Main goals, themes, messages, interpretive communication objectives, and storylines are the key elements that drive the development of the Interpretive Master Plan. This chapter addresses questions like, “What is the most important idea to be passed on to visitors?” and “How to organize all themes around a central idea?” To answer these questions, it is necessary to create a clear communication style.

Often, emotional connections and experiences are most memorable. The interaction of emotion, intellect, and action constitute our human experience. A high quality, interpretive experience provides these connections in a way that offers visitors a special, personal and lasting experience – a unique memory.

In developing interpretive programs, elements, and stories, consideration should be given to different methods of learning as well as behavioral and emotional outcomes. Behavioral and emotional objectives are critical tools in providing a meaningful and memorable Park experience. The interpretive program should be developed in tandem with a way to measure the target audience’s ability meet the interpretation objectives.

## Guidelines

The following foundational guidelines were crafted using input from multiple sources to guide the development of interpretive themes and elements at Tolay Lake Regional Park, and will serve as guiding principles for the goals outlined in chapter 2.

Goal 1: All interpretation emphasizes connections, balance, and historic relationships between natural uses and cultures at Tolay Lake.

Goal 2: Interpretation focuses on the past, present, and future of Tolay Lake, natural systems, habitats, Native Americans, and ranching/agriculture.

Goal 3: Using a layered approach, interpretation offers a multi-sensory and interactive visitor experience, allowing for varying degrees of discovery and learning.

Goal 4: Interpretation is in step with developing technologies, encourages reflection and deeper understanding, and has a light impact on the land.

Goal 5: Stories pertaining to Native American culture and heritage will be developed for public education in collaboration with Federated Indians of Graton Rancheria (FIGR) and with respect to the sacred quality of the landscape, and the site’s cultural resources, and rich heritage of oral traditions. Traditional Coast Miwok language should be featured in exhibits.

Goal 6: Exhibits/installations that change based on education goals, societal need, and interest ensure that visitors always find new things to explore at Tolay Lake.

Goal 7: All interpretive content will be developed to deepen visitors’ personal and emotional connections to Tolay Lake, thereby cultivating public stewardship.

Goal 8: Through educational efforts, programs, and partnerships, Tolay Lake will strive to raise awareness, improve knowledge and encourage responsible actions and behaviors while focusing on natural and cultural history.

Goal 9: Interpretive kiosks, museum exhibits, signage, programming, and other interpretive features will be universally accessible (ADA) per the 2015 California State Parks Accessibility Guidelines.

## Themes, Messages, and Stories

- The Theme is the central and most important idea for any site and its interpretation.
- Subthemes are used to organize complex stories under the umbrella of the larger theme.
- Messages are the summarizing statements forming the basis for the objectives we're trying to achieve with our interpretive audience.
- Stories should be the fun stuff. Stories contain the content that helps visitors to form a relationship to the Park.

### HOW THEMES, MESSAGES AND STORIES ARE USED

A list of themes and sub-themes for the Park are included below. The Story Fields and Theme Locations Map (Figure 7-1) help correspond the themes with an appropriate location, or backdrop. There are several ways to organize themes, messages, stories, and types of media used.

- Introductory programs are those that provide an overview of the Park its values and goals. A broad and more general view of as many of the Park themes that can be practically shared should be included. Types of interpretive programs could be visitor center exhibits, site tours, outreach programs, and publications.
- Specialized programs focus on a specific theme. The sub-themes should be used as a supplemental message to provide a rich story. A docent-led tour of the Lake may focus on birds that inhabit the lake, with sub-themes that highlight the Lake's cultural value to the Coast Miwok and the living Tribe, and how hydrological manipulation has changed the Lake.
- Interpretive panels should focus on subjects that require very little text. No more than a couple of stories to highlight the theme for a single panel should be used. The theme should be easily determined by the audience.
- Film, audio tours, brochures and self-guided tours can be varied in depth of detail. A single theme should be the focus, with subthemes providing stories to enrich and elaborate on each subject.
- Some forms of interpretation may be better suited to specific themes and subjects. Explore options and types of interpretation and work to determine the best form for programming.

### INTERPRETIVE THEMES

The following collection of interpretive themes was developed by focusing on the site's natural and cultural assets, many of which have been documented in previous studies. This includes the 2008 Cultural Resources Study completed by LSA, the 2009 Biological Resources Study completed by LSA, the 2012 Historic Structures Report completed by Architectural Resources Group, and the 2014 Cultural Landscape Inventory completed by MIG. Stakeholder meetings and public outreach associated with the Park Master Plan also provided a forum for information gathering.

Most information about local Native American culture and history is not documented in reports. Therefore, it is imperative that interpretation of native culture be done in consultation with the FIGR to determine which stories are appropriate to tell, and what style of interpretation best reflects the FIGR's vision for public education at Tolay Lake.

### OVERARCHING THEME

Tolay Lake and its surrounding landscape symbolize a continuum of human history and a theme of balance. For thousands of years, people have gathered here for spiritual and healing purposes; today, visitors can connect with the sense of place created by the Park's rich history. The natural, cultural, and agricultural histories are unified in this iconic landscape, and this is a legacy that must be cherished and protected.



## SUBJECT SPECIFIC THEMES

### Regional Overview

Tolay Lake Regional Park is part of the Sonoma County Parks and Recreation system, and contributes to important natural and cultural systems in the region.

Sample sub-topics:

- Overarching introduction to Sonoma County.
- Context within the Sonoma County Parks and Recreation system.
- Introduction to Native Americans - Coast Miwok people

### Property Overview

Welcome to Tolay Lake. This landscape possesses rich layers of history and distinctive natural resources.

Sample sub-topics:

- Overarching introduction of Tolay Lake's cultural history & timeline of human activity (Native American history through 20th century agricultural uses).
- Overarching introduction of outstanding natural resources in the park, and description of Tolay Lake's dramatic seasonal changes.
- Message emphasizing sacred quality of the landscape and respect for cultural resources and tribal beliefs.
- Overarching story of California history focusing on immigration, ranching, and agricultural history.
- Orientation to the park – maps, where to find interpretive locations, rules and regulations, invitation to experience all Tolay Lake has to offer including the pursuit of health, recreation, and connection to our past.

### Native Americans

Tolay Lake reflects millennia of regional Native American history. Ancient cultural beliefs and a unique archaeological record make this site a sacred place. In spite of tremendous hardship and loss of culture, many of California's indigenous tribes have survived. Today, the Federated Indians of Graton Rancheria continue to honor their cultural traditions here.

Sample sub-topics:

#### History and Values

- Warning about federal and state protection of archaeological sites, and the legal consequences of vandalizing or looting.
- Description of the types of archaeological sites and artifacts found.
- Discussion of how some Tolay Lake artifacts are at The Smithsonian Institution today; how the artifacts got there, and how the FIGR is working to get them returned.
- Overview of how site was used during the pre-contact era – seasonal use, settlements, ceremonies, hunting, and gathering.
- Description of prehistoric relationships between indigenous residents of the area and food sources (hunting animals and harvesting plants).
- Description of early native communities, chronologies, and introduction to FIGR community.
- Description of cultural significance of Tolay Lake to FIGR and, if appropriate, descriptions of past and present cultural activities performed there.
- Present overview of California history for Native Americans in the region including disease, loss of ancestral lands, missionaries, and cultural revival.

### Ethnobotany

- FIGR continues to use this area for traditional cultural ceremonies, gathering plants, etc.
- Ethnobotanical description of plant types used for cultural and medicinal purposes by the tribal community, and use of seasonal burning techniques to encourage desired plant growth.
- FIGR Traditional Environmental Knowledge and western science – exploring different ways of understanding the natural world.

### Vaqueros

Lieutenant Mariano G. Vallejo was the first non-native person to settle the Tolay Lake area. His Rancho Petaluma operation relied on Native American labor to produce hides and tallow, agricultural products, blankets, candles, and shoes. The Tolay Lake margins and foothills likely served as rangeland for his herds of cattle, horses, and sheep.

#### Sample sub-topics:

- Introduce the first European settlement of the area including Vallejo and how the establishment of the nearby Mission San Francisco Solano affected the native people and the landscape.
- Provide context for this era from a regional, state and international perspective, including how the Native Americans were affected by European settlement, the influence of the establishment of Catholic missions, and the conflict between Spain and Mexico and then the U.S. in gaining control over this part of the country.
- Overview of how site was used during early contact era – seasonally, settlements, agriculture, hunting and gathering.

### Early Ranching/Farming

Nineteenth-century agricultural practices transformed Tolay Lake and helped define the current character of Sonoma County.

#### Sample sub-topics:

- Introduce early ranchers and farming families that operated out of Tolay Lake including Bihler, Fair, Foster, and North Bay Farms Company.
- Contextualize settlement of the area by Euro-American residents in broader state and county history.
- Overview of how site was used during early agriculture/ranching era – types of crops grown/ animals raised, scale of operations, type of built features constructed, machinery used, effect of ranching on the land, etc.
- Effects of historic ranching/farming on the land – draining lake for fields, ranching effects on grasslands - tie into how uses affect character of landscape (compare with Native American burning of grasslands for food and materials).

### Portuguese Ranchers/Farmers

The Cardoza Family left a lasting agricultural legacy at Tolay Lake.

#### Sample sub-topics:

- Introduce the Cardoza Ranch family and their dairy and livestock operations.
- Contextualize arrival of Portuguese immigrant families in Sonoma County and their contributions to the region.
- Describe Cardoza family's creation of an on-site museum for Native American artifacts and historic agricultural implements – early interpretive efforts, how awareness of site's prehistoric cultural resources and treatment of those resources has changed over time (tie into information about artifacts at The Smithsonian Institution and how the FIGR is working to get artifacts returned).

- Overview of how site was used during later agriculture/ranching era (1940- 1950s) – types of crops grown/animals raised, scale of operations, type of built features constructed, machinery used, effect of ranching on the land (informed with interviews with living Cardoza family members).

### Current Agricultural Uses

The site still employs grazing and other agricultural practices as land management tools, providing opportunities for agricultural and natural resource education and community involvement through an integrated, interdisciplinary, multi-agency approach.

Sample sub-topics:

- Describe current agricultural practices and reasons why these crops/animals (cattle, viticulture, food crops) are being used – examples include land management and historic uses.
- Connecting people with the food they eat and the land on which it grows – how factors such as culture, climate, soil composition, and water source affect which crops are grown locally.
- Opportunities for hands-on learning, growing, and eating, as well as partnerships with local farmers and schools.

### Tolay Lake

For thousands of years, Tolay Lake has been revered as a place for health, healing, spiritual renewal, and agricultural production.

Sample sub-topics:

- Describe importance of Tolay Lake to Native American culture and practices – for example, healing ceremonies that were performed at Tolay Lake (based on oral history).
- Infuse poetic reflections / quotes about health, healing, and water as a source of life into the area.
- Describe era when lake was drained for agricultural purposes and the distress that this caused for local Native American tribes; contrast perspectives between cultures about Tolay Lake.
- Contextual information about Tolay Lake in relationship to site and region's hydrological system and features (Tolay Creek, San Pablo Bay, springs, manmade ponds).
- Description of lake restoration efforts today and how that will alter site's hydrological system (and how those efforts reflect our current perspective about Tolay Lake).
- Upper and Lower Ponds – history, purpose, and current functionality.
- Duck pond and waste water system – what is it, and how it works. Associated with former hunting blinds and a well, this feature is related to the historic hunting use on site. The Duck Pond no longer retains water after the area was modified for farming, but its berm and the pond footprint are still visible.

### Climate Change and Local Effects

Climate change has changed Tolay Lake's landscape and ecosystems, and will continue to contribute to future changes.

Sample sub-topics:

- Discussion of climate change and its potential effect on the region and site – potential for future flooding in the region (but not within site) with predicted sea level rise, weather pattern changes, droughts, and wildfires.
- Dynamic overview of climate change in action at Tolay Lake with past, present, and future conditions, as well as human adaptation – how the region and site has been affected by changes in global climate over centuries and millennia.



### Geology/Geomorphology

The region surrounding Tolay Lake has a fascinating geomorphologic history and unique geologic features that are evident in today's landscape.

Sample sub-topics:

- The Tolay fault – where it is and how it relates/reacts to the lateral-shifting San Andreas Fault and corresponding Pacific and North American plates.
- The Petaluma Formation, Sonoma Volcanics and Franciscan Complex – what they are, what historic era they date from and what types of habitat they foster.
- Serpentine soils and their contribution to the evolution of rare plants around the site, including identifying the rare plants that grow there.

### Natural Habitat

From native grasslands to seasonal wetlands, the natural environment of Tolay Lake is constantly changing and is home to diverse plant species and wildlife.

Sample sub-topics:

- Overview of Tolay Lake and Tolay Creek's seasonal patterns of wet and dry (Mediterranean climate) including explanation about why Tolay Lake is not a lake, but a wetland.
- Description of types of diverse natural vegetation and the types of wildlife that thrive/can be found in these habitat types at Tolay Lake. Habitats include fresh water springs, marsh/wetland, riparian, serpentine ecosystem, Bay oak woodland, and Bay ecosystem (see more specific information under Restoration/Preservation Efforts).
- Ethnobotanical description of plant types used for cultural and medicinal purposes by tribal community and use of seasonal burning techniques to encourage desired plant growth.
- Description of cultural vegetation in the park, i.e., historic eucalyptus windbreaks, non-native grasslands, and how agricultural techniques have impacted native vegetation and contributed to non-native plant species.
- Tolay Lake supports an incredible number of bird species, including two state protected species, three species of special concern, and serves as nesting grounds for many native birds. Overview of significant bird diversity and Pacific Flyway migration routes – what bird species are here seasonally and what bird species are present year-round. Weave in activity focused on identifying common and rare species by season. Description of protected and special concern species and their habitat needs.

### Restoration/Preservation Efforts

Tolay Lake has long been home to a diverse range of plant and wildlife. Fragile or rare habitats and resources are in need of restoration and protection. Thanks to ongoing efforts, Tolay Lake can serve as a place where these endangered habitats and resources remain.

Sample sub-topics:

- Highlight lake and habitat restoration efforts, including: riparian areas, marsh/wetland, Bay oak woodland.
- Highlight preservation efforts of the cultural landscape and historic features, including: historic buildings and structures (bridges), historic roads, agricultural ditches, eucalyptus allee, etc.
- Highlight what the future holds for Tolay Lake – the need to achieve balance and engineer thoughtful solutions with variants such as climate change, adaptation, economics, preservation and stewardship
- Overview of restoration efforts underway today to improve wildlife habitats. Special feature on threatened-species: the California Red-Legged Frog. Special feature on endangered species of butterflies: Callippe Silverspot Butterfly and Myrtle's Silverspot Butterfly and diet of violets and wildflowers.

Crash Site Memorial

A U.S. Air Force transport plane crashed along what is now the boundary between the Tolay Lake Regional Park and the Roche Winery on May 4, 1970, killing 13 of the 14 personnel aboard.

Sample sub-topics:

- Tell the story of the rescue and recovery of the sole survivor.
- Highlight the site of the crash as a place of remembrance.



## Challenges and Strategies

### Planning Approach

The various stakeholders, users, and user interests presents a challenge in managing the Park. Regional Parks has a responsibility to Park visitors and stakeholders that are essential to preserve and maintain the Park's natural and cultural resources. Regional Parks' collaboration with partners should be viewed as an opportunity to enhance the visitor experience. Stakeholders' perspectives may enrich stories shared with visitors.

The Tribe's unique perspective is a valued opportunity to enhance visitor experience and to allow visitors to appreciate the value of Tolay Lake Regional Park. The Land Trust as former land owners and managers of the large Tolay Creek Riparian Enhancement Project have their own unique perspectives that should be shared. The Sonoma County Agricultural Preservation and Open Space District and as Conservation Easement holders helps to maintain Park values and present interpretive subject opportunities. The Coastal Conservancy and California Department Fish and Wildlife also have a vested interest, particularly in lake restoration.

The graphic below highlights the relationships of Park users with many possible opportunities to interact in a variety of ways. It is important to identify potential conflict to best mitigate so that the interaction of users and visitor experiences are positive.





## Challenges

### ENHANCE TOLAY LAKE REGIONAL PARK OPERATIONS:

- Develop operational approaches that underscore collaboration across disciplines and organizations.
- Support Park Staff, Tribal Staff, docent volunteers, and subject experts by encouraging meeting regularly to support the collaborative effort.
- Support Park staff and volunteers by providing trainings on docent-led tours and how to share with the public the many Park stories.
- Form partnerships with community groups and organizations that can provide interpretive and messaging support.

### REDUCE ON-SITE USER CONFLICTS

The Tolay Regional Park Master Plan and Resource Management Plan have been developed in acknowledgment of the possible conflicting interests. Section 3, Audience Evaluation of this document describes the approaches taken in developing the Master Plan. In programming interpretive activities and events scheduling should include consideration of common visitor uses, biotic resource season, and ranching seasons working to minimize potential conflict. Adaptive management should be a prominent tool used, understanding that as stewards of the Park we learn from past experience and should boldly shift strategy to better provide protection of resources and service to Park visitors.

### ADDRESS SOCIO-ECONOMIC AND LANGUAGE BARRIERS

The points developed below are in recognition of and support the ongoing effort to provide recreational and interpretive opportunities for the diverse population and communities that make up the County. Park visitors have a varied background in terms of family income level, ethnic identify, and language spoken. Currently, 50% of school groups that attend field trips at the Park receive scholarships due to the high percentage of students that receive free or reduced-cost lunches. The school groups and youth that visit the park reflect the increasing diversity of Sonoma County residents.

- Provide opportunities for lower income participation in diverse activities.
- Develop affordable, group event, overnight stay opportunities.
- Reach out to a diversity of community leaders.
- Develop strategies to reach out to Hispanic communities in program development.

### PROVIDE ACCESSIBLE FACILITIES AND INTERPRETIVE PROGRAMS

- Provide a range of recreational and interpretive opportunities for users of varying cognitive and physical abilities. Examples include incorporating braille on interpretive signs, providing headphones to play pre-recorded tours in various languages, and having tour staff with sign language capabilities.
- Develop programs to adapt to specific user needs.

### BROADEN APPEAL

- Increase exposure and message
- Work to attract new audiences
- Develop activities and programs that are coupled with real learning for an intentional special experience
- Appeal to a niche that is unique from surrounding offerings
- Recognize limitations inherent at Tolay Lake Regional Park, and therefore cannot adapt and appeal to everyone

## AESTHETICALLY AND ENVIRONMENTALLY SENSITIVE DESIGN

Interpretive facilities should be designed to pay respect to the natural beauty and scenic quality of the Park. New buildings, picnic areas, signs, and built features should be designed to enhance the natural beauty and/or historical significance of the Park. They should blend in and help communicate the Park's history and values through architecture. For example, environmentally sustainable design would reflect one of the Park's values..

## OPERATION AND MANAGEMENT

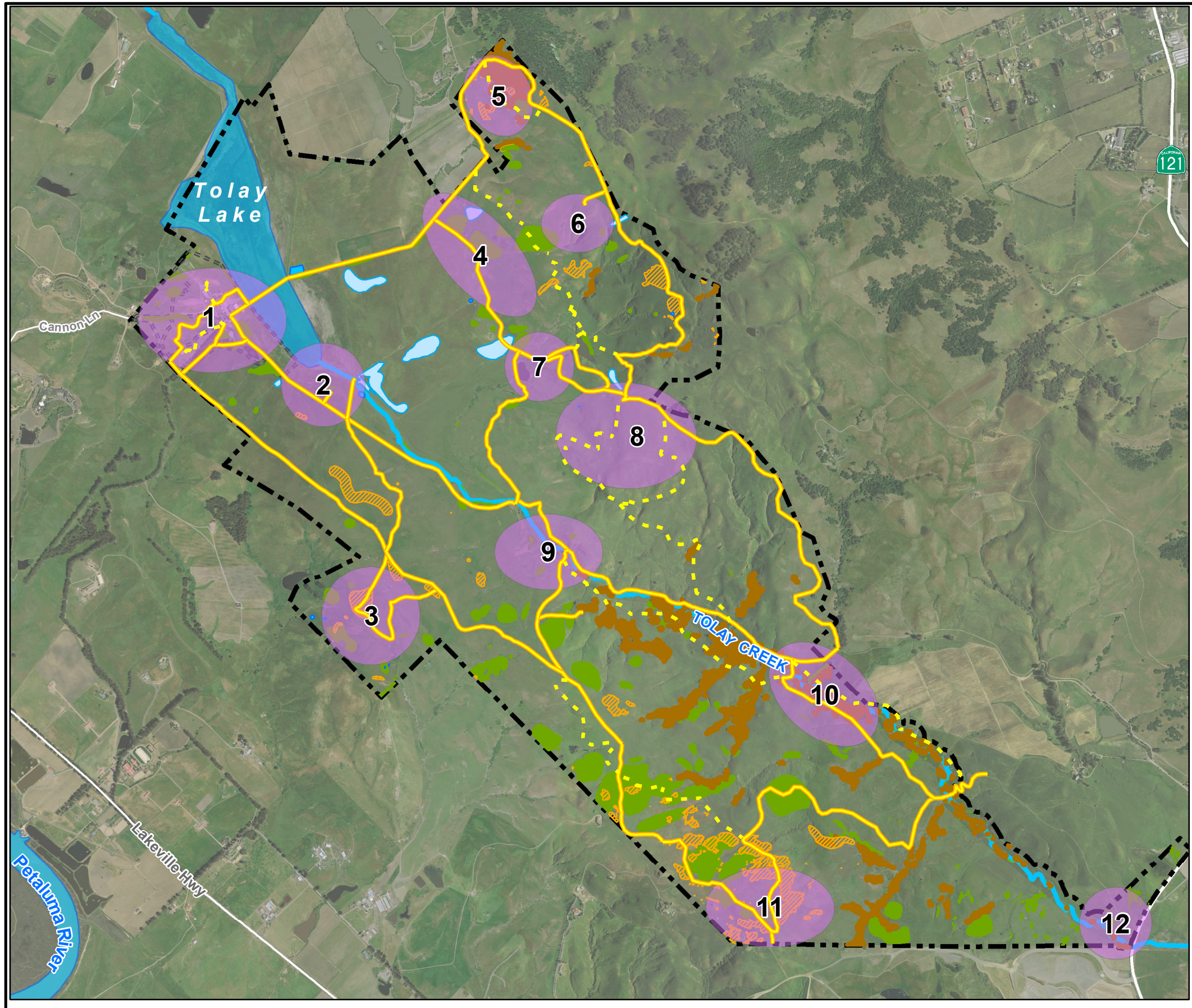
The Park features complex experiences with new programs that result in frequent and intensive use. Staff, volunteers, and operation and management density requirements will be adjusted to manage events, overnight facilities, and programs. Possible additional staff and operational requirements include:

- Managing and maintaining staff at the Visitor Center
  - » Managing and maintaining staff for overnight stay facilities.
  - » Staffing additional knowledge-based natural and/or cultural resource staff at the Park
- Park Complex
  - » Increased staffing for operation of retail services at the Visitor Center.
  - » Have expert staff or volunteer docent lead tours near sensitive biotic resources.
  - » Provide adequate and competent staff to monitor both natural and cultural resources, oversee preservation efforts, and continue to develop strategies for adaptive land management
  - » Increase management staff to oversee volunteers working at the Park



Photo credit: Regional Parks staff





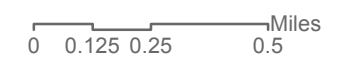
**STORY FIELDS AND THEMES**

- 1 - RANCH / VISITOR CENTER**
  - Regional Overview
  - Site Overview (from turnout near entry gate)
  - Native American Comprehensive Story of Tolay Valley
  - Vaqueros story
  - Portuguese farmers story
  - Present agricultural use
  - Duck pond and wastewater system
- 2 - LAKE VISTA**
  - Native American significance
  - history & values
  - ethnobotanical uses - Living Tribe
  - Story of the Lake
  - Hydrology
  - Birds
  - Ecosystem of native flora / fauna
- 3 - PETALUMA MARSH**
  - Natural habitat - marsh/wetland
  - Restoration - marsh/wetland
  - Climate change and local effects
  - Native American prehistoric tribal values
  - Lakeville town story
  - Geology / geomorphology
- 4 - AGRICULTURE**
  - Restoration - ag ditching and diking
  - Native American significance - land changes
  - ethnobotanical uses - Living Tribe
  - Ranchers story
  - Vaqueros story
- 5 - OAK WOODLANDS**
  - Native American significance
  - history and values
  - ethnobotanical uses - Living Tribe
  - Ranchers story
  - Restoration - Bay oak woodland
- 6 - EAST RIDGE VIEW POINT**
  - Views
  - Native American surrounding community
  - Regional overview
  - Site overview
  - Geology / geomorphology
- 7 - CENTRAL PONDS**
  - Natural habitat - fresh water springs
  - Native American changes through time
  - Historical route
  - Birds
  - Fishing destination
- 8 - MIDDLE REACH**
  - Views
  - Native American land management
  - Crash site memorial
- 9 - HISTORICAL ROUTE**
  - Historical route
  - Natural habitat - riparian
  - Restoration - creek riparian areas
- 10 - TOLAY CREEK**
  - Historical route
  - Natural habitat / Restoration
  - riparian, Bay oak woodland
- 11 - BAYVIEW POINT**
  - Native American regional tribe land uses
- 12 - SOUTH ENTRANCE**
  - Native American overview of story
  - history of Living Tribe

**POTENTIAL MEDIA TYPES**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>Trail maps or site maps</li> <li>Interior interpretive signage / displays</li> <li>Laminated story books</li> <li>Use of #hashtags on social media sites</li> <li>Embedded and/or etched interpretive elements</li> <li>Artifact display</li> <li>Static or multi-media dioramas</li> <li>Soundscapes</li> <li>Film and theatre space</li> </ul> | <ul style="list-style-type: none"> <li>Audio tours</li> <li>Place-based, cutting-edge art installations</li> <li>Farm to table educational program</li> <li>Horse drawn cart tours</li> <li>Kiosks</li> <li>Roving bird blind</li> <li>Authentic Ranger Led Boat Paddle</li> <li>Smart-phone storytelling app</li> <li>Restoration and demonstration areas</li> </ul> |
|---|---|

- |  |   |  |                                |
|--|---|--|--------------------------------|
|  | Hiking Only Trail                       |  | Woodlands                      |
|  | Multi Use Trail                         |  | Sensitive Biological Resources |
|  | Upland Grasslands and Wildflower Fields |  | Water Feature / Wetland        |



Sources: Esri Digital Basemap, Sonoma County Regional Parks



Figure 7-1  
Proposed Conceptual Interpretive Plan



*This page intentionally left blank.*

# Trails Plan







Photo credit: Kent Walker



## TRAILS PLAN

The trail system proposed in this Master Plan provides Park visitors with an opportunity to explore the various park features, to learn about the Park's history, and to increase their awareness of the natural world. Trails provide both physical and cognitive benefits - regular physical activity lowers blood pressure, helps with weight management, lowers the risk of diabetes and cardiovascular diseases, and improves the brain's creativity and problem-solving functions. Interaction with nature is particularly effective in replenishing brain attention function. The part of the brain that controls attention function can become depleted with multi-tasking common in the use of cell phones and computers. Spending time outdoors helps to increase attention spans and creative problem-solving skills (Atchley et. al, 2012).

There is also the benefit of the sights, sounds, smells of nature, which revitalizes the spirit. Nature walks are associated with reducing the risk of depression, in addition to alleviating the negative effects of stress (Steele 2014). The Park trails allow users to experience solitude and quiet, take in spectacular views, find space to contemplate alone, or join an interpretive group hike that shares the spiritual history of the native people and the land.

The trail plan is designed to accommodate all types of trail users, ranging from passive recreation (birding, wildlife viewing, looking at scenery, botanizing, hiking) to active recreation (horseback riding, or mountain biking). The multi-use trails through pastoral lands are attractive to equestrians and to mountain cyclists looking for an easy to moderate riding experience or a through-route from Highway 121 to Lakeville Highway. Park trails provide varied opportunities for hikers of all abilities. From short interpretive hikes at the Park Complex to climbing trail-loops up ridgelines, the trail system accommodates many abilities and interests.

Key themes that emerged through stakeholder meetings included:

- Creating a centralized trail system, with easy trails in the Park Complex
- Designing new trails for optimum safety
- Ensuring trails are protected during the wet season
- Providing some pedestrian only trails
- Providing access to the Park from Highway 121
- Providing equestrian friendly gates
- Protecting sensitive resources
- Providing connections to regionally significant trails
- Providing opportunity for interpretation and education of cultural, prehistoric, historic and natural resources throughout the park.

The trail system was conceived after extensive public input and consideration of the many unique opportunities and the constraints of protecting sensitive natural and cultural resources. The Master Plan team made multiple site visits, hiking possible trail alignments to verify the feasibility of proposed new trails. Alignments were assessed to minimize impacts and to best protect and avoid natural and pre-historic cultural resources. The final preferred trail alignments are shown in Figure 1 -G

### Types of Trails

The Park will include two basic trail classifications: multiple use (multi-use) and pedestrian use (hiker-only) only trails. The existing roads used by park staff will also serve as travel-ways for all users. Trails widths as described below:

- 12' wide trail (maximum). These existing unpaved roads will be open to emergency and Regional Parks maintenance vehicles in addition to all types of trail users.

- 5' wide trail (maximum). The predominant trail type in the park is built to five-foot width but more commonly maintained at three-foot width with regular trail use. This width pertains to multi-use trails.

## Multiple Use Trails

Most of the existing trails on the property open to the public (Interim Access Tolay Lake Regional Park) are defined as multiple use, which means they are open to the public for hiking, mountain biking, and equestrian use. Multiple use trails will be constructed of native soil, stabilized soil, or gravel, with the exception of segments designated as “accessible” that are required to have an all-weather surface per California State Parks Accessibility Guidelines.



12-foot wide trail

## Hiker-Only Trails

In response to public requests for the provision of some quieter, more peaceful experiences within the trail system, the Master Plan features a select number of trails that will be limited to pedestrian use only.

Construction of hiker-only trails is like multi-use trails, but will be signed at key locations alerting users to trail use limitations. These trails may also be considered single track from 18” to 36” in width. Additionally, hiker-only trails are designed to meet the criteria for an “educational nature trail” as defined in Section 41 of the California State Parks Accessibility Guidelines.



3-foot wide trail

Photo credit: Regional Parks staff

## Existing Trails

### Description

Table 8-1 summarizes information about existing trails or road trail conversion. This table includes: trail type, length, difficulty, and habitats. There are approximately 12.7 miles of existing trails, and all are multi-use trails. On Figure 5-2, yellow trail lines denote trails or ranch road/trail conversion that will remain on existing alignments.

| Table 8-1 Trails on Existing Alignments |                 |   |
|---|-----------------|---|
| Trail Name                              | Approx. Mileage | Description   |
| Cardoza Lane                            | 0.40            | This trail has a slight grade and follows a historic route lined with eucalyptus trees.   |
| Ranch Interpretive                      | 0.20            | This is a gentle grade trail that uses internal ranch circulation paths to enable visitors to view historic structures within the Park Complex. |
| Duck Pond                               | 0.20            | Gentle grade trail that uses internal ranch circulation paths to enable visitors to view spring fed ponds in the Park Complex.                  |
| Causeway                                | 1.30            | Trail has a gentle to slight grade and crosses Tolay Lake. It offers views of the lake, and opportunities to view waterfowl and other wildlife. |
| Historic Lakeville Road                 | 2.70            | Trail on the historic alignment of Lakeville Road is a gentle grade to and along Tolay Creek passes through rock cairns that form a gate.       |



| Table 8-1 Trails on Existing Alignments |                 |   |
|---|-----------------|---|
| Trail Name                              | Approx. Mileage | Description   |
| West Ridge                              | 3.60            | Trail has a gentle grade and offers outstanding views of San Pablo Bay and the Petaluma River.  |
| East Ridge                              | 1.60            | Trail has a gentle to moderate grade, and passes through an oak woodland area to 3-Bridge Vista and provides outstanding views of the Tolay Creek Watershed, providing views of the Bay, surrounding Cities and Tolay Creek Watershed |
| Pond                                    | 0.80            | Trail has a gentle to slight grade and connects the Causeway Trail to the upland ponds.   |
| Upland Pond Loop                        | 0.90            | Trail has a slight grade and provides access to a unique portion of the Park with its own micro-topography, springs, and spring wildflowers.  |
| South Creek                             | 0.30            | Spur trail from West Ridge Trail that provides views of the Petaluma River and South Creek.   |
| Middle Reach                            | 0.50            | Existing section of ranch road on moderate grade from Upland Pond Loop Trail along east side of the park.   |
| Coyote                                  | 0.30            | Trail begins on an existing ranch road alignment and extends from West Ridge Trail to Tolay Creek near backcountry campsites.   |
| Total Miles                             | 12.8            |   |



Photo credit: Gerald Moore



## Proposed Trails

### Description

Table 8-2 shows the implementation schedule for trails. Phases 1 through 3 include a mix of trails and bridge replacements, and trail development throughout the Park. Phase 4 focuses on trails on the Tolay Creek Ranch property. Trail names are used for identification purposes for this document, but many will change with construction and installation of the new trail sections. New trails are depicted in green in Figure 5-2.

| Phase and Trail Segment  | Approx. Mileage | Description   |
|--|-----------------|---|
| Tolay Creek Ranch Entry to West Ridge (m)  | 1.80            | Moderate grade trail from southern park entry road creek crossing (Bridge #1) connecting to the existing section of West Ridge Trail.   |
| South Entry (n)  | 0.30            | Switchback accessible compliant trail from southern parking area across bridge #1 to the intersection of Tolay Creek Ranch Entry and Meadow Trail.  |
| Bridge Southern Entry (#1)<br>(Vehicle Bridge – maintenance operations and emergency access vehicles only) | n/a             | Multi-use trail access across Tolay Creek at southern park entrance.  |
| Lake Vista (o)   | 0.10            | Short multi-use trail connects the Historic Lakeville Road Trail to an overlook of southern Tolay lake.   |
| Fish Pond (b)  | 0.60            | This multi-use trail has a slight grade and extends trail south of Cardoza Creek to the Historic Lakeville Road Trail.  |
| Oak Knoll (c)  | 0.40            | This hike-only trail has a slight grade wandering through the only oak woodlands in the north area of the park, opening to picnic area and views of the Tolay watershed.  |
| West Ridge Interpret (d)   | 1.20            | Hike-only trail has a slight grade and offers outstanding views of the Petaluma River and San Pablo Bay.  |
| South Creek (e)  | 0.60            | This multi-use trail has a moderate grade running from the Vista on the Existing South Creek Trail down to the creek and provides a quiet area to rest or picnic along the creek.   |
| Burrowing Owl (a) (new alignment)  | 0.70            | This multi-use trail has a moderate grade on a new alignment from Historic Lakeville Road Trail to the intersection of West Ridge Trail and South Creek Trail. Creating a shorter loop walk, approximately three miles round trip from the park center. |
| Ghost Rock (p) (Park Complex)  | 0.20            | This hike-only trail has a gentle grade and offers views from the northwest end of Tolay Lake.  |
| Equestrian (q) (Park Complex)  | 0.40            | This short segment of multi-use trail connects the equestrian parking area to the Northern Park Core.   |

Phase 1 – First 5 Years

Table 8-2 Trail Implementation Phasing and Mileage

| Phase and Trail Segment |  | Approx. Mileage   | Description  |
|-------------------------|--|---|--|
| Phase 2 - 5-10 years    | Middle Reach Loop (f)  | 1.50  | This hike-only trail has a moderate grade and offers panoramic views of the region.  |
|                         | East Ridge South (r)   | 1.30  | The extension of the Middle Reach multi-use trail on moderate to steep grades will connect the Upland Pond Loop Trail with the southern end of the Historic Lakeville Road Trail   |
|                         | Historic Lakeville Eastside Link (s)   | 0.40  | The short segment of multi-use trail with gentle grades is on a new alignment on the east side of Tolay Creek. The new alignment is provided to avoid the thick growth of willows along the original road alignment on the Westside of Tolay Creek. The new alignment will link the existing northern and southern segments of the Historic Lakeville Road Trail |
|                         | Bridge Lakeville Road (#4)<br>(Vehicle Bridge – maintenance operations and emergency access vehicles only) | n/a   | n/a  |
|                         | East Ridge Canyon (k)  | 1.20  | This multi-use trail has a moderate to steep grade through a secluded canyon along upper Cardoza Creek   |
|                         | Group Camp (Park Complex)  | 0.10  | This short multi-use trail has a moderate grade and connects the Group Camp to equestrian parking.   |
|                         | Group Camp (Park Complex)  | 0.10  | This short hike-only trail connects the group camp at the park center to Cardoza Road Trail.   |
|                         | Group Picnic (Park Complex)  | 0.10  | Hike-only trail from existing group picnic area to equestrian trail.   |
|                         | Kaye (j)   | 1.10  | This hike-only trail is a gentle grade running above and west of Tolay Creek from the Meadow Trail to Coyote Trail   |
| Phase 3 – 10-20 Years   | Coyote (t)   | 0.40  | This multi-use trail on moderate grades connects the Historic Lakeville Road Trail to the backcountry Coyote campsites and West Ridge Trail  |
|                         | Coyote Camp (t)  | 0.20  | Internal circulation trail to backcountry campsites.   |
|                         | Tolay Creek East (i)   | 0.90  | This hike-only trail has a gentle grade, starting from the southern park entry along the eastside of Tolay Creek to Historic Lakeville Road Trail.   |
|                         | Bridge - Near Mangel Road (#2)<br>(trail bridge)   | n/a   | n/a  |
|                         | Replacement – (#3) (trail bridge)  | n/a   | n/a  |
| Meadow (u)              | 0.90   | This multi-use trail has a gentle grade starting at the southern park entry through open meadow to Historic Lakeville Road Trail. |  |

Table 8-2 Trail Implementation Phasing and Mileage

| Phase and Trail Segment | Approx. Mileage                                | Description  |
|-------------------------|--|--|
| Phase 3 – 10-20 Years   | Middle Reach Connect (f)                       | 0.80<br>The hike-only trail with moderate grade connects Middle Reach Loop through open grasslands to Historic Lakeville Road Trail  |
|                         | Toe of Slope (v)                               | 1.0<br>This hike-only trail with a gentle to moderate grade that follows the base of the East Ridge from the Causeway Trail to the Upland Pond Loop Trail. This trail provides a unique perspective of the park just above the valley floor.                     |
|                         | Tolay Lake Boardwalk (Park Complex – Causeway) | 0.10<br>This short hike-only boardwalk trail will connect the Vistor Center to the Causeway Trail in the Northern Park Core.   |
|                         | Assess Additional Trail Needs                  | n/a<br>n/a   |
| Phase 4 – 20-35 Years   | Assess Additional Trail Need                   | n/a<br>These trails are tentatively proposed. Specific trail alignments would be determined only if there is sufficient demand and no impacts to sensitive cultural and biological resources. These trails will not exceed three miles in combined total length. |
|                         | One Tree Knoll                                 | n/a<br>n/a   |
|                         | Boardwalk Boat Access                          | n/a<br>n/a   |
|                         | Tolay Creek connect to Hwy 121                 | n/a<br>n/a   |
|                         | East Ridge Connect Hike                        | n/a<br>n/a   |



Photo credit: Regional Parks staff



## Road and Trail Decommissioning

Many of the existing ranch roads on the property are in eroding and poor condition. The Master Plan identifies existing ranch roads and trails that will be decommissioned. These existing trails and ranch/maintenance roads are either unnecessary for ranch/maintenance needs or are on poor/unstable alignments. New alignments for these eroding road/trails have been identified and are included as new trails, depicted in green in Figure 5-2. Nearly eight miles of deteriorating ranch roads will be decommissioned.

When a section of road/trail is abandoned, steps shall immediately be taken to restore it. For sections that have been abandoned but not yet restored, assessment of obliteration and restoration will be evaluated for extent and immediacy of the restoration need and a restoration plan developed before implementation. Restoration work will include the following as needed:

- Correct the source of any problems such as source of water flowing into and down road/trail.
- Scarify the road/trail tread surface to break up the compacted soils to allow new vegetation to grow.
- Where erosion has occurred, the resulting ruts and gullies must be eliminated to prevent further loss of soil. This will be accomplished by filling in channels if possible with local soils and gravel and returning the surface to its original shape and contour. Further stabilization may be accomplished by the placement of rocks in areas of sheet erosion or use of erosion cloth, net or other biodegradable covering agents so that the speed of water runoff is impeded and gullying and riling inhibited.
- Once cuts and gullies have been stabilized, vegetation needs to be reestablished with native seed in open grasslands or woody vegetation in wooded areas.
- The areas being restored must be blocked from use and, if possible, from being seen. This will be accomplished by laying logs, limbs, brush and rocks on the area.

## Trail Design and Construction

The following contains guidelines and standards for designing and constructing the trail system at the Park. General information is presented that applies to all trails, followed by specific details for each of the different trail types. Guidelines are good trail building and maintenance practices that should be followed where and when feasible. Standards are intended to be trail building and maintenance practices that should be followed more strictly than the guidelines. Trail logs will be developed prior to construction implementing these guidelines and standards.

### General Trail Design

The following is a list of general guidelines and standards that apply to all trail types within Tolay Lake Regional Park

| General Trail Design and Construction Guidelines and Standards |  |
|--|--|
| T-G1   | Locations for new trails should take advantage of existing roads, trails, or other disturbed areas wherever possible and appropriate.  |
| T-G2   | Trails should provide diverse opportunities for visitors to experience a variety of environments, settings, and features.  |
| T-G3   | Strategies should be implemented to keep visitors on trails and discourage informal trail creation. These may be: install clear directional signage at trailheads and intersections, provide educational signage on trail stewardship, install new trails using as possible natural features as barriers to minimize volunteer trail development, use volunteer trail patrols, engage trail users in park stewardship, use logs and vegetation debris to block newly developed volunteer trails, and keep trails well maintained and usable. |

## General Trail Design and Construction Guidelines and Standards

- T-G4** Benches or other seating opportunities should be provided along trails at key locations such as: at the top of steep inclines, near educational exhibits, and at significant viewpoints. Benches should be sensitively placed in the landscape, such as under large shade trees and use natural features to provide a peaceful respite. Avoid placing benches or other infrastructure in native grasslands and setback trails as feasible from other sensitive resources.
- T-G5** Locations of new trails should be planned to minimize ground alteration activities. Where ground alteration is unavoidable, mitigate disturbance and revegetate promptly.
- T-S1** To maximize accessibility for most users, all trails shall meet the following criteria wherever practicably feasible:
- Minimum 32" in width. Exception: trail segments identified as single track may be narrower.
  - Minimum 80" vertical clearance (to overhanging tree limbs, etc). If this cannot be mitigated, a cane-detectable barrier to warn the visually impaired shall be provided.
- T-S2** Visual impact of trails shall be minimized. Final routing should be carefully considered in order to preserve the integrity of viewsheds into the property from the Petaluma and adjacent lands, and also from within the property.
- T-S3** Trails will be aligned along cross slopes and outsloped as feasible; running slopes will be minimized to avoid erosion to the greatest extent feasible.
- T-S4** Full bench construction shall be used where feasible. This means the full tread width is supported by undisturbed soil without the need for fill on the downhill side. This technique results in more stable trails that are less susceptible to erosion.
- T-S5** Locally-sourced materials shall be used for trail construction as available.
- T-S6** Recycled and/or renewable materials shall be used for trail construction where feasible.
- T-S7** A clinometer or other device shall be used to determine running slope of final trail layout. See Table 8.3 for running slope standards.
- T-S8** Comply with all applicable County, State, and federal regulations for construction activities relevant to trails.
- T-S9** Rolling dips shall be constructed to direct water off the trail for minor seasonal drainage crossings and at appropriate intervals to effectively dewater trail based on trail slope.
- T-S10** Armored rolling dips shall be constructed at moderate seasonal drainage crossings to minimize erosion and sediment impacts and provide all weather access for trail users.
- T-S11** Log causeways, armored crossings, or drainage lenses shall be constructed at seasonally wet areas to minimize erosion and sediment impacts and provide all-weather access for trail users.
- T-S12** Corner-cutting shall be discouraged through the use of rock, log or other physical barriers or by veering the trail away quickly at switchbacks.
- T-S13** The development of new trail crossings over stream channels and through riparian vegetation shall be avoided to the greatest extent feasible. Where possible, trails shall be located on existing stable roads or pathways rather than developing new trails through undisturbed riparian habitat. See S20 and S66.
- T-S14** New riparian/creek crossings shall be located on geomorphically stable sites (i.e. low slopes in channel and banks) and constructed to minimize, to the greatest extent possible, streambank and bed erosion. See S20 and S66.
- T-S15** Development of new public trails through landslide areas shall be avoided.



Photo credit: Kent Walker



## Multiple-Use Trails

Most of the trails in Tolay Lake Regional Park are multi-use trail designed for use by pedestrians, bikers, and equestrians. Multi-use trails will be constructed of native soil, stabilized soil, or gravel. The trail segments designated as “accessible” will have an all-weather surface to comply with California State Parks Accessibility Guidelines.

### Multiple-Use Trail Design and Construction Guidelines and Standards

- T-G6** Easy and accessible trail sections should be provided close to staging/parking areas.
- T-G7** Sudden transitions between open, straight sections and tighter, curvy sections of trail should be avoided. Smooth transitions help cyclists’ maintain control at higher speeds, and reduces a common cause of conflict with pedestrians.
- T-G8** Trails should “surf the contours.” On side slope traverses, consider creating a trail that dips and rises frequently but subtly about every 20’ to 40’. Use existing natural barriers such as boulders or trees to surf around. This adds interest, and is especially appealing for mountain bikers.
- T-G9** Frequent grade breaks should be incorporated into trail routes. Long runs of constant grade encourage excessive cycling speed (if downhill), can be boring (if uphill), and can accelerate erosion issues. Long climbs with short descents mixed in, allow users to catch their breath and regain momentum.
- T-G10** Trails should provide good visibility to users when approaching sharp turns or crests.
- T-G11** Trails should be designed to control speeds. Some techniques to consider include: curvilinear alignment with frequent wide turns, add or leave existing barriers, vary the terrain and trail surface, make steep sections one-way up only.
- T-G12** At busy staging areas, consideration should be given to separating the different user groups by providing each group with their own trailhead. This allows the users on the trail to thin out before the trails converge into one trail a short distance ahead.
- T-S16** Width shall be between 32” and 72” (48” is ideal if terrain allows). Exception: single track segments may be as narrow as 18”, and emergency access routes shall be 8’ to 10’ wide.
- T-S17** Average trail slope shall be 10% or less for distinct segments of trail over the length of the trail.
- T-S18** Clear tread width shall be a maximum of 72”.
- T-S19** The running slope of a trail shall not exceed half the cross slope of the hillside (also known as the “half-rule”).
- T-S20** Running slopes in the direction of travel shall be as shown in Table 8.3.
- T-S21** Trail cross slope (perpendicular to the direction of travel) shall be 5% maximum, except at armored crossings and rolling dips where cross-slope shall not exceed 10%.
- T-S22** Resting spaces shall be no less than 60” in length, and less than 5% running slope at the intervals.
- T-S23** Trail shall be constructed with pervious material. Appropriate materials are native soil, stabilized soil, and gravel.
- T-S24** Trails shall be routed to the uphill side of established trees to avoid roots, and to utilize the structural support they provide.
- T-S25** Fence crossings will include equestrian friendly gates.

## Educational Nature Trails (Pedestrians Only)

An educational nature trail is defined by the California State Parks Accessibility Guidelines as a pedestrian-only trail whose primary purpose is to educate the public on the natural or cultural resources of the area. At Tolay Lake Regional Park, these trails will not be open to bikers or equestrians, and will offer hikers the opportunity for a calm and relaxing experience.

Educational nature trails place an emphasis on providing access to a variety of environments and features with a corresponding interpretive program aimed at highlighting the natural and cultural resources of the property. These trails are located at lower elevations of the property, and although they may contain some short, steeper segments, they are relatively easy routes.

### Educational Nature Trail Design and Construction Guidelines and Standards

- T-G13** Minimize average slope not to exceed 8%. Steeper sections should be kept to a minimum.
- T-S26** Overall average slope should be gentle and minimize steeper trail sections.
- T-S27** Clear tread width shall be 36".
- T-S28** Running slopes in the direction of travel shall be sufficient to cross drain water.
- T-S29** Widened areas shall be provided near interpretive signage and at frequent intervals along trail to enable small groups to gather and/or pass.
- T-S30** When an educational nature trail crosses a wetland or seep, a boardwalk may be constructed. See boardwalk guidelines and standards below.

### Boardwalk Design and Construction Guidelines and Standard

- T-G14** Boardwalks should be constructed using the longest practicable post spacing to minimize site disruption.
- T-G15** Boardwalks should be constructed between 12" to 18" above the ground just above water where practical to avoid need for safety rails, and to minimize visual impact.
- T-G16** Boardwalks should have frequent changes in direction to provide interest, minimize visual impact, and discourage non-permitted (i.e. mountain biking and equestrian) use.
- T-G17** Boardwalk width should be wider where interpretive or educational exhibits are located.
- T-G18** Technology and installation techniques should be utilized to minimize disruption to the site. For example, steel helical piles have a smaller footprint and require less excavation than wood posts.
- T-S31** Boardwalks shall be pedestrian-only.
- T-S32** Clear tread width shall be 36".
- T-S33** Openings in the surface shall not be greater than ½" wide.
- T-S34** Elongated openings shall be either perpendicular or diagonal to the dominant direction of travel. Exception: Openings may run parallel to the direction of travel if the openings are no wider than ¼".
- T-S35** Running slope shall not exceed 3%.
- T-S36** Cross slope perpendicular to the direction of travel shall not exceed 2%.

## Boardwalk Design and Construction Guidelines and Standard

- T-S37** Objects that protrude into the boardwalk between 27" and 80" from the deck surface, such as a mounted sign, shall not protrude more than 4" into the path of travel. Objects mounted below 27", such as an interpretive exhibit or bench, may protrude any amount but shall not reduce the clear width of the boardwalk to less than 36".
- T-S38** Install a safety rail or toe plate wheel guard along edge if boardwalk surface is equal to or greater than 30" above the adjacent ground.



Photo credit: Regional Parks staff

## Accessible Trails

ADA-accessible trails shall be connected to developed staging areas. They are intended to be the most accessible of all the trail types and should comply with Americans with Disabilities Act (ADA) guidelines. These trails are intended to be utilized by the broadest section of the community, including people who are physically impaired, seniors, and parents/caregivers with strollers or wheelchairs.

## Accessible Trail Design and Construction Guidelines and Standards

- T-G19** Accessible trails should be loops where feasible.
- T-S39** Primary facilities and programs shall be connected by an outdoor recreation route pursuant to ADA Section 1016.
- T-S40** Clear tread width of accessible trails shall be 48" minimum, and 72" maximum.
- T-S41** Cane-detectable edging shall be provided along at least one side of accessible trails. This can either include an elevation change (such as curb, 3" minimum height), or texture change (such as a transition from gravel to vegetation).
- T-S42** Running slopes of accessible trails in the direction of travel shall be as follows:  
5% or less for any distance.  
From 5.1% to 8.33% for 200' maximum.



### Accessible Trail Design and Construction Guidelines and Standards

- T-S43** Cross slope (perpendicular to the direction of travel) of accessible trails shall be 3% maximum.
- T-S44** Where accessible trail clear tread width is less than 60", and the running slope is greater than 5%, a 60" long resting space shall be provided at least every 200'.
- T-S45** Accessible trails shall be constructed with an all-weather surface that retains its surface integrity when wet. Examples include stabilized soil or decomposed granite, wood or plastic decking, unit pavers, asphalt paving, or concrete.
- T-S46** Steps shall not be permitted on accessible trails.
- T-S47** Accessible trails shall not have tread obstacles, such as roots or rocks, higher than 3"
- T-S48** Objects that protrude into an accessible trail between 27" and 80" from the ground shall not protrude more than 4". Objects mounted below 27", such as interpretive exhibits or benches, may protrude any amount but shall not reduce the clear width of the trail to less than 36".

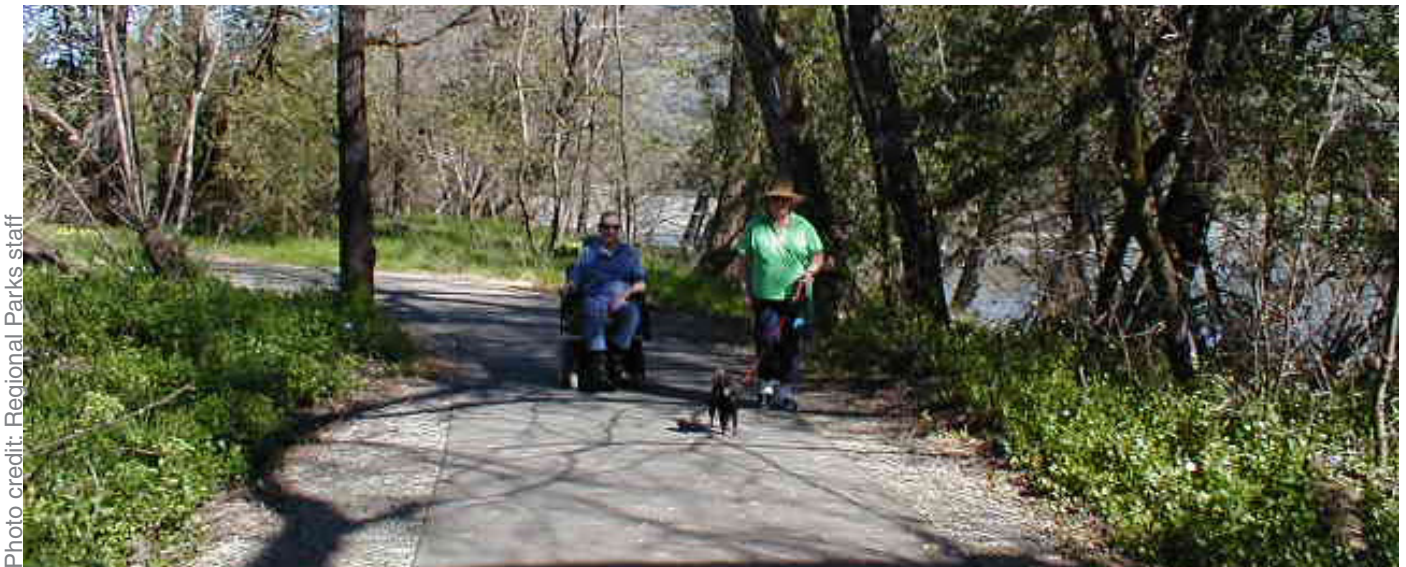


Photo credit: Regional Parks staff

### Emergency Access Roads

These routes are designed to allow emergency vehicles and other authorized vehicles (such as Regional Parks operations and maintenance trucks) occasional access to some key areas of the park, and will have the character of a ranch road. In daily use, emergency access routes simply function as wide multi-use trails. In the event of a true emergency, these roads would present a launching point for 4WD vehicles to access more remote areas.

### Emergency Access Road Design and Construction Guidelines and Standards

- T-S49** Emergency access roads shall be permeable wherever feasible. Suitable materials include compacted or stabilized native earth, or gravel.
- T-S50** Emergency access roads shall be a minimum of 8' wide and a maximum of 12'.
- T-S51** Corner radii shall be 20' minimum to accommodate truck turning movements.



# Trail Maintenance Guidelines and Standards

## Trail Tread

### Trail Tread Guidelines and Standards

- T-G20** Trail features and associated infrastructure shall be well maintained and pose no threat to surrounding sensitive biological resources.
- T-S52** Sonoma County Regional Parks staff shall conduct annual trail inspections noting conditions and need for repair.
- T-S53** Trail inspectors shall record information about runoff and effects on water quality of nearby habitats, spread of invasive exotic plants, and status and quality of any known sensitive resources in the immediate vicinity that could be affected by road or trail use and/or maintenance.



Photo credit: Regional Parks staff



## Trail Drainage Structures

### Trail Drainage Structures Guidelines and Standards

- T-G21** Blocked culverts may affect water quality, change the watercourse, increase erosion or sediment runoff, or affect wildlife. Therefore, trails should be designed to minimize the need for culverts. Those trails that do include culverts should be inspected on a regular basis to ensure that they do not clog with sediment or debris. Any materials blocking culverts should be removed and disposed of outside the watercourse in an area not subject to erosion. If a significant blockage or sedimentation exists, Regional Parks should plan and implement corrective actions as necessary. Excavation of sediments within “Waters of the State” may require a maintenance permit from the U.S. Army Corps of Engineers, the California Department of Fish and Wildlife, and/or the Regional Water Quality Control Board.
- T-G22** Any unstable fill slopes and cut banks that have the potential to erode and negatively affect water quality of nearby wetlands and waters should be removed entirely and graded to a stable contour. These areas should be revegetated with appropriate native species. Sediment filtration barriers should be deployed around the edges of unstable slopes as necessary to prevent erosion and runoff into wetlands and waters.
- T-S54** Where applicable, prune woody vegetation four feet back from sides of all roads and trails, with a 14-foot vertical clearance.
- T-S55** Evaluate and remove unhealthy or dead trees and limbs in close proximity to all roads and trails.
- T-S56** Remove sediment and debris from drainage structures.
- T-S57** Grading and other activities associated with road or trail maintenance shall only occur during the dry months (generally April 1 to October 31), when associated erosion can be reduced to the maximum extent possible.

## Litter Removal Standards

### Litter Removal Standards

- T-S58** All trash receptacles shall be emptied daily on weekends, and at least every other day on weekdays.
- T-S59** All trash receptacles shall have lids that close and lock to dissuade wildlife from foraging, and thus limit potential interaction between park visitors and wildlife.
- T-S60** From April through October, restroom facilities shall be cleaned regularly, with daily trash removal and amenities (e.g., toilet paper, soap, paper towels) checked for replacement.
- T-S61** Manufacturer guidelines for proposed self-composting toilets shall be followed, with consideration of maintenance suggestions from contractors as appropriate.



Photo credit: Regional Parks staff



*This page intentionally left blank.*

# Operations and Maintenance







Photo credit: Regional Parks staff



## OPERATIONS AND MAINTENANCE

Regional Parks anticipates that visitation to the Park will increase as they increase public access and attractions. Regional Parks staff will need to monitor changes in visitation in terms of demand and specific timing for proposed new facilities; costs of developing, operating and maintaining those facilities; and revenues and potential funding sources to offset new costs associated with Park build-out. To address changes in use and associated costs, a business plan, operations and maintenance (O&M) guidelines and standards, a phasing plan for new development, and a list of potential funding sources are included in this chapter.

### Business Plan, Operations, and Maintenance

#### Business Plan

The business plan for Tolay Lake Regional Park is established to estimate expenditures and revenue stream to offset as much of the operational costs as possible. Table 9-1 shows revenues for the last four years, and for the time period following Master Plan implementation. Revenue is organized into three categories; park and recreation services, rents and concessions and miscellaneous revenue. Existing park and recreation services include day use and special events (Fall Festival); proposed future services to be added include day use, group camping, group camping, and group camping. The bunkhouse will be added in 2025, and the bunkhouse will be added in 2035.

Revenue peaked in fiscal year 2012-13. Projected revenue is based on assumptions about future visitation levels as the Park is fully developed.

| Year       | Parks and Recreation Services | Rents and Concessions | Miscellaneous | Total     |
|------------|-------------------------------|-----------------------|---------------|-----------|
| 2011-2012* | \$3,702                       | \$39,792              | \$29,380      | \$72,874  |
| 2012-2013* | \$5,757                       | \$38,969              | \$62,593      | \$107,319 |
| 2013-2014* | \$2,256                       | \$45,093              | \$42          | \$47,391  |
| 2014-2015* | n/a                           | n/a                   | n/a           | \$49,990  |
| 2016       | \$53,131                      | \$60,945              | \$-           | \$114,077 |
| 2017       | \$81,227                      | \$94,742              | \$-           | \$175,969 |
| 2018       | \$83,878                      | \$96,145              | \$-           | \$180,023 |
| 2019       | \$86,633                      | \$96,932              | \$-           | \$183,565 |
| 2020       | \$100,392                     | \$102,694             | \$-           | \$203,084 |
| 2025       | \$133,744                     | \$108,99              | \$-           | \$242,144 |
| 2030       | \$145,010                     | \$122,585             | \$-           | \$267,596 |
| 2035       | \$443,977                     | \$132,608             | \$-           | \$576,586 |

\* Fiscal Year for Regional Parks  
 Source: Tolay Lake Regional Park and MIG (2015)

Table 9-2 displays historic, current and projected expenditures for the Park. From 2011 through 2015 annual expenditures have remained relatively constant, varying between about \$290,000 and \$330,000.

| Table 9-2 Historic, Current, and Projected Expenditures |                       |                       |                |                          |             |
|---|-----------------------|-----------------------|----------------|--------------------------|-------------|
| Year  | Salaries and Benefits | Services and Supplies | Capital Assets | Encumbrance Expenditures | Total       |
| 2011-2012*  | \$195,172             | \$124,105             | \$7,987        | \$760                    | \$328,024   |
| 2012-2013*  | \$215,962             | \$79,265              | \$-            | \$-                      | \$295,226   |
| 2013-2014*  | \$226,752             | \$70,730              | \$-            | \$-                      | \$297,482   |
| 2014-2015*  | \$179,091             | \$96,625              | \$-            | \$-                      | \$275,716   |
| 2016  | \$229,325             | \$135,000             | n/a            | n/a                      | \$364,325   |
| 2017  | \$284,940             | \$215,000             | n/a            | n/a                      | \$499,940   |
| 2018  | \$292,690             | \$216,000             | n/a            | n/a                      | \$508,690   |
| 2019  | \$303,092             | \$217,000             | n/a            | n/a                      | \$520,092   |
| 2020  | \$322,210             | \$223,000             | n/a            | n/a                      | \$545,210   |
| 2025  | \$455,913             | \$208,000             | n/a            | n/a                      | \$663,913   |
| 2030  | \$547,643             | \$267,000             | n/a            | n/a                      | \$814,643   |
| 2035  | \$718,609             | \$341,000             | n/a            | n/a                      | \$1,059,609 |

\* Fiscal Year for Regional Parks

Source: Tolay Lake Regional Park and MIG (2015)

Table 9-3 depicts revenues minus expenditures. Historical data shows the Park has been annually spending about \$190,000 to 250,000 more than it derives from revenue. Projections of spending and revenue show the Park spending annually \$250,000 to \$480,000 more than it will derive from revenue. For further information regarding revenues and expenditures, please refer to Appendix R.

| Table 9-3 Revenue Less Expenditures |            |
|-------------------------------------|------------|
| Year                                | Total      |
| 2011-2012*                          | -\$255,150 |
| 2012-2013*                          | -\$187,907 |
| 2013-2014*                          | -\$250,091 |
| 2014-2015*                          | -\$225,726 |
| 2016                                | -\$250,248 |
| 2017                                | -\$323,971 |
| 2018                                | -\$328,667 |
| 2019                                | -\$336,527 |
| 2020                                | -\$342,126 |
| 2025                                | -\$421,769 |
| 2030                                | -\$547,047 |
| 2035                                | -\$483,023 |

\* Fiscal Year for Regional Parks

Source: Tolay Lake Regional Park and MIG (2015)

## Operations and Maintenance

The Operations and Maintenance (O&M) element provides guidelines and standards for the

Park. These guidelines and standards were designed for flexibility to accommodate potential legal, regulatory, and social changes in the future. Guidelines provide general direction about how particular actions will be completed. Standards are more specific and in some cases include a quantifiable action. Guidelines and standards were developed from review of other similar Master Plans and based on current management practices at Regional Parks. In addition to guidelines and standards provided below, a checklist to aid Park staff complete routine actions is found in Appendix S.

## GENERAL GUIDELINES AND STANDARDS

### Operations Guidelines and Standards

#### *Patrols/Opening and Closing*

- OM-G1 Conduct periodic patrol of facilities, trails, and staging areas to ensure all park rules are enforced. The frequency and strategy of patrols will be determined by the Supervising Park Manager.
- OM-G2 Allow parking only in designated lots and marked spaces.
- OM-S1 Close staging areas and trails from dusk to dawn.
- OM-S2 Close and open gates, when the park opens and closes, respectively.
- OM-S3 Implement seasonal limitations on trails through wetland habitats and other areas where potential environmental impacts are likely to occur due to weather or ground conditions. Close or use-restrict trails through fencing and/or signage during the wet season and/ or periods of inundation if fresh erosion and/or vegetation trampling are visible.
- OM-S4 Dogs shall be on a leash less than 6 feet in length at all times, and under immediate physical control.
- OM-S5 Remove dog feces per Sonoma County Code 5-125(a). Install signage at all staging areas and trailheads directing owners to pick up after their dogs and dog “pick up” stations.
- OM-S6 Permits are required for camping reservation.
- OM-S7 Quiet hours for overnight use are from 10pm to 8am.

#### *Fee Collection*

- OM-G3 Ensure fees are and park revenue are handled consistent with departmental guidelines, including ensuring that iron rangers or electronic pay stations, where in use, are properly maintained and emptied on a regular basis.

#### *Public Safety*

- OM-G4 Enforce park rules, regulations and coordinate with wildlife management agencies to enforce fish and wildlife regulations.
- OM-G5 Coordinate fire management and safety planning with local fire agencies including the Lakeville Volunteer Fire Department.
- OM-G6 Provide local law enforcement access to the park, as needed. Provide law enforcement and fire protection agencies with access to locked gates throughout the park.
- OM-G7 Collaborate with local agencies, including the Sonoma County Sheriff, on search and rescue operations and site-specific trainings conducted in or adjacent to the Park.
- OM-G8 Inform local agencies and organizations (such as ambulance services and regional fire service) about the location of alternative park access points, the condition of unpaved roads, park helipads, and water sources.



## Operations Guidelines and Standards

### Sanitation

- OM-G9 Provide an adequate number of restrooms (permanent or temporary) to accommodate demand, including Special Events.
- OM-G10 Keep restrooms clean and restocked as needed.
- OM-S8 Remove litter on a regular basis.
- OM-S9 Empty trash bins on a regular basis to avoid excessive buildup or overflow of on-site trash facilities.
- OM-S10 Dispose of solid waste consistent with local and statewide regulations.

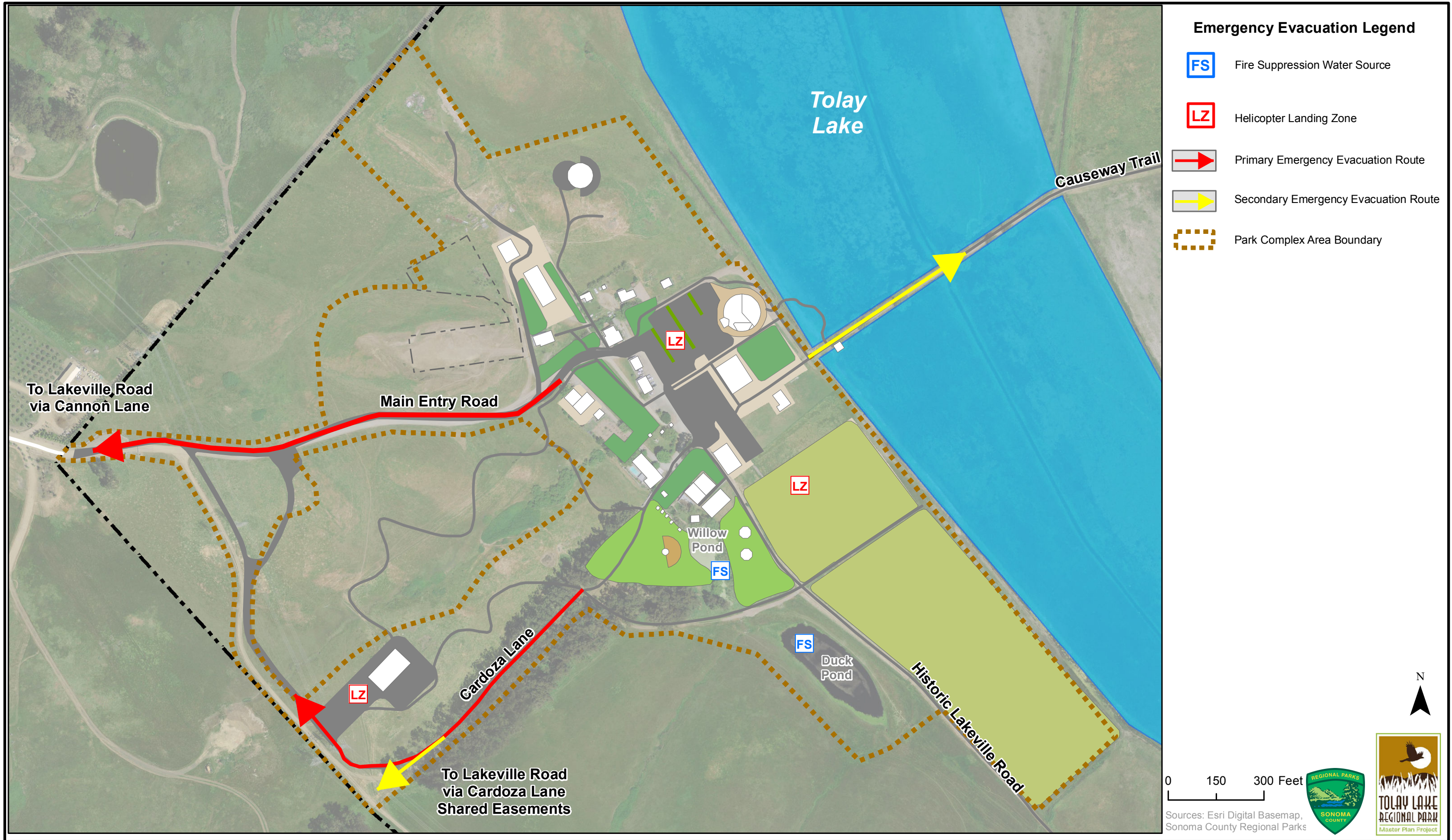
### Public Outreach

- OM-G11 Inform park visitors of park regulations and appropriate visitor behavior.
- OM-G12 Support park volunteers and collaborate with voluntary organizations to help meet park goals.
- OM-G13 Support docents leading park tours, environmental educators working with school groups as well as other community partners.
- OM-G14 Coordinate and collaborate with park neighbors when appropriate.
- OM-G15 Continue to orient permit holders until permits are no longer required to access the park.

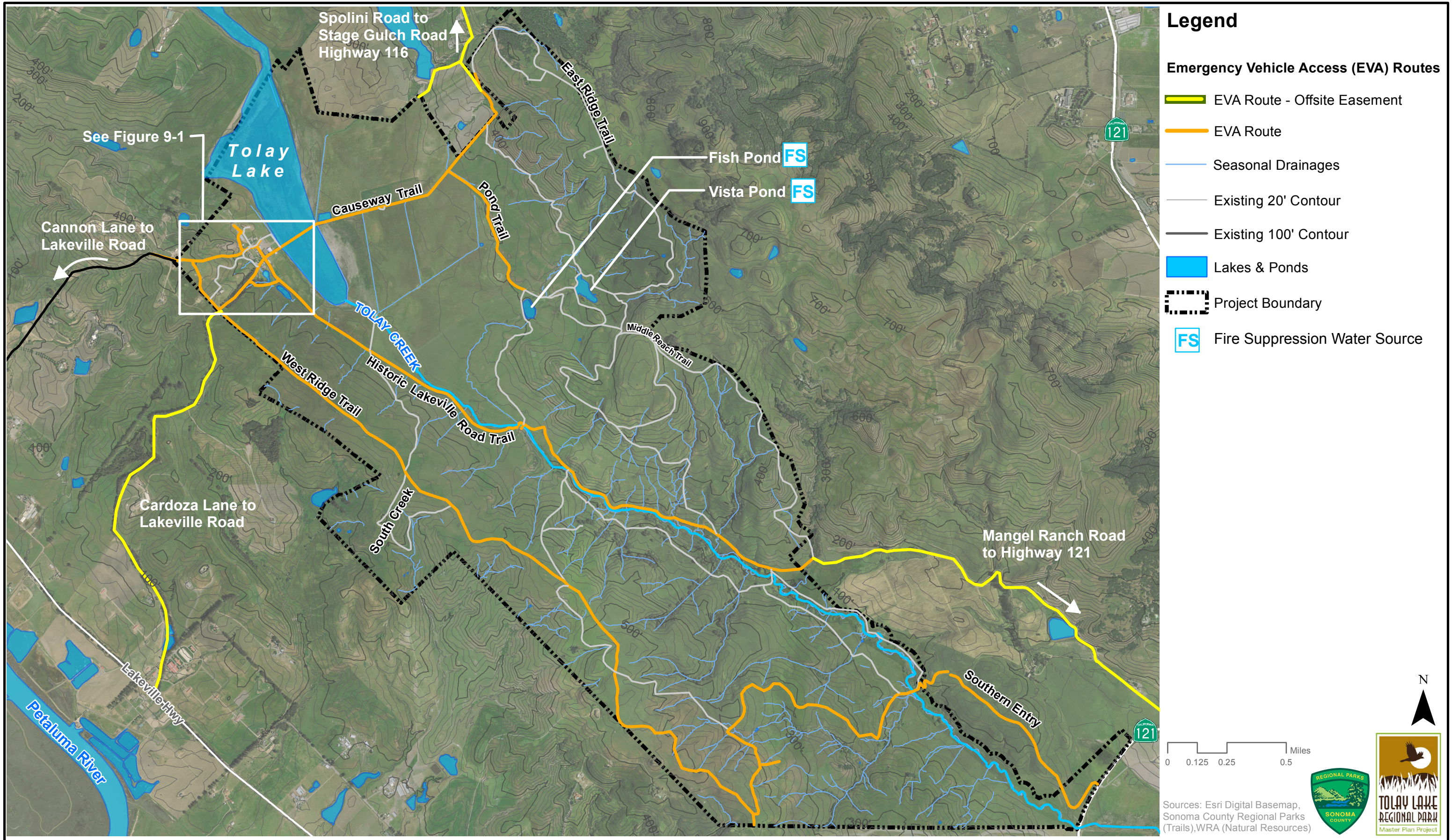


Photo credit: Regional Parks staff











## Maintenance Guidelines and Standards

### *Infrastructure*

- OM-G16 Maintain bridges and park-managed buildings in a manner to ensure staff and visitor safety.
- OM-G17 Remove graffiti on a regular basis.
- OM-G18 Replace vandalized park features as soon as is feasible. Make vandalized features that create a hazard to the public safe or cordoned off, as soon as possible.
- OM-G19 Keep staging area gates in an operable state.
- OM-G20 Keep potable and non-potable water systems, including irrigation systems in workable condition.
- OM-G21 Ensure proper function of the wastewater system. Maintain and pump septic systems, when required.
- OM-G22 Maintain and properly check storm water drainage systems in advance of storms. Keep storm water systems clear of vegetation and other obstructions to limit localized flooding and/or damage attributable to erosion.
- OM-S11 Check water outlets (e.g. drinking fountains and hose bibs) regularly for leaks. Repair leaking fixtures as quickly as possible.
- OM-S12 Check fences regularly and repair as needed.
- OM-S13 Work with PG&E to maintain a reliable electrical delivery system within the park.
- OM-S14 Keep signage in a condition as to remain visible to park visitors.
- OM-S15 Maintain lighting to enhance park safety. Replace lamps and bulbs, as needed.

### *Paved and Non-Paved Surfaces*

- OM-G23 Keep trails in functional and safe condition.
- OM-G24 Use water or alternative dust control treatments on dirt and gravel roads, when necessary, to prevent the blowing of fugitive dust.
- OM-G25 Manage drainage structures on dirt roads and trails to limit the impacts of erosion.
- OM-S16 Paved surfaces: Stripe parking spaces and add road lines when appropriate.
- OM-S17 Paved surfaces: Seal paved surfaces, when needed.
- OM-S18 Non-paved surfaces: Grade roads periodically to maintain functional park roads.
- OM-S19 Non-paved surfaces: Consider decommissioning trails determined to be leading to significant resource damage, including but not limited to impacting threatened and endangered species.
- OM-S20 Non-paved surfaces: Consider seasonal closures of trails, due to wet conditions, when appropriate.

### *Park Amenities*

- OM-G26 Periodically inspect all park amenities such as including BBQs, fire rings, tables, benches, drinking fountains to ensure they are in good working order.
- OM-S21 Maintain, and replace when necessary, park amenities including BBQs, fire rings, tables, benches, drinking fountains.

### *Vegetation / Landscape Management*

### Maintenance Guidelines and Standards

- OM-G27 Educate construction personnel on the symptoms of Sudden Oak Death on common forest plants, pathogen transmission pathways, prohibition of unauthorized movement of plant material, and equipment cleaning procedures. If possible, restrict work in oak woodlands during the wet, rainy and cool times of the year when the risk of movement and spread of the organism is greatest in muddy areas and during rainy weather.
- OM-G28 Remove trees consistent with the County of Sonoma’s Tree Protection Ordinance. Leave trees intact unless they pose an immediate safety risk.
- OM-S22 Clean mowing equipment and undercarriages of other park vehicles after passing through weed-infested areas and before entering and leaving the property.
- OM-S23 When necessary to utilize pesticides and herbicides, BMP’s and compliance with CA Dept. of Pesticide Regulations and local regulations will be followed.
- OM-S24 Precede mowing during bird nesting season with bird nest surveys.
- OM-S25 Prune or remove vegetation deemed potentially damaging to the electrical system, such as limbs overhanging wires.
- OM-S26 Complete other vegetation management activities such as weeding, sodding, mulching, pruning of trees as needed throughout the park.
- OM-S27 Maintain the Ethno-botanical garden using park staff and volunteers.

### FIRE MANAGEMENT

There is the potential for natural or human-caused wildfires within or adjacent to the Park. Given the proximity to urban development, the need to manage the property to reduce the risk of fire and allow for appropriate control measures in the event of a fire is a real concern. The following guidelines and standards will help protect both the natural resources and built structures on the property, as well as the community, in the event of a fire.

### Fire Management Guidelines and Standards

- OM-G29 Provide multiple site access points and ensure partner fire agencies have keys to access gates to allow for good fire response.
- OM-G30 Allow fires only in designated areas, such as fire pits/rings and BBQs.
- OM-G31 Consult with a vegetation ecologist to minimize impacts to native habitats, if native plant removal is necessary to provide fire protection around buildings.
- OM-G32 Where possible, use livestock grazing or mowing to reduce fire fuels. Remove only enough vegetation to accomplish fire hazard management goals. Minimize the use of disking for fire hazard reduction.
- OM-G33 Prevent the establishment or control invasive plant species that can increase the risk for fire.
- OM-G34 Prohibit the use of power tools for maintenance or other activities during periods of high and very high fire hazard.
- OM-G35 During periods of high and very high fire hazard, restrict the driving of maintenance vehicles into undeveloped areas of the property except during emergencies.
- OM-S28 Provide adequate barriers and fences at trailheads and access points to keep non-authorized motorized vehicles off the property, especially motorcycles and ATV’s .
- OM-S29 Prohibit smoking per Sonoma County Ordinances 5947 and 5953. Install signage at staging areas and trailheads referencing the Ordinances and their enforcement.



### Fire Management Guidelines and Standards

- OM-S30** Fire pits shall meet the following criteria:
- Construct fire pits to limit the fuel area to 3 feet in diameter by 2 feet in height;
  - Space fire pits at least 25 feet from combustible material (such as vegetative fuels);
  - Provide means of extinguishing the fire (such as a hose bib);
  - Require fires be constantly monitored or extinguished.

### AGRICULTURAL PRACTICES

#### Agricultural Practices Guidelines

- OM-G36** Maintain agricultural lands to allow for continuing sustainable yield of crops and other farm products. Agricultural practices include (1) care, management and handling of farm animals; (2) cattle grazing; (3) maintaining “Marvin’s Garden” (4) repairing farm equipment; and (5) managing the orchard trees and harvesting fruit.
- OM-G37** Collaborate with individuals with special use permits to harvest hay, among other activities.

### ITEMS REQUIRING COORDINATION/SUPPORT WITH OTHER AGENCIES

#### Interagency Coordination Guidelines

- OM-G38** Collaborate with other agencies to maintain and upgrade historic buildings.
- OM-G39** Collaborate with other agencies to restore habitat.
- OM-G40** Collaborate with other agencies to protect and maintain cultural resources.
- OM-G41** Collaborate with other agencies to manage mosquitoes and other disease vectors
- OM-G42** Work with other County agencies and Caltrans to ensure signage leading into the park is correct and up to date

---

## References





## REFERENCES

### Chapter 1

- Altimira, J. Diario de la expedicion verificada con objeto de reconocer terranos para la neuva planta de la Mision de N.P.S. Francisco...: ms.S, 1823 June 25 - July 6. 1823, Bancroft Library: Berkeley, CA
- Bettinger, Robert L. 1991. Hunter-Gatherers: archaeological and Evolutionary Theory. Interdisciplinary Contributions to Archaeology, Michael Jochim, series editor. Plenum Press, New York.
- Binford, Lewis R. 1980. Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4-20.
- Balls, Edward K. 1962. Early Uses of California Plants. California Natural History Guides 10. University of California Press, Berkeley.
- Elsasser, Albert B. and Peter T. Rhode. 1996. Further Notes on California Charmstones. Coyote Press Archives of California Prehistory Number 38. Coyote Press. Salinas, California.
- Goerke-Shrode. 2000. Pioneer Swift Persevered Despite the Odds. Historical Articles of Solano County Online Database. [http://www.solanoarticles.com/history/index.php/weblog/more/pioneer\\_swift\\_persevered\\_despite\\_the\\_odds/](http://www.solanoarticles.com/history/index.php/weblog/more/pioneer_swift_persevered_despite_the_odds/)
- Goerke, Betty. 2007. Chief Marin: Leader, Rebel and Legend: A History of Marin County's Namesake and His People. Heydey Books, Berkeley.
- Kelly, Isabel. 1978. Coast Miwok. In *California*, edited by Robert F. Heizer, pp. 414-425. Handbook of the North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
- Kroeber, Albert. 1925. Handbook of the Indians of California. Bureau of American Ethnology, Bulletin 78, Washington D.C. Reprinted 1976 by Dover Publications, New York.
- Kroeber, Albert. 1952. The Nature of Culture. University of Chicago Press, Chicago.
- Latta, Frank. 1977. Handbook of Yokuts Indians. Bear State Books, Santa Cruz, California.
- LeBaron, Gaye. 1987. Lost lakes, lost towns revisited. Press Democrat.
- LSA, 2009. A Cultural Resource Study of the Tolay Creek Ranch near Petaluma, Sonoma County, California.
- LSA. 2006. Historical Resources Evaluation Report: Cardoza Ranch.
- Milliken, Randall. 2009. Ethnohistory and Ethnogeography of the Coast Miwok and their Neighbors, 1783-1840. Technical paper presented to National Park Service, Golden Gate NRA, Building 101, Fort Mason.
- Moorehead, W.K. 1910. The Stone Age in America. Boston, MA: The Houghton Mifflin Company.
- Moorehead, W.K. 1917. Some Ornaments Used by Indians in the United States and Canada. Andover, Maine.
- Nelson, P. 2016. Summary of Unrecorded Archaeological Sites at Tolay Lake Regional Park
- Parrish, Will. 2016. Sacred Ground: Graton Rancheria helps restore Tolay Lake's place in American Indian past - and present. Bohemian.com. <http://www.bohemian.com/northbay/sacred-ground/Content?oid=2938739>

- Phebus, George. 1990. Plates 23-26 from Archeological Investigations in the San Pablo-Suisun Region of Central California. Privately published, Astoria, Oregon.
- Ricksecker, L.E. 1907. Correspondence to Mr. Loomis re. some data regarding the collection of Indian charm-stones presented to the California Academia of Sciences. On file at the northwest Information Center of the Historical Resources Information System, Sonoma State University, Rohnert Park, California
- RUST Environment & Infrastructure. 1996. Geological Assessment of Alternative Reservoir Sites and Pipeline Routes Volume 1 Report: Santa Rosa Subregional Long-Term Wastewater Project. January
- Santos, Robert L. 1995. Azoreans to California: A History of Migration and Settlement. Alley-Cass Publications, Denair, California.
- Taylor, Jeff. 2015. Personal communications to Regional Parks staff.
- Thompson, Robert. 1877. Descriptive Sketch, Sonoma County, California. L.H. Everts & Co., Philadelphia.

## Chapter 2 - Chapter 5

No references

## Chapter 6

- Alvarez, J.A. 2004. *Rana aurora draytonii* (California Red-legged Frog). Microhabitat. Herpetological Review 35: 162-162.
- Anderson, M.K. 2005. Tending the Wild: Native American Knowledge and the Management of California's Natural Resources. University of California Press, Berkeley, CA. 526 pp.
- Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, 2nd Edition. University of California Press, Berkeley, CA. 1568 pp.
- Barbour, M.G., T. Keeler-Wolf, and A.A. Schoenherr (eds.). 2007. Terrestrial Vegetation of California, 3rd Edition. University of California Press, Berkeley, CA. 712 pp.
- Barrett, R.H. and T.E. Kucera. 2005. The Wild Turkey in Sonoma County State Parks, California Department of Parks and Recreation.
- Bartolome, J.W., W.J. Barry, T. Griggs, and P. Hopkinson. 2007. Valley Grassland. Pages 367-393 in M.G. Barbour, T. Keeler-Wolf, and A.A. Schoenherr (eds.). Terrestrial Vegetation of California, 3rd Edition. University of California Press, Berkeley, CA. 712 pp.
- Bay Area Open Space Council (BAOSC). 2015. Conservation Lands Network. Available at: <http://www.bayarealands.org/explorertool.html>. Accessed: February 2015.
- Belsky, A.J., A. Matzke, and S. Uselman. 1999. Survey of livestock influences on stream and riparian ecosystems in the western United States. Journal of Soil and Water Conservation 54: 419-431.
- Block, W.M. and M.L. Morrison. 1998. Habitat Relationships of Amphibians and Reptiles in California Oak Woodlands. Journal of Herpetology, Vol 32(1): 51-60.



## References

- Brooks, M.L., C.M. D'Antonio, D.M. Richardson, J.B. Grace, J.E. Keeley, J.M. DiTomaso, R.J. Hobbs, M. Pellant, and D. Pyke. 2004. Effects of invasive alien plants on fire regimes. *BioScience* 54: 677-688.
- Bulger, J.B., S.J. Norman, and R.B. Seymour. 2003. Terrestrial Activity and Conservation of Adult California Red-legged Frogs (*Rana aurora draytonii*) in Coastal Forests and Grasslands. *Biological Conservation* 110 (2003) 85–95.
- Burridge, B. (ed.). 1995. *Sonoma County Breeding Bird Atlas, A Project of Madrone Audobon Society*. Madrone Audobon Society, Santa Rosa, CA. 203 pp.
- Bush, L. 2006. *Grazing Handbook: A Guide for Resource Managers in Coastal California*. Sotoyome Resource Conservation District, Santa Rosa, CA. 68 pp.
- Bush, L. 2010. *Tolay Creek Ranch Grazing Plan*. Prepared for: Sonoma Land Trust. June 8, 2010.
- Calflora website (Calflora). 2014. Website: Information on wild California plants for conservation, education, and appreciation. Available at: <http://www.calflora.org/>. Accessed: December 2014.
- California Department of Conservation (CDC), California Geological Survey (CGS). 2002a. Geologic Map of the Sears Point 7.5-minute Quadrangle, Sonoma, Solano, and Napa Counties, California: A Digital Database.
- California Department of Conservation (CDC), California Geological Survey (CGS). 2002b. Geologic Map of the Petaluma River 7.5-minute Quadrangle, Marin and Sonoma Counties, California: A Digital Database.
- California Department of Fish and Game (CDFG). 2010. Natural Communities List. California Natural Resources Agency, CDFW, Biogeographic Data Branch. September 2010.
- California Department of Fish and Wildlife (CDFW). 2014. California Natural Diversity Database (CNDDB), Wildlife and Habitat Data Analysis Branch. Sacramento, CA. Accessed: December 2014.
- California Native Plant Society (CNPS). 2000. California Native Plant Society Releve Protocol. CNPS Vegetation Committee. Revised August 23, 2003.
- California Native Plant Society (CNPS)/California Department of Fish and Wildlife (CDFW). CNPS/CDFW Protocol for Combined Vegetation Rapid Assessment and Releve Sampling Field Form. April 10, 2014.
- California Native Plant Society (CNPS). 2014. Online Inventory of Rare, Threatened, and Endangered Plants of California. Available at: <http://www.rareplants.cnps.org/>. Accessed: December 2014.
- California Partners in Flight (CalPIF). 2002. Version 2.0. The oak woodland bird conservation plan: a strategy for protecting and managing oak woodland habitats and associated bird species in California (S. Zack, lead author). Point Reyes Bird Observatory, Stinson Beach, CA. Available at: <http://www.prbo.org/calpif/pdfs/oak.v-2.0.pdf>. Accessed: March 2013.
- Circuit Rider Productions. 2006. *Tolay Lake Regional Park Baseline Documentation*. Prepared for Sonoma County Agricultural Preservation and Open Space District.
- Consortium of California Herbaria (CCH). 2014. Data provided by the participants of the Consortium of California Herbaria. Available at: <http://ucjeps.berkeley.edu/consortium>. Accessed: December 2014.
- Cook D.G. and M.R. Jennings. 2001. *Rana aurora draytonii* (California red-legged frog) Predation. *Herpetological Review* 32: 182-183.

- Cook D.G. and M.R. Jennings. 2007. Microhabitat use of the California Red-legged Frog and Introduced American Bullfrog in a Seasonal Marsh. *Herpetologica* 63(4): 430-440.
- D'Antonio, C.M., S.J. Bainbridge, C. Kennedy, J.W. Bartolome, and S. Reynolds. 2001. Ecology and restoration of California grasslands with special emphasis on the influence of fire and grazing on native grassland species. Unpublished report to the David and Lucille Packard Foundation.
- D'Antonio, C.M. and T.L. Dudley. 2010. Invasive species and fire in California ecosystems. *Fremontia* 38(2): 29-36.
- DeLonge, M.S., R. Ryals, and W.L. Silver. 2013. A Lifecycle Model to Evaluate Carbon Sequestration Potential and Greenhouse Gas Dynamics of Managed Grasslands. *Ecosystems* 16: 962-979.
- DeLonge, M.S., J.J. Owen, and W.L. Silver. 2014. Greenhouse Gas Mitigation Opportunities in California Agriculture: Review of California Rangeland Emissions and Mitigation Potential. Nicholas Institute Report.
- DiTomaso, J.M., G.B. Kyser, and M.S. Hastings. 1999. Prescribed burning for control of yellow star thistle (*Centaurea solstitialis*) and enhanced native plant diversity. *Weed Science* 47: 233-242.
- DiTomaso, J.M. 2000. Invasive weeds in rangelands: Species, impacts, and management. *Weed Science* 48(2): 255-265.
- DiTomaso, J.M., M.L. Brooks, E.B. Allen, R. Minnich, P.M. Rice, and G.B. Kyser. 2006. Control of Invasive Weeds with Prescribed Burning. *Weed Technology* 20: 535-548.
- Ducks Unlimited. 2005. Feasibility Analysis for the Restoration of Tolay Lake, Sonoma County, California. Prepared for: Sonoma County Agricultural Preservation and Open Space District. March 2005.
- Dunk, J.R. 1995. White-tailed Kite (*Elanus leucurus*). In *The Birds of North America*, No. 178 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.
- Eviner, V. 2014. Effects of Weather Variations on Species Composition and Production in California's Grasslands. *Grasslands, Quarterly Journal of California Native Grasslands Association*. Fall 2014: 2-6.
- Fellers, G. and P. Kleeman. 2007. California red-legged frog (*Rana draytonii*) movement and habitat use: Implications for conservation. *Journal of Herpetology* 41:271-281.
- Fleischner, T.L. 1994. Ecological costs of livestock grazing in western North America. *Conservation Biology* 8: 629-644.
- Fornara, D.A. and D. Tilman. 2012. Soil carbon sequestration in prairie grasslands increased by chronic nitrogen addition. *Ecology* 93(9): 2030-2036.
- Guenther, K. and G. Hayes. 2008. Monitoring Annual Grassland Residual Dry Matter: A Mulch Manager's Guide for Monitoring Success, 2nd ed. Brochure: 34 pp.
- Gurnell, A.M. 1998. The hydrogeomorphological effects of beaver dam-building activity. *Progress in Physical Geography* 22(2): 167-189.
- Hayes, G.F. and K.D. Holl. 2003. Cattle grazing impacts on annual forbs and vegetation composition of mesic grasslands in California. *Conservation Biology* 17: 1694-1702.
- Hayes, M. P. and M. R. Jennings. 1986. Decline of ranid frog species in western North America: Are bullfrogs (*Rana catesbeiana*) responsible? *Journal of Herpetology* 20(4):490-509.
- Holland, D.C. 1994. The Western Pond Turtle: Habitat and History. Final Report. Portland, OR: U.S. Department of Energy, Bonneville Power Administration.

## References

- Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resource Agency. California Department of Fish and Game. Sacramento, CA. 156 pp.
- Holt, D.W. and S.M. Leasure. 1993. Short-eared Owl (*Asio flammeus*) in: The Birds of North America (A. Pool and F. Gill, eds.), no. 62. Academy of Natural Sciences, Philadelphia, PA.
- Huntsinger, L, J. Bartolome, and C. D'Antonio. 2007. Grazing Management on California's Mediterranean grasslands. In M. Stromberg, J. Corbin, and C. D'Antonio (eds.). California Grasslands. University of California Press, Berkeley, CA. 408 pp.
- Jackson, L.E. 1985. Ecological origins of California's Mediterranean grasses. *Journal of Biogeography* 12: 349-361.
- Jameson, E.W., Jr. and H.J. Peeters. 2004 Mammals of California. California Natural History Guide No. 66. University of California Press, Berkeley, CA. 429 pp.
- Jennings, M. R. 1988. Natural history and decline of native ranids in California. Pp. 61–72 in: H. F. DeLisle, P. R. Brown, B. Kaufman, and B. M. McGurty (editors), Proceedings of the conference on California herpetology. Southwestern Herpetologists Society, Special Publication (4).
- Jennings, M.R. and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Final report submitted to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California. Contract No. 8023. November.
- Kamman Hydrology and Engineering, Inc. (Kamman). 2003. Hydrologic Feasibility Analysis for The Tolay Lake Ranch Property, Sonoma County, California. Prepared for: Sonoma County Agricultural Preservation and Open Space District. December 2003.
- Karl, T.R., J.M. Melillo, and T.C. Peterson (eds.). 2009. Global Climate Change Impacts in the United States. Cambridge University Press. 188 pp.
- Keeley, J.E. 2001. Fire and invasive species in Mediterranean-climate ecosystems of California. Pages 81-94 in K.E.M. Galley and T.P. Wilson (eds.). Proceedings of Invasive Species Workshop: the Role of Fire in the Control and Spread of Invasive Species. Fire Conference 2000: the First National Congress on Fire Ecology, Prevention, and Management. Miscellaneous Publication No. 11, Tall Timbers Research Station, Tallahassee, FL.
- Keeley, J.E. 2006. Fire Management Impacts on Invasive Plants in the Western United States. *Conservation Biology* 20(2): 375-386.
- Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). In The Birds of North America, No. 684 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Koenig, J.B. 1963. Geologic Map of California, Santa Rosa Sheet. Olaf P. Jenkins edition.
- Knopps, J.M.H. and J.F. Barthell. 1996. Flower abundance in a population of sky lupine (*Lupinus nanus*) over three years in Central Coastal California. *Madroño* 43(1): 85-92.
- Kyser, G.B. and J.M. Ditomaso. 2002. Instability in a grassland community following control of yellow star thistle (*Centaurea solstitialis*) with prescribed burning. *Weed Science* 50: 648-657.
- Lanman, C.W., K. Lundquist, H. Perryman, J.E. Asarian, B. Dolman, R.B. Lanman, and M.M. Pollock. 2013. The historical range of beaver (*Castor canadensis*) in coastal California: an updated review of the evidence. *California Fish and Game* 99(4): 193-221.
- Lau, T. 2006. Spatial and Habitat Overlap of Wild Turkeys and California Quail at Annadel State Park, California. White Paper.



- Leppig, G. and J.W. White. 2006. Conservation of Peripheral Plant Populations in California. *Madrono* 53(3): 264-274.
- Lippert, C.L., D.A. Stow, J.F. O'Leary, and J. Franklin. Influence of short-interval fire occurrence on post-fire recovery of fire-prone shrublands in California, U.S.A. *International Journal of Wildland Fire* 22: 184-193.
- Long, C.A. 1973. *Taxidea Taxus*. American Society of Mammalogy, Mammalian Species No. 26. 4 pp.
- LSA Associates, Inc. (LSA). 2008. A Cultural Resources Study for the Tolay Lake Regional Park Project, Near Petaluma, Sonoma County, California. Prepared for: Sonoma County Regional Parks Department. March 28, 2008.
- LSA Associates, Inc. (LSA). 2009a. Rangeland Resources Study: Tolay Lake Regional Park, Sonoma County, California. Prepared for: Sonoma County Regional Parks Department, March 13, 2009.
- LSA Associates, Inc. (LSA). 2009b. Biological Resources Study: Tolay Lake Regional Park, Sonoma County, California. Prepared for: Sonoma County Regional Parks Department, April 24, 2009.
- LSA Associates, Inc. (LSA). 2009c. Biological Resources Study: Tolay Creek Ranch, Sonoma County, California. Prepared for: Sonoma Land Trust, May 20, 2009.
- Luers, M.L., D.R. Cayan, G. Franco, M. Hanemann, and B. Croes. 2006. Our Changing Climate: Assessing the Risks to California, A Summary Report from the California Climate Change Center. 16 pp.
- Malcolm, J.R. and L.F. Pitelka. 2000. Ecosystems and Global Climate Change: A Review of Potential Impacts on U.S. Terrestrial Ecosystems and Biodiversity. December 2000.
- Marin Carbon Project (MCP). 2013. Marin Carbon Project Online. Available at: <http://www.marincarbonproject.org>. Accessed: February 2015.
- McNaughton, S.J. 1968. Structure and function in California grasslands. *Ecology* 49(5): 962-972.
- Merenlender, A., S. Reed, J. Kitze, and S. Feirer. 2010. Mayacamas Connectivity Report. Prepared for: Sonoma County Agricultural Preservation and Open Space District. U.C. Berkeley.
- Messick, J. P., and M. G. Hornocker. 1981. Ecology of the Badger in Southwestern Idaho. *Wildlife Monographs* 76:1-53.
- MIG, Inc. (MIG). July 2013. Tolay Lake/Cardoza Ranch Cultural Landscape Inventory: Site History, Inventory, and Evaluation. Prepared for: Sonoma County, California.
- Natesen, E., J. Appel, C. Apperson, C. Blomquist, E. Bernhardt, S. Chenue, R. Eaton, S. Frankel, M. Garbelotto, J. Gorham, K. Kosta, S. Latham, G. Lyman, J. Ortiz, D. Peterson, D. Robertson, and T. Swiecki. 2015. Challenges of large-scale restoration projects. Presentation at the California Native Plant Society Conservation Conference, San Jose, CA. January 2015.
- Newhouse, N. J., and T. A. Kinley, T.A. 2000. Ecology of American Badgers near their range limit in southeastern British Columbia. Report submitted to Forest Renewal British Columbia, BC Environment, Columbia Basin Fish and Wildlife Compensation Program, Canadian Parks Service, East Kootenay Environmental Society. Invermere, BC. Available online at: <http://www.env.gov.bc.ca/kor/wld/final.html>.
- Norton, J.B. and W.R. Horwath. 2006. Soil Carbon and Nitrogen Dynamics in Fire-Suppressed, Wildfire-Burned, and Prescribed-Burned Chaparral in the Sierra Nevada Foothills. Kearney Foundation of Soil Science: Soil Carbon and California's Terrestrial Ecosystems Final Report: 2003329.

## References

- Painter, E.L. 1995. Threats to the California flora: ungulate grazers and browsers. *Madroño* 42: 180-188.
- Parsons Harland Bartholomew and Associates, Inc. (Parsons). 1996. Draft EIR/EIS Santa Rosa Subregional Long-term Wastewater Project. Prepared for City of Santa Rosa and U.S. Army Corps of Engineers.
- Peeters, H. and P. Peeters. 2005. *Raptors of California*. California Natural History Guide No. 82. U.C. Press, Berkeley, CA. 295 pp.
- Pew Charitable Trusts (PCT). 2013. Pew Center on Global Climate Change. Available at: [http://www.pewtrusts.org/our\\_work\\_detail.aspx?id=327744](http://www.pewtrusts.org/our_work_detail.aspx?id=327744). Accessed: April 2013.
- Pierson, E.D. and W.E. Rainey. 1998. Distribution, Status and Management of Townsend's Big-eared Bat (*Corynorhinus townsendii*) in California. Department of Fish and Game. BMCP Technical Report Number 96-7.
- Pollock, M.M., M. Heim, and D. Werner. 2003. Hydrologic and Geomorphic Effects of Beaver Dams and Their Influence on Fishes. *American Fisheries Society Symposium* 37.
- Pollak, O. and T. Kan. 1996. The use of prescribed fire to control invasive exotic weeds at Jepson Prairie Preserve. In C.W. Whitham, ed. *Proceedings, Ecology, Conservation, and Management of Vernal Pool Ecosystems*. Sacramento, CA: California Native Plant Society. Pp. 241-249.
- Powell, J.A. 1969. A synopsis of Nearctic adelid moths, with descriptions of new species (Incurvariidae). *Journal of the Lepidopterists' Society* 23: 211-240.
- Reese, D. A. and H. H. Welsh. 1997. Use of Terrestrial Habitat by Western Pond Turtles, *Clemmys marmorata*: Implications for Management. *Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles*. An International Conference held in 1997 by the New York Turtle and Tortoise Society. pp. 352-357.
- Reiner, R. 2007. Fire in Grasslands. In *California Grasslands: Ecology and Management*, edited by M.R. Stromberg, J.D. Corbin, and C.M. D'Antonio. UC Press, Berkeley, CA.
- Rice, P.M. and J.K. Smith. 2008. Chapter 4: Use of Fire to Manage Populations of Nonnative Invasive Plants in USDA Forest Service Gen. Tech. Rep. RMRS-GTR-42-vol. 6.
- Rosell, F., O. Bozser, P. Collen, and H. Parker. 2005. Ecological impact of beavers *Castor fibre* and *Castor canadensis* and their ability to modify ecosystems. *Mammal Rev.* 35.
- Ryals, R. and W.L. Silver. 2013. Effects of organic matter amendments on net primary productivity and greenhouse gas emissions in annual grasslands. *Ecological Applications* 23: 46-59.
- Sawyer, J.O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society. Sacramento, CA. 471 pp.
- Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation, 2nd Edition*. California Native Plant Society in collaboration with California Department of Fish and Game. Sacramento, CA. 1300 pp.
- Sheppard, A.W. and J.R. Hosking (eds.). 1998. *Broom Management: Proceedings of a workshop held at Ellerston and Moonan on 16-17 November 1998*. Co-operative Research Centre for Weed Management Systems in Plant Production Quarterly 15(4): 2000.
- Shuford, W.D. and Gardali, T., eds. 2008. *California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California*. *Studies of Western Birds* 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

- Silver, W.L., R. Ryals, and V. Eviner. 2010. Soil Carbon Pools in California's Annual Grassland Ecosystems. *Rangeland Ecology and Management* 63(1): 128-136.
- Sonoma Land Trust (SLT), U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFW). 2012. Sears Point Wetland and Watershed Restoration Project Sonoma County, California: Final Environmental Report/Environmental Impact Statement; State Clearinghouse #: 2007102037.
- Sonoma Land Trust (SLT). 2014. Keeping the Sonoma Valley Wildlife Corridor open and wildlife friendly. January 2014.
- Texas Parks and Wildlife. 1997. Pallid Bat in the Mammals of Texas. Available at: <http://www.nsrll.ttu.edu/tmot1/antrpall.html>.
- Thompson, R.A. 1877. Historical and Descriptive Sketch of Sonoma County, California. L.H. Everts & Co., Philadelphia, PA. 104 pp.
- U.S. Army Corps of Engineers (Corps). 2015. Compensatory Mitigation and Monitoring Guidelines for South Pacific Division USACE. January 12, 2015.
- U.S. Department of Agriculture (USDA), U.S. Forest Service (USFS), and Soil Conservation Service (SCS). 1977. Soil Survey of Sonoma County, California. In cooperation with the University of California Agricultural Experiment Station.
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2012. List of Hydric Soils, California.
- U.S. Fish and Wildlife Service (USFWS). 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon.
- U. S. Fish and Wildlife Service (USFWS). 2006. Designation of Critical Habitat for the California Red-Legged Frog, and Special Rule Exemption Associated With Final Listing for Existing Routine Ranching Activities; Final Rule. *Federal Register* 71(71): 19243-19346. April 13.
- Vermont Fish and Wildlife Service (VFWS). 2002. Best Management Practices for Resolving Human-Beaver Conflicts in Vermont. Vermont Department of Environmental Conservation. Revised 2004.
- Vickery, P.D. 1996. Grasshopper Sparrow (*Ammodramus savannarum*). In *The Birds of North America*, No. 239 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, DC.
- Walther, G., E. Post, P. Convey, A. Menzel, C. Parmesan, T.J.C. Beebee, J. Fromentin, O. Hoegh-Gudberg, and F. Bairlein. 2002. Ecological Responses to Recent Climate Change. *Nature* 416: 389-395.
- Weiss, S.B. 1999. Cars, Cows, and Checkerspot Butterflies: Nitrogen Deposition and Management of Nutrient-poor Grasslands for a Threatened Species. *Conservation Biology* 13(6): 1476-1486.
- Weiss, S.B., D.H. Wright, and C. Niederer. 2007. Serpentine Vegetation Management Project Final Report. Creekside Center for Earth Observation Report.
- West Coast Watershed. 2009. Tolay Creek Riparian Enhancement Plan. Developed for: Sonoma Land Trust. With assistance from: Rob Evans & Associates. November 2009.
- Western Bat Working Group (WBWG). 2013. Species Accounts. Available at: [http://www.wbwg.org/speciesinfo/species\\_accounts/species\\_accounts.html](http://www.wbwg.org/speciesinfo/species_accounts/species_accounts.html). Accessed: September 2013.
- Western Regional Climate Center (WRCC). 2014. Online data: Desert Regional Institute. Available at: <http://www.wrcc.dri.edu/>. Accessed: January 2014.



## References

Wilcox, J.T. 2011. *Rana draytonii* (California red-legged frog) Predation. *Herpetological Review* 42(3): 414-415.

WRA, Inc. (WRA). 2013. Biological Resources Report: Tolay Lake Regional Park. Prepared for: Sonoma County Regional Park District. June 2013.

WRA, Inc. (WRA). 2014. Technical Memorandum: Tolay Lake Restoration Alternatives. Revised April 18, 2014.

### Personal Communications and Observations

Steve Ehret, Park Planner, Sonoma County Regional Parks in: LSA 2009b.

Jake Newell, Stewardship Planner, Sonoma County Agricultural Preservation and Open Space District. Email correspondence.

Janet Thiessen, volunteer for the Raptor Project in: LSA 2009b.

WRA 2010. Observations of plants and wildlife throughout California.

## Chapter 7

Sarris, G., n.d. Transcript of Sacred Sites Protection Committee Interview with Greg Sarris Federated Indians of Graton Rancheria: Rohnert Park, CA.

Nelson, P. 2016. Tolay Cultural Affiliation and Interpretive Document, Federated Indians of Graton Rancheria: Rohnert Park, CA

Dawson, A. 1998. *The Stories behind Sonoma Valley Place Names*. Kulupi Publishing

California State Parks. 2015. *California State Parks Accessibility Guidelines: 2015 Edition*.

## Chapter 8

Atchley, Ruth Ann, David L. Strayer, and Paul Atchley. 2012. *Creativity in the Wild: Improving Creative Reasoning through Immersion in Natural Settings*

California State Parks. 2015. *California State Parks Accessibility Guidelines: 2015 Edition*.

Steele, Lauren. 2014. *Study: Hiking Makes You Happier*

## Chapter 9

No References