**Final**

# Habitat Conservation Plan
# Ranch View Terrace,
# University of California, Santa Cruz

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Chapter 1
# Introduction

## Purpose

This habitat conservation plan (HCP) has been developed by the Regents of the University of California (UC Regents) to support an application to the U.S. Fish and Wildlife Service (Service) for an Incidental Take Permit (permit) under Section 10(a)(1)(B) of the Federal Endangered Species Act (ESA) of 1973, as amended (16 U.S. Code [USC] § 1531–1544, 87 Stat. 884). The permit would allow take, as that term is defined in Section 1532 (19) of the ESA, of those species adequately addressed in this HCP as incidental to actions taken by the UC Regents associated with the development, management, and use of faculty housing in an area designated as Inclusion Area D of the University of California, Santa Cruz (UCSC) (figure 1-1)[1]. The UC Regents are requesting that the permit be issued for a period of 60 years.

The UC Regents seek regulatory compliance for the construction and operation of portions of two projects. The first project, Ranch View Terrace, includes faculty housing and associated infrastructure in and adjacent to Inclusion Area D. The second project is an equipment storage building for the new Emergency Response Center. Both projects are referred to as the Projects hereafter[2]. The Projects have a low potential to result in take of the federally threatened California red-legged frog (*Rana aurora draytonii*).

The federally endangered Ohlone tiger beetle (*Cicindela ohlone*), while not present on either project site, is present in nearby campus grasslands. Construction of the Ranch View Terrace Project has a low potential to take Ohlone tiger beetle. These two species are collectively referred to hereafter as the Plan Species. The UC Regents propose to implement this HCP to minimize and mitigate adverse effects on the Plan Species. This HCP is also intended to support the broader campus goals for habitat conservation.

This HCP is intended to satisfy the ESA. Because no state-listed species are found on Inclusion Area D, compliance with the California Endangered Species Act (CESA) is not required.

[1] *Inclusion Area* refers to an area on a University of California campus that is identified in the campus Long Range Development Plan as being suitable for nonacademic university-related development.
[2] Even though the HCP covers two projects, it is named after the project that dominates the permit area.

# Permit Area

The HCP permit area includes the portions of the Projects with the low potential to result in take of one or both Plan Species. The total permit area is approximately 38.8 acres. The legal description of the permit area is attached to the Implementing Agreement (IA) (appendix C). The Projects are described in more detail in chapter 2, "Covered Activities."

## Ranch View Terrace

The UC Regents are requesting coverage primarily for construction and operation of the Ranch View Terrace Project, an 84-unit housing development (84 single-family homes) and associated infrastructure, including open space amenities. The goal of the Project is to increase the supply of affordable, high-quality housing for faculty and staff in a timely and environmentally appropriate manner. The homes will be sold to faculty at below-market prices and rates to meet this goal.

The permit area for the Ranch View Terrace project (figure 1-2) includes:

- all of Inclusion Area D, including the Ranch View Terrace project site and the on-site mitigation area (Inclusion Area D Preserve),
- the off-site mitigation area (Inclusion Area A Preserve) (figure 1-3),
- the secondary emergency, primary loop road and service vehicle road (figure 2-2),
- a gas pipeline easement, and
- the ERC equipment storage building site

Inclusion Area D is a 25.5-acre site located on the southern edge of the UCSC campus, between the main entrance and the Arboretum. Of this site, 13 acres will be impacted by the Ranch View Terrace Project. The remaining portion (12.5 acres) will be set aside as on-site mitigation. The UC Regents will set aside another 13.0 acres as off-site mitigation, located in Inclusion Area A and the adjacent Campus Reserve lands (figure 1-3). The mitigation sites are included in the permit area to provide coverage for possible incidental take from management or monitoring activities. The mitigation sites are described in more detail in chapters 3, "Environmental Setting," and 5, "Conservation Strategy."

The Ranch View Terrace Project also includes the creation of 5.4 acres of farm plots to replace approximately 3.0 acres of existing farm plots temporarily occupying a portion of Inclusion Area D that will be used for the housing development (figure 1-2). The replacement farm plots are not expected to result in take of the Plan Species, and are therefore excluded from the permit area. Although the total size of the Ranch View Terrace Project is 18.4 acres, only the 13.0-acre Inclusion Area D is included in the permit area.

Similarly, the secondary emergency and service vehicle road is included in the permit area but the primary access road to Coolidge Drive is excluded from the permit area. The primary access road does not contain suitable habitat for either Plan Species. A gas pipeline easement connecting Inclusion Area D with the Emergency Response Center equipment storage site is also included in the permit area.

### Emergency Response Center Equipment Storage Building

The UC Regents are also requesting coverage for a 0.2-acre storage site that will support a new Emergency Response Center in Lower Campus. The storage site would be located southeast of the Arboretum and adjacent to Empire Grade (figure 2-1). A 3,400 square-foot prefabricated building would be placed on the site for equipment storage. The site would also continue to be used by UCSC maintenance staff for temporary storage of debris and landscape material.

## Permit Term

The UC Regents request the permit for the Project for a period of 60 years from permit issuance. The permit term will cover the construction period and approximately 59 years of occupancy (i.e., Project operation) of Ranch View Terrace, although the likelihood of take of Plan Species during this period is expected to be extremely low. The permit term was chosen to match the term of the property's ground lease.

The permit term will also cover approximately 60 years of use of the Emergency Response Center equipment storage building and site.

## Regulatory Setting

### Sections 9 and 10 of the ESA

ESA Section 9 prohibits the take of any fish or wildlife species listed under the ESA as endangered. *Take*, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Harassment* is defined by the Service (50 Code of Federal Regulations [CFR] 17.3) as an intentional or negligent action that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Service regulations define *harm* to include significant habitat modification or degradation which actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding or

sheltering. All or some forms of take of threatened species are prohibited by regulation at the time of listing.

Individuals and local agencies proposing an action that is expected to result in the take of federally listed species must apply for an Incidental Take Permit under Section 10(a)(1)(B) of the ESA. Such permits are issued by the Service when take is not the intention of and is incidental to otherwise legal activities. An application for an incidental take permit must be accompanied by a conservation plan, commonly referred to as an HCP. The regulatory standard under Section 10 of the ESA is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable. Under ESA Section 10, a proposed project also must not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and adequate funding for a plan to minimize and mitigate impacts must be ensured.

This HCP is intended to satisfy the requirements of Section 10(a)(1)(B) for a conservation plan. This HCP also follows Service Section 10 regulations (50 CFR 17), the guidelines for HCP development set forth in the Service HCP handbook (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996), and the Service five-point policy (65 Federal Register [FR] 106, 35242-35257, June 1, 2000), which amended the 1996 HCP handbook.

## Section 7 of the ESA

Section 7 of the ESA requires Federal agencies to ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify listed species' critical habitat. Issuance of an incidental take permit under ESA Section 10(a)(1)(B) by the Service is a federal action subject to Section 7 of the ESA. As a Federal agency issuing a discretionary permit, the Service is required to consult with itself (i.e., conduct an internal consultation). Delivery of the HCP and Section 10 permit application initiates the Section 7 consultation process within the Service. The regulatory standard under Section 7 is that no Federal action may jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat.

The requirements of Section 7 and Section 10 substantially overlap. Elements unique to Section 7 include analyses of impacts on designated critical habitat, analyses of impacts on listed plant species, if any, and analyses of indirect and cumulative impacts on listed species. These additional analyses are included in this HCP to meet the requirements of Section 7 and to assist the Service with its internal consultation.

# Background

This HCP was developed to support an application for ESA-covered take of the Plan Species. Because both species occur on the UCSC campus, the UC Regents have explored several conservation and management strategies to protect these populations and to address the regulatory requirements of ESA, including Project designs that are intended to avoid take. An HCP was deemed the most beneficial to the Plan Species because it will provide a vehicle for conservation that guarantees implementation.

## Relationship to Other UCSC Plans

### Long-Range Development Plan

Inclusion Area D is included in UCSC's 1988 Long Range Development Plan (University of California, Santa Cruz 1988). The Long Range Development Plan (LRDP) provides a blueprint for campus development and landscape planning based on UCSC's projected space requirements and academic goals. The LRDP identified Inclusion Area D as one of five areas on campus suitable for nonacademic university-related development, including the construction of housing for UCSC faculty and staff. The faculty housing project proposed for Inclusion Area D implements elements of the LRDP.

### Campus-wide Planning for Biological Resources

As UCSC continues to grow, there could be additional impacts on biological resources on campus. Some of the growth anticipated could adversely affect the Plan Species as well as other special-status species, some of which may be listed in the future. The UC Regents recognize the need to integrate planning for future development with planning for the continued preservation and enhancement of biological resources on campus. Collection of baseline data on campus-wide biological resources has been initiated (e.g., Jones & Stokes 2003).

## HCP Biological Goals and Objectives

This HCP establishes biological goals with respect to the two Plan Species (table 1-1). Specific objectives outlined below are intended to support the achievement of the biological goals and reflect the needs of the two Plan Species (table 1-2).

**Table 1-1.** Biological Goals for Covered Species in the Ranch View Terrace HCP

| Species | Biological Goals |
|---|---|
| Ohlone tiger beetle | 1. Increase the quality, quantity, and protection of suitable breeding habitat on selected areas on campus that will support the species in the long term. |
| | 2. Minimize adverse effects from Ranch View Terrace development and residency. |
| California red-legged frog | 1. Increase the quality, quantity, and protection of suitable dispersal habitat in the lower campus that will support the species. |
| | 2. Minimize adverse effects from Ranch View Terrace development and residency. |

**Table 1-2.** Biological Objectives for Covered Species in the Ranch View Terrace HCP

| Species | Biological Objectives |
|---|---|
| Ohlone tiger beetle | 1. Preserve and manage in perpetuity 13.0 acres of grassland and woodland in Inclusion Area A and adjacent Campus Resource Land to help maintain the habitat for Ohlone tiger beetle west of Empire Grade. *Supports goals 1 and 2.* |
| | 2. Establish a 5.7-acre beetle management area on Inclusion Area D in which management activities will be designed and implemented to create suitable habitat for the beetle. *Supports goals 1 and 2.* |
| | 3. Incorporate design features into Ranch View Terrace that minimizes impacts on Ohlone tiger beetles during occupancy. *Supports goal 2.* |
| California red-legged frog | 1. Preserve and manage in perpetuity 13.0 acres of upland habitat for California red-legged frog in Inclusion Area A and adjacent Campus Resource Land. *Supports goals 1 and 2.* |
| | 2. Minimize the chances of take of the California red-legged frog from construction of the Ranch View Terrace Project by implementing construction avoidance and minimization measures. *Supports goal 2.* |
| | 3. Incorporate design features into Ranch View Terrace that minimizes impacts on California red-legged frogs during occupancy. *Supports goal 2.* |

# HCP Planning Process

## Public Involvement

HCPs are subject to the National Environmental Policy Act (NEPA) because issuance of a 10(a)(1)(B) permit is a major Federal action. To comply with NEPA, a draft environmental assessment (EA) has been prepared to evaluate the environmental effects of the proposed action. The draft EA accompanies the

draft HCP. To facilitate public review of an EA, NEPA requires a public notice of the availability of the EA[3].

## Coordination with the Service

UCSC planning staff and legal staff at the University of California Office of the President (UCOP) have served as representatives of the UC Regents during development of the HCP (see appendix E for a list of preparers). These representatives have coordinated closely with Service staff in the Ventura, California office and the Portland, Oregon regional office during development of this HCP. The UC Regents and their consultants met or held conference calls with Service staff Colleen Sculley (HCP Coordinator, Ventura), Amelia Orton-Palmer (Chief, Division of Santa Cruz and San Benito Counties, Ventura), Rick Amidon (HCP Coordinator, Portland), Debra Kirkland (Fish and Wildlife Biologist, Ventura), Connie Rutherford (Botanist, Ventura), Diane Gunderson (Fish and Wildlife Biologist, Ventura), Jen Lechuga (HCP Coordinator, Ventura), Karen Koch (Solicitor, Department of the Interior, Sacramento), Diane Steeck (Fish and Wildlife Biologist, Ventura), Dave Pereksta (Division Chief of Santa Cruz and San Benito Counties, Ventura), and Julie Concannon (NEPA Coordinator, Portland), on the following dates:

- November 7, 2001 (Sculley, Kirkland),
- January 9, 2002 (Sculley),
- February 11, 2002 (Sculley),
- March 18, 2002 (Sculley, Orton-Palmer),
- March 26, 2002 (Sculley, Kirkland),
- May 8, 2002 (Sculley, Orton-Palmer, Amidon),
- August 19, 2002 (Rutherford),
- September 18, 2002 (Orton-Palmer, Rutherford),
- October 22, 2002 (Orton-Palmer),
- November 20, 2002 (Orton-Palmer),
- June 10, 2003 (Orton-Palmer),
- June 11, 2003 (Orton-Palmer, Gunderson),
- July 1, 2003 (Orton-Palmer, Gunderson),
- September 23, 2003 (Amidon),
- September 26, 2003 (Gunderson, Lechuga),
- October 8, 2003 (Gunderson, Lechuga, Koch),

[3] The final decision document would be either a finding of no significant impact (FONSI) for an EA, or a record of decision (ROD) if the NEPA review process proceeded through preparation of an EIS.

- January 12, 2004 (Lechuga, Steeck),
- February 18, 2004 (Pereksta),
- April 27, 2004 (Lechuga, Concannon, Amidon, Pereksta),
- May 3, 2004 (Lechuga, Amidon, Koch), and
- May 26, 2004 (Lechuga).

# Document Organization

This document is organized into 9 chapters. Following chapters include:

- chapter 2, "Covered Activities,"
- chapter 3, "Environmental Setting,"
- chapter 4, "Effects on Covered Species,"
- chapter 5, "Conservation Strategy,"
- chapter 6, "Monitoring, Reporting, and Adaptive Management,"
- chapter 7, "Funding, Implementation, and Regulatory Considerations,"
- chapter 8, "Alternatives," and
- chapter 9, "References."

Chapter 2 describes the activities covered in this HCP and the activities for which take of Plan Species will be allowed under the permit. Chapter 3 provides information on existing natural resources on the UCSC campus, with particular focus on Inclusion Area D. Chapter 4 summarizes the Project's expected impacts on Plan Species. Chapter 5 presents the conservation principles and strategies central to this HCP and describes expected outcomes for Plan Species when the HCP is implemented. Chapter 6 describes the monitoring plan that will gauge the success of the HCP and the adaptive management strategy that will ensure that management strategies continue to be improved, as their efficacy is field-tested. Chapter 7 provides information on HCP funding and implementation, and summarizes requested assurances, changed circumstances, remedial measures that will be implemented to address such changes, and procedures for addressing unforeseen circumstances. Chapter 8 provides an analysis of alternatives to the management plan proposed in this HCP. Chapter 9 provides a listing of the sources cited in the document or consulted in its preparation.

This document also includes the California red-legged frog habitat assessment (appendix A) and the 2002 and 2003 Ohlone tiger beetle habitat assessment and surveys (appendix B) conducted in conjunction with this HCP.

Chapter 2
# Covered Activities

## Introduction

The UC Regents request ESA coverage for the Ranch View Terrace Project, the proposed Emergency Response Center equipment storage building, and HCP implementation (Covered Activities). The UC Regents are requesting ESA coverage for all activities associated with the construction, management, and occupancy of Ranch View Terrace, the construction and use of the Emergency Response Center storage site, and the mitigation and management activities associated with implementation of the HCP for a 60-year period. This chapter describes activities that are expected to occur within the permit area that may impact the Plan Species. The activities are divided into three general categories: Project construction, Project use, and HCP implementation activities.

In summary, the UC Regents request take coverage for:

- construction and ongoing use of the Ranch View Terrace Project, including:
  - incidental take of Plan Species from construction activities (see chapter 4),
  - capture and relocation of Plan Species from the construction site, if necessary (see chapters 5 and 7), and
  - incidental take of Plan Species from ongoing use of the Project (see chapter 4);
- construction of the Emergency Response Center equipment storage building and use of the site, including:
  - incidental take of California red-legged frog (CRLF) from construction activities and ongoing use (see chapter 4), and
  - capture and relocation of CRLF from the construction site, if necessary (see chapters 5 and 7); and
- HCP implementation activities, including:
  - incidental take of Ohlone tiger beetle (OTB) and CRLF on the Inclusion Area A Preserve during vegetation management activities (see chapters 4 and 5), and

- incidental take of OTB from presence/absence monitoring surveys on the Inclusion Area A Preserve (see chapters 4 and 6).

# Covered Activities

## Ranch View Terrace

### Project Location

Ranch View Terrace will be located on Inclusion Area D on the southern edge of the UCSC campus, adjacent to and west of the main campus entrance on High Street. The 25.5-acre Inclusion Area D site is bordered by the 1988 UCSC Long Range Development Plan land use designation of Site Specific Research which includes the Arboretum to the west, the Center for Agroecology and Sustainable Food Systems (the Farm) to the north, Campus & Community Support with an overlay "historic area" district and main entrance to the east, and the western residential edge of the city of Santa Cruz to the south (see figure 1-2). Adjacent land uses are described in more detail in chapter 3, "Environmental Setting."

The Ranch View Terrace Project will be built on 13 acres in the northern half of Inclusion Area D (i.e., the Project site), as illustrated in figure 2-1. The Ranch View Terrace Project also includes the creation of 5.4 acres of farm plots to replace approximately 3.0 acres of existing farm plots temporarily occupying a portion of Inclusion Area D that will be used for the housing development (figure 1-2). The replacement farm plots are not included in the HCP permit area because they are not expected to result in take of the Plan Species.

### Project Purpose

Ranch View Terrace is designed to increase the currently inadequate supply of affordable on-campus housing for UCSC faculty members. Over the next decade, the UC Regents expect to recruit 300 new professors who will replace retiring teachers and accommodate expanding enrollment. The 130 units of on-campus housing presently available are inadequate to meet projected demand. Ranch View Terrace will contribute 84 single-family homes to the UCSC's on-campus housing supply. Because units will be sold and rented at below-market prices and rates, Ranch View Terrace will provide affordable housing options for entry-level faculty members and will help offset housing demand in the regional housing market. Successful completion of the Project is a critical step in enabling the UC Regents to recruit and retain the best faculty and therefore to meet the academic mission of UCSC and the University of California system.

## Project Description

Ranch View Terrace follows the design concepts established by UCSC in the Inclusion Area D Master Plan and Design Guidelines (Moore, Ruble, and Yudell 2001). The housing units, including buildings, carports (totaling approximately 200 parking spaces), and streets, will cover approximately 6.4 acres; landscaped open space will cover the remaining 6.6 acres. The 6.6 acres of landscaped grounds include a neighborhood park, and shared amenities such as picnic facilities, playgrounds, and community gardens. Construction of Ranch View Terrace will include the following elements:

- constructing 84 homes on 6.4 acres;
- building a primary loop road and a secondary emergency and service vehicle road (figure 2-2);
- developing 6.6 acres of the site to landscaped open space; and
- replacing an unpaved utility access route with an 8-to-10-foot-wide, 1,000-foot-long utility service road.

Two- or three-story homes will be built in mixed clusters on the Ranch View Terrace site. The three- or four-bedroom homes will range from 1,750 to 2,080 square feet each. Each cluster will include private outdoor spaces (decks, patios, or yards), a parking court and perimeter landscaped courtyards.

The new 22-foot-wide primary loop road will be constructed on-site and an existing gravel road off-site will be improved with paving and widening to connect Ranch View Terrace to Coolidge Drive on the east (figure 2-2). Housing clusters will be situated on cul-de-sacs off the loop primary road. The secondary emergency and service vehicle road will follow the existing unpaved road between the Farm and Arboretum and will link the primary loop road to the Village development near Hagar Drive. The road will be surfaced with a minimum 6-inch depth of Class II aggregate. Improvement will be made to a 7.8-acre area to create open space for passive use. Landscape treatment will be included. Additional landscaping in and around residential clusters will favor drought-tolerant, low-maintenance plants. Existing trees will be retained as visual buffers along the northern, southern, and western boundaries of Ranch View Terrace.

A recharge system for stormwater runoff will be established in the southeastern corner of the Project site during Phase 1. This recharge system will ensure that the hydrologic conditions on Inclusion Area D will be maintained. The stormwater system will be designed so that it will not attract CRLF and will minimize impact to the hydrology of the surrounding area. The Project includes three interconnected detention basins tiered on the hillside in the eastern side of the development site to minimize grading impacts. The storm drain system would have three main lines, each discharging into one of the basins so that utilization of the available detention capacity would be optimized. The basins would then use weirs to limit discharge to the receiving pipe system that flows

into the City storm drain system on Empire Grade/High Street, which in turn discharges to Arroyo Seco.

Fences and gates will be constructed along the remaining unfenced perimeter of Ranch View Terrace (some of the perimeter is already fenced) to control pedestrian access into the Farm, Arboretum, and Inclusion Area D Preserve in the southern half of Inclusion Area D.

The proposed utility corridor, running from the southeastern corner of the Project site along the eastern edge of Inclusion Area D, will include a 10-foot-wide utility road that will link the Project site to existing infrastructure and utility connection points, including a campus water pressure regulating valve (PRV) (see figure 2-2). The access road will be gated and fenced on the western side to minimize access into the Inclusion Area D Preserve in the southern half of Inclusion Area D. A new 2-inch gas pipeline will be installed within a 10-foot wide and approximately 500-foot long gas easement that runs southwest from the Ranch View Terrace site to connect with the existing Pacific Gas and Electric Company (PG&E) gas facility at the proposed Emergency Response Center equipment storage site through the eucalyptus grove. The pipeline will be placed next to an existing 8-inch gas line.

## Project Construction

Project construction will occur in phases to assist future faculty recruitment efforts and limit the possibility of units being sold to the University or to the general public. The first phase will consist of building most of the infrastructure, roads and 45 homes in the western portion of the site. It is expected that this phase will commence in summer 2005 with all construction being completed in fall 2006. Future phases will commence based on demand and recruitment needs, and will take place at the option of the campus, not the developer. Each subsequent phase is expected to require 8 to 9 months to construct.

Construction of the first phase of Ranch View Terrace is expected to last approximately 16 months. All rough site grading (i.e., for all three phases) would occur in phase 1 in the summer and fall to avoid the wettest portion of the rainy season. Construction activities associated with the development of the site include vegetation grubbing and clearing, grading, materials storage and transport, building construction, hardscape development (roads, bike lanes, and paths), and landscaping. All construction activities will be restricted to the area of disturbance shown in figure 2-2. A temporary construction barrier will be installed around the Ranch View Terrace perimeter to keep construction vehicles and personnel away from sensitive habitats. Onsite equipment staging, parking, and material storage will be restricted within the fenced area of the Project site. Construction vehicles and personnel will access the site from Coolidge Drive.

Immediately after rough grading of the phases 2 and 3 portion of the site, these areas will be hydroseeded with mix of native and non-invasive exotic grasses and herbs to minimize erosion. This vegetation cover will be maintained through

irrigation and additional seeding, if needed, until construction of the next phase of the housing project begins.

### Project Use

The UC Regents expect the Ranch View Terrace to house between 200 and 250 residents. Residential use of the site will include daily travel on the primary loop road, cycling and walking on paved bike and pedestrian paths, and passive recreational use of open spaces. Because the Project does not include a commercial component, use of the Project site by nonresidents is expected to be low.

The UC Regents and the developer will share project management and maintenance activities. The UC Regents will retain responsibility for operation and maintenance of site utilities, roads, common area landscaped areas, and the community center. The UC Regents will enter into a ground lease agreement with the developer for ownership, management, and maintenance of the apartments. Periodic maintenance activities will include building repairs, pest control, painting, and landscape irrigation and maintenance.

Apart from daily residential and periodic maintenance use, the primary loop road will require periodic access by emergency (fire and police) and service personnel (water, trash, recycling, sewer, and PG&E). Emergency and service vehicles will infrequently use the secondary service road between the Farm and the Arboretum as required. A locked barrier will prohibit residential use of this road. The utility connection points, including an existing campus pressure-regulating valve, will also require periodic inspection by service personnel. Service vehicle and pedestrian traffic will be allowed along the length of the road to its outlet on Bay Street.

## Emergency Response Center Equipment Storage Building (LPG Site)

The UC Regents are proposing to construct an equipment storage building to support a new Emergency Response Center (ERC) in Lower Campus. The building would be constructed on a 0.2-acre concrete pad southeast of the Arboretum and adjacent to Empire Grade. The site is also known as the “LPG site” because the site once contained a liquid propane gas (LPG) tank (figure 2-1; hereafter, the site will be referred to as the LPG site).

The concrete pad on the entire site and the chain link fence surrounding the site would be retained and possibly expanded into the berm that surrounds the site on three sides. The height of the berm would remain the same. Existing debris piles and other small structures may be removed to provide more room for equipment storage. A Butler building, a 3,400 square-foot prefabricated building, would be placed on the site for equipment storage. The site would also continue to be used

by UCSC maintenance staff for temporary storage of debris and landscape material. Because of the proximity of the LPG site to Inclusion Area D, the UC Regents are also requesting take coverage for the construction of the equipment storage building for the ERC and long-term use of the site.

## HCP Implementation

Implementation of HCP conservation measures will be covered by the Federal authorizations for incidental take in order to account for potential take of OTB and CRLF from long-term management of one of the two proposed preserves. As described in chapter 4, "Effects on Covered Species," vegetation management and species monitoring on the Inclusion Area A Preserve may result in low levels of take of OTB. Although take of CRLF will likely not occur, take authorization is requested for CRLF for the long-term management of the Inclusion Area A Preserve for the same management actions conducted for OTB.

The purpose of vegetation management on the Inclusion Area A Preserve is to maintain the current conditions of the grassland habitat in that area, which provides habitat for CRLF and OTB. Vegetation management results in a decrease in the density, cover, and thatch of non-native plant species, while increasing the abundance and diversity of native plants as well as the amount of bare ground available for foraging, mating, and thermoregulatory behavior. Vegetation management, including weed control, will most likely be accomplished through the use and refinement of an existing cattle grazing program. Other management techniques that may be used include mowing, raking, or grazing with goats. The proposed vegetation management program and the rationale for the program are discussed in detail in chapter 5.

Monitoring activities associated with this HCP are discussed in chapter 6, and include annual monitoring of vegetation characteristics for the Plan Species and annual monitoring for the presence or absence of OTB in the preserves. These activities may result in low levels of take of OTB in the Inclusion Area A Preserve if burrows or adult beetles are inadvertently crushed while scientists collect data so this is a covered activity under the HCP. No take of CRLF is expected from management or monitoring activities.

Chapter 3

# Environmental Setting

## Introduction

This chapter describes the environmental characteristics of Inclusion Areas A and D, including physical setting (climate, topography and geomorphology, geology, soils, and hydrology), UCSC 1988 LRDP land use designations, and biological resources. The level of detail in this chapter reflects the amount of information relevant to the HCP. Additional setting information is included in the draft Environmental Assessment accompanying this HCP and the environmental impact Report (EIR) for Ranch View Terrace (UCSC 2004).

## Methods

Setting information is based on a combination of existing data, site visits, and knowledge of the site and its history by UCSC staff. Jones & Stokes biologists conducted botanical and wildlife surveys of the site between May 2002 and June 2003. Dr. Richard Arnold surveyed the site from late December 2001 through early February 2002 and January through April of 2003 for OTB. Larval burrows of OTB were also observed in Inclusion Area A in July, August, and October 2003. Periodic site visits were also conducted by the project team in 2002, 2003, and 2004 to observe site conditions and adjacent land uses.

## Physical Setting

The physical resources that influence the natural communities in Inclusion Area D include climate, topography and geomorphology, geology, soils, and hydrology.

### Climate

The Santa Cruz area exhibits a maritime Mediterranean climate. Winter conditions are mild (typically 49 to 55°F), and account for most of the area's approximately 30 inches of rainfall annually (Arkley 1963). Summers are

rainless but often foggy from May through July because of warm temperatures in California's inland valleys. A considerable amount of precipitation in the area's forests and vegetation communities is supplied by fog drip, which is produced when moisture condenses on trees and other plants. Warmer temperatures (typically 58 to 63°F) occur from August through October after the temperature of inland areas cools.

## Topography and Geomorphology

The UCSC campus and City of Santa Cruz are situated in the central part of California's Coast Ranges geomorphic province (Norris and Webb 1990). The UCSC campus lies on the southeastern end of Ben Lomond Mountain, a major ridge in the Santa Cruz Mountains. Ben Lomond Mountain rises from near sea level in the City of Santa Cruz and climbs gradually to the northwest in a series of steplike terraces. Inclusion Area D is situated on one of the terraces that comprise most of the lower campus. Marine terraces are geomorphic remnants of the former shoreline now elevated above sea level by active uplift associated with the growth of the Coast Ranges.

The elevation of the UCSC campus ranges from approximately 290 to 1,180 feet above sea level, with a general south/southwest aspect. The highest elevation in Inclusion Area D is 448 feet at the northwest corner near the Farm. From that point, the topography slopes downward gently to the south towards Empire Grade and High Street, and east toward the historic core, to an elevation of 320 feet (6% slope).

## Geology

The UCSC campus is located relatively near several of the region's principal faults. Both the San Andreas fault, some 11 miles to the northeast of the campus, and the San Gregorio fault, approximately 8 to 9 miles to the west, are recognized as active by the State of California and have been zoned pursuant to the state's Alquist-Priolo Earthquake Fault Zoning Act (see Hart and Bryant 1997); both are considered Type A faults under the most recent version of the Uniform Building Code (UBC) (International Conference of Building Officials 1997)[4].

Bedrock underlying the UCSC campus consists primarily of metasedimentary rocks of Paleozoic–Mesozoic age.

Surficial units in Inclusion Area D include marine terrace deposits, stream deposits, landslide deposits, and colluvium, all of Quaternary age. The terrace

[4] Under the Alquist-Priolo Earthquake Fault Zoning Act, faults that show evidence of activity within the past 11,000 years are considered *active*; construction in the corridors (Earthquake Fault Zones) along active faults is strictly regulated. The UBC uses the Type A classification to identify the state's most significant active faults; among other characteristics, these structures are considered capable of producing earthquakes with Richter magnitudes exceeding 7.0.

deposits typically consist of sand with intercalated lenses and layers of gravel made of granite, quartzite, Santa Cruz mudstone, and schist (Warrick 1982).

# Soils

By contrast with much of central coastal California, the Santa Cruz campus supports unusually thick, iron-rich soils, probably because of the local climate's humidity and warmth. The grasslands of the lower campus regions, including Inclusion Area A and D, are generally thought to be underlain by a claypan in the B horizon of the soil profile, creating an impervious layer that cannot support tree-dominated communities (Warrick 1982; University of California, Santa Cruz 1988).

## Inclusion Area D

A detailed soil survey of the campus identified 27 soil types, some many thousands of years old (Arkley 1963). Soil types identified by Arkley in Inclusion Area D include Pinto loam, Pinto sandy loam, and Pinto clay loam. A subsequent, but less detailed soil survey was conducted by the Soil Conservation Service (SCS) in 1980. The soils in the southern portion of Inclusion Area D were identified and named as Tierra-Watsonville complex, and the soils in the north as Elkhorn sandy loam. Although named differently, the surface texture, drainage, and morphology of the soils described in the lower portion of Inclusion Area D by Arkley and the SCS are basically the same. The Pinto and Elkhorn series are members of the Argixeroll great group, while the Watsonville series are Palexeralfs; the differences between them are very subtle. Therefore, the differences in nomenclature may reflect nuances in field conditions at the time, location and condition of soil at the sampling points chosen, methodology and approach to the survey, or interpretation of the data.

Because of the correlation of occurrence between soils of the Tierra-Watsonville complex and the OTB (see *Biological Resources* section of this chapter), as well as the small scale and lack of precision associated with countywide soil mapping, the Natural Resource Conservation Service (NRCS) was retained to verify the presence and boundaries of the Tierra-Watsonville complex in Inclusion Area D in 2002. Their results confirm that the boundary between the Tierra-Watsonville complex and Elkhorn sandy loam in Inclusion Area D occur in the location indicated on the Santa Cruz County soil map[5] (figure 3-1) (Soil Conservation Service 1980).

[5] At six known Ohlone tiger beetle locations surveyed by NRCS, soil types identified included: similar to Tierra-Watsonville complex, Pinto sandy loam, similar to Pinto sandy loam, similar to Pfeiffer, similar to Pinto clay loam, and similar to Bonnydoon loam (Natural Resources Conservation Service 2002).

## Inclusion Area A

Soils in the upland portions of Inclusion Area A are similar to those at Inclusion Area D, and were assigned to the Watsonville loam and Elkhorn sandy loam by the Soil Conservation Service (figure 3-2). The Watsonville loam and Elkhorn sandy loam are deep to very deep soils formed in sedimentary deposits. They range from somewhat poorly drained to well drained and are very slowly to moderately slowly permeable. Runoff is slow to medium and erosion hazard is slight to moderate (Soil Conservation Service 1980).

On the western edge of Inclusion Area A, soils in the Wilder Creek drainage belong to the Ben Lomond-Felton complex and Ben Lomond-Catelli-Sur complex (figure 3-2). The Ben Lomond-Felton complex consists of deep loamy soils formed in residuum produced by weathering of granite, sandstone, or metasedimentary bedrock. Ben Lomond and Felton soils are typically well drained, with permeability ranging from moderately slow to moderately rapid. Runoff is rapid to very rapid, and erosion hazard is high to very high. The Ben Lomond-Catelli-Sur complex consists of moderately deep to deep loamy soils formed in residuum produced by weathering of sandstone or quartz diorite bedrock. They range from well drained to somewhat excessively drained; permeability is moderately rapid. Runoff is rapid to very rapid and erosion hazard is high to very high (Soil Conservation Service 1980).

Most of the soil on the proposed Inclusion Area A Preserve is Watsonville loam. The northwest corner of the preserve contains soils of Elkhorn sandy loam and the Ben Lomond-Felton complex.

# Hydrology

Average annual rainfall on the UCSC campus is approximately 30 inches (Warrick 1982). Surface runoff varies throughout the campus, but totals approximately 8 inches per year in Inclusion Area D.

Little is known about the hydrology on campus because much of the area's water flows underground. Most surface streams flow only during storms, with the exception of Cave Gulch and Moore Creek, which continue to flow into the summer months. Surface flows commonly flow into sinkholes or other karst features on campus. These underground flows resurface in springs at lower elevations where the water table intersects the ground surface. Inclusion Area D is drained by the Arroyo Seco and Jordan Gulch watersheds of lower campus (Johnson 1988) (figure 3-3). Arroyo Seco drains the western portion of Inclusion Area D and eventually discharges into the Pacific Ocean between Swift Street and Natural Bridges State Park in the City of Santa Cruz. The Jordan Gulch watershed drains the eastern portion of Inclusion Area D and empties into Neary Lagoon. There are no surface streams, ponds, or channels on Inclusion Area D. Surface water drains through the site by sheet flow that follows site topography from north to south.

Two natural seeps are located in the west central and lower portions of Inclusion Area D south of the proposed Ranch View Terrace development. A survey for plant species usually associated with wet areas was conducted, and the results were used to estimate the size of the seeps (1.3 acres) (Morgan 1989). The UC Regents also installed a series of 7 piezometers in 2002 to monitor ground water levels and to attempt to determine the source of the water that supplies them (Nolan, Zinn, and Associates 2002). Results indicate that an artesian condition exists at the northern seep, in which pressurized water below subsurface rock or relatively impermeable soil flows to the soil surface. The conditions at the southern seep are different, and indicate a semi-perched condition, where downward percolation of water is impeded by impermeable layers in the soil.

Surface conditions of the seeps are highly variable. Generally, water does not pond in the seep areas, nor does the soil remain saturated through the dry summer months. In spring 2002, the seep areas appeared to be no different than the surrounding areas in terms of moisture content or vegetation. However, previous researchers (Reis pers. comm.) have observed saturated soils into April and May.

# Land Use and Management

## Inclusion Area D

### Current Land Use

Inclusion Area D, one of five Inclusion Areas identified in the 1988 LRDP, occupies approximately 25.5 acres. The area is primarily undeveloped and has been managed as open space. The majority of Inclusion Area D (approximately 16 acres) is open grassland. Portions of Inclusion Area D are actively used for purposes that include organic research/cultivation plots, a recycling compost program, and storage and sorting of rock cleared during construction activities on the campus.

The area of Inclusion Area D not currently in use is largely in a seminatural state. Much of the vegetation is ruderal (see *Biological Resources* section of this chapter), probably as a result of past disturbances such as grazing and grain farming. Current yearly maintenance in this area includes mowing the perimeter of the nonnative annual grassland for fire prevention. Inclusion Area D is crossed by a fire road that also requires periodic management (e.g., grading). The fire road runs through the grassland from the nearby historic area, between the Farm and Arboretum, and connects with other fire roads in the lower campus.

The central portion of the site (approximately 5 to 9 acres) supports patches of native bunchgrasses, and was designated as a mitigation site for coastal terrace prairie habitat. Various management activities occurred within this coastal prairie mitigation site over a 3-year period, including the use of experimental manual techniques to clear thatch and nonnative vegetation to enhance the native

vegetation (ABA Consultants and Joni L. Janecki & Associates 1992). Approximately 2 acres were included in a 3-Year Coastal Terrace Prairie mitigation project associated with impacts from the construction of the Music Center in 1997 (ABA Consultants and Joni L. Janecki & Associates 1992). This area was treated with experimental restoration techniques for coastal terrace prairie enhancement, including clearing vegetation and planting native grasses such as purple needle grass (*Nassella pulchra*) and California oat grass (*Danthonia californica*). Although management of the site was discontinued, many native bunchgrasses are still present in the grasslands of Inclusion Area D.

The northernmost portion of Inclusion Area D is currently used as temporary research plots by the UCSC Center for Agroecology and Sustainable Food Systems (Farm). The area is planted in row crops and is irrigated using overhead and drip irrigation. This area is currently separated from the rest of Inclusion Area D by a tall wire fence.

Adjacent to the cultivated portion of Inclusion Area D is a disturbed area that is used to store rock removed from campus construction projects. The rock is stored in numerous large piles, and is in the process of being separated according to size by maintenance personnel using heavy equipment. The heavy equipment used to conduct this work is often stored on the site. Soils and vegetation in and around the rock storage area are highly disturbed.

The northwest portion of Inclusion Area D is covered with gravel and stockpiles of organic compost materials. Operations staff create windrows of organic waste as part of a campus recycling program, and tend them on a weekly schedule. The complete compost product is loaded and trucked to landscape areas on campus.

Although many historic resources are found in the adjacent historic area of UCSC, no historic buildings occur within the Inclusion Area D boundary. Buildings that are proposed for Inclusion Area D will be sited with sensitivity toward the nearby historic area.

There are no easements or other rights-of-way in the southern half of Inclusion Area D, so there are no potential land use conflicts with the proposed Inclusion Area D Preserve.

## Adjacent Land Uses

As described in the 1988 LRDP, current land use designations surrounding Inclusion Area D include: Campus and Community Support (with a historic area overlay) to the east, Protected Landscape to the northeast of Inclusion Area D, and Site-Specific Research north and west of Inclusion Area D (figure 3-4).

The historic area, located to the east of Inclusion Area D, is a historic district eligible for listing in the National Register. The district consists of a combination of contributing and non-contributing buildings and elements. Several of the

buildings have been refurbished to house some of UCSC's administrative services.

Also to the east of Inclusion Area D is an area designated in the 1988 LRDP as Protected Landscape. The land use designation is designed to maintain special campus landscape features for their scenic value, for biological interest, and as wildlife corridors (specific reasons for the designation of this area as Protected Landscape have not been documented). The Protected Landscape area adjacent to Inclusion Area D consists primarily of undeveloped land with minor roadway and utility improvements.

An area to the west and north of Inclusion Area D is designated as Site-Specific Research, and includes the UCSC Farm and Arboretum. The Farm supports row crops, intensive-method farming orchards, greenhouses, classrooms, and farm-related storage. Farm uses within and immediately adjacent to Inclusion Area D include fields farmed in row crops. Many of these fields are irrigated.

The Arboretum, to the west, houses a unique collection of Australian, South African, native Californian, and other Mediterranean climate-adapted vegetation. Many of the specimens in the Arboretum are watered using drip irrigation. Although land use is intense near the Arboretum greenhouses and horticulture buildings, it is sparsely planted and less maintained near the boundary of Inclusion Area D. A large eucalyptus (*Eucalyptus* spp.) grove bounds Inclusion Area D on the southwest. This grove is part of an extensive collection of Arboretum planting and is an overwintering site for Monarch butterflies (*Danaus plexippus*).

## Past Use and Management

Descriptions of past use and management of the Cowell Ranch and other areas in Lower Campus do not specifically distinguish uses of Inclusion Area D from other nearby areas. Therefore, descriptions of past uses of the meadows in Lower Campus are assumed also to apply.

Before European settlement of the lands in and around the UCSC campus, the Inclusion Area D meadows and the adjacent meadows were probably burned on a regular basis by native inhabitants. Burning of the meadows continued into the early 20$^{th}$ century, ceasing around 1911 when significant cattle grazing was implemented.

For instance, the meadows in lower campus, including those in Inclusion Area D, have been grazed more or less continuously since the area was settled by the Spanish (Warrick 1982). More recently, the Cowell family burned the pastures periodically to ensure maximum forage for their livestock, and to allow them to sow oat and barley for seed and feed. Since the property was acquired by the UC Regents, methods of maintaining the lower campus grasslands have included mowing and light grazing.

Fires continued to be lit in or near the campus meadows during the ranching days of the Spanish and Mexican ownership of California in order to maintain open meadows and to increase the yield of forage for cattle. Burning of the meadows continued during the ownership and operation of the lime kilns by the Davis & Jordan Company. Only after the Henry Cowell Lime and Cement Company took over the campus lands were annual burns finally stopped in 1911 (Warrick 1982).

After 1911, the land in and around Inclusion Area D most likely continued to be used for grazing cattle or was planted with nonnative oat and barley grasses for seed and animal feed (Warrick 1982).

After the UC Regents purchased the land from the Cowell Foundation and constructed the UCSC campus, fire prevention vegetation management, grazing and mowing, continued in the meadows in and around Inclusion Area D.

# LPG Site

The LPG site (i.e., the location for the Emergency Response Center equipment storage building) is a concrete pad that is surrounded by a gated and locked chain-link fence. The site contains miscellaneous equipment and debris piles. The site is currently used by UCSC maintenance staff for temporary storage of debris.

# Inclusion Area A

Inclusion Area A and the adjacent Campus Resource Lands are undeveloped and used exclusively for livestock grazing and pedestrian recreation. There are no easements or other rights-of-way within the proposed Inclusion Area A Preserve.

## Livestock Grazing

UCSC currently grazes the 82 acres of Inclusion Area A and adjacent Campus Resource Lands (i.e., all land west of Empire Grade in the southwestern corner of UCSC) to control non-native plants and reduce fire risk. Cattle are managed in this area by an independent operator under a license agreement with the UC Regents. The annual license fee provides the funds for the labor and materials for fencing inspection and maintenance. Inclusion Area A is fenced and gated to control public access and to contain livestock.

The license agreement limits the grazing operator to 45 animal-unit-months (AUM) within the site between July 1 and October 31 each year. Depending on site conditions, the area is grazed approximately 3 months each year by a herd of approximately 15 cattle (3 months X 15 cattle = 45 AUMs). The site may be grazed for a shorter or longer period with more or less cattle to achieve vegetation condition goals. Following above-average rains, the grazing intensity

has been increased to up to 100 AUMs to meet management goals of fuel reduction, with UCSC approval. Horses or weaned calves can be substituted for adult cattle at ratios of 1.5:1 or 0.5:1, respectively. The UC Regents can revoke the grazing license at any time.

The grazing license agreement provides for flexible use of the site "in the interest of sound land management". UCSC land management staff consult with the grazing operator each spring to determine the proper timing and stocking rate for the predicted site conditions that year. The terms of the grazing lease may be modified on an annual basis, based on monitoring results and management recommendations. UCSC staff also frequently consults with scientific experts. For example, UCSC staff has recently retained Dr. Grey Hayes to provide advice on proper grazing techniques and to train UCSC staff on plant identification. Dr. Hayes recently completed his dissertation at UCSC on the effects of grazing on native grasslands and rare plants to optimize the grazing regime for native biological diversity. UCSC also consults with Dr. Karen Holl at UCSC on grazing practices. Specific considerations taken into account when implementing the grazing program each year are described in detail in chapter 5.

### Recreational Trails

Three recreational trails are present on the Inclusion Area A Preserve (figure 1-3), an access road and two informal trails. UCSC policy allows pedestrian use in Inclusion Area A and the adjacent Campus Resource Lands but prohibits bicycle use of these trails at all times. Mountain bikers continue to use these trails illegally, despite patrols by UCSC police. During the adult activity period, UCSC installs temporary fencing and information signs to close the trails and to protect OTB that use portions of the trails in the preserve. The information signs advise hikers of the need to avoid these areas. (This practice will continue as part of this HCP.)

## Biological Resources

### Vegetation

Approximately 40% of the UCSC campus consists of grassland habitat (Warrick 1982). Extensive grasslands occur in both the upper and lower campus. The lower campus is generally dominated by rolling, gently sloping grasslands. These meadows were originally composed of native perennial bunchgrasses. However, land use practices over the last century in these meadows have resulted in the domination of these areas by introduced Mediterranean annual grasses; only a few concentrations of native species remain.

Much of Inclusion Area D now consists of dense nonnative grassland and ruderal upland habitat indicative of relatively recent disturbance. Dominant species include wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), rattlesnake

grass (*Briza maxima*), plantain (*Plantago* sp.), summer mustard (*Hirschfeldia incana*), cranesbill (*Erodium botrys*), wild radish (*Raphanus sativa*), and Italian thistle (*Carduus pycnocephalus*). Isolated patches of native bunchgrasses also occur within Inclusion Area D. Species surviving in these areas include California oatgrass (*Danthonia californica*), purple needle grass (*Nassella pulchra*), and giant wild rye (*Elymus glaucus*). Because the vegetation on Inclusion Area D has not been actively managed for several years, a dense layer of thatch has accumulated on the soil surface.

The LPG site is paved and contains no vegetation. Berms that surround the site on three sides support sparse weedy vegetation.

Inclusion Area A is dominated by grassland habitat. A fringe of mixed evergreen forest bounds the western perimeter of the site. Grassland habitat in Inclusion Area A is similar to that in Inclusion Area D but has a lower density, vegetation height, and lower density of exotic species than on Inclusion Area D because of livestock grazing. In addition, the southern half of Inclusion Area A supports Mima mound and swale topography that may be classified as coastal terrace prairie habitat, and is characterized by native perennial grasses. California oatgrass is particularly prominent, and although nonnative annual grasses are still present, they are less abundant in the Mima mound and swale areas than in drier portions of Inclusion Areas A and D. Coastal prairie areas are much more mesic than other grasslands on campus, and support a diverse assemblage of native perennials, including coyote thistle (*Eryngium armatum*), dwarf brodiaea (*Brodiaea terrestris*), Kellogg's yampah (*Perideridia kellogii*), coast trefoil (*Lotus formosissimus*), and Olney's sedge (*Carex gynodynama*).

## Wildlife Species

Wildlife species that may use Inclusion Area D include common local species associated with grassland communities, as well as species that are tolerant of previously disturbed sites and sites frequented by humans. Bird species observed in Inclusion Area D include: mourning dove (*Zenaida macroura*), western meadowlark (*Sturnella neglecta*), white-crowned sparrow (*Zonotrichia albicollis*), turkey vulture (*Cathartes aura*), and Anna's hummingbird (*Calypte anna*). Reptiles such as western fence lizard (*Sceloporus occidentalis*) and gopher snake (*Pituophis melanoleucus*) were also seen using the site. Numerous mammal species were also detected such as black-tailed deer (*Odocoileus heminous*), meadow vole (*Microtis californicus*), pocket gopher (*Thomomys bottae*), and brush rabbit (*Sylvilagus bachmani*).

Other wildlife species that likely occur in the area include racoon (*Procyon lotor*), coyote (*Canis latrans*), and opossum (*Didelphis virginiana*). Raptor species such as white-tailed kite (*Elanus leucurus*), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*) are known to use the site for foraging. Sensitive species such as Monarch butterflies (*Danaus plexippus*) and bats (e.g., fringed myotis (*Myotis thysanodes*), Townsend's big-eared bat

(*Corynorhinus* (=*Plecotus*) *townsendii*)) that occupy nearby wooded areas may also occasionally forage along the margins of Inclusion Area D.

# Plan Species

Species covered by this HCP (Plan Species) are the California red-legged frog (*Rana aurora draytonii*) and the OTB (*Cicindela ohlone*). A description of status, distribution, ecology, and occurrence on and near the permit area of each species is provided below. Additional information and details of the distribution of the Plan Species are included in appendix A, "California red-legged frog habitat assessment," and appendix B, "OTB habitat assessment."

## California Red-Legged Frog

### Status and Range

The California red-legged frog is listed as threatened under the ESA and meets requirements for "rare, threatened, or endangered species" under the California Environmental Quality Act (CEQA).

The historic range of the California red-legged frog extended along the coast from near Point Reyes National Seashore (Marin County), and inland from Redding (Shasta County), south to northwestern Baja California (Hayes and Jennings 1986; Hayes and Kremples 1986). The current distribution of this species is reduced to isolated localities in the Sierra Nevada, northern Coast Ranges, and northern Transverse Ranges. The species is still common in the San Francisco Bay area and along the central coast. It is also believed to exist in the southern Transverse Ranges and Peninsular Ranges (U.S. Fish and Wildlife Service 2000).

### Distribution and Habitat

California red-legged frog habitat generally contains permanent or ephemeral water sources with emergent and/or submerged vegetation; riparian areas; and upland areas (U.S. Fish and Wildlife Service 1999). The distribution of CRLF among breeding and nonreproductive aquatic, and upland habitats is determined by the different requirements of each life stage and by variations in climate.

California red-legged frog breeding habitat typically includes deep pools and backwaters in streams and creeks; ponds; and lagoonal or estuarine areas with salinities <4.5 parts per thousand (ppt). The most suitable habitats are deep (>2.3 feet), still or slow-moving water bodies that support dense, shrubby riparian or emergent vegetation (U.S. Fish and Wildlife Service 1999). Even better are pools that dry in the late summer, allowing larval CRLF to

metamorphose, but preventing predators such as mosquito fish (*Gambusia affina*) and bullfrogs (*Rana catesbeiana*) from becoming established.

Nonbreeding aquatic habitat for CRLF includes permanent or ephemeral creeks, ponds, seeps, and other wetland features. Bodies of water should be large enough to allow frogs to escape predators by jumping to the center of the pool, or contain enough cover and moisture to support frogs seeking refuge.

Both adult and juvenile frogs use aquatic nonbreeding habitat. Adult frogs move between breeding and nonbreeding habitat during the breeding season, and seek refuge in nonbreeding habitat as the ponds dry in late spring and summer. Intense competition from adult frogs within breeding ponds makes the presence of nonbreeding habitat especially important for juvenile frogs. Reis (1999) found juvenile CRLF most often in shallow aquatic habitats with limited shoreline or emergent vegetation. More open vegetation structure may provide juveniles with small breaks in the vegetation for basking and foraging, while supplying adjacent refuge and cover (Jennings and Hayes 1988). Ecosystems West (2000) reported that in the nearby Waddell Creek and lagoon system, juveniles remain farther upstream during the reproduction season.

During dry periods, CRLF are seldom found far (approximately 325 feet or less) from water. However, during wet weather, individuals may make overland excursions through upland habitats over distances of as much as 3 miles (Rathbun and Schneider 2001; U.S. Fish and Wildlife Service 2000; Allaback pers. comm.; Reis pers. comm.). These dispersal movements are generally straight-line, point-to-point migrations rather than following specific habitat corridors (Rathbun and Schneider 2001). Dispersal distances are believed to depend on the availability of suitable habitat and prevailing environmental conditions. Very little is known about how CRLF use upland habitats during these periods.

During the summer, some populations of CRLF typically disperse from their breeding habitat to forage and seek summer habitat if water levels drop significantly or if the water source dries completely (U.S. Fish and Wildlife Service 2000). This habitat may include shelter under boulders, rocks, logs, industrial debris, agricultural drains, watering troughs, abandoned sheds, or hayricks. California red-legged frogs also use small mammal burrows, incised stream channels, and areas with moist leaf litter (Jennings and Hayes 1994; U.S. Fish and Wildlife Service 1999, 2000).

## Life History

California red-legged frogs breed from November through April (Storer 1925; U.S. Fish and Wildlife Service 2000). Males usually appear at the breeding sites 2 to 4 weeks before females. Females are attracted to calling males. Females lay egg masses containing 2,000 to 5,000 eggs, which hatch in 6 to 14 days, depending on water temperature (U.S. Fish and Wildlife Service 2000). Larvae metamorphose in 3.5 to 7 months, typically between July and September (Storer 1925; Wright and Wright 1949; U.S. Fish and Wildlife Service 2000). Sexual

maturity is usually attained by males at 2 years of age and by females at 3 years of age.

Adult CRLF can live as long as 8 to 10 years (Jennings et al. 1993), but the average life span is probably much shorter (U.S. Fish and Wildlife Service 2000). Most mortality occurs during the tadpole stage (Licht 1974). No long-term studies have been conducted on the population dynamics of CRLF.

## Threats

The viability of existing CRLF populations is threatened by numerous human activities that often act synergistically and cumulatively with natural disturbances such as droughts and floods (U.S. Fish and Wildlife Service 2000). Human activities that result in the degradation, fragmentation, and loss of habitat include agriculture, urbanization, mining, overgrazing, recreational use, timber harvesting, water impoundments and diversions, degradation of water quality, introduction of nonnative plants, and introduction of nonnative predators.

Although the population of CRLF along the central coast of California appears to be more stable than the state's other populations, increasing urban development could result in continuing loss and fragmentation of habitat and could create barriers to dispersal of frogs between neighboring populations (U.S. Fish and Wildlife Service 2000). Isolated populations are more vulnerable to increased predation from nonnative predators, changes in hydroperiod due to variable wastewater outflows, and increases in toxic runoff from developments. All of these conditions can reduce the viability of affected frog populations. Poorly managed recreation, mining, and timber harvesting activities can also have significant detrimental effects on remaining habitat through disturbance, contamination, and introduction of nonnative species that prey on or compete with CRLF.

## Occurrences of California Red-Legged Frog on and near Campus

Occurrences of CRLF on and near the UCSC campus have been detailed in reports by Ecosystems West (2000) and Jones & Stokes (2002a) and are shown in figures 3-5, 3-6a, and 3-6b.

Site assessments for CRLF have also been prepared for UCSC in conjunction with past planning activities (Ecosystems West 2000; University of California, Santa Cruz 1988; Environmental Assessment Group 2000; Jones & Stokes 2002b). Additional studies on CRLF have been conducted by researchers in lower campus aquatic locations such as Moore Creek and the College 8 detention pond (Fusari pers. comm., Allaback pers. comm.).

These surveys indicate that almost all of the CRLF activity documented on campus is associated with the Moore Creek drainage. Confirmed sighting

locations are shown on figure 3-5. They include the breeding population at the Arboretum pond and adult frogs found adjacent to the Arboretum mist house; adult and sub-adult frog(s) observed in east Moore Creek between Empire Grade and the Arboretum pond; adult frogs observed in student project ponds adjacent to Moore Creek, immediately east of Oakes Field; and adult frogs observed along the east fork of Moore Creek adjacent to Oakes College (Ecosystems West 2000). Frogs probably use upland habitat near the Arboretum pond, but the direction in which CRLF disperse, and the distances they travel, are unknown. There have been no verified reports of frog sightings on the Farm (Leap pers. comm., Bernau pers. comm.).

The nearest observation of CRLF off campus was recorded approximately 0.4 mile northwest of the North Campus area, west of Empire Grade (figure 3-6a). Two adult CRLF were found in a small pool below a culvert along Adams Creek, a tributary of Wilder Creek (Ecosystems West 2000; figure 3-6a). All other known locations of CRLF observations are south and southwest of the campus (figure 3-6b). These locations include breeding populations of frogs located 1 to 1.8 miles from UCSC at two agricultural ponds in Wilder Ranch State Park, at an agricultural pond near Highway 1 and at several ponds within the Granite Rock Company sand quarry. Observations of nonbreeding CRLF have been recorded at locations 1.3 to 2 miles from UCSC, including Antonelli Pond; a site along Highway 1 between the Granite Rock Company sand quarry and Moore Creek (roadkill); a pond at Natural Bridges State Park; Wilder Creek and Lagoon; near the northern boundary of Terrace Point; and Old Dairy Gulch Lagoon.

## Potential for California Red-Legged Frog to Occur in the Permit Area

There have been no verified reports of sightings of CRLF on Inclusion Area D or the LPG site. No surveys for frogs have been conducted on these sites, because they contain only upland habitat and no survey methods are available to reliably detect this species in upland habitat. The potential for occurrence of CRLF on the sites must therefore be inferred from habitat conditions, surrounding land use, the site's proximity to known breeding sites, and the site's position relative to potential dispersal corridors.

### Inclusion Area D

No aquatic habitat occurred on Inclusion Area D in 2002 and no breeding habitat was present (Jones & Stokes 2002a). In 2002, the seeps in the middle of Inclusion Area D were no wetter than the surrounding areas and did not support vegetation characteristic of wetland areas. Under these conditions, the seeps do not provide any additional habitat value to CRLF beyond that offered by adjacent upland areas. However, the wet conditions observed in previous years may have provided better upland habitat for CRLF than the adjacent dry grasslands. Because of the topography of the site and the ephemeral nature of the groundwater hydrology, the seeps are unable to support breeding habitat for CRLF.

Inclusion Area D is marginally suitable for aestivation by CRLF. Small mammal burrows—probably created by northern pocket gopher (*Thomomys talpoides*)—occur on the site at a low to moderate density. Although frogs are not expected to aestivate on Inclusion Area D, these burrows may occasionally provide aestivation habitat for CRLF. The vegetation on Inclusion Area D is also relatively thick and likely reduces the frogs' ability to traverse the site and find the burrows. The nearest breeding site is the Arboretum pond, located approximately 1,500 feet from the western edge of Inclusion Area D. Although CRLF are known to travel as much as 3 miles during warm, wet, rainy nights (U.S. Fish and Wildlife Service 2000), frogs are much less likely to travel long distances through dense, dry vegetation during the summer to seek refuge or to find aestivation sites. Instead, when the Arboretum pond dries (typically for several months each fall), frogs most likely seek out aestivation sites in the immediate vicinity of the pond. The area surrounding the pond remains relatively moist because of the dense vegetation along its margins. Since aestivation habitat of better quality is available closer to the known breeding site at the Arboretum pond, CRLF are not expected to use Inclusion Area D for aestivation.

Because of the area's proximity to the Arboretum pond, frogs may attempt to travel or move through Inclusion Area D. However, Inclusion Area D is not considered a dispersal corridor, because it is not located between any aquatic habitats. Moreover, numerous hazards to CRLF are located around Inclusion Area D (figure 3-5). For example, Inclusion Area D forms the edge of urbanization that leads into the City of Santa Cruz, south and east of the site. No suitable habitat is present within the city's urban boundary, so the site does not function as a migratory corridor to suitable aquatic habitat, but rather functions as a dead-end for any frogs that may find their way into the area. Because of the large extent of disturbed and weedy vegetation, the lack of aquatic habitat, and the current dry condition of the seeps, Inclusion Area D also does not provide any significant resource values for CRLF.

The portion of Inclusion Area D that is currently in use by the Farm (approximately 4 acres) is planted in row crops and is irrigated through the dry summer months. It is unknown whether the irrigation attracts frogs, although it may provide some moisture during the summer. There have been no verified reports of frog sightings on the Farm; however, frogs may move through the Farm during warm rainy nights. It is unlikely that the Farm forms a barrier to frog movement; farming activities are unlikely to deter frogs because the frogs tend to move at night and farming activities occur during the day.

In summary, there is no evidence that CRLF currently use Inclusion Area D, although they may attempt to move through it or use it infrequently for aestivation. There is no potential breeding habitat on the site, no aquatic habitat, and aestivation habitat is marginally suitable. Inclusion Area D does not function as a dispersal corridor because of barriers around the site, lack of destination for frogs, and thick vegetation on-site.

### Inclusion Area A

California red-legged frogs are known to occur in the Wilder Creek/Cave Gulch and Moore Creek watersheds (Inclusion Area A is located between these two watersheds). The evergreen forest habitat present along the slopes of the drainage for Wilder Creek/Cave Gulch provides shade and a cool, moist corridor for the species to use. The adjacent grassland habitat may provide a dispersal corridor between frog populations in the Wilder Creek/Cave Gulch watershed and the Moore Creek watershed on campus. No surveys have been conducted in this area to determine whether frogs use Inclusion Area A. However, use of the site is considered likely due to its proximity to the Arboretum Pond and known sightings in Wilder Creek, and its high-quality habitat.

Mima mound and swale topography in Inclusion Area A provides high quality upland habitat for CRLF dispersal. The topographic low areas between the Mima mounds remain wet for extended periods during the winter and spring, providing moist resting habitat for dispersing frogs. The wet areas also often facilitate the growth of native plant species and decrease the amount of nonnative weedy species. Small temporary ponds also form along the swales (approximately 25–40 square feet in size), providing resting and foraging places for frogs (these ponds are too small and too temporary to provide suitable breeding habitat). Such conditions increase the habitat value for the species.

UCSC currently allows cattle to graze the area, and this practice maintains relatively short vegetation (up to approximately 8–10 inches tall before grazing), which is considered high-quality movement habitat for CRLF (see section *Livestock Grazing* below for more details on current grazing practices). Vegetation cover across the site ranges from 80-100%, primarily by grasses; herb cover is less than 20%, and often less than 5%. Livestock grazing prevents the buildup of litter (i.e., thatch) so that it remains at very low levels (less than 10% cover). In other parts of Santa Cruz and Monterey Counties, shrubs such as coyote brush (*Baccharis pilularis*) can invade grasslands and convert them to coastal scrub. There are several individuals of coyote brush in Inclusion Area A that are heavily browsed and stunted, suggesting that cattle also prevent scrub invasion of the grassland. The vegetation on Inclusion Area A facilitates dispersal by red-legged frogs by providing cover (i.e., protection from predators) and resting areas, while also allowing unhindered movement through the site.

### Other Sites in and near Permit Area

California red-legged frogs have a low likelihood of occurring on the LPG site. Frogs dispersing from the Arboretum pond 1,800 feet away may seek temporary refuge under the debris piles on the site. The site is adjacent to a small temporary pond that may be used by dispersing frogs (Jones & Stokes 2002; see “eucalyptus pond,” appendix A, figure 4).

On the eastern edge of the Farm there is a concrete-lined ornamental pond approximately 10 feet in diameter. This pond is fenced and contains some aquatic and emergent vegetation. Although it offers aquatic habitat for CRLF, it is unlikely that frogs would use the site because of the lack of upland cover, the small size of the pond, its close proximity to high levels of human activity, and its distance from the Arboretum Pond (approximately 2,000 feet). Sites to the

east and northeast of Ranch View Terrace have little or no potential to support red-legged frogs. The primary access road to the Ranch View Terrace site is already disturbed and does not support any vegetation. It occurs down a steep ridge, which may be a barrier to red-legged frog movement, and is farther from the Arboretum pond than Inclusion Area D.

# Ohlone Tiger Beetle

## Status and Range

The OTB is a federally listed endangered species (U.S. Fish and Wildlife Service 2001) and meets the requirements for a "rare, threatened, or endangered species" under CEQA.

Freitag et al. (1993), describers of this new beetle species, noted that because of the beetle's apparent restriction to clay-based, marine terraces that support native grassland remnants in the coastal mid-Santa Cruz County area, much of its former habitat within this portion of Santa Cruz County and similar areas in neighboring San Mateo and Monterey counties had already been converted for development or other land uses before the new beetle was recognized as a species in 1993. For this reason, they suggested that it was unlikely that the OTB would be found in many other locations. Results of subsequent field surveys have supported this theory.

## Distribution and Habitat

Of the approximately 110 species of tiger beetles that have been described in North America (Boyd and Associates 1982), the OTB exhibits one of the most restricted geographic ranges. It has been reported at only 15 locations in central and western Santa Cruz County (figure 3-7).

The description of this new species was based on specimens collected from three sites in central Santa Cruz County between 1987 and 1992:

- on Winkle Avenue in Soquel (1 on figure 3-7), which is the type locality of the OTB, and is also known as the Santa Cruz Gardens Project site;
- in the complex of meadows that are part of Marshall Field (4, 6, 7 and 15 on figure 3-7) in the upper portion of the UCSC campus; and
- on the former Bombay property (now the Moore Creek Open Space managed by the City of Santa Cruz) at the western end of Meder Street in Santa Cruz (3 and 11 on figure 3-7).

After the publication of the Freitag et al. paper (1993), a fourth site supporting the beetle was discovered above the Vine Hill Elementary School (2 on figure 3-7), and a fifth site was discovered at Pogonip City Park (5 on figure 3-7) adjacent to the UCSC campus. Surveys in the grasslands that lie west and largely

downslope of Empire Grade have resulted in the discovery of several additional OTB locations on the UCSC Campus (10), a private ranch (9 and 12), an area that includes portions of private ranches plus a portion of Wilder Ranch State Park (8, 9, and 12), and a second location on the Wilder Ranch state park (14). In spring 2000, the OTB was discovered on private property near Western Drive (13 on figure 3-7).

Each of the occurrences of OTB is limited in extent to 5 acres or less, and is geographically separated from other OTB areas. However, potential habitat for the species (i.e., open space on Tierra-Watsonville complex or similar soils, but with vegetation too dense to support beetles) may link some of the areas currently occupied by OTB.

Although the potential exists for this range-limited beetle to occur in other locations in the county supporting similar habitat, the beetle has not yet been found in other similar areas that have been checked. The OTB appears to be presently restricted to coastal terrace situations, at low to mid-elevations (lower than 1,200 feet), located between the crest of the Santa Cruz Mountains and the Pacific Ocean.

Ohlone tiger beetle inhabits areas characterized by remnant stands of native grassland, in particular coastal terrace prairie. California oatgrass (*Danthonia californica*) and purple needlegrass (*Nasella pulchra*) are two native grasses known to occur at all sites. Within these grasslands, the beetle has been observed primarily on level ground and less frequently on slopes, where the vegetation is sparse or bare ground is prevalent. The substrate at each known beetle location consists of shallow, poorly drained clay or sandy clay soils that have accumulated over a layer of bedrock known as Santa Cruz Mudstone (Freitag et al. 1993). The soils at all known OTB sites, as mapped by the Soil Conservation Service (1980), are Tierra-Watsonville complexes, but the recent survey by NRCS (2002) indicates that other soils, similar to Tierra-Watsonville complex occur at many of the locations known to support the beetle. The county's soil map (Soil Conservation Service 1980) does not indicate that Tierra-Watsonville complex is present in the portion of Inclusion Area D proposed for development.

## Life History

Ohlone tiger beetle females lay eggs within the soil, specifically in Tierra-Watsonville complex soils or Bonnydoon soil series. It is not known how many eggs are laid by the females, but other species within the family lay between 1 and 126 eggs per female (U.S. Fish and Wildlife Service 2001). Larvae emerge from the egg and harden, enlarging the chamber where the egg was laid into a tunnel (Pearson 1988; U.S. Fish and Wildlife Service 2001). Tunnel length varies depending on the larval development stage, species, season, and substrate, but ranges from approximately 6 to 75 inches (Pearson 1988; Willis 1967).

Larvae are caterpillar-like (campodeiform) and remain within the burrow, coming to the surface to hunt, lunging at and seizing passing invertebrate prey (U.S. Fish and Wildlife Service 2001). To aid in hunting, burrows are circular

and flat, with no dirt piles or mounds around their edges. Larvae undergo three instars and then plug the entrance to the burrow to create a chamber for pupation. After pupation, the adult OTB will dig out of the soil and emerge.

The larvae of most tiger beetles occur in a narrower range of microhabitats than their adult stages, probably because they tolerate less variation in many physical factors, especially soil moisture, soil composition, and temperature (Pearson 1988; Shelford 1907, 1909). Larvae of other tiger beetle species that live in grasslands typically build their tunnels at the edges of the bare or sparsely vegetated portions of the grassland where adult beetles are most commonly observed (Knisley and Schultz 1997; Pearson and Vogler 2001).

Collection records indicate that most adult OTB are active from mid-January through mid-May, although the duration and timing of the adult activity period can vary from year to year and between places within a particular year. Specific dates when beetles have been observed range from January 17 through May 11 (Freitag et al. 1993; BUGGY Data Base 2003). Reproduction, foraging, and dispersal activities occur during this time. If disturbed, OTB have been observed flying to densely vegetated areas (Freitag et al. 1993; U.S. Fish and Wildlife Service 2001).

The diurnally active adults and larvae of the OTB are associated with sunny areas of bare or sparsely vegetated ground. Adults run rapidly in and near the larval habitat. They are strong flyers for short distances, however data on related taxa indicate that longer dispersal flights may occur with the aid of wind or storms (Knisley and Hill 1989). Because they are cold-blooded, are active during the winter and spring months, and favor microhabitats that are sparsely vegetated and can become quite warm during their activity period, adults and larvae typically spend a considerable portion of their daily activity thermoregulating.

Both adults and larvae of tiger beetles are opportunistic, preying on smaller, soft-bodied insects and invertebrates. Adults possess good visual acuity and are found on sunny glades of bare or sparsely vegetated soil, where they actively search for potential prey. In contrast, larvae remain in their tunnels and ambush prey that wander within their striking distance. Specific prey items of the OTB are not well known, but include at least ants, spiders, and earthworms, while prey for other species of tiger beetles have been identified as ants, adult and larval flies (*Diptera*), tiny insects, small beetles, and worms (Larochelle 1974).

## Threats

Ohlone tiger beetles are threatened by habitat destruction and fragmentation by development, and habitat degradation from exotic invasive plants. They are vulnerable to local extirpation from catastrophic events or from natural fluctuations in their population because they are limited both geographically on a regional scale and in the extent of local occurrences. Populations are also small and geographically separated. Areas fragmented by urban development prevent natural gene flow between sites. The small size of the habitat and small population size of beetles increases the likelihood that natural occurrences, such

as erosion, may extirpate beetle populations without the possibility of recolonization.

Nonnative plants such as French broom (*Cytisus monspessulanus*), velvet grass (*Holcus linatus*), and rattlesnake grass (*Briza major*) convert open areas that provide habitat for burrowing and thermoregulating into heavily thatched, shaded areas that are inaccessible to beetles and do not provide the sunlight necessary for their thermoregulation. Nonnative plants also can reduce the number, distribution, and diversity of prey species that OTB rely on for food. Active management of vegetation, using various tools, including grazing, is necessary to maintain open areas critical to the persistence of OTB.

## Occurrences of Ohlone Tiger Beetle on and near Campus and in the Permit Area

Known locations and potential habitat for OTB both on and near campus have been surveyed for the presence of OTB adults and burrows (appendix B). All known locations of the species occur on Tierra-Watsonville complex or similar soils along trails and in bare areas within meadows. Many of these sites are surveyed and/or monitored annually by entomologists.

Ohlone tiger beetles are known to occur in two locations on campus: Inclusion Area A and Marshall Field (figure 3-7). Beetles are active in the southwest portion of Inclusion Area A. At both campus locations, OTB are found along trails and in barren or sparsely vegetated areas within meadows.

Ohlone tiger beetles are also known to occur in areas near the campus. Beetle populations have been identified in Gray Whale State Park, Pogonip City Park, Moore Creek Open Space, as well as on private lands south and southwest of UCSC. Gray Whale State Park is located to the west of campus across Empire Grade, Pogonip City Park is directly east of UCSC, and Moore Creek Open Space is southwest of campus. All of these populations are within 2 miles of the campus. The Inclusion Area D Preserve would be the only remaining undeveloped area of the Tierra-Watsonville complex soil between the Inclusion Area A and Pogonip populations of OTB; the Inclusion Area D Preserve is approximately equidistant between the two.

Potential habitat for the OTB has been identified to the northwest, northeast, and east of Inclusion Area D on grasslands mostly without soils of the Tierra-Watsonville complex (other soil types may have unmapped inclusions of Tierra-Watsonville soils within them) (appendix B). However, no beetles have been observed in these areas.

### Inclusion Area D

No OTB adults or burrows have been found on Inclusion Area D in surveys in 2002 (appendix B) and 2003. The closest known campus population occurs in Inclusion Area A, located approximately 0.6 mile to the west of Inclusion

Area D. The other known campus location in Marshall Field is over 3 miles to the north.

The southern portion of Inclusion Area D (south of the proposed development area) has been mapped as Tierra-Watsonville complex (Soil Conservation Service 1980; Natural Resources Conservation Service 2002) (figure 3-1), indicating that it may be suitable for OTB (U.S. Fish and Wildlife Service 2001). Current vegetation conditions on almost the entire site, however, are unsuitable for use by beetles. The grassland in Inclusion Area D has become dominated by tall, dense, nonnative vegetation and the ground is covered by deep thatch.

The only project area that currently provides suitable but unoccupied habitat for OTB is a maintenance road along the eastern edge of Inclusion Area D. Vegetation along the road is mowed to provide occasional access by maintenance vehicles. This road provides approximately 0.2 acre of sunlit bare or sparsely vegetated patches that could provide habitat for OTB. No beetles or burrows have been found in this area in recent surveys.

### Inclusion Area A

Ohlone tiger beetle occupies approximately 0.2 acre of Inclusion Area A (and the Campus Resource Land within it) in three distinct areas: along the north/south trail in grassland at the edge of the mixed evergreen forest, along the southern boundary fence, and along a small trail that leads northwest from the entrance gate along Empire Grade[6]. Approximately 0.1 acre of the 0.2 acres of occupied habitat within Inclusion Area A and Campus Resource land lies within the Inclusion Area A Preserve. The population of OTB in Inclusion Area A is thought to form the northern edge of a previously observed larger, denser population on the adjacent privately owned ranch. Approximately 0.1 acre of suitable but unoccupied habitat occurs along the east-west access road and trail that traverses the site.

Much of the soil on the lower portion of the Inclusion Area A Preserve is classified as Tierra-Watsonville complex, which is known to support OTB (Soil Conservation Service 1980; U.S. Fish and Wildlife Service 2001). The topography of the area is dominated by Mima mounds and swales. Grasslands away from the roads and trails are not considered suitable habitat for the species. The lower elevation, wetter areas formed from the Mima mound topography are too wet to support OTB. The role of moisture in the life history of the species, however, is still unknown. UCSC currently grazes Inclusion Area A and the adjacent Campus Resource land with cattle (see section *Livestock Grazing* below for more details on current grazing practices). Cattle grazing or other types of vegetation management are thought to be critical to maintaining suitable habitat for OTB in the proposed Inclusion Area A Preserve. Grazing decreases the height and density of vegetation and thatch, and with proper timing and intensity, increases the proportion of native grass species (D. Raven pers. comm.). This in turn increases the amount of bare or sparsely vegetated portions of the grassland where adult beetles are most commonly observed. Sparsely-vegetated and bare

[6] Due to the sensitivity of the species, precise locations of adult Ohlone tiger beetles or larval burrows are not included in this HCP.

areas maintained by grazing and trail use are thought to be essential for successful foraging and breeding by OTB.

The most recent monitoring of OTB on Inclusion Area A detected five times the number of adult beetles than larval burrows (75 and 15, respectively) over the beetle activity period in 2003 (appendix B). This indicates that relatively few beetles complete their life cycle on Inclusion Area A; the mima mound and swale topography remains wet through most of the adult activity period, leaving limited areas of higher elevation available for larval burrows. Thus, the presence of larger numbers of adult beetles suggests that adults are immigrating to Inclusion Area A from nearby locations, and that early stages of OTB are developing off-site.

### Other Sites in and near Permit Area

No beetles are known or expected to occur on any sites of the Emergency Response Center (in or out of the permit area) because of a lack of suitable habitat (these areas do not contain Tierra-Watsonville complex soils). The LPG site is paved, and the surrounding Eucalyptus trees shade portions of the ground, rendering it unsuitable for beetles.

Chapter 4

# Effects on Covered Species

## Introduction

This chapter evaluates the potential effects of the covered activities on Plan Species. The impact analysis is based on the activities described in chapter 2 and the ecological information on Plan Species summarized in chapter 3, appendix A, and appendix B. Direct, indirect, and cumulative effects on each of the Plan Species and estimated levels of take are described below.

This HCP meets the requirements of Section 7 and assists the Service with its internal consultation. Under Section 7, Federal agencies must ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify listed species' critical habitat. Proposed actions must be evaluated in terms of their direct and indirect effects on listed species. Service regulations define indirect effects as "those that are caused by the proposed action and are later in time, but are still reasonably certain to occur" (50 CFR 402.02). In this HCP, indirect effects on Plan Species are those that may occur during occupancy of Ranch View Terrace and include effects to Plan Species habitats adjacent to the proposed housing project.

## Effects on California Red-Legged Frog

### Direct Effects

#### Construction-Related Take

There is a low probability that CRLF would move through the Ranch View Terrace site during the construction period. Because CRLF are largely nocturnal, they probably will not move through the Project site while construction activities are occurring. However, they may be present at the start-up of daily construction activities. Construction activities during the winter may also create depressions in bare soil that could fill with water and that may attract frogs to the Project site.

If a CRLF occurs on the site during construction activities, individuals may be harassed[7], injured, or killed by construction vehicles or equipment.

Construction of the equipment storage site for the Emergency Response Center on the LPG site includes construction of the Butler building and construction-related movement of debris. These activities have a low potential for harassing, injuring, or killing red-legged frogs if construction occurs during the rainy season.

It is unlikely that frogs occur on the LPG site because it is fenced, paved, and surrounded by an earthen berm. The site does not provide any suitable natural habitat for frogs. However, red-legged frogs have been known to seek refuge in or under buildings or debris piles (U.S. Fish and Wildlife Service 2002). Although unlikely, frogs dispersing from the Arboretum pond (approximately 2,000 feet away) may seek temporary refuge under the existing debris piles on the site. If these debris piles are moved or cleared during the red-legged frog dispersal period and frogs are present, frogs could be harassed, injured, or killed by construction vehicles or equipment.

Application of the construction avoidance measures described in chapter 5 will greatly reduce the impact to frogs and likely eliminate the potential for take.

## Removal of Marginal Upland Habitat

Development of Ranch View Terrace will result in the loss of approximately 7.5 acres of annual grassland, which is marginal upland habitat for CRLF. The remaining 5.5 acres of the development footprint, including the dirt access road, rock pile, and compost area, are highly disturbed and are unsuitable for use by CRLF.

Excavation of the gas pipeline trench in the eucalyptus grove south of Ranch View Terrace will temporarily disturb approximately 500 square feet (0.01 acre) of marginal upland habitat that may occasionally be used by dispersing frogs. No natural habitat for red-legged frog would be removed by construction of the ERC equipment storage building.

In summary, a total of 7.5 acres of marginal upland habitat for CRLF would be removed by the covered activities. The removal of this habitat is not considered take because it does not meet the definition of "harm" under the ESA[8]. The removal of this habitat, in and of itself, will not kill or injure CRLF because of its marginal quality. This habitat does not support breeding and provides only marginal feeding and sheltering areas.

[7] "Harassment" is defined by Federal regulation as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering."

[8] "Harm" under the ESA is defined by Federal regulation as "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering." (50 CFR 17.3).

# Indirect Effects

## Ranch View Terrace

### Roadkill on New Roads

Because frogs have never been seen on the site, the overall chance of roadkill of red-legged frogs on new Ranch View Terrace roads is considered very low. Roadkill or injuries to CRLF caused by vehicles operated lawfully on designated public roads is not a violation of Section 9 of the ESA (U.S. Fish and Wildlife Service 1996), although it is considered an impact under NEPA and Section 7 of the ESA.

Development will create or improve approximately 3,800 linear feet of four roads on the Ranch View Terrace site: the primary access road (improve approximately 600 feet of existing road), the primary loop road (approximately 1,400 feet of new road), secondary emergency and service road (improve approximately 600 feet of existing road), and utility access road (improve approximately 600 feet of existing road). Road development will create vehicle traffic in Ranch View Terrace and introduce the potential for roadkill of CRLF that may move across roads. Chances of such roadkill will be greatly reduced by the new barriers to movement posed by the housing development and new landscaping. The placement of the roads to the interior of the project will ensure that the frogs encounter the development and landscaping first. The presence of human activity should deter frogs from proceeding toward the interior road. However, daily use of the primary loop road by residents may injure or kill CRLF, if any occasionally move through the Project site. The risk to frogs will be greatest after dark, when their movements are most likely to occur, although vehicular traffic is expected to be lowest during this time.

Periodic use of the secondary service road between the Arboretum and Farm may also result in injury or mortality of frogs. California red-legged frogs are not known to occur on the Farm, however, and frog movement between the Arboretum and Farm is expected to be non-existent to low. Because the secondary road will be closed to residents, vehicular traffic will be light. Periodic use of the utility access road along the eastern edge of Inclusion Area D may also injure or kill frogs if any occasionally move through the area. Frog movement across the road is expected to be extremely low or nonexistent because the utility road borders developed areas to the east. Utility vehicle traffic on this road will be infrequent.

### Predation

Occupancy of Ranch View Terrace may increase the population of animals known to kill or injure CRLF in other areas, including domestic cats and dogs, feral cats, and native wildlife such as raccoons and opossums (*Didelphis virginiana*). Dogs and cats will be allowed in faculty housing on Inclusion Area D under restricted conditions. Cats may also roam toward frog habitat west

of Ranch View Terrace. Garbage, recycling waste, pet food, and unauthorized feral cat or wildlife feeding stations may also attract feral cats and native wildlife to the Project site. Free-ranging animals may harass, injure, or kill CRLF that move occasionally through the Project site.

### Reduction in Quality of Remaining Upland Habitat

Project development and occupancy would indirectly and adversely affect 12.5 acres of marginal upland habitat for CRLF in the southern half of Inclusion Area D. Exterior lights along roads and among housing clusters will increase the amount of artificial illumination adjacent to remaining marginal upland habitat and may reduce habitat quality for nocturnal CRLF. Development of Ranch View Terrace will also increase the extent of impermeable surfaces from buildings and roads upslope from remaining marginal upland habitat. Impermeable surfaces may collect urban pollutants containing heavy metals, hydrocarbons, and fertilizers and may increase surface stormwater flow. Chemical loading and erosion of remaining upland habitat may result. These indirect impacts will collectively reduce the quality of the habitat on the undeveloped portion of Inclusion Area D. None of these effects would cause take of red-legged frogs, but are considered an impact under NEPA and Section 7 of the ESA.

## LPG Site

### Ongoing Take from Operations

Ongoing use of the LPG site has a low potential to affect CRLF. As discussed above, the LPG site is paved, fenced, and surrounded by a earthen berm. The site does not provide any suitable natural habitat for frogs. However, red-legged frogs have been known to seek refuge in or under buildings or debris piles (U.S. Fish and Wildlife Service 2002). Although unlikely, frogs dispersing from the Arboretum pond (approximately 2,000 feet away) may seek temporary refuge under the existing debris piles on the site or debris piles that are created during on-going use. If these debris piles are moved or cleared during the red-legged frog dispersal period, frogs could be injured or killed.

## Vegetation Management on Preserves

Cattle grazing is currently used as a vegetation management tool west of Empire Grade on Inclusion Area A and the adjacent Campus Resource Land. Livestock grazing may continue within the new Inclusion Area A Preserve to meet vegetation management goals. Livestock grazing may also be used in the Inclusion Area D Preserve for vegetation management. Livestock grazing will have beneficial effects on CRLF and their habitat (including the high-quality habitat provided by the mima mound and swale topography) in both areas.

Grazing will reduce thatch and the density and diversity of non-native plants, both of which may limit the ability of CRLF to disperse.

Livestock grazing reduces the height of wetland vegetation found in swales on Inclusion Area A, but does not appear to affect wetland vegetation cover or plant density (wetland vegetation approaches 100% cover in most swales). This does not affect habitat suitability for CRLF. Grazing intensity on Inclusion Area A is light enough and temporary enough that effects such as trampling appear to have minimal effects on wetland soils. The moist conditions suitable for red-legged frogs would therefore remain when grazing continues.

Cattle will not likely result in take of individual CRLF because grazing will be conducted during the dry season and outside of the primary dispersal period for frogs. Cattle will also have no direct effects to the riparian area along Wilder Creek. A fence along the western boundary of the grassland in Inclusion Area A blocks livestock access to Wilder Creek.

This analysis is consistent with the Service's final rule listing the CRLF as threatened, in which they state "light to moderate carefully managed livestock grazing that prevents or minimizes the excessive trampling of riparian and wetland habitat" is not expected to result in a violation of Section 9 of the ESA (U.S. Fish and Wildlife Service 1996).

## Estimated Level of Take

HCPs are required to determine the amount of incidental take that may occur as a result of covered activities and that will be authorized during the take permit term (50 CFR 17.22[b]). The following estimate of take considers the avoidance and minimization measures described in chapters 2 and 5.

Incidental take of CRLF may occur as a result of construction activities on the Ranch View Terrace or LPG sites, or from on-going use of the Ranch View Terrace or LPG site. In the unlikely event that frogs disperse through the Ranch View Terrace site, they may be harassed by Ranch View Terrace residents or their pets, or injured or killed by people, pets or vehicles. Frogs dispersing through the Inclusion Area D Preserve could also be taken by people or pets that illegally use the Preserve. Although unlikely, frogs using the LPG site as temporary refuge could be unintentionally harassed, injured or killed by UCSC maintenance staff using the site. There will be no take of frog larvae or tadpoles because there is no breeding habitat on the Ranch View Terrace site or on the LPG site. The maximum level of take that could occur during the 60-year permit term is estimated to be 60 frogs, which includes incidences of unintentional harassment or harm. The Regents request take authorization for up to 60 frogs during the permit term and up to 3 frogs per year. Actual take is expected to be substantially lower given the marginal quality of upland habitat on both Project sites and the avoidance and minimization measures that will be implemented.

## Cumulative Effects

Implementation of Ranch View Terrace may incrementally contribute to cumulative loss or degradation of CRLF habitat. In this HCP, the cumulative effects of the Project on CRLF are assessed relative to past, present, and reasonably foreseeable projects. Cumulative effects are evaluated within the Moore Creek watershed. The Moore Creek watershed was chosen as the unit of analysis because the population on UCSC is likely part of a larger population within this watershed. As discussed in the habitat assessment for CRLF (appendix A), CRLF occurring in the lower reaches of Moore Creek may utilize suitable non-breeding aquatic and upland habitats for dispersal within and between Moore, Wilder, and Cave Gulch Creeks, including portions of UCSC.

The historic distribution of CRLF in the Moore Creek watershed is unknown, but they likely occurred throughout grasslands and riparian areas near suitable aquatic sites. Much of the Moore Creek watershed east of Moore Creek has been developed with the expansion of the City of Santa Cruz, likely removing extensive breeding and upland aestivation and dispersal habitats. The City of Santa Cruz is largely built out east of Moore Creek. The remaining undeveloped areas of the Moore Creek watershed are either protected (e.g., Wilder Ranch State Park, Natural Bridges State Park, Younger Lagoon Natural Reserve, Antonelli Pond Preserve, and Moore Creek Preserve), or in agricultural production.

It is unknown whether development of the UCSC campus has contributed to the past cumulative loss and degradation of CRLF habitat in the Moore Creek watershed. Prior to the City of Santa Cruz building the dam that formed the Arboretum pond, it is unknown whether red-legged frogs would have had sufficient aquatic habitat to support a population on campus. Furthermore, because of the karst geology on campus, natural ponds are rare or ephemeral and all streams are ephemeral. Because of the limited amount of future development expected, the vast majority of effects on CRLF within the watershed have already occurred, and these have occurred off-campus.

There are several proposed projects within the Moore Creek watershed. A 3.5-acre subdivision was recently approved by the City of Santa Cruz on a disturbed site adjacent to UCSC across Empire Grade (City of Santa Cruz 2002). Although the site is less than 1,500 feet from the Arboretum pond, it was determined not to support CRLF or habitat for red-legged frogs because the site is disturbed and occurs at the edge of urban development (Ecosystems West 2002a).

Development of the UCSC Campus Core may occur in the future. UCSC is also currently assessing the feasibility of developing facilities in the largely undeveloped North Campus. There is no habitat for CRLF in these areas because of their distance from the Arboretum pond and lack of suitable upland or aquatic sites. Future development in these areas will not contribute to cumulative habitat loss for the species. However, development of these areas may increase traffic on Empire Grade and the potential for roadkill of CRLF. Stormwater runoff from intensification of the Campus Core may contribute to erosion in Moore

Creek and reduce the value of CRLF habitat downstream. Because campus projects are required to control and meter stormwater runoff, the indirect effects of Campus Core development on CRLF habitat may be reduced. New projects such as Core West Parking and the Physical Sciences Building, for example, have incorporated these measures. No other development on campus that could affect CRLF is currently planned.

Planned expansion of the Marine Science Campus on the University's 98-acre coastal property located at the western edge of the City of Santa Cruz will remove ruderal, nonnative grassland and coastal scrub habitat. These non-aquatic habitats are not likely used by CRLF, as no frogs have ever been observed in these areas during surveys conducted between 1993 and 2002 and as these habitats provide poor cover and foraging resources for frogs (Ecosystems West 2002b). Several CRLF have been observed in a small pool along a drainage ditch on the northern boundary of the site (3 individuals in 1997 [Mori 1997] and 1 in 2002 [EcoSystems West 2002b]). California red-legged frogs have not been observed elsewhere on the site during surveys conducted between 1993 and 2002; however, frogs may use aquatic habitats on the northern and western margins of the site for dispersal between the lower Moore Creek and Wilder Creek drainages (Ecosystems West 2002b). It is unlikely that CRLF breed or regularly occur in the lower Moore Creek watershed because suitable habitat in this area is highly degraded by large populations of non-native predators (bullfrogs and fish), which prey on red-legged frogs (EcoSystems West 2002b). While this is the case, development will not occur on any aquatic habitat to protect suitable CRLF habitat and potential dispersal routes on the site.

The Ranch View Terrace Project on Inclusion Area D will contribute to these cumulative effects by removing 7.5 acres of marginal upland habitat for CRLF.

## Effects on Critical Habitat

There is no designated critical habitat for the CRLF on the UCSC campus; therefore, no effects on critical habitat would result from covered activities.

# Effects on Ohlone Tiger Beetle

## Direct Effects

As discussed in chapter 3, “Environmental Setting,” OTB do not use the Ranch View Terrace Project site or the LPG site. Beetles may, however, fly into the Ranch View Terrace site during or immediately after grading. Because the LPG site does not support suitable habitat, the ERC equipment storage building would have no effect on OTB.

The Permit Area for this HCP also includes the proposed permanent habitat preserve on Inclusion Area A and adjacent Campus Resource Land. OTB are

active on this site and may be affected by proposed management or monitoring activities.

## Construction-Related Take

Grading and trenching for Phase 1 Ranch View Terrace Project is expected to occur from August to December. Because this is outside the adult activity period for the OTB, project grading is likely to have no impact on the species. If grading occurs during the beetle activity period, however, OTB may be attracted to the site because grading activities will clear vegetation and open areas currently unsuitable to the species. Beetles have been observed to colonize areas within a few feet from a known population when cleared of vegetation. In 2003, beetles were observed colonizing recent pig rooting areas in Lower Marshall Field in a relatively high density. Mating and oviposition was observed in the pig rooting area in the same season in which it occurred, suggesting OTB are capable of rapid colonization of recent clearings.

The nearest on-campus beetle population is 0.6 mile from the Project site, but the flight range of beetles during their activity period and the distance from which they could be attracted to the site are unknown. Research on another endangered tiger beetle (*Cicindela dorsalis dorsalis*) in the eastern United States showed they can readily disperse over unsuitable habitat 5-11 miles from where they were originally observed (Knisley and Hill 1989). In addition, other tiger beetle taxa have been known to disperse long distances with the aid of wind or storms (Knisley and Hill 1989). However, field observations on OTB suggest that the chance of beetles colonizing the Ranch View Terrace construction site is low. However, the possibility cannot be dismissed entirely because of the unavailability of data. If OTB fly into the Project site during their active flight season (January to May), they may be harassed, injured, or killed by construction activities including vegetation clearing, grading, building construction, hardscape development, and landscaping. Because Ranch View Terrace is on Elkhorn sandy loam, OTB are not expected to breed on the site. Because data are inconclusive, the development site may contain inclusions of Tierra-Watsonville complex or similar soils that provide suitable breeding habitat. Because OTB do not occur within 0.6 mile of the Project site, the potential for take during construction is considered extremely low.

## Management- and Monitoring-Related Take on the Inclusion Area A Preserve

Cattle annually graze Inclusion Area A for 3 to 4 months from July through October, outside the activity period of OTB. Grazing creates open and bare ground and keeps grasses short creating a habitat that is beneficial to the beetle. However, some OTB larvae that occur on the site may be injured or killed by cattle if they crush burrows during the early larval development period when eggs are close to the soil surface. After this period (1$^{st}$ or 2$^{nd}$ instar), larvae have burrowed deeper in the soil and may be unaffected by trampling. Even if their

natal burrow collapsed, larvae could emerge from the soil by tunneling an alternate location. Beetles may be accidentally injured or killed by personnel during HCP monitoring activities on the Inclusion Area A Preserve.

Bicycles are not allowed on any trails within Inclusion Area A or the adjacent Campus Resource Land. Despite patrols by UCSC police, mountain bikers continue to use these trails illegally and may crush OTB adults, burrows, larvae, or eggs. UCSC is implementing measures to prevent illegal activities from occurring on Inclusion Area A and to reduce the potential for take from the legal and illegal use of trails on Inclusion Area A including posting signs and installing temporary fencing during the past two beetle adult activity periods.

# Indirect Effects

## Effects of Project Development on Grassland in Inclusion Area D

Construction and occupancy of Ranch View Terrace on the northern half of Inclusion Area D may indirectly affect the 12.5 acres of annual grassland in the southern half of Inclusion Area D. This habitat is currently unsuitable for OTB but could be made suitable through vegetation management. Ranch View Terrace may affect the suitability of this area for OTB. Exterior lights along roads and among housing clusters will increase the amount of artificial illumination adjacent to this area, which may alter the normal seasonal photoperiod pattern of OTB, potentially changing the emergence time of juvenile beetles. Ranch View Terrace may also create a partial barrier to the dispersal of OTB within their known range.

These effects may reduce the quality of the annual grassland in the undeveloped portion of Inclusion Area D and may affect the future suitability of this area for OTB. These impacts are not considered take but are considered impacts under NEPA.

Take of OTB within the Ranch View Terrace Project site is not expected because the preserve fencing and the housing units themselves will serve as partial barriers to beetle movement. Moreover, there would be no suitable habitat within the development site and few areas of bare ground that might be attractive to beetles. Unlike other insects, tiger beetles are not thought to be attracted to lights at night. Take may be possible, however, from human activity (e.g., crushing by pedestrians or bicycles) or by outdoor pets. If take occurs, it would be very infrequent and would likely be offset by the beneficial effects of vegetation management on the Inclusion Area D Preserve if beetles colonized the site. The Service generally considers occupancy of housing to have a negligible or no effect on OTB (Orton-Palmer pers. comm.). However, if any take of OTB occurs as a result of occupancy of the Ranch View Terrace Project, that take is covered by this HCP.

### Removal of Unoccupied but Suitable Habitat

Construction of the new utility road will remove approximately 0.20 acre of unoccupied but suitable habitat for OTB along the utility corridor on the eastern edge of Inclusion Area D. The mowed grass corridor contains barren or sparsely vegetated patches that provide suitable OTB habitat. Surfacing on the proposed utility road will eliminate patches of bare ground required by the species for foraging and reproduction. Because this habitat is not occupied and the impact is very small, the impact is not considered take but is considered an impact under NEPA.

## Cumulative Effects

The Project site is not known to be occupied by OTB; nevertheless, construction of Ranch View Terrace may incrementally contribute to cumulative loss of potential expansion areas available to the beetles. In this HCP, the cumulative effects of the Project on OTB are assessed relative to past, present, and reasonably foreseeable projects. Projects are evaluated at seven sites that support known OTB populations in or adjacent to UCSC. This area was chosen as the unit of analysis because genetic exchange may occur between OTB at UCSC and at these sites. Isolated populations in Soquel and Scotts Valley are not considered in this HCP.

The historic distribution of OTB in the vicinity of UCSC is unknown, but they likely occurred more extensively on coastal terraces within mid-coastal Santa Cruz County. Much of the coastal prairie habitat has been developed with the expansion of the City of Santa Cruz, and this development has likely removed and fragmented OTB habitat. Some remnant coastal prairie sites are protected within Wilder Ranch State Park, Pogonip Park, and Moore Creek Preserve. One small parcel on the western edge of the City of Santa Cruz currently supports OTB. While it has not yet been developed, there is a pending proposal that would develop a portion of the site and protect the remainder via a conservation easement. No other known or potentially suitable OTB habitat remains in the developed areas of the City of Santa Cruz.

Development of the west side of Santa Cruz has contributed to the cumulative loss and degradation of OTB habitat. The former extent of suitable habitat or OTB on the UCSC campus is unknown. Tierra-Watsonville complex occurs in Lower Campus in small patches. The development of Porter College, Kresge College, the Arboretum, and facilities in the southeastern corner of the campus occurred on Tierra-Watsonville complex so may have removed suitable habitat for the OTB. However, development on campus has contributed to the cumulative loss of Tierra-Watsonville complex soils to a much lesser extent than residential expansion in Santa Cruz. Vineyard development on private ranches has also contributed to the loss of occupied OTB habitat. There are also unknown levels of on-going take from the legal and illegal use of open and closed trails on UCSC and in Wilder Ranch State Park from hiking, jogging, and

mountain biking. UCSC and the California Department of Parks and Recreation are implementing measures to reduce these impacts.

No projects that may affect potential OTB habitat are planned on campus.

## Estimated Level of Take

As described above, incidental take of OTB may occur during construction of Ranch View Terrace or during management and monitoring activities on the permanent habitat preserves. Quantifying take of OTB is difficult given the lack of data on population size and dispersal capability (Orton-Palmer pers. comm.). Moreover, monitoring take in a quantitative way would also be difficult because of the small size of individuals and their relatively brief and variable activity period. Take of larvae would be impossible to quantify because they occur beneath the soil surface. Because of the difficulties in estimating the level of take to individual OTB, take is estimated by the size of the area in which take could occur. Using this method, take of OTB may occur within 26 acres of the permit area (13 acres on the Ranch View Terrace Project site and 13 acres in the Inclusion Area A Preserve) by the mechanisms described above. If it occurs, take would be most likely to occur within occupied habitat (approximately 0.1 acre in the Inclusion Area A Preserve).

The proportion of the OTB population at UCSC that may be subject to take is expected to be extremely low. In addition, the avoidance and minimization measures incorporated into the Project will likely reduce incidental take further.

## Effects on Critical Habitat

Critical habitat for the OTB has not been designated by the Service; therefore, no effects on critical habitat would result from the covered activities.

# Effects on Other Listed Species

There are no other species on or near the Ranch View Terrace site listed under the ESA; therefore, no other ESA-listed species will be affected.

Chapter 5
# Conservation Strategy

## Introduction

The conservation strategy includes five types of conservation measures:

- construction avoidance and minimization measures,
- project design elements that minimize impacts,
- habitat preservation,
- habitat enhancement, and
- long-term habitat management.

The conservation strategy is designed to mitigate the impacts of the covered activities on the Plan Species and achieve the biological objectives of this HCP (table 1-2). The conservation strategy is based upon:

- the level of impact to each species as a result of the covered activities,
- the ecological requirements of the Plan Species,
- the conservation needs of the Plan Species (U.S. Fish and Wildlife Service 2001, 2002), and
- discussions with species experts and Service staff.

Conservation measures were designed to benefit both Plan Species whenever possible. The UC Regents will be responsible for the proper implementation of all measures in this conservation strategy. However, the UC Regents will direct the UCSC campus to implement these measures using their maintenance staff, consultant contractors, and the developer for Ranch View Terrace.

## California Red-Legged Frog

Conservation measures for the CRLF include construction measures and project design elements for Ranch View Terrace that will help to avoid or minimize

impacts to the species. To mitigate for impacts that cannot be avoided, upland grassland habitat will be preserved on and off-site.

# Avoidance and Minimization Measures

## Construction Measures

The UC Regents will implement the following measures before and during all phases of construction of the Ranch View Terrace Project to avoid and minimize impacts to CRLF. Implementation of these measures will support HCP Biological Goal 2 (table 1-1) and achieve HCP Biological Objective 2 (table 1-2) for the CRLF.

- At least 30 days before activities begin, a UC representative will submit to the Service the name(s) and credentials of biologists who will conduct activities specified in the following measures. Only Service-approved biologists may conduct project-related avoidance and mitigation measures for CRLF.
- Under the supervision of an approved biologist, the developer will use the following protocol to clear vegetation and debris that may provide cover for CRLF on the construction site:
  - A biologist will perform a pre-construction survey of the Project site for CRLF.
  - After an approved biologist has declared the area free of frogs, the developer may use heavy equipment to completely remove all of the vegetation and debris, and may begin work.
  - If CRLF are found on site the approved on-site monitor or approved biologist will order the crews to stop construction work immediately. The biologist will remove the frog from the Project site and place it in a safe location near the Arboretum pond. The biologist will then re-inspect the site. Construction may resume when the biologist ensures that no frogs are within the construction site.
  - Within 1 working day of finding dead, injured, or sick frogs on the construction site, an approved biologist will notify the Service at the Ventura Field Office orally and within 5 calendar days in writing. Notification in writing will include, at a minimum, the date and time, when the specimen was found and its location, as well as information about the conditions under which the frogs were found.
- The developer will install fencing around the perimeter of the construction site to minimize disturbance to upland habitat outside the construction site by

work crews and equipment. The purpose of this fencing is to exclude construction equipment but allow passage by frogs[9].

- During construction activities, the developer will remove from the work site or properly contain all trash that may attract predators of CRLF.
- Within the first week of construction activities, an approved biologist will conduct a training session for the construction superintendents. Training will include, but is not limited to:
  - legal obligations of the UC Regents to the Service as a result of the HCP and IA,
  - description of CRLF and its habitat,
  - importance of CRLF and its habitat,
  - measures that are being implemented to conserve CRLF as they relate to the Ranch View Terrace project,
  - procedures to follow in case CRLF are found on the Project site, and
  - ways to prevent the creation of attractive nuisances for CRLF.

  One person on-site (e.g., the construction superintendent) will be designated as the on-site monitor. The on-site monitor will be responsible for calling UCSC staff if a frog is found on site or a biologist is needed to inspect standing water (see below).

  The biologist will also provide the superintendent with copies of a 1-page handout that lists these legal obligations and contains photos and a clear physical description of the Plan Species, and instructions if the Plan Species are found on-site. The superintendent will distribute this handout to all construction personnel that might come in contact with the Plan Species (e.g., equipment operators, landscaping contractors). Handouts will be printed in English and Spanish.

  The biologist will conduct an additional site visit at the beginning of each rainy season to conduct refresher training for construction superintendents and to emphasize the need for heightened monitoring of the construction site during the rainy season for frogs and standing water. Refresher training will also be conducted whenever there is a change in the on-site monitor. UCSC staff, as part of their site inspections, will check up on the construction contractor to ensure that the avoidance and minimization measures are being followed.

- Standing water greater than 4 inches deep on the construction site may attract red-legged frogs and increase the risk of take. There is likely no minimum size of pond that will attract frogs, although the larger the pond, the more

[9] Amphibian exclusion fencing was considered for the conservation strategy to minimize the chance of a California red-legged frog entering the construction site. This technique was rejected, however, because of the risk to frogs from predators that might take advantage of the fence, the high cost of monitoring the fence, and the difficulty in designing a fence that is 100% effective at excluding the species.

likely a frog could find it. To minimize this attraction, the on-site monitor will monitor the construction site for standing water greater than 4 inches deep on a regular basis. If standing water of this depth or greater remains on the site for more than a week, the on-site monitor will notify UCSC staff immediately in order for an approved biologist to survey the pond for red-legged frogs. If frogs are found in the pond, the removal protocol described above will be followed. When the pond is clear of frogs, it will be filled in.

A biologist will also conduct a pre-construction survey of the LPG site if initial construction of the Butler building on this site occurs during the rainy season. No avoidance or minimization measures are proposed for on-going use of the LPG site due to the low risk of take, the small size of the site, and the highly variable nature of its on-going use by UCSC maintenance staff. The avoidance and minimization measures will be a requirement of contracts for the construction of the Ranch View Terrace Project.

## Project Design Elements

The Developer and UCSC have incorporated features into the design of the Ranch View Terrace project that will minimize impacts to CRLF as a result of Project occupancy. All of the design features will be implemented by the Ranch View Terrace developer. Implementation of these measures will support HCP Biological Goal 2 (table 1-1) and achieve HCP Biological Objective 3 (table 1-2) for the CRLF. All design features apply to the Ranch View Terrace development area (13 acres) unless otherwise noted.

### Design Features

- No ornamental ponds or other standing water sources will be constructed in the common areas of Ranch View Terrace that may attract CRLF.
- Drought-tolerant, low-water-use landscaping will be used in common areas, especially along the perimeter of the Project, to minimize the attractiveness of the site to CRLF.
- Waste and recycling receptacles that discourage foraging by CRLF predators, such as raccoons (*Procyon lotor*), will be used in common areas throughout Ranch View Terrace.
- Exterior lighting will be installed in common areas that emphasizes low-intensity, focused, directional lights to reduce light spillage into adjacent open space. This approach will minimize disturbance to CRLF and other nocturnal wildlife.
- The primary loop road will primarily be built on the interior of the Ranch View Terrace site (the southern portion of the road is along the boundary of the proposed Project site), away from sensitive habitats, to minimize the chance of roadkill of CRLF (see figure 2-2).

- Open fencing will be installed at most of the perimeter of the Ranch View Terrace site to minimize pedestrian traffic through sensitive habitats in the Inclusion Area D Preserve.
- Stormwater drainage will be directed into stormwater drain infrastructure (a detention basin or recharge system as described in chapter 2) to maintain the hydrologic conditions south of the Project including within the Inclusion Area D Preserve.

## Ongoing Use Restrictions

- Dogs and indoor cats will be allowed in Inclusion Area D housing under restricted conditions enforced by the Campus Animal Control Officer. Dogs will be required to be on a leash at all times while outside. The area where dogs can be exercised would be clearly defined. Owners will be required to register their pets with the Campus Animal Control Officer. The Campus Animal Control Officer or Campus Police will conduct daily patrols of the Ranch View Terrace area. These restrictions are designed to prohibit cats and discourage dogs from entering the Inclusion Area D Preserve and harming or killing CRLF[10].
- UCSC staff will produce and distribute an informational flyer to all owners of Ranch View Terrace units describing the Plan Species (with photos), the nature of the HCP, and the obligation of residents to try to avoid harassing or injuring the Plan Species in the unlikely event they occur on site, including their obligations regarding pets. The informational material will also include a phone number to call to report sightings of Plan Species. Material will be distributed during the permit term to new owners and renters, and whenever unit ownership or renter changes.
- Maintenance staff will use pesticides and herbicides only in landscaped areas of Ranch View Terrace and following all label directions during application. The application of herbicides and pesticides is not expected to affect CRLF because of its limited application and distance from known frog locations. However, the application of herbicides and pesticides cannot be covered by the Service and is therefore not a covered activity in this HCP.
- Any modifications to the common areas during Project use (e.g., landscaping changes) will be consistent with the restrictions and goals of this conservation strategy.

[10] These pet provisions are the same as those at Cardiff Terrace on UCSC. The Campus Animal Control Officer or Campus Police will conduct daily patrols at Ranch View Terrace. Further, the officer has had no problems enforcing those provisions at Cardiff Terrace and does not expect anything different at Ranch View Terrace (J. Holtz, pers. comm.).

# Habitat Preservation and Management

## Inclusion Area A

The primary conservation measure intended to mitigate Project impacts on CRLF will be the preservation of 13.0 acres of grassland and forest habitat on UC land adjacent to Wilder Creek (figure 1-3). This site, to be temporarily called the Inclusion Area A Preserve, was chosen because of its high value for the species, the presence of the largest population of OTB known in Lower Campus (see discussion in chapter 3). Implementation of this measure will support HCP Biological Goals 1 and 2 (table 1-1) and achieve HCP Biological Objective 1 (table 1-2) for the CRLF.

Of the 13 acres within the Inclusion Area A Preserve, approximately 11 acres are located on Inclusion Area A and approximately 2 acres are on Campus Resource Lands. Inclusion Area A is one of several Inclusion Areas designated in the 1988 LRDP to provide "University-affiliated, non-academic facilities advantageous to the functioning of the campus community" (University of California, Santa Cruz 1988). A previous study concluded that Inclusion Area A could support between 235 and 255 dwelling units, as well as a public school (Turnbull et al. 1991). This high density of development was based on the site's proximity to utilities and easy access via Empire Grade, a public road. Campus Resource Lands are areas not currently planned for extensive development; they are properties reserved for future potential development on campus. A change in the site's land use designation will ensure the permanent protection of the high quality grassland and forest habitat that occurs there.

CRLF are known to occur in the Wilder Creek/Cave Gulch and Moore Creek watersheds. The evergreen forest habitat present along the slopes of the drainage for Wilder Creek/Cave Gulch provides shade and a cool, moist corridor for the species to use. The Inclusion Area A Preserve is located between Wilder Creek/Cave Gulch watershed and the Moore Creek watershed on campus, and may provide a dispersal corridor between these two frog populations. Assuming CRLF use this movement route, preservation of lands in Inclusion Area A would promote genetic exchange between the two populations and enhance the long-term viability of the species in the area.

The preserve is adjacent to the 4,505-acre Wilder Ranch State Park so it provides important connectivity to that large open space for CRLF. Wilder Ranch State Park supports known locations of CRLF (figure 3-6b). Although the Inclusion Area A Preserve is not connected to protected areas on campus, the campus may in the future consider protecting more of Inclusion Area A and Campus Resource Lands to expand the preserve and connect it to the Environmental Reserve adjacent to Empire Grade.

Mima mound and swale topography in and around the proposed preserve provides high quality upland habitat for CRLF aestivation and dispersal. The topographic low areas between the Mima mounds remain wet for extended periods during the winter and spring, providing moist resting habitat for

dispersing frogs. The wet areas also often facilitate the growth of native plant species and decrease the amount of nonnative weedy species. Such conditions increase the habitat value for the species. UCSC currently allows cattle to graze the area, and this practice maintains the vegetation in a condition that benefits CRLF (see Habitat Management section below). This site also provides high quality habitat for other wildlife species, including raptors and small mammals.

## Habitat Management

The goal of management for CRLF will be to maintain current conditions of the approximately 11 acres of grassland found on the Inclusion Area A Preserve (as described in chapter 3) using the methods described below. UCSC currently permits grazing on the 82 acres of Inclusion Area A land and the adjacent Campus Resource Lands (i.e., all land west of Empire Grade), including the proposed preserve. The primary purpose of the cattle grazing is to reduce fuel loads and fire hazard. Grazing also helps to promote the growth and persistence of native grass and herb species while controlling the growth and seed production of nonnative weedy species. As described in chapter 3, grazing increases the quality of upland habitat for wildlife species, including CRLF, by reducing the biomass and density of residual dry matter (i.e., thatch), maintain a low to moderate vegetation height, and reducing the proportion of exotic plants. This increases the amount of open area available by frogs for dispersal and foraging. The species benefits from this vegetation structure and composition because it provides enough cover for dispersing frogs, while not hindering movement through the area. Habitat value is also increased by the presence of small mammal burrows, which the frogs use for refuge and aestivation.

The current vegetation management program of livestock grazing will continue in all of Inclusion Area A, including within the Inclusion Area A Preserve, to maintain current conditions. Livestock grazing on the Inclusion Area Preserve cannot be managed separately from the rest of Inclusion Area A because the preserve will not be fenced and 13 acres is too small an area for cattle to graze independently. Because of this limitation, vegetation in all of Inclusion Area A will therefore be managed with cattle based on the needs of the Inclusion Area A Preserve. In the future, the vegetation management program may include livestock grazing or other techniques such as mowing or hand clearing.

### Grazing Program

Cattle are managed in Inclusion Area A by an independent contractor under a license agreement with the UC Regents. The license fee provides the funds for the labor and materials for fencing inspection and maintenance. The license agreement limits the grazing operator to 45 AUM within the site. The current grazing schedule permits grazing in the Inclusion Area A Preserve site between July 1 and October 31 each year. With the approval of UCSC, the grazing timing and intensity are changed to achieve fuel reduction and vegetation condition goals. The UC Regents can revoke the grazing license at any time.

To ensure that the impacts of the grazing program are within that evaluated in this HCP (i.e., that impacts to OTB are minimized to the maximum extent

practicable), the Service must approve in writing any changes to the grazing program prior to its implementation if grazing within Inclusion Area A (and the adjacent Campus Resource Land) occurs before May 15 or after October 31 of each year, or is longer than 4 months in duration. The additional time at the beginning of the season will provide needed flexibility in grazing timing to benefit habitat for the Plan Species while still avoiding the adult activity period for OTB.

The grazing license agreement provides for flexible use of the site "in the interest of sound land management". UCSC land management staff will consult with the grazing operator each spring to determine the proper timing and stocking rate for the predicted site conditions that year. UCSC staff also frequently consult with scientific experts such as Dr. Grey Hayes and Dr. Karen Holl, as described in chapter 3. This practice will continue.

Current conditions of the vegetation on the Inclusion Area A preserve will be recorded and assessed through the monitoring program (chapter 6). A Service-approved biologist will conduct annual quantitative vegetation monitoring each spring prior to grazing to determine if the favorable site conditions are being maintained. Vegetation condition will be measured by the biologist in permanent plots or transects and by a site-wide Utilization Index or Residual Dry Matter index. These values will be compared to the baseline condition established in Year 1. Both measures are needed to track both small-scale changes (plots or transects) and larger scale site conditions (Utilization Index or similar index). UCSC land management staff with range management experience will also visually monitor vegetation conditions during the grazing period to determine the optimal time to remove livestock from the area. All of these data will be used to design and guide vegetation management (e.g., grazing timing and intensity) to meet vegetation goals. Monitoring methods are described further in chapter 6.

Weather, soil moisture, and other growth conditions may vary from year to year. Through the adaptive management process, this information will be used to make small changes to the timing and intensity of grazing activities. Changes to the timing of grazing will be coordinated by UCSC land management staff under the direction of a qualified biologist and with input from the Service. The following parameters will be taken into account to determine the timing, duration, and intensity of the grazing program for that year for CRLF.

The current and projected growth of the grassland vegetation is related to annual rainfall and weather patterns. Warm, sunny weather and soil moisture influence vegetation growth, and can subtly affect the ratios, diversity, growth, and persistence of native plants. Results of yearly vegetation monitoring (as described in chapter 6) as well as rainfall totals and predictions will be used to modify the timing and/or intensity of the grazing program as needed to increase the density and diversity of native plants and the amount of bare ground present in the Inclusion Area A Preserve, and/or decrease the height and cover of non-natives. Grazing earlier in the season can be especially effective in the control of non-native species which grow faster and taller than native plants during that time (D. Raven pers. comm.). Native species then have a chance to grow with less competition for resources later in the season. Early grazing must be

balanced with the need to avoid the OTB activity period and moist soil conditions that may increase the chance of damage to beetle larvae (see discussion below under *Ohlone Tiger Beetle*).

Although providing an important service to the grasslands, cattle can impact the grassland habitat negatively if the grazing program is unsupervised or inflexible. Yearly monitoring of the vegetation and soils as described in chapter 6 will ensure that excessive damage to soil and vegetation is avoided by removing cattle from the preserves if necessary, and/or altering the grazing timing, intensity, and/or duration. In addition, changes or additions to fencing (including temporary fencing to exclude cattle from an area or to concentrate the cattle in a small area for a short period of time) may help to achieve vegetation management goals.

Other methods are available for vegetation management, and will be considered if grazing becomes ineffective or infeasible. These choices include raking, mowing, or grazing with goats or other livestock, and are described below.

- **Raking.** Raking involves the physical removal of thatch using manual or mechanized equipment. Raking can be effective at removing a very dense layer of thatch on the ground, but would most likely be feasible for relatively small areas. This method could be employed if cows or other livestock are not effective in preventing the buildup of thatch (they prefer to eat standing live vegetation). Raking would also be effective in managing a relatively small area with great care, since it can be conducted in a discrete period of time with complete control over the intensity and area that is managed.
- **Mowing.** Mowing is a large-scale method of vegetation management that is frequently employed on campus using motorized mowers. Mowing will cut the vegetation, preventing non-native species from going to seed, decreasing the height of vegetation, and reducing fire risk. Mowing typically does not remove the cut vegetation from the site, so to prevent buildup of thatch may be combined with raking. Mowing can be effective if cattle or other livestock cannot be used on the site due to soil conditions, logistical issues, or other reasons.
- **Grazing with Other Livestock.** Grazing can also be conducted with goats or other livestock. These animals tend to be less selective than cattle, and are therefore used to manage thorny or otherwise unpalatable plants such as thistles, ivy, or shrubs. They are also effective in controlling grassland vegetation. Goats are much easier to move and contain (with fencing) than cows, and may need less water. However, their small size and lack of selectivity in food choice can make them less effective on a large scale than cattle.

UCSC will provide the Service with the results of the previous year's grazing program and a tentative plan to modify the program for the coming year, if needed, in each annual report on the HCP. The annual report will also include any relevant research results or advice provided by scientific experts consulted by UCSC on the grazing program. The Service can comment on that report and provide recommendations for the coming season. UCSC will also notify the

Service of any field visits to the site to provide an opportunity for the Service to observe the site conditions and assist UCSC in developing the grazing program for the coming season.

### Management of Invasive Exotic Plants

UCSC maintenance staff will coordinate, under the direction of an approved biologist, the management and removal of invasive exotic plants from the preserve. Because of the dynamic nature of invasive plants, the UC Regents propose management methods that are flexible and adaptable. Invasive exotic species that pose a serious threat to the habitat such as yellow star-thistle (*Centaurea soltitialis*), fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), pampas grass (*Cortaderia jubata*), Italian thistle (*Carduus pycnocephalus*), or bull thistle (*Cirsium vulgare*) (California Exotic Pest Plant Council 1999) will be removed at the appropriate season and with the appropriate removal method (Bossard et al. 2000). The biologist will determine which species to remove based on the species' ecology, its threat to the quality of the grassland habitat, and the potential adverse effects of the removal techniques. The biologist will also determine the appropriate timing of removal to maximize the success of removal efforts (including minimizing the seed bank of the exotic plant) while minimizing adverse impacts to native vegetation and to Plan Species. Removal of small patches of invasive exotic plants (e.g., less than 1 square-foot) will allow reseeding and natural regeneration of natives from adjacent plants. If patches of invasive exotic plants removed are larger than 1 square foot, they may require hand-seeding of native grasses and herbs collected from the Inclusion Area A Preserve to prevent recolonization by invasive exotic species. The need for hand seeding and the methods used will be determined by the biologist based on site conditions and the following guidelines:

**Species Removed.** Patches in which perennial weeds were present may not have a persistent seed bank of perennial weeds with which natives would compete. Patches in which annual weeds were present will likely have a persistent seed bank. Seeding with native plants will be more important after annual weeds were present, depending on the season of removal.

**Season of Removal.** Weeds removed during the growing season can be replaced with native seed collected in the same season. Weeds removed outside the growing season may still have a seed bank of weed seed in the soil that should be monitoring in the next growing season. If weed seeds sprout, they should be removed prior to planting native seeds, if needed.

**Surrounding Species.** Weeds removed from patches of mostly native species will have a higher chance of being replaced by native species than patches surrounded by exotic species. Bare patches surrounded by mostly exotics should be hand seeded with native plants.

### Inclusion Area D

The remaining undeveloped portion of Inclusion Area D (12.5 acres) will be preserved, 5.7 acres of which will be protected and managed as mitigation to benefit the OTB. The remaining 6.8 acres will be managed to benefit CRLF as temporary foraging and movement habitat (CRLF are thought to use the site only rarely, if at all, as described in chapter 3). Vegetation in the Inclusion Area D Preserve will be managed to benefit CRLF and provide vegetation conditions similar to those found in most of the Inclusion Area A Preserve, except for the seep. A higher density and height of vegetation will be maintained around the seep in order to provide additional cover for CRLF and other native species that may use the seep for temporary refuge. Because of the different habitat needs of CRLF and OTB, each portion of the Inclusion Area D Preserve will need to be managed differently. Because of the small size of the Preserve, cattle grazing may not be feasible, so other vegetation management techniques may need to be employed (e.g., grazing by sheep or goats, mowing, or raking).

## Ohlone Tiger Beetle

Conservation measures for OTB involve avoidance and impact minimization, and habitat preservation, enhancement, and management of upland grassland habitat on and off-site. Ohlone tiger beetles are not likely to occupy the Ranch View Terrace development area, because according to the best available information the site only contains Elkhorn sandy soil, which is not a soil type favored by the OTB. Also, the vegetation is too dense for OTB use. Ohlone tiger beetles are not expected to colonize the construction site. However, because there is a possibility that an adult beetle may be attracted to a graded area, and because of the species' rarity, construction measures and project design elements for Ranch View Terrace have been added to avoid or minimize impacts to OTB.

### Avoidance and Minimization Measures

#### Construction Measures

The following construction measures will minimize impacts to the species. Implementation of these measures will support HCP Biological Goal 2 (table 1-1) and help to achieve HCP Biological Objective 3 (table 1-2) for the OTB.

- At least 30 days before the onset of grading or housing construction activities, a UC representative will submit the name(s) and credentials of biologists to the Service who will conduct activities specified in the following measures. Only Service-approved biologists may conduct project-related avoidance and mitigation measures for OTB.

- The developer will install fencing around the perimeter of the construction site to minimize disturbance to upland habitat outside the Ranch View Terrace site by work crews and equipment.
- If grading or housing construction is scheduled during the OTB adult activity period (January through May), an approved biologist will monitor the construction site once each week to determine if the beetle is visiting or otherwise using the Project site.
- If an OTB is found on site crews will stop work in the area immediately and call an approved biologist. The biologist will remove the beetle from the construction site and will relocate it to site pre-approved by the Service that is known to support a beetle population (e.g., Marshall Field or Inclusion Area A). The biologist will then re-inspect the site. Construction may resume when the biologist ensures that no more beetles occur in the construction site.
- Within 1 working day of finding dead or injured beetles on the construction site, the biologist will notify the Service at the Ventura Field Office orally and within 5 calendar days in writing. Notification in writing shall include, at a minimum, the date, time, and location of the specimen and information about the conditions under which it was found.
- Within the first week of grading or housing construction activities, an approved biologist will conduct a training sessions for all construction personnel. Training should include, but is not limited to:
  - legal obligations of the UC Regents to the Service as a result of the HCP and IA,
  - description of OTB and its habitat,
  - importance of OTB and its habitat, and
  - procedures to follow in case OTB are found on the Ranch View Terrace site.

One person on-site will be designated as the on-site monitor (e.g., construction superintendent). The on-site monitor will be responsible for calling UCSC staff if a beetle is found on site. The biologist will also provide the superintendent with copies of a 1-page handout that lists these legal obligations and contains photos and a clear physical description of the Plan Species, and instructions if the Plans Species are found on-site. The superintendent will distribute this handout to all construction personnel that might come in contact with the Plan Species (e.g., equipment operators, landscaping contractors). Handouts will be printed in English and Spanish.

The biologist will make an additional site visit at the beginning of each OTB flight season to conduct refresher training for the construction superintendent and to emphasize the need for heightened monitoring of the construction site during this period. Refresher training will also be conducted whenever there is a change in the on-site monitor. UCSC staff, as part of their site inspections, will check up on the construction contractor to ensure that these provisions are being followed.

Adherence to these construction measures will be a requirement of the construction contracts for the Ranch View Terrace Project.

## Project Design Elements

The developer and the UC Regents have incorporated features into the design of Ranch View Terrace that will minimize potential impacts to OTB from Project occupancy. Except where noted, all of the design features will be implemented by the Ranch View Terrace developer. Implementation of these measures and the avoidance and minimization measures described above will support HCP Biological Goal 2 (table 1-1) and achieve HCP Biological Objective 3 (table 1-2) for the OTB.

### Design Features

- Exterior lighting will consist of low-intensity, focused, directional lights to reduce light spillage into adjacent open space and minimize attractiveness and nuisance to insects, including OTB.
- The developer will install fencing around the perimeter of the Ranch View Terrace site to discourage pedestrians from entering the undeveloped portion of Inclusion Area D.
- The developer will also install fencing along the remaining east side of Inclusion Area D (western edge of the utility corridor) and ensure that the fencing on the other two sides is in good repair to minimize access from off-site. This fencing will be constructed of wire, wood, or any other type of material that is open and does not shade adjacent soil and vegetation to maintain sunlit bare soil on which OTB can thermoregulate.
- UCSC will design signs in conjunction with the Service to educate the public about the habitat value of the undeveloped portion of Inclusion Area D. UCSC will install signs at appropriate locations along the perimeter fence of this area.
- Graded but undeveloped portions of the site (phases 2 and 3) will be hydroseeded with a mixture of grasses and herbs. This vegetation cover will be maintained through supplemental watering or hydroseeding to eliminate any bare ground that may attract beetles to the area.
- Stormwater drainage will be directed into stormwater drain infrastructure (a recharge system as described in chapter 2) to maintain the hydrologic conditions south of the Project including within the Inclusion Area D Preserve. A change in hydrology could affect the soil moisture levels and the vegetation community in the lower portion of Inclusion Area D.
- The utility corridor along the east side of the Inclusion Area D Preserve will be surfaced with an impermeable material such as gravel, asphalt, or a polymer-based composite. This material will allow all-weather access, while preventing OTB from burrowing into the soil along the corridor where they

could be harmed by vehicles, pedestrians, or bicycles. If possible, the surface placed on the corridor will be light in color and varied in texture to decrease the likelihood that OTB will attempt to land on the trail/road surface for thermoregulation.

### Ongoing Use Restrictions

- Dogs and indoor cats will be allowed in Inclusion Area D housing under restricted conditions enforced by the Campus Animal Control Officer. Dogs will be required to be on a leash at all times while outside. The area where dogs can be exercised would be clearly defined. Owners will be required to register their pets with the Campus Animal Control Officer. These restrictions are designed to discourage cats and dogs from entering the Inclusion Area D Preserve and harming or killing OTB.
- UCSC staff will produce and distribute an informational flyer to all owners of Ranch View Terrace units describing the Plan Species (with photos), the nature of the HCP, and the obligation of residents to try to avoid harassing or injuring the Plan Species in the unlikely event they occur on site, including their obligations regarding pets. The informational material will also include a phone number to call to report sightings of Plan Species. Material will be distributed during the permit term to new owners and renters, and whenever unit ownership or renter changes.
- Maintenance staff will use pesticides and herbicides only in landscaped areas of Ranch View Terrace and following all label directions during application. The application of herbicides and pesticides is not expected to affect OTB because of its limited application and distance from known beetle populations. However, the application of herbicides and pesticides cannot be covered by the Service and is therefore not a covered activity in this HCP.

## Habitat Preservation and Management

### Inclusion Area A

Permanent preservation of 13.0 acres in the southwest corner of Inclusion Area A (described above for CRLF) is also proposed as mitigation for impacts to OTB (figure 1-3). Implementation of this measure will support HCP Biological Goals 1 and 2 (table 1-1) and achieve HCP Biological Objective 1 (table 1-2) for the OTB.

The species is known to occupy approximately 0.1 acre of this preserve in two distinct areas: along the north/south trail in grassland at the edge of the mixed evergreen forest, and along the southern boundary fence. Another approximately 0.1 acre of suitable but unoccupied habitat occurs along the east-west trail that traverses the preserve. Much of the soil on the lower portion of Inclusion Area A is classified as Tierra-Watsonville complex, which is known to support OTB (Soil Conservation Service 1980; U.S. Fish and Wildlife Service 2001). The

topography of the area is dominated by Mima mounds and swales. Although approximately 11 acres of grassland occurs in the preserve, the dense grassland is not considered suitable for the species. The preserve is adjacent to Wilder Ranch State Park, which contains a known population of OTB (figure 3-7[11]). The preserve therefore provides important connectivity to that large open space for OTB.

## Habitat Management

Current vegetation management practices (i.e., livestock grazing) and trail use help to maintain the bare and sparsely-vegetated areas that support OTB. Both trail use and livestock grazing are thought to be important to the maintenance of OTB habitat, although it is not clear which factor is more important. Browsing by cattle and trampling by trail users and cattle likely benefit OTB by providing bare areas which the beetles need to thermoregulate, feed, mate, and burrow. Vegetation management will continue on the site to maintain current beneficial conditions for OTB. Techniques that may be used include, but are not limited to, hand-raking, mowing, or grazing by goats, cattle, or other livestock. Trail use will also continue except during the adult activity period. Cattle grazing is currently being used on the site, and it is expected this practice will continue in the future. Through the adaptive management process, small changes to the timing of grazing activities may be implemented in the future to ensure that grazing does not harm OTB during their activity period or harm larvae and burrows when the soil is too wet and soft.

The timing, quantity, and projected amount of rainfall are necessary to determine and/or predict the moisture content of the soil each year. Beetle larvae follow the water table down into the soil as the water level drops and soil dries (U.S. Fish and Wildlife Service 2001). If grazing is to benefit the species, the soil must be dry and stable enough to support cows so that egg and early instar larval burrows of the OTB in the soil are not crushed or damage is minimized. Therefore, cows must not be put on the site when the soil is too wet and soft. However, the cows must be put on the site early enough in the growing season to decrease the growth and persistence of non-native vegetation and maintain the low vegetation height and bare areas needed for Ohlone beetle feeding, reproduction, and thermoregulation.

Changes to the timing of grazing will be coordinated by UCSC land management staff with range management experience under the direction of a qualified biologist and with input from the Service. Approval by Service staff will be required if grazing occurs before May 15 or after October 31, or the grazing period is longer than 4 months. The start date is designed to avoid the activity period for OTB adults.

Livestock grazing on the 0.2 acres of OTB habitat on the Inclusion Area A Preserve cannot be managed differently from the rest of the preserve because of

[11] Note that figure 3-7 does not show the recent addition of Gray Whale Ranch to Wilder Ranch State Park, which connects the park to UCSC.

its small size. However, this area will be monitored separately from the rest of the preserve to ensure that the unique conditions currently present are maintained (see chapter 6 for details). If necessary, additional treatments such as raking, mowing, or hand removal can be applied to the OTB habitat to supplement grazing in order to meet biological goals for OTB. All or portions of OTB habitat can be fenced in the future if necessary to exclude livestock, if monitoring data warrant it.

### Management of Invasive Exotic Plants

UCSC maintenance staff will control invasive exotic plants within the preserve under the instructions of a qualified biologist, as described in the CRLF section above. During the adult activity period, UCSC will install temporary fencing and information signs to close the trails and protect the portions of the trails in the preserve that are used by the OTB. The information signs will advise hikers of the need to avoid these areas (mountain bike use of these trails is prohibited at all times).

No other changes in management are proposed for Inclusion Area A because the quality of habitat for OTB is already high. The existing conditions will be maintained through careful monitoring and adaptive management.

## Inclusion Area D

The remaining undeveloped portion of Inclusion Area D (12.5 acres) will be preserved, 5.7 acres of which will be protected and managed as mitigation to benefit the OTB. The underlying soil of this area is classified as Tierra-Watsonville complex, which is correlated with the presence of the species (U.S. Fish and Wildlife Service 2001). This area currently provides no value for the beetles because of the dense thatch build-up on the soil surface. If the area is enhanced as described below, it may provide habitat and allow for natural colonization. Implementation of this measure will support HCP Biological Goals 1 and 2 (table 1-1) and achieve HCP Biological Objective 2 (table 1-2) for the OTB.

Within the Inclusion Area D Preserve, the UC Regents will manage 5.7 acres of upland grassland habitat within an Ohlone Tiger Beetle Management Area (Management Area) (figure 5-1). The remaining 6.8 acres will be managed to benefit CRLF, as described above. The Ohlone Tiger Beetle Management Area was designed to include areas of higher elevation along the north, east, and south boundaries of the Inclusion Area D Preserve; seeps that are located in the lower areas within the western portion of the site are excluded. The wet soil around the seeps will not support the burrowing activities of the beetle.

The Inclusion Area D Preserve is now the only remaining undeveloped area of Tierra-Watsonville complex soil between the Inclusion Area A and Pogonip populations; the preserve is approximately equidistant between the two. If habitat on the site is made suitable for OTB and the site is colonized, it could

provide a connection between these two existing populations. Because the movement patterns and dispersal distances of the species are not yet known, this concept remains theoretical. Preservation of this site would, however, maintain the potential for OTB use in case this theory proves to be valid.

Even if habitat in the Management Area can be made suitable, it is not known whether the beetles can or will colonize the site on their own. The dispersal distance and patterns of dispersal of OTB are not yet known. It is also unknown if there are barriers that prevent or limit dispersal to the site (e.g., the adjacent eucalyptus grove). The ability of the species to persist on the site should it colonize is likewise unknown. In view of these uncertainties, the goal of habitat enhancement will be to create suitable habitat based on vegetation characteristics, not to ensure occupancy of this site by OTB. Vegetation management of the Inclusion Area D Preserve will be experimental because it is not known whether the site can support OTB.

## Enhancement and Management

The overall goal of enhancement and management is to encourage colonization of the site by OTB by creating suitable habitat within the Management Area (figure 5-1). This goal will be accomplished by reducing the amount of thatch and standing dead vegetation, providing bare areas suitable for OTB, decreasing the density of invasive nonnative grasses and herbs, and increasing the density and diversity of native grass and herb species in the Management Area. Because of the dynamic nature of invasive plants, the UC Regents propose management methods that are flexible and adaptable.

The removal of thatch and standing dead vegetation in the Management Area will be coordinated by UCSC land management staff. Techniques include, but are not limited to, hand-raking, mowing, or grazing by goats, cattle, or other livestock. These methods are described above (see Habitat Preservation and Management, Inclusion Area A). Raking will be needed after initial mowing events as cut vegetation will create a build-up of thatch that would not increase the quality or quantity of potential habitat (e.g., bare open ground). Under the direction of a qualified biologist, UCSC land management staff will coordinate the vegetation management of the Ohlone Tiger Beetle Management Area. Typical vegetation removal will take place in late spring after the OTB adult activity period and when the soil begins to dry. Vegetation enhancement will also include the management of invasive exotic plants.

UCSC will manage invasive exotic plants on all 12.5 acres of the Inclusion Area D Preserve (not on the Ohlone Tiger Beetle Management Area alone). Exotic plant removal is needed on the entire preserve to minimize the spread of these species into the Management Area. The boundaries of the Management Area were determined based on field conditions in fall 2002. Portions of the proposed Inclusion Area D Preserve have been enhanced in the past. Approximately 2 acres were included in a 3-Year Coastal Terrace Prairie mitigation project associated with impacts from the construction of the Music Center in 1997 (ABA Consultants and Joni L. Janecki & Associates 1992). This area was treated with

experimental restoration techniques for coastal terrace prairie enhancement, including clearing vegetation and planting native grasses such as purple needle grass (*Nassella pulchra*) and California oat grass (*Danthonia californica*). Although management of the site was discontinued, many native bunchgrasses are still present in the grasslands of Inclusion Area D. The success of past efforts to introduce native plants suggests that enhancement activities are possible on the site.

The experimental vegetation management described above would continue throughout the permit term. If beetles colonize the site, the UC Regents will maintain the site so that it continues to support beetles. After beetles are detected on the Preserve, UCSC staff, a qualified biologist, and the Service will review the vegetation management program to determine if adjustment is necessary (e.g., timing, intensity, or location) to maintain and, if possible, enhance the new population of OTB.

If it is found through future studies that the Inclusion Area D Preserve cannot support OTB even with proper vegetation management or the site is not important for the species' long-term survival, management of the Preserve could cease before the end of the permit term, but only upon mutual agreement between the UC Regents and the Service.

# Expected Outcomes

The implementation of the HCP is expected to result in a net benefit to the OTB, but in a slight decrease of available upland habitat for the CRLF that is offset by the proposed mitigation.

CRLF will benefit from the permanent protection and management of 13 acres of high quality forest and upland grassland habitat in Inclusion Area A. There will be a net loss of 7.5 acres of marginal upland habitat from construction of Ranch View Terrace. Because of its poor quality and the abundance of better quality upland habitat on campus, the loss of 7.5 acres of this habitat is not expected to harm the population of the species on campus.

Based on the best available information, the Project site on Inclusion Area D does not contain a soil types known to support OTB, so no beetle habitat will be lost. The HCP will benefit OTB with the permanent protection of the Inclusion Area A Preserve and a portion of a known population of beetles. During the life of the permit, the UC Regents will also increase the amount of suitable habitat for beetles by preserving, enhancing, and managing upland grassland habitat on the Inclusion Area D Preserve. After the conservation strategy has been implemented, approximately 23.5 acres of upland grassland habitat will be preserved (11 in the Inclusion Area A Preserve and 12.5 in the Inclusion Area D Preserve). Of this area, approximately 0.1 acre of habitat is currently occupied by OTB, and up to 5.7 acres of habitat will be enhanced to support the species.

Chapter 6

# Monitoring, Reporting, and Adaptive Management

## Monitoring

Monitoring is considered an integral part of the conservation strategy. Monitoring is also an integral component of the adaptive management plan, which is described later in this chapter. The monitoring program is designed to fulfill three purposes:

- to verify the completion of HCP requirements (compliance monitoring),
- to assess the levels of take resulting from Ranch View Terrace (effects monitoring), and
- to monitor and evaluate the effectiveness of the conservation strategy (effectiveness monitoring).

The type and level of monitoring was designed to ensure that the biological objectives of this HCP (table 1-2) are achieved and to be commensurate with the level of impact to the Plan Species expected under this HCP and the duration of the operating conservation program (U.S. Fish and Wildlife Service 1996, as amended in 2000). Tables 6-1 and 6-2 summarize effects and effectiveness monitoring for CRLF and OTB, respectively.

### Compliance Monitoring

Compliance monitoring is required to verify and document that all requirements in this HCP and terms and conditions of the incidental take permit are carried out. For example, a UC representative must verify that the construction avoidance and minimization measures have been implemented successfully. UCSC staff will conduct the compliance monitoring, except for the technical monitoring, which will be conducted by contract biologists for all phases of the project. Compliance monitoring will be successful once all of the terms and conditions of the incidental take permit have been implemented and documented.

# Monitoring of Impacts (Effects Monitoring)

## California Red-Legged Frog

### Construction Monitoring

Monitoring the effects of the project actions on the Plan Species informs the project proponent and the Service about actual levels of take. A biologist will train construction personnel, for all phases of construction, to monitor for red-legged frog on the Ranch View Terrace site. Training will occur within the first week of construction activities and again at the onset of the wet season (November through May). Monitoring by the on-site monitor will also occur on the construction site for standing water. UCSC staff will monitor the graded areas of phases 2 and 3 for standing water. In either case, if standing water greater than 4 inches deep remains longer than one week, the biologist will be notified to inspect the pond for CRLF. A biologist will also conduct preconstruction monitoring (i.e., a preconstruction survey) at the LPG site. No monitoring for red-legged frog will be conducted on the Inclusion Area A Preserve because no take is expected there.

If more than one frog per year is taken as a result of construction of the Covered Activities, UCSC will contact the Service to determine whether additional measures should be implemented to avoid or minimize additional take. During this consultation, work on the site will continue but at heightened levels of monitoring by construction workers and the on-site monitor to avoid take. Once the cause of take is determined, additional avoidance and minimization measures will be taken, if feasible, to further reduce the likelihood of take of CRLF. Effects monitoring for CRLF will be successful when, at the end of the permit term, the actual take is equal to or less than the take limit.

## Ohlone Tiger Beetle

### Construction Monitoring

Biological monitoring for OTB on the Ranch View Terrace site, for all phases of construction, will occur once a week while grading, landscaping, or other construction that occurs in disturbed soil overlaps with the beetle activity period (January through May). A biologist will survey the construction site for beetles, beetle remains, and beetle burrows. The biologist will also collect any beetle remains or records of burrows from the previous week.

During all phases of construction activities, construction personnel will watch for beetles under the supervision and training of the on-site monitor (e.g., construction superintendent), who will be trained by the biologist. If any live beetles are found, work will stop in the immediate vicinity and the biologist will be called to remove the beetle from the site. Any beetle remains will be collected and deposited with the biologist.

**Table 6-1.** Monitoring, Success Criteria, and Remedial Actions for California Red-legged Frog



| Monitoring Type | Monitoring Responsibility | Monitoring Frequency | Monitoring Timing | Monitoring Protocol | Success Criteria | Action if Criteria Not Met | Supports HCP Objective |
|---|---|---|---|---|---|---|---|
| Construction activities (effects monitoring) | All construction personnel, supervised by designated on-site monitor | Continuously during all construction activities | During CRLF breeding and dispersal periods | Watch for frogs on-site while conducting all activities; if found, stop work and notify on-site monitor immediately | Take limit of permit (average of one frog per year) not exceeded | If take of CRLFs exceeds one, contact FWS to determine course of action while work continues; if take limit (three) is exceeded in any one year, work will stop until coordination with the FWS to adjust avoidance and minimization measures is complete | CRLF Objective 2: Minimize take of CRLF from construction of Ranch View Terrace |
| Standing water on construction site (effects monitoring) | On-site designated monitor (to call biologist); biologist to inspect water | As needed, if standing water >4” deep remains on site for >1 week | As needed during rainy season | Work in vicinity of standing water stops; biologist inspects water for frogs and removes frogs if necessary | Take limit of permit not exceeded | Same as above | CRLF Objective 2: Minimize take of CRLF from construction of Ranch View Terrace |
| Standing water on graded areas prior to construction (effects monitoring) | UCSC staff | As needed after major rain event, if standing water >4” deep remains on site for >1 week | As needed during rainy season | Biologist inspects water for frogs and removes frogs if necessary to discourage use as breeding site prior to construction | Take limit of permit not exceeded | Same as above | CRLF Objective 2: Minimize take of CRLF from construction of Ranch View Terrace |
| Effectiveness of vegetation | Biologist | Once per year for first 10 years, | Same time each spring | Collect quantitative vegetation data in | Vegetation condition within | Vegetation management | CRLF Objective 1: |

| | | | | | | |
|---|---|---|---|---|---|---|
| management on Inclusion Area A-Quantitative | every third year afterwards if success criteria are met in at least 3 sequential years[2] | prior to grazing | permanent plots | reasonable range of baseline[1] | (e.g., grazing timing or intensity) will be adjusted | Preserve and manage 13.0 acres in IAA |

Table 6-1. Continued



| Monitoring Type | Monitoring Responsibility | Monitoring Frequency | Monitoring Timing | Monitoring Protocol | Success Criteria | Action if Criteria Not Met | Supports HCP Objective |
|---|---|---|---|---|---|---|---|
| Effectiveness of vegetation management on Inclusion Area A-Qualitative | UCSC land management staff | Once per year | Spring prior to grazing or application of other technique | Qualitatively assess vegetation health and condition to determine appropriate action | Vegetation condition similar to baseline condition | Same as above | CRLF Objective 1: Preserve and manage 13.0 acres in IAA |
| Assess the levels of take resulting from Ranch View Terrace occupancy (Effects Monitoring) | UCSC land management staff | After rain event | Morning after rain event | Visual inspection of paved and unpaved roads on IAD | No Plan species are found to be taken | Contact the Service, work with the Service to develop feasible minimization measures to reduce impacts, and include information in annual report | CRLF Objective 2: Minimize take of CRLF from construction of Ranch View Terrace |

Notes:

[1] Baseline vegetation conditions and permanent plots will be established quantitatively during the first year of monitoring.

[2] If success criteria are not met under the reduced monitoring schedule, annual monitoring must resume until success criteria are met again in at least 3 sequential years.

**Table 6-2.** Monitoring, Success Criteria, and Remedial Actions for Ohlone Tiger Beetle



| Monitoring Type | Monitoring Responsibility | Monitoring Frequency | Monitoring Timing | Monitoring Protocol | Success Criteria | Action if Criteria Not Met | Supports HCP Objective |
|---|---|---|---|---|---|---|---|
| Construction activities (effects monitoring) | Biologist | Weekly | During OTB activity and construction periods | Search entire site for beetles, beetle remains, and burrows | Take of beetles is avoided or minimized | If take of OTBs exceeds one, contact FWS to determine course of action while work continues; if take limit (three) is exceeded in any one season[2], work will stop until coordination with the FWS to adjust avoidance and minimization measures is complete | OTB Objective 3: Minimize impacts on OTB |
| Construction activities (effects monitoring) | All construction personnel, supervised by designated on-site monitor | Continuously during all construction activities | During OTB activity period | Watch for beetles on-site while conducting all activities; if found, stop work and notify on-site monitor immediately | Take of beetles is avoided or minimized | Same as above | OTB Objective 3: Minimize impacts on OTB |

**Table 6-2.** Continued



| Monitoring Type | Monitoring Responsibility | Monitoring Frequency | Monitoring Timing | Monitoring Protocol | Success Criteria | Action if Criteria Not Met | Supports HCP Objective |
|---|---|---|---|---|---|---|---|
| Effectiveness of vegetation management on Inclusion Area A-Quantitative | Biologist | Once per year for first 10 years, every third year afterwards if success criteria are met in at least 3 sequential years[3] | Same time each spring prior to grazing | Collect quantitative vegetation data in permanent plots | Vegetation condition within reasonable range of baseline[1] | Adjust vegetation management (e.g., grazing timing or intensity) | OTB Objective 1: Preserve and manage 13.0 acres on IAA |
| Effectiveness of vegetation management on Inclusion Area A-Qualitative | UCSC land management staff, grazing operator (if used) | At least twice per month; more frequently near the end of the grazing period | During the grazing period | Qualitatively assess vegetation health and condition to determine appropriate action | Vegetation condition similar to baseline condition | Same as above | OTB Objective 1: Preserve and manage 13.0 acres on IAA |
| Amount of beetle habitat on Inclusion Area A | Biologist | Once per year | During beetle activity period | Map extent of suitable beetle habitat in preserve | Amount of suitable beetle habitat equals or exceeds baseline conditions | Adjust vegetation or trail management to increase habitat | OTB Objective 1: Preserve and manage 13.0 acres on IAA |
| Effectiveness of vegetation management on Inclusion Area D-Qualitative | UCSC staff, grazing operator (if used) | Once per year | Spring prior to grazing or application of other technique | Qualitatively assess vegetation health and condition to determine appropriate action | Vegetation condition similar to Inclusion Area A | Same as above | OTB Objective 2: Establish 5.7-acre beetle management area on IAD to create suitable habitat |
| Condition of trail closure signs and fencing on Inclusion Area A | UCSC maintenance staff | At least 3 times annually | During beetle activity period | Assess condition of signs and fencing | Fencing and signs are in good condition | Repair or replace signs or fencing | OTB Objective 1: Preserve and manage 13.0 acres on IAA |

**Table 6-2.** Continued



| Monitoring Type | Monitoring Responsibility | Monitoring Frequency | Monitoring Timing | Monitoring Protocol | Success Criteria | Action if Criteria Not Met | Supports HCP Objective |
|---|---|---|---|---|---|---|---|
| Recreational use of trails on Inclusion Area A | UCSC police | At least once on each sunny weekend | During beetle activity period | Patrol site on foot | No violations during patrols | Issue citations to violators and increase frequency of patrols | OTB Objective 1: Preserve and manage 13.0 acres on IAA |
| Effects of livestock grazing on OTB larvae on Inclusion Area A | Biologist | Four times per year for first 5 years | June to September (early larval stages) but will vary slightly to correspond with grazing period each year | Map active larval burrows before grazing begins and observe burrows for damage during and after grazing period | Little or no evidence of damage to larval burrows during egg stage from livestock grazing | Delay livestock grazing on site until after egg stage to allow beetles to burrow deeper in soil or soil has hardened to prevent burrow damage | OTB Objective 3: Minimize impacts on OTB |
| Presence/Absence of OTB on Inclusion Areas A and D | Biologist | Once per year for first 10 years, every third year afterwards[4] | During beetle activity period | Meandering transects on site to detect beetles or burrows | Beetles present | Continue to adjust vegetation management | OTB Objectives 1 and 2 |

Notes:

[1] Baseline vegetation conditions and permanent plots will be established quantitatively during the first year of monitoring.

[2] Service will be notified of any take of OTB (see chapter 5). No take limit has been established for OTB for this HCP because of the difficulty in measuring and monitoring take (see chapter 4). Take of 3 adults in a single season was considered a reasonable trigger for coordinating with FWS to adjust construction avoidance and minimization measures. Because of the low probability of finding beetles on the site, UCSC and the designated biologist will re-assess construction avoidance and minimization measures if any take occurs.

[3] If success criteria are not met under the reduced monitoring schedule, annual monitoring must resume until success criteria are met again in at least 3 sequential years.

[4] More extensive and frequent OTB surveys on UCSC, including both Preserves, may be conducted to help guide campus-wide management decisions, but are not required as part of this HCP.

### Inclusion Area A Preserve

Take of OTB may also be possible on Inclusion Area A as a result of management activities such as livestock grazing. Ohlone tiger beetles on Inclusion Area A will be monitored once annually during the adult activity period (January through May) in conjunction with the effectiveness monitoring of this site (see below). Because it is uncertain whether livestock grazing has adverse effects on OTB, a pilot monitoring study will be conducted for the first five years of the permit term on the Inclusion Area A Preserve. Monitoring of larval burrows will be conducted four times per year between June and September. Monitoring timing will be adjusted each year to correspond with the livestock grazing period (e.g., monitoring will occur immediately before, during, and immediately after livestock grazing occurs on site). Monitoring would likely be concentrated at beginning of the beetle larvae development period because the egg stage is the one most susceptible to damage from trampling. The results of the pilot monitoring study will be used to adjust livestock grazing on the site, if necessary. If substantial amounts of take are observed and if this take can be attributed to livestock grazing, then cattle will be removed from the site and not returned until soil has sufficiently dried and hardened. Grazing timing will be adjusted in the following year to minimize take of OTB. If substantial amounts of take are observed in Year 5 of the study, monitoring will continue each year thereafter until the level of take attributed to livestock has been substantially reduced.

The annual report will recommend monitoring methods for the next year based on results of that year's monitoring and the current scientific understanding of effective monitoring techniques. Unless the Service reasonably objects to the recommendations in the report, such recommendations will be implemented the following year.

## Effectiveness Monitoring

Effectiveness monitoring is designed to evaluate the success of the conservation strategy and mitigation requirements of this HCP. The progress of the conservation strategy will be judged in relation to success criteria (table 6-2), which are developed from the goals and objectives of the HCP and the anticipated benefits provided to the Plan Species.

The UC Regents will conduct the effectiveness monitoring for the lifetime of the incidental take permit. If, at the end of the life of the permit, the Inclusion Area A Preserve is still functioning as suitable habitat for both Plan Species the UC Regents will request permission from the Service to discontinue monitoring in this area. If, however, at the end of the life of the permit, the Inclusion Area A Preserve is not functioning as suitable habitat for both Plan Species, the UC Regents will be required to continue to monitor the Inclusion Area A Preserve as needed to ensure the success of the HCP.

Effectiveness monitoring will be conducted in the Inclusion Area D Preserve through the end of the permit life. If, at the end of the life of the permit, the vegetation has met its success criteria, monitoring for beetles on this site may be discontinued.

## California Red-Legged Frog

The Inclusion Area A Preserve already offers high quality upland grassland and forest habitat for CRLF. The benefit to the species will remain high as long as the quality of the habitat remains high. The effectiveness of the conservation strategy for CRLF therefore depends on maintaining current vegetation and landscape conditions. Conditions of the Inclusion Area A Preserve will be monitored and reported as discussed below.

Success criteria for the CRLF on Inclusion Area A will be based on the existing vegetation condition. The baseline condition will be quantitatively estimated in the spring immediately after the Inclusion Area A Preserve is established. The quantitative vegetation criteria will reflect the current conditions on the site as surveyed and described by a biologist. Current conditions will be described in two ways:

1. Overall vegetation condition, as measured by a Utilization Index (UI) or Residual Dry Matter (RDM) throughout the preserve, and
2. Vegetation composition within permanent plots.

A Utilization Index or Residual Dry Matter measure will be used to monitor overall vegetation biomass within the preserve to ensure that current conditions are being maintained for CRLF. This monitoring will support Goal 1 for CRLF to increase the quality and protection of suitable dispersal habitat in the lower campus and Objective 1 for CRLF to preserve and manage the Inclusion Area A Preserve (see chapter 1). The proper index and quantitative benchmark will be established by the biologist in the first season of HCP implementation.

Permanent plots or transects will be used to more carefully track vegetation parameters in areas used by each Plan Species. The biologist will randomly establish permanent plots or transects in areas mostly likely to be used by CRLF in which the following data will be recorded:

- the average percent cover and height of vegetation, bare ground, and thatch within the grassland of the Preserve (woodland vegetation will not be measured);
- dominant plant species;
- occurrence and extent of any invasive nonnative plant species that may endanger the quality of the habitat; and
- potential barriers or hazards to dispersing CRLF.

The results of that field survey will be used to determine the baseline conditions of the site and the success criteria against which future monitoring will be evaluated. Because the site conditions will fluctuate over time, the vegetation success criteria should be a range of vegetation conditions within which the site will vary. This range will be determined based on the baseline condition and adjusted over time if necessary as more information is gathered about the site. Following monitoring, UCSC maintenance staff, under the direction of the biologist, will adjust management activities to attempt to replicate the baseline conditions.

In addition to the quantitative methods described above, UCSC land management staff with range management experience will continue to qualitatively assess the vegetation condition on Inclusion Area A to help guide vegetation management. Qualitative vegetation monitoring will be conducted periodically during the grazing period to determine when the Utilization Index or Residual Dry Matter index is met. Qualitative visual monitoring will be less frequent at the beginning of the grazing period (minimum monitoring frequency = twice monthly) and more frequent near the end of the grazing period (e.g., several times per week) to determine the optimal time at which livestock will be removed to meet vegetation success criteria. More frequent monitoring at the end of the grazing period will also help to avoid overgrazing of the site. UCSC land management staff will consult a biologist when necessary. The terms of the grazing lease may be modified on an annual basis, based on monitoring results and management recommendations.

## Effectiveness Monitoring Schedule

For the first 10 years after establishment of the Inclusion Area A Preserve, effectiveness monitoring for CRLF will be conducted once annually. Monitoring will be conducted in early spring based upon the activity period for OTB to possibly allow the same biologist to conduct monitoring for both species.

After 10 years, quantitative effectiveness monitoring may be reduced to once every 3 years if results indicate that success criteria are being met in at least 3 sequential years. If subsequent surveys conducted every 3 years indicate that success criteria are not being met, the UC Regents will revert to the annual quantitative monitoring schedule, until criteria are met for 3 sequential years. This monitoring schedule will continue through the life of this permit, unless a new one is developed via adaptive management and with the agreement of both the Service and the UC Regents.

Qualitative vegetation monitoring will continue annually prior to the application of vegetation management treatments (e.g., livestock grazing). All monitoring for CRLF associated with this HCP will be discontinued at the end of the Permit term.

## Ohlone Tiger Beetle

The primary goal of effectiveness monitoring for OTB is to ensure that suitable habitat remains on Inclusion Area A as described in the HCP Biological Objective #1 for this species (table 1-2). A secondary goal of effectiveness monitoring is to track the progress of vegetation management on the Ohlone Tiger Beetle Management Area of Inclusion Area D. Monitoring is primarily habitat-based because of the very low (or non-existent) impacts to the species expected from covered projects and activities. Intensive population monitoring is not warranted for this HCP.

UCSC has been funding monitoring for the OTB on campus for the last several years to increase the scientific understanding of this species and to help develop management techniques that will maintain and enhance species populations on campus. UCSC intends to continue this monitoring project independent of the Ranch View Terrace HCP.

### Inclusion Area A

Suitable habitat for OTB will be tracked in three ways: habitat extent, habitat quality, and presence/absence of beetles. Habitat extent will be tracked by annually mapping suitable habitat in the preserve. Baseline conditions of suitable habitat, including the extent of bare ground or sparsely vegetated areas, will be defined in the field during the first year of monitoring. Suitable habitat will be remapped each year to determine if habitat is stable, growing, or shrinking. If habitat declines in extent, vegetation management techniques or trail management will be adjusted to increase habitat extent (table 6-2).

Vegetation monitoring will be used to monitor the quality of habitat for OTB. The biologist will establish permanent vegetation transects or permanent plots, conduct reconnaissance-level surveys to detect exotic plant taxa, and document site conditions. Vegetation monitoring will be conducted in early spring (prior to grazing) based upon the activity period for OTB. The survey results will be compared to the baseline conditions mapped per the CRLF effectiveness monitoring.

The results of that field survey will be used to determine the baseline conditions of the site and the success criteria against which future monitoring will be evaluated. Vegetation plots or transects will be established in areas used by OTB and monitored as described for CRLF. To ensure that the vegetation condition of beetle habitat is quantified, some of the plots (the exact number will be determined during the first year of sampling) will be located in beetle habitat. In addition to the quantitative methods described above, UCSC staff will continue to qualitatively assess habitat conditions and vegetation health on Inclusion Area A to help guide vegetation management. The terms of the grazing lease may be modified on an annual basis, based on monitoring results and management recommendations.

As described above, beetle monitoring is expected to continue throughout UCSC to help guide campus-wide management decisions. For this HCP, beetle monitoring will be restricted to presence/absence surveys. These surveys will be conducted once annually during the beetle activity period and are intended to provide the most basic data in the event that the intensive beetle monitoring is discontinued.

## Inclusion Area D

Monitoring on the Inclusion Area D Preserve will focus on vegetation parameters because OTB do not currently utilize the site.

### Vegetation Monitoring

Livestock grazing, raking, or other vegetation management activities will be utilized to improve habitat conditions to favor use of the protected area by the OTB.

The same types of vegetation data and monitoring techniques described for the Inclusion Area A Preserve will be used to measure vegetation in Inclusion Area D. Because the techniques used at each site will differ slightly (e.g., use of raking in the Inclusion Area D Preserve), vegetation monitoring in Inclusion Area D may need to be adjusted to account for these differences. Because the baseline condition in Inclusion Area D is currently unsuitable for beetles, the site will be managed so that vegetation conditions approach that of suitable habitat on Inclusion Area A. Monitoring data collected in Inclusion Area D will be used to evaluate its similarity with suitable habitat in Inclusion Area A.

### Surveys for Ohlone Tiger Beetles

The qualified biologist will survey the site during the adult activity period to determine if OTB have colonized Inclusion Area D. The survey may correspond to the monitoring of the species occurring on Inclusion Area A.

## Effectiveness Monitoring and Survey Schedule

For the first 10 years after establishment of the Preserves, presence/absence surveys for OTB will be conducted once annually during the adult activity period for each of the Preserves. After 10 years, surveys for OTB will be reduced to once every 3 years. Surveys will be discontinued at the end of the Permit term.

For the first 10 years after establishment of the Inclusion Area A Preserve, the effectiveness monitoring described for CRLF will be used as the basis for OTB habitat monitoring for both Inclusion Area A and Inclusion Area D preserves. (Monitoring will be conducted in early spring as described for CRLF above).

After 10 years, quantitative effectiveness monitoring may be reduced to once every 3 years if results indicate that success criteria are being met in at least 3 sequential years. If subsequent surveys conducted every 3 years indicate that

success criteria are not being met, the UC Regents will revert to the annual quantitative monitoring schedule, until criteria are met for 3 sequential years. This monitoring schedule will continue through the life of this permit, unless a new one is developed via adaptive management and with the agreement of both the Service and the UC Regents. Qualitative habitat monitoring of both Preserves will continue annually prior to the application of vegetation management treatments (e.g., livestock grazing). All monitoring for OTB associated with this HCP will be discontinued at the end of the permit term.

# Reporting

On behalf of the UC Regents, UCSC will submit an annual report to the Service documenting the results of the year's monitoring and surveys, including

- vegetation and exotic plant monitoring within the Preserves,
- any presence of the Plan Species on the Preserves,
- a cumulative accounting of any take of Plan Species that has occurred that year, and
- a discussion of management and monitoring activities undertaken in that year with recommendations for management and monitoring activities for the following year.

For the first two years over which construction would occur, the annual report will also document whether each of the construction avoidance and minimization measures was implemented successfully (i.e., compliance monitoring results). In the reporting period following construction, the report will also include the actual acreage of land disturbed by construction of the Ranch View Terrace Project. Subsequent reports will document implementation and success of the ongoing conservation measures identified in chapter 5. UCSC will submit these reports to the Service's Ventura Field Office before September 1 of each year during the permit term.

Take of Plan Species will be documented by maintenance staff throughout the permit term. For both species, take will be documented within the Project site on annual basis as part of the avoidance and minimization measures described in chapter 5 *(Conservation Strategy)*. Take of any CRLF on the LPG site will be documented.

If take occurs of either Plan Species, the Service will be notified according to the procedures outlined in chapter 5 and according to the terms and conditions of the incidental take permit. Annual levels of take will be reported as part of the annual reporting schedule for compliance monitoring described above.

# Adaptive Management

Uncertainty is an unavoidable component of managing natural systems. To address such uncertainties, the UC Regents will implement this HCP based on the principles of adaptive management; these principles allow the conservation measures to be adjusted over time based on results of each year's monitoring to better ensure that the biological goals and objectives of this HCP are achieved. Under this process, management is implemented, monitored and evaluated, and refined based on monitoring results (Holling 1978; Walters 1986; Kershner 1997). Successful adaptive management in conservation planning requires:

- success criteria based specifically on the biological goals and objectives for each species,
- an explicit link between monitoring and the success criteria, and
- a mechanism to refine or redirect management activities if success criteria are unmet.

The primary source of uncertainty in this HCP, relative to the biological goals and objectives, involves the likelihood of the two conservation areas to provide suitable habitat for the two Plan Species through time. Inclusion Area A presently functions as suitable habitat for the OTB and likely functions as suitable habitat for the red-legged frog. Inclusion Area D may presently function as marginal upland habitat for the CRLF and has suitable soils for OTB. It is unknown whether these sites will continue to function in this way in perpetuity. The adaptive management plan is based primarily on this uncertainty.

## Evaluation and Action

The success of the conservation strategy will be measured by evaluating the monitoring results in light of the success criteria. If monitoring results indicate that the success criteria are unmet and the quality of the habitat is declining, adaptive management will be employed to change the current management techniques so that they can achieve the success criteria to the maximum extent practicable.

If at any time during monitoring, adaptive management results in changes to any conservation measure or management activity, the UC Regents will notify the Service. Specific reporting requirements for the adaptive management plan are described below. Major changes to the conservation measures or management activities may require a more intensive monitoring schedule, to be determined in conjunction with the Service, and may require an amendment to the HCP or incidental take permit (see chapter 7, "Funding, Implementation, and Regulatory Considerations"). Species-specific considerations for adaptive management are described below.

## California Red-Legged Frog

As shown in table 6-1, quantitative and qualitative vegetation monitoring on the Inclusion Area A Preserve is the primary measure of habitat suitability for the CRLF. If vegetation success criteria are not met, management techniques will be adjusted. For example, if livestock grazing is used as the primary tool to manage vegetation, the timing of grazing can be changed (e.g., begin earlier in the summer, or extend later in the fall) or the intensity of grazing can be increased or reduced (e.g., grazing for longer duration or for shorter duration using more livestock). If mowing is used as the primary technique, mowing height, timing, and frequency can be varied to produce desired results. Alternatively, mowing can be used in combination with livestock grazing (e.g., spot mowing for areas inaccessible or undesirable to livestock) to increase the chance of meeting vegetation success criteria.

Compared with other federally listed species, the life history and habitat requirements of CRLF are relatively well studied. However, little is known about the species population at the Arboretum Pond, or about how the frogs use upland habitat. Research is not included in the conservation strategy for this HCP. If additional information about the species, its use of upland grassland habitat, or its use of habitats on campus becomes available, the UC Regents will incorporate this information into the management of Inclusion Areas A and D Preserves.

## Ohlone Tiger Beetle

Considerable information about the biology, habitat requirements, and management techniques for the OTB remains to be learned. Thus, the flexibility of an adaptive management approach will allow adjustments to be made throughout the implementation of the HCP and ensure that the goals and objectives of this HCP for the OTB are achieved. This practice is considered fundamental for successful implementation of the preservation, maintenance, and management measures described in this HCP. Adaptive management for OTB has four general elements:

- forming preservation, maintenance, and management measures based on the existing site conditions as a baseline and current knowledge of the Ohlone tiger beetle's life history and ecology (i.e., the measures presented in this HCP);
- monitoring to detect and assess OTB populations in occupied habitat;
- monitoring to detect any negative or unexpectedly low positive impacts of management on habitat quality for the OTB; and
- periodically reassessing the preservation, maintenance, management measures based on the results of monitoring of the habitat and OTB.

As shown in table 6-2, quantitative and qualitative vegetation monitoring on the Inclusion Area A Preserve is the primary measure of habitat suitability for the

OTB. If vegetation success criteria are not met, management techniques will be adjusted to ensure that success criteria are met. Actions that may occur if success criteria are not met include those described above for CRLF to alter vegetation management techniques. However, adjustments for OTB may occur on a smaller scale in order to maintain and enhance suitable beetle habitat in small areas (e.g., spot raking to prevent build up of thatch). Management of the trail system in the Inclusion Area A Preserve may also need to be adjusted to ensure reasonable compliance with trail closure rules.

This adaptive management framework will be applied to management of the Inclusion Area A and Inclusion Area D Preserves for the benefit of OTB.

Chapter 7

# Funding, Implementation, and Regulatory Considerations

This chapter addresses the funding and implementation requirements for this HCP and various regulatory considerations necessary to comply with the ESA:

- Mitigation Certainty,
- how to address changed or unforeseen circumstances, and
- the HCP and permit amendment process.

## Funding

HCPs are required to describe the funding that will be made available to implement the plan. The estimated costs of the plan elements and their proposed funding sources are listed in table 7-1. The total funding needs for the HCP, in 2004 dollars, are estimated to be $54,000 in one-time costs and up to $20,900, in annual costs for the duration of the permit. This total includes a 10% contingency that could be used for additional costs such as changes in management or monitoring needs in response to adaptive management. This contingency fund could also be used by the UC Regents to address unforeseen circumstances at their discretion.

The vegetation management program on the Inclusion Area A Preserve (including exotic plant removal) and the installation of temporary fencing and signs on the Preserve during the beetle activity period would continue in perpetuity. Implementing these measures in perpetuity is estimated to cost $7,000 per year in 2004 dollars after the permit term. All the remaining conservation measures would be implemented during the permit term (see table 7-2). The Regents commit to fully funding remedial measures for changed circumstances described in this chapter. For budgeting purposes, the cost of remedial measures is estimated to be $10,000.

# Funding Sources

Funding will come from two sources (table 7-1). The third-party developer of Ranch View Terrace, Valeo Ranch View Terrace I, L.P., will bear the cost of those conservation measures directly associated with construction of the Project such as construction avoidance and minimization measures, project design elements, and fencing the Inclusion Area D Preserve. Funding for these measures will be guaranteed through the license agreement and contract between the Regents and Valeo Ranch View Terrace I, L.P. The agreement and contract will be available to the Service and will require the developer to implement all of the conservation measures specified in table 7-2 as their responsibility.

Funding for all other measures that UCSC will implement (table 7-2) will come from the annual payout generated by a fund which will be established through a one-time fee on all for-sale housing units built as part of phase 1 (therefore, the HCP will be fully funded in phase 1). The funds will be held in escrow and turned over to UCSC at the conclusion of all sales. These funds will be invested by the UC Regents in the UC General Endowment Pool to provide for the long-term management and monitoring of the Inclusion Area A and D Preserves during the permit term. The General Endowment Pool is a $53.2 billion balanced portfolio of equities and fixed-income securities that has had an annualized net total return of 10.2% for the 10 years prior to June 30, 2003. A unique account will be created for receipt of the annual income and expenditures related to the HCP.

Increased costs due to inflation will automatically be handled through management and appreciation of the fund. However, should funds in the account be insufficient in any one year to cover inflation or any other costs, UCSC will dedicate additional funds from the lot lease operation account[12] or other sources to make up the difference. An additional source available to fund any shortfalls is the Santa Cruz Housing System Reserve.

Funding of the HCP Conservation Measures in Year 1, $15,000 for the pilot monitoring study, and $10,000 budgeted for remedial measures will come directly from the home sale fee in phase 1 (rather than from interest generated by the fund) in order to allow sufficient time for the fund to produce the required annual income. This will be taken into account when determining the necessary home sale fee.

[12] The lot lease is a monthly rent payable by the homeowner to the University for a term of at least 60 years. This rent is recorded in the homeowner's lot lease and is deducted from the homeowner's paycheck, as applicable, every month, or is assessed as a monthly fee. The lot lease fee will escalate as specified in the lot lease to account for typical increases in operations and maintenance costs over time.

**Table 7-1.** Funding Sources, Mechanisms, and Costs of HCP Conservation Measures



| Conservation Measure | Funding Source | Funding Mechanism | Unit Cost* | Estimated One-time Cost* | Estimated Annualized Cost* | Notes |
|---|---|---|---|---|---|---|
| **Construction Avoidance and Minimization Measures** | | | | | | |
| Survey Project site for CRLF before vegetation removal | Developer | Developer; part of contract terms | $85/hr | $1,000 | N/A | 1 |
| Conduct training for construction Superintendents | Developer | Developer; part of contract terms | $85/hr (frog) $140/hr (beetle) | $1,000 | N/A | |
| Install and maintain temporary fencing around construction site to contain work crews and equipment | Developer | Developer; part of contract terms | $8,000 | $8,000 | N/A | |
| Survey Project site during construction (weekly for beetle during activity period; if called by on-site monitor or UCSC for frog) | Developer | Developer; part of contract terms | $85/hr (frog) $140/hr (beetle) | Up to $5,000 | N/A | |
| Daily removal of trash from construction area | Developer | Developer; part of contract terms | $500/mo | $8,000 | N/A | |
| Enforce Pet Policy at Ranch View Terrace | UCSC | Endowment funded by initial home sales | N/A | N/A | $1,000 | |
| Install permanent fencing around IAD Preserve | Developer | Developer | $5,000 | $5,000 | N/A | 2 |
| Design and install signs around IAD Preserve | UCSC | UCSC | $1,000 | $1,000 | N/A | 2 |
| Maintain fencing and signs around IAD Preserve | UCSC | Endowment funded by initial home sales | N/A | N/A | $500 | |
| Temporary fencing and signs on IAA on trails during beetle activity period | UCSC | Endowment funded by initial home sales | $500 | N/A | $500 | |
| Other Project Design Features to Minimize Impacts | Developer | Developer; part of contract terms | N/A | Part of Design Elements | N/A | 3 |

**Table 7-1.** Continued



| Conservation Measure | Funding Source | Funding Mechanism | Unit Cost* | Estimated One-time Cost* | Estimated Annualized Cost* | Notes |
|---|---|---|---|---|---|---|
| **Land Dedication** | | | | | | |
| Permanent Habitat Preserve designation on Inclusion Area A (IAA) Preserve | UCSC | No cost | N/A | N/A | N/A | 4 |
| Habitat Preserve designation on Inclusion Area D (IAD) Preserve for the life of the permit | UCSC | No cost | N/A | N/A | N/A | 4 |
| **Habitat Management/Enhancement** | | | | | | |
| Vegetation management program on IAA Preserve | UCSC | Endowment funded by initial home sales | Up to $5,000 | N/A | Up to $5,000 | 5 |
| Vegetation management program on IAD Preserve (enhancement) | UCSC | Endowment funded by initial home sales | $5,000 | N/A | $5,000 | 6 |
| Exotic plant removal from Preserves, as needed | UCSC | Endowment funded by initial home sales | $100/hr | N/A | $1,000 | 7 |
| **Monitoring** | | | | | | |
| Annual OTB survey on IAA | UCSC | Endowment funded by initial home sales | $140/hr | N/A | $2,000 | 8 |
| Pilot study of livestock grazing effects on OTB on IAA (5 years) | UCSC | Endowment funded by initial home sales | $140/hr | $15,000 | N/A | |
| Annual vegetation monitoring on IAA and IAD for CRLF and OTB | UCSC | Endowment funded by initial home sales | $85/hr | N/A | $3,000 | |
| Patrols on IAA Preserve during beetle activity period to monitor recreational use and condition of signs/fencing[9] | UCSC | Endowment funded by initial home sales | $500 | N/A | $500 | |
| Annual Survey for OTB on IAD Preserve | UCSC | Endowment funded by initial home sales | $140/hr | N/A | See Note | 8 |
| **Reporting** | | | | | | |
| Annual report to Service | UCSC | Endowment funded by initial home sales | $500 | N/A | $500 | |

| Conservation Measure | Funding Source | Funding Mechanism | Unit Cost* | Estimated One-time Cost* | Estimated Annualized Cost* | Notes |
|---|---|---|---|---|---|---|
| **Total Estimated costs:** | | | | | | |
| One-Time Costs* (Developer) | $ 28,000 | | | | | |
| One-Time Costs* (UCSC) | Up to $ 26,000 | | | | | |
| Annual Costs* (UCSC) | $ 19,000 | | | | | |
| Changed Circumstances (UCSC)[10] | $ 10,000 | | | | | |
| Annual Contingency* (10%; UCSC) | $ 1,900 | | | | | |
| Estimated Endowment Required[11] | $480,500 | | | | | |

*Costs are in not to exceed 2004 dollars.

Notes/Assumptions:

1 Assumes red-legged frogs or OTB may be found during the surveys.

2 Permanent fencing will be installed by the developer as part of the project specifications and the license agreement between the developer and The Regents. The improvements will be maintained by UCSC maintenance staff funded through a maintenance fee assessment (or similar fee assessment) established for the Ranch View Terrace Project. Fees will be assessed and collected annually from the homeowners via a lot lease agreement and the developer for the rental properties via a ground lease. Funds will be deposited into an account used for the maintenance of exterior improvements including the identified HCP costs. Signs will be installed and maintained by UCSC. See the text for more details.

3 Project design features have been incorporated into the Project plans and specifications that will be implemented by the general contractor. Specific costs for these design features have not been determined.

4 No cost is anticipated for the dedication of the Preserves. The land use designation of the Preserves will be established by a Long Range Development Plan amendment to be submitted and approved by the Regents concurrent with the IA.

5 The cost for vegetation management on the IAA Preserve assumes the maximum cost that may be needed to maintain current vegetation conditions using new techniques such as mowing, hand removal of vegetation, or a grazing program that is not economically viable. UCSC has a current lease agreement with a private rancher for cattle grazing on Inclusion Area A. There is minimal cost associated with use of the land incorporated in the lease.

6 Costs include UCSC land management staff to manage of the IAD Preserve. If a grazing lease is executed for the IAD Preserve, similar to the IAA Preserve, then no costs would be associated with vegetation management and paid for through the land lease.

7 Exotic plant removal will likely occur every several years instead of annually; annualized cost takes this into account.

8 The annual survey for OTB will be conducted for the Inclusion Area A and D Preserves on the same visit.

9 Funding for the patrols on IAA to monitor recreational use is in addition to UCSC's annual operating budget to fund patrols on campus.

10 The extent and nature of vandalism or a natural disaster cannot be determined at this time. The UC Regents commit to fully remediating any damage caused by vandals for the term of the permit. They also commit to remediating the site, if necessary, as a result of a natural disaster, as outlined in the HCP and the IA. For budgeting purposes, these remedial costs are estimated to be $10,000 over the permit term.

[11] The endowment funds all conservation measures implemented by UCSC. The endowment size will be conservatively estimated based on the current interest rate of the investment to generate at least $20,900 per year. The actual endowment investment will be determined after home sales occur and will be based on interest rates at the time of fund establishment. The endowment provided is an example only. See text for details.

**Table 7-2.** Implementing Plan for HCP Conservation Measures 

| Conservation Measure | Implementing Party[1] | Implementing Mechanism[2] | Implementation Schedule |
|---|---|---|---|
| **Avoidance and Minimization Measures** | | | |
| Survey Project site for CRLF before vegetation removal | Qualified herpetologist | Developer contract with Regents | Prior to construction |
| Conduct training for construction Superintendents | Qualified herpetologist and entomologist | Developer contract with Regents | Within the first week of construction |
| Install and maintain temporary fencing around construction site to contain work crews and equipment | Developer | Developer contract with Regents | Prior to and during construction |
| Daily removal of trash from construction area | Developer | Developer contract with Regents | During construction |
| Enforce Pet Policy at Ranch View Terrace | Campus Police | HCP IA | Throughout the Permit term |
| Temporary fencing and signs on IAA on trails during beetle activity period | UCSC | HCP IA | In perpetuity |
| Install permanent fencing around IAD Preserve | Developer | Developer contract with Regents | Install prior to first sale or rental of units; maintain through Permit term |
| Design and install signs around IAD Preserve | UCSC | HCP IA | Install at same time as fence; maintain through Permit term |
| Other Project Design Features to Minimize Impacts | Developer | Developer contract with Regents | During construction |
| Produce and distribute educational material to Ranch View Terrace residents regarding the HCP | UCSC | HCP IA | After new residents move in and before first dispersal period of Plan Species |
| **Land Dedication** | | | |
| Permanent protection designation on Inclusion Area A (IAA) Preserve | UCSC Planning Staff | Land Use designation | Concurrent with execution of the IA |
| Land protection designation on Inclusion Area D (IAD) Preserve | UCSC Planning Staff | Land Use designation | For the life of the permit, concurrent with execution of the IA |
| **Habitat Management/Enhancement** | | | |
| Vegetation management program on IAA Preserve | Grazing contractor, UCSC land management staff, under direction from qualified biologist | Grazing lease or HCP IA | In perpetuity |
| Vegetation management program on IAD Preserve (enhancement) | Grazing contractor (if livestock used), UCSC land management staff, under direction from qualified biologist | Grazing lease or HCP IA | Through Permit term[3] |

**Table 7-2.** Continued



| Conservation Measure | Implementing Party[1] | Implementing Mechanism[2] | Implementation Schedule |
|---|---|---|---|
| Exotic plant removal from Preserves, as needed | Grazing contractor (if livestock used), UCSC land management staff, under direction from qualified biologist | Grazing lease or HCP IA | In perpetuity on IAA Preserve; for duration of Permit on IAD Preserve[3] |
| **Monitoring** | | | |
| Ohlone tiger beetle survey on IAA | Qualified biologist | HCP IA | Throughout the Permit term; see chapter 6 for details |
| Pilot study of livestock grazing effects on OTB on IAA (5 years) | Qualified biologist | HCP IA | For first 5 years of the Permit term; see chapter 6 for details |
| Annual vegetation monitoring on IAA and IAD for CRLF and OTB | Qualified biologist | HCP IA | Throughout the Permit term[3] |
| Patrols on IAA Preserve during beetle activity period to monitor recreational use and condition of signs/fencing | UCSC police (patrols) and maintenance and operations staff (sign/fencing monitoring) | HCP IA | In perpetuity |
| Survey for OTB on IAD Preserve | Qualified biologist | HCP IA | Throughout the Permit term[3]; see chapter 6 for details |
| Patrols on Ranch View Terrace project site to ensure compliance with pet policy | UCSC police (patrols) | HCP IA | Throughout permit term |
| **Reporting** | | | |
| Annual report to Service | UCSC staff | HCP IA | Throughout the Permit term |
| **Changed Circumstances** | | | |
| Vandalism of Preserve(s) | UCSC maintenance and operations staff | HCP IA | Throughout the Permit term |
| Natural catastrophe | UCSC maintenance and operations staff | HCP IA | Throughout the Permit term |
| **Funding** | | | |
| Establish endowment | UCSC | HCP IA | After sale of all homes |

Notes:

[1] The UC Regents will be responsible for implementing all measures described in this HCP, but they will direct other parties to implement them on behalf of UCSC through incorporation of conservation requirements in agreements or leases with third parties.

[2] All conservation measures in the HCP will be implemented pursuant to the IA and HCP. Some measures, however, will be further implemented through additional mechanisms as described in this table.

[3] After the permit term, the UC Regents reserve the right to cease vegetation management on the Inclusion Area D Preserve and allow it to return to its previous condition. If it is found through future studies that the Preserve cannot support OTB or is not important for the species' long-term survival, management and monitoring of the Preserve would cease before the end of the permit term, but only upon mutual agreement between the UC Regents and the Service. Vegetation management on the Inclusion Area A Preserve will continue in perpetuity. See the text for details.

For example, if the fund had been created on June 30, 2003, $480,500 would have been required to generate the necessary annual payout of $20,900 at the then-current 4.35% interest rate plus an additional $44,800 to provide immediate funding for Year 1 HCP activities. This translates to a fee per for-sale unit of approximately $11,673 (= [$480,500 + $44,800] / 45 for sale units). The unit fee will be determined conservatively prior to home sales, and the actual amount of the fund will be conservatively determined after the sale of the houses, based on investment options and interest rate at the time. All home sales are expected to occur by the end of the construction period because a waiting list exists now that is well beyond the number of units available. However, if for any reason, the sale of the 80 units is not completed by the end of the construction period (16 months), and the endowment is not the size necessary to generate enough interest to cover annual costs, then UCSC will take full responsibility to cover the short fall.

# Implementation

The UC Regents are the governing body and the public corporation of the University of California. The UC Regents will be responsible for implementing this HCP under the terms of the Section 10(a)(1)(B) permit issued by the Service for the Ranch View Terrace project. The UC Regents regularly delegate authority to chancellors at the University of California campuses to act on behalf of the Regents. Campuses, including UCSC, are not independent entities and act only on behalf of the UC Regents. For this HCP, the Regents will likely authorize the UCSC Chancellor to sign the IA on behalf of the UC Regents, as done by the UC Irvine Chancellor for the IA for the Central/Coastal Orange County Natural Community Conservation Plan (NCCP). Alternatively, the Secretary of the Regents will sign the IA.

The UC Regents will delegate the tasks of preservation, enhancement, management, monitoring, and reporting activities described in this HCP to UCSC or the third-party developer through the license agreement and contract for Ranch View Terrace (table 7-2). The UC Regents will also be responsible for implementing the remedial measures described in this chapter in the event of changed circumstances. The license agreement and contract for Ranch View Terrace will include the requirement that the contracting party or leasee must adhere to the minimization and mitigation requirements of the HCP, implement the relevant conservation measures specified in this HCP, and perform in accordance with the HCP requirements. Draft copies of the license agreements and any contracts and other license agreements relevant to the HCP will be provided to the Service prior to permit issuance so the Service can review them for consistency with the HCP and IA. Copies of the final license agreement and any final contracts and other final license agreements relevant to the HCP will be provided to the Service upon execution so the Service can review the final versions for consistency with the HCP and IA.

Avoidance and minimization measures will be implemented in accordance with the terms and conditions of the HCP, including provisions for adaptive management and specifications outlined in the IA (table 7-2). The pet policy will be included in the codes, covenants, and restrictions (CC&Rs) associated with the Ranch View Terrace project. (The UC Regents will send the Service a copy of the CC&Rs for the Ranch View Terrace project after they are finalized.) Monitoring, reporting and remedial measures will be implemented in accordance with the terms and conditions of the HCP, including provisions for adaptive management, as specified in the IA. Livestock grazing, when used for vegetation management in the preserves, will be implemented through the license agreement with the grazing operator (Appendix E). Land dedication is described below.

If the Service determines that the conditions of the Section 10(a)(1)(B) permit are not being met, it may suspend its permit consistent with applicable laws and regulations and the terms of the IA. Under suspension, incidental take would become unlawful. The Service would notify the UC Regents of the specific deficiencies leading to suspension. Upon acceptance of corrective action, the Service could reverse the suspension. If corrective action cannot be taken, the Service could revoke the Section 10(a)(1)(B) authorization.

## Land Dedication

The primary method of mitigating the effects of the covered projects and activities on Plan Species will be the preservation of two mitigation sites. The 13.0-acre site on Inclusion Area A will be preserved in perpetuity. The 12.5-acre site on the remaining undeveloped portion of Inclusion Area D will be preserved through the Permit term and reevaluated periodically to determine if the site provides the conservation benefit assumed in this HCP. To implement these conservation measures, the UC Regents will impose a new land use designation on these sites. Current land use designations on UCSC have not provided the level of protection or the permanence required to ensure the conservation of the Plan Species[13], so a new designation is required. The UC Regents will create this designation to be consistent with the goals and objectives of this HCP and amend the UCSC LRDP to designate the mitigation sites as preserves. The LRDP amendment will be submitted and approved by the Regents concurrent with the IA. Under this designation, the Inclusion Area A Preserve and the Inclusion Area D Preserve will remain in their current condition as open space with no development allowed. The preserves will be managed according to the provisions of this HCP. Access to the preserves will be limited to pedestrians and any equipment necessary for land management.

[13] The land use designation of Environmental Reserve, used extensively at UCSC, is similar but it does not provide for the conservation of threatened and endangered species as its highest priority.

## Inclusion Area A Preserve

The land dedication on the Inclusion Area A Preserve will be irrevocable through the requirement of the HCP IA. To ensure the dedication runs with the land, the UC Regents will record a notice or memorandum with the office of the County Recorder in the chain of title for the Inclusion Area A Preserve. The notice will include the date that the Service and the UC Regents entered into the agreement, a summary statement of the purpose of the HCP, a statement that the provisions of the HCP affect and restrict the use of the parcel and a reference to the HCP for further information. The UC Regents used the same mechanism in 1996 to permanently dedicate land at UC Irvine for the Central/Coastal Orange County Natural Community Conservation Plan and HCP.

## Inclusion Area D Preserve

Because of the experimental nature of the management on Inclusion Area D, the land dedication on the Inclusion Area D Preserve will apply until the end of the Permit term. As described in chapter 5, the Regents will manage the vegetation on the Inclusion Area D Preserve to make the habitat as suitable as possible for the OTB to attract them to the site naturally. Vegetation management of the site will continue for the duration of the Permit. At the end of the Permit term, the Regents, in consultation with the Service, will consider whether to make the land dedication permanent based on a variety of biological factors, including but not limited to:

- the persistence of the OTB population on the site;
- the size of the OTB population;
- the linkage of the Inclusion Area D OTB population with other OTB populations; and
- the importance of the Inclusion Area D Preserve for the long-term survival and recovery of OTB, as determined by further study and recovery planning.

The UC Regents will notify the Service if the Inclusion Area D Preserve is colonized by OTB. At this time, and in consultation with the Service, the UC Regents will discuss appropriate management, mitigation, and levels of take consistent with No Surprises assurances. Also in consultation with the Service, the UC Regents will consider making the preserve designation permanent before the Permit term ends. Any permanent designation would be recorded with the Office of the County Recorder as described above.

The UC Regents will not incur additional liabilities under the ESA by the presence of the new population of beetles on Inclusion Area D due to ongoing activities in the area that are covered by this HCP. Any take from management or monitoring activities of OTB from the new population of beetles in the Inclusion Area D Preserve, if such take occurs during the permit term, is covered by this HCP and the incidental take permit.

This HCP will not provide take authorization for OTB on Inclusion Area D beyond the permit term without a formal permit amendment. Take authorization is also not provided during the permit term for activities not covered by this HCP.

## Implementation Schedule

The term of the permit will be for a period of 60 years. Implementation of the avoidance and minimization measures will occur immediately before and during construction of the Project. The Inclusion Area A and Inclusion Area D Preserves would receive new land protection designation concurrent with the execution of the IA and notice of the designation of the Inclusion Area A Preserve will be recorded with the County Recorder. Management activities on the Inclusion Area A Preserve will continue in perpetuity (table 7-2). The UC Regents will implement enhancement activities on the Inclusion Area D Preserve following construction of Ranch View Terrace. The UC Regents will begin monitoring both Preserves following issuance of the permit and will continue during and after construction of the Project according to the monitoring schedule described in chapter 6, “Monitoring, Reporting, and Adaptive Management.”

# Assurances

The purpose of the No Surprises Rule is to provide assurances to non-federal landowners participating in habitat conservation planning under the ESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

## Changed and Unforeseen Circumstances

### Changed Circumstances

The Service defines changed circumstances as those changes affecting a species or geographic area covered by the HCP that can reasonably be anticipated by the applicant, the Service, and other parties, if any, to the IA and HCP at the time of document preparation, and for which the parties can plan a response. The UC Regents, in consultation with the Service, have identified the following changes that could arise during the permit term and that could adversely affect

the Plan Species within the permit area in ways not identified in this HCP and mitigated to the maximum extent practicable:

- listing of new species not covered by this HCP;
- vandalism of Preserves; and
- natural catastrophic events such as a fire, severe water erosion, extended drought, or landslides.

Each of these changed circumstances is discussed below. Notification of the Service and the timing of responses to these changed circumstances are described in the IA.

## Listing of New Species

No special-status or other species that occur on the Ranch View Terrace site are expected to become listed before Project construction, when the majority of Project impacts would occur. However, if the Service lists a new species during the permit term and if the Project may result in take of that species, the HCP and the permit may be reevaluated. The HCP covered activities may be modified, as necessary, to ensure that the activities covered under the HCP are not likely to jeopardize, or result in the take of, the newly listed species, or adversely modify any newly designated critical habitat. The UC Regents will implement the modifications to the HCP covered activities identified by the Service as necessary to avoid the likelihood of jeopardy to or take of the newly listed species or adverse modification of newly designated critical habitat. If implementing the requirements of this HCP would result in take of the newly listed species, then the HCP would need to be modified and the permit amended or the UC Regents would need to apply for a new permit. The incidental take permit would be amended according to the procedures outlined in the section *Amendment Process* below and in the IA. No cost is identified for this changed circumstance because of the speculative nature of the event. If an HCP amendment or new HCP is needed to address a new listed species, the UC Regents would pay the needed cost.

## Vandalism of the Preserves

If the Preserves are disturbed through acts of vandalism (e.g., removal of fencing, signage, or use of unauthorized vehicles), UCSC staff will assess the extent of the damage, implement measures to repair the damage, and minimize future vandalism. Measures may include repair or redesign of fencing and signage, more frequent monitoring to assess natural regeneration, or active revegetation of native species to accelerate regeneration. The HCP assumes $5,000 for the cost of remedial measures in the event of vandalism.

### Natural Disasters

If all or a portion of the Preserves are disturbed by fire, extended drought[14], severe water erosion, or landslides (including landslides resulting from earthquakes), the Permittee will engage a Service-approved biologist, as appropriate, to assess the extent of the damage and determine whether remedial measures are warranted. In some cases, action may be needed to minimize further habitat degradation, restore vegetation, or speed the natural regeneration process. UCSC will implement measures such as soil stabilization, natural regeneration monitoring, or active revegetation of native plants, as necessary. UCSC will determine whether remedial measures are warranted and which measures to implement in consultation with and with the approval of the Service. The HCP assumes $5,000 for the cost of remedial measures in the event of natural disasters.

## Unforeseen Circumstances

The No Surprises Rule defines unforeseen circumstances as changes in circumstances that affect a species or geographic area covered by the HCP that could not reasonably be anticipated by plan developers and the Service at the time of the plan's negotiation and development and that result in a substantial and adverse change in status of the covered species.

In the case of an unforeseen event or circumstance that may adversely affect the Plan Species, the UCSC will promptly notify the Service to determine a course of action. If such an event or circumstance could cause mortality, injury, or harm to the Plan Species beyond that anticipated in this HCP, the UC Regents will make all reasonable efforts to stop the activities that could cause these adverse effects until all threats to the Plan Species are eliminated or the issues are otherwise resolved.

In determining whether such an event or circumstance constitutes an unforeseen circumstance as defined by the No Surprises Rule, the Service will consider, but not be limited to, the following factors:

- size of the current range and population of the affected species,
- percentage of range and population of the affected species adversely affected by the event or circumstance,
- percentage of range and population conserved by the HCP,
- ecological significance of that portion of the range or population affected by the Project,

[14] A drought lasting less than 5 years is considered foreseeable during the permit term; a drought lasting more than 5 years is considered an unforeseen circumstance.

- other conservation measures implemented or planned by the UC Regents for the Plan Species outside the Ranch View Terrace and mitigation areas, and
- whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

If the Service determines that additional conservation measures are necessary to mitigate the adverse effects of the unforeseen circumstances, and the HCP is being implemented properly, the Service may request, in writing, additional measures be implemented. The Service may require additional measures if such measures will not require the commitment or restrictions of additional land, water, or other natural resources or additional financial compensation beyond that specified in the HCP, so long as the additional measures augment conservation measures already specified in the HCP. Otherwise, the UC Regents will evaluate those measures and determine whether they can be incorporated into the HCP and will consult with the Service regarding implementation.

# Take Authorization

The UC Regents are requesting incidental take coverage for the Plan Species for the covered projects and activities described in this HCP, including:

- construction and operation of the Ranch View Terrace housing project;
- construction and operation of the Emergency Response Center Equipment Storage Site #2 (LPG Site);
- management and monitoring of the Inclusion Area A Preserve;
- management and monitoring of the Inclusion Area D Preserve;
- capture and relocation of Plan Species, if necessary; and
- replacement of an unpaved utility access route with an 8-to-10-foot-wide, 1,000-foot-long utility service road.

## Capture and Relocation of Plan Species

Capture of CRLF or OTB from the Ranch View Terrace site or Site 2 of the ERC (the LPG site), and relocation to a safe site would result in intentional, as opposed to incidental, take. Typically, intentional take that is for scientific or recovery purposes is authorized by a permit under Section 10(a)(1)(A) of the ESA. However, intentional take for purposes of mitigation would be authorized under this HCP subject to the conditions described below.

For purposes of the mitigation activities described in chapter 5, “Conservation Strategy,” the Section 10(a)(1)(B) permit issued pursuant to this HCP would

authorize take of CRLF or OTB resulting from the capture and relocation of frogs or beetles, provided that:

- Such take is specifically intended to minimize more serious forms of take (i.e., killing or injury);
- Such take is directly associated in time and place with activities authorized under the permit;
- The person(s) undertaking or retained to undertake the capture and relocation activities has been approved by the Service under the procedures outlined in chapter 5; and
- The Service has authorized the person(s) to undertake the capture and relocation activities via a written letter, memorandum, or electronic mail. In addition, the person undertaking the capture and relocation activities must implement any terms and conditions with respect to those activities provided by the Service in its authorization. These provisions are consistent with Service policy as described in the Service's habitat conservation planning handbook (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996).

### Specimen Deposit

Any dead specimens of CRLF or OTB found during monitoring will be labeled with the date and location found and deposited at the Museum of Natural History, University of California, Santa Cruz, California (Tanya Haff, Curator).

## Amendment Process

The HCP or incidental take permit can be amended or modified in accordance with Service regulations and the terms of the IA. Terms of the IA will be governing in the event there is a conflict between its terms and those of the HCP.

### Minor Amendment

Amendments to the HCP may be minor or major. Minor amendments are changes that do not affect the scope of the HCP's impact and conservation strategy, or affect the ability of the UC Regents to meet the biological goals and objectives of this HCP. Minor amendments would not typically require an amendment to the incidental take permit and can be accomplished administratively through amendment of the HCP and/or the IA by agreement of the parties. Examples of minor amendments include:

- corrections of errors in the HCP or exhibits that do not change the intended meaning,

- minor changes to survey or monitoring protocols not in response to adaptive management,
- minor boundary changes to the Preserves that do not result in a net loss of land and do not alter the effectiveness of the HCP, and
- minor changes to the reporting protocol.

Adjusting management in response to monitoring or research results (i.e., adaptive management) is part of this HCP and is not considered an amendment. To amend the HCP without amending the permit, the UC Regents will submit to the Service in writing a description of the proposed amendment, an explanation of why the amendment is necessary or desirable, and an explanation of why the effects of the proposed amendment are believed not to be significantly different from those described in the original HCP. If the Service concurs with the amendment proposal, it shall authorize the HCP amendment in writing, and the amendment shall be considered effective upon the date of the Service's written authorization.

## Major Amendment

A major amendment is one that would affect the scope of the HCP impact and conservation strategy such as an increase in the development footprint of Ranch View Terrace. Examples of changes that would require a major amendment, including but are not limited to:

- significant revisions of the permit area boundary;
- the listing under the ESA of a new species not currently addressed in this HCP that may be taken by HCP implementation;
- modification of any project action, mitigation component, or other action taken under the HCP, including funding, that may significantly affect authorized take levels, effects of the project, or the nature or scope of the mitigation or monitoring program; or
- any other modification of the project likely to result in significant adverse effects to the OTB or CRLF not addressed in the original HCP, including the IA, Biological Opinion and EA.

Major amendments would typically require amending the HCP and the incidental take permit through the same formal review process as the original HCP and permit, including NEPA review, a Federal Register notice, and an internal Section 7 consultation. The UC Regents will submit a proposal for a major amendment to the Service in a report that will include a description of the need for the amendment, an assessment of its impacts, and any alternatives by which the objectives of the proposal might be achieved. In this report, the UC Regents will describe appropriate changes to the conservation measures so that the Plan Species covered by this HCP are appropriately protected.

## Permit Renewal

Prior to expiration, the permit may be renewed, if necessary, without the issuance of a new permit, provided that the permit is renewable, the permit holder is in compliance with all permit terms and conditions, and that biological circumstances and other pertinent factors affecting the OTB or CRLF at the site are not significantly different than those described in this HCP. If the UC Regents wish to renew the permit, they will submit in writing to the Service at least thirty (30) days prior to the expiration of this permit:

- a request to renew the permit for a specified duration;
- reference to the original permit number;
- certification that all statements and information provided in the original HCP and permit application, together with any approved HCP amendments, are still true and correct, or a list of proposed changes;
- a description of what take of the Plan species has occurred under the existing permit; and
- a description of what portions of the project are still to be completed, if any, or what activities under the original permit the renewal is intended to cover.

## Permit Transfer

In the event of sale or transfer of ownership of the property, transfer of the permit shall be governed by the Service's regulations in force at the time. The permit applicant would need to meet the regulations governing the transfer of permits as defined in 50 CFR section 13.25 (64 FR 32711, June 17, 1999, as amended 64 FR 52676, Sept. 30, 1999) or those equivalent regulations in effect at the time of transfer, if any.

Chapter 8
# Alternatives

Section 10(a)(2)(A)(iii) of the ESA of 1973, as amended, requires that alternatives to the take of species be considered and that reasons why such alternatives are not implemented be discussed. The alternatives to the Ranch View Terrace Project and selection of the ERC Site 2 that were considered are described below. Alternatives are also described and analyzed in the EA for the HCP.

## Alternative 1: Proposed Action

The proposed action alternative is the action described and addressed in this HCP. This alternative may result in some incidental take of the Plan Species. This alternative was selected as the preferred alternative because:

- it best satisfies the need for and purpose of the proposed Projects;
- it is likely to result in a very low level of incidental take and overall impacts to both species;
- funding is available for the HCP elements and the projects as designed; and
- 13 acres of the UCSC campus, pending Service approval, will be protected under a new land use designation in perpetuity.
- an additional 5.7 acres of potential habitat for the OTB will be enhanced and protected over the duration of the permit within a new 12.5-acre preserve.

## Alternative 2: No Action

The No-Action alternative would occur if the Service did not approve the Section 10(a)(1)(B) incidental take permit application for Ranch View Terrace or for the Equipment Storage Site of the ERC. This alternative may prevent the UC Regents from proceeding with the Ranch View Terrace Project and building faculty housing on the Inclusion Area D site due to chance of take of Plan Species on the site.

The No-Action alternative would also occur if the UC Regents chose to abandon the Projects because of funding issues or unforeseen and extraordinary constraints. In either scenario, failure to implement the Projects would avoid any potential impacts to listed species or the potential for take of any listed species. The No-Action alternative does not meet the need for and the purpose of the Projects and is therefore not feasible.

# Alternatives Considered but Eliminated

The UC Regents considered but rejected several alternatives to the Ranch View Terrace Project.

## Alternative Locations for the Emergency Response Center Equipment Storage Building

UCSC currently stores emergency response equipment in the Hay Barn (4,940 assignable square feet), located in the southern portion of campus near the campus entry and directly east of the project. The hay barn is a contributing element to the National Register-eligible Cowell Ranch Historic District (University of California, Santa Cruz 2003). The site contains bare ground and ruderal vegetation; no special-status plants or wildlife species have been found on the site. The site does not support suitable habitat for the Plan Species.

The barn structure has deteriorated and would require significant re-construction to provide a safe facility for the intended use. Under this alternative, the existing building would be removed and a replica unheated storage building would be constructed using a steel supporting structure and specially-milled redwood retrieved from trees cleared for another project on campus. Removal of the original building and construction of a replica could compromise the value of the hay barn as a historic resource. The site is highly visible from the main entry road on campus. The cost of rebuilding the hay barn ($691,000 in 2002 dollars) is significantly greater than the cost of the Butler building ($337,000 in 2004 dollars). This alternative was rejected because of the significance of the hay barn site as a historic resource, the visibility of the site from the historic core of campus, and the prohibitive cost of replacing the hay barn.

The proposed ERC equipment storage site (the LPG site) is already paved and used for storage of debris and other similar activities. The construction and use of this site may impact CRLF, but impacts are considered negligible due to the developed nature of the site and its marginal value for the species.

## Reduced Housing Project Size or Footprint

Reducing the number of units in Ranch View Terrace would slightly reduce the potential for impacts to the Plan Species by decreasing the human population of the development. Similarly, reducing the project footprint would also reduce the potential impacts on Plan Species and the potential for take slightly. The potential for take could not be eliminated by a reduction in the number of units or the project footprint because of the site's proximity to known populations of the Plan Species.

Impacts to CRLF would be reduced incrementally and in proportion to the reduction of the size of the project density or footprint. Potential impacts to OTB would be reduced in a similar fashion. However, any reduction in the density of the housing project or its footprint would decrease the economic viability of the project and the ability of the UC Regents to meet faculty housing needs on campus. As described in chapter 4, "Effects on Covered Species," the impacts of Ranch View Terrace on Plan Species are very low. Reduction of the project size or footprint would reduce these impacts only incrementally and in an amount disproportionate to the economic costs of these reductions and to the costs to the academic program of UCSC. For these reasons, this alternative is considered not feasible and is rejected.

## Alternative Sites for Housing Project on Campus

Two sites on campus were considered as alternative sites for the Ranch View Terrace Project. Inclusion Area E is a 16-acre site that is dominated by annual grassland. The site also contains a segment of the western-most branch of Moore Creek, which is dominated by coast redwood and California bay-laurel. Development of this site would have a greater impact to CRLF than development of the proposed project. There is no OTB habitat on Inclusion Area E (Entomological Consulting Services 2002). Development would affect upland habitat for red-legged frog and could directly or indirectly affect a potential movement corridor for the frog though this branch of Moore Creek (Jones & Stokes 2002a). Because of this and other site constraints, a housing development would not meet the purpose and need of the project, so this site was rejected as an infeasible alternative.

Development on Inclusion Area A was also considered as an alternative housing site (see figures 3-3, 1-3). This site, however, contains extensive and high-quality suitable upland habitat for CRLF, and occupied suitable habitat for OTB. Development on this site would have much greater effects on Plan Species than development on the proposed Project site. For this and other reasons, this alternative site was rejected as infeasible for the Ranch View Terrace Project.

## Off-Campus Housing Project

The construction of the proposed project at an off-campus location was also considered. Potential locations with the greatest feasibility for constructing off-campus faculty and staff housing included four sites in the City of Santa Cruz:

- the UC property at Long Marine Laboratory (LML),
- the Swenson property on Shaffer Road (adjacent to LML),
- an open lot on Golf Club Drive, and
- an open lot on Isabel Drive, adjacent to Highway 1.

At the Long Marine Laboratory, the construction of faculty and staff housing not affiliated with coastal dependent and coastal related uses on the site would likely not conform to California Coastal Act policies. In addition, much of the site is occupied by wetlands, and could result in greater impacts on hydrology, biology, and visual quality than the proposed Project site. The other off-campus locations are designated and zoned for low density residential in the City of Santa Cruz General Plan. Development on these sites would require the preparation of a Specific Plan and, in some cases, an amendment to the Local Coastal Program, which must be adopted by the City and certified by the Coastal Commission prior to development. In addition, development at these sites would result in greater traffic effects on the City and UCSC campus due to the number of additional vehicle trips that would be required by faculty and staff to travel between residences and campus facilities.

These sites also support a variety of known archeological and biological resources, and geologic and hydrologic features that could be adversely affected by project construction. Therefore, faculty and staff housing development at an off-campus location would likely result in greater environmental effects than the proposed project, and would not fully meet the objectives related to locating and designing faculty housing in a manner that supports a sense of community and a high quality of life, and locating housing to support the achievement of campus traffic management goals.

## Alternative Conservation Strategies

Increasing or decreasing the land dedication on Inclusion Area A was considered as an alternative to the proposed Preserve for CRLF. The proposed Inclusion Area A Preserve, which supports 13.0 acres of high quality upland habitat, is proposed to offset the impacts of the covered activities on CRLF. The loss of 7.5 acres of marginal upland habitat is therefore mitigated at a greater than 1-to-1 mitigation ratio. This ratio is considered more than adequate to offset Project impacts and is the maximum practicable mitigation for the CRLF.

The UC Regents also considered altering the conservation measures for OTB by increasing or decreasing the size of the Preserve on Inclusion Area A. The

proposed Preserve protects the largest portion of the only known OTB population in Lower Campus. This mitigation is also considered more than adequate, given that no OTB are currently found on the Ranch View Terrace site or the ERC Site 2.

Mitigation on the Inclusion Area D site, establishing the 12.5-acre Inclusion Area D Preserve, is the maximum practicable because the Preserve boundaries cannot be expanded. The proposed Preserve on Inclusion Area D for OTB incorporates all of the Watsonville soils on the site that can be managed to create suitable habitat for the beetle. For these reasons, mitigation for OTB is the maximum practicable for this species and for the Project impacts.

Chapter 9
# References Cited

## Printed References


ABA Consultants and Joni L. Janecki & Associates. 1992. UC Santa Cruz Music Facility Coastal Terrace Prairie Enhancement and Management Plan. Prepared for Office of Campus Facilities, Environmental Assessment Group. University of California, Santa Cruz, CA.

Arkley, R.J. 1963. Soils of the Santa Cruz Campus. (Unpublished report.) University of California, Berkeley, Department of Soils and Plant Nutrition. Berkeley, CA.

Bossard, C.C., J.M. Randall, and M.C. Hoshovsky, eds. 2000. *Invasive Plants of California's Wildlands*. University of California Press. Berkeley, CA.

Boyd, H.P. and Associates. 1982. Annotated Checklist of Cicindelidae *(Coleoptera)*, the Tiger Beetles of North and Central America and the West Indies. Plexus Publishing, Inc. Marlton, NJ.

BUGGY Data Base. 2002. Report of Occurrences for the Ohlone Tiger Beetle. Entomological Consulting Services, Ltd. Pleasant Hill, CA.

California Exotic Pest Plant Council. 1999. Exotic Pest Plants of Greatest Ecological Concern in California. (Updated lists available at <www.caleppc.org>.)

City of Santa Cruz. 2002. Initial Study for the Tosca Terrace Subdivision, 1463 High Street, Santa Cruz, CA.

Ecosystems West Consulting Group. 2000. Draft University of California Santa Cruz California Red-Legged Frog Site Assessment. Santa Cruz, CA. Prepared for Campus Planning Department, University of California. Santa Cruz, CA.

———. 2002a. Biological Report for the Proposed Tosca Terrace Subdivision Site, Santa Cruz, CA. Prepared for Mr. Tom French, 107 Moore Creek Road, Santa Cruz.

———. 2002b. California Red-Legged Frog Biological Assessment for the Proposed University of California Santa Cruz Marine Science Campus. Prepared for Campus Planning Department, University of California. Santa Cruz, CA. July.

Entomological Consulting Services, Inc. 2002. UCSC Campus-Wide Habitat Assessment for the Ohlone Tiger Beetle. Letter report to the Law Offices of Cheryl Tillotson, San Francisco, CA.

Environmental Assessment Group. 2000. Final Initial Study Checklist (Environmental Impact Assessment), Moore Creek Drainage Remediation Project, University of California, Santa Cruz. Prepared by the Environmental Assessment Group, Physical Planning and Construction, University of California, Santa Cruz, with assistance from Jones & Stokes. San Jose, CA.

Freitag, R., D.H. Kavanaugh, and R. Morgan. 1993. A New Species of *Cicindela* (*Cicindela*) *(Coleoptera: Carabidae: Cicindelini)* from Remnant Native Grassland in Santa Cruz County, California. The Coleopterists Bulletin 47:113–120.

Hart, E.W., and W.A. Bryant. 1997. *Fault-Rupture Hazard Zones in California – Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps*. (Special Publication 42.) California Division of Mines and Geology. Sacramento, CA.

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.

Hayes, M.P., and D.M. Kremples. 1986. Vocal Sac Variation Among Frogs of the Genus *Rana* from Western North America. Copeia 1986(4):927–936.

Holling, C.S., ed. 1978. *Adaptive Environmental Assessment and Management*. Wiley. London, UK.

International Conference of Building Officials. 1997. Uniform Building Code. International Conference of Building Officials. Whittier, CA.

Jennings, M.R., and M.P. Hayes. 1988. Habitat Correlates of Distribution of the California Red-Legged Frog (*Rana aurora draytonii*) and the Foothill Yellow-Legged Frog (*Rana boylii*): Implications for Management. *Proceedings*, Management of Amphibians, Reptiles, and Small Mammals in North America Symposium 1988.

Jennings, M.R., and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Report prepared for the California Department of Fish and Game, Inland Fisheries Division. Rancho Cordova, CA.

Jennings, M.R., M.P. Hayes, and D.C. Holland. 1993. A Petition to the U.S. Fish and Wildlife Service to Place the California Red-Legged Frog (*Rana aurora draytonii*) and the Western Pond Turtle (*Clemmys marmorata*) on the List of Endangered and Threatened Wildlife and Plants.

Johnson, N.M. 1988. Evaluation of Drainage Conditions at the University of California Santa Cruz Under Existing and Proposed Campus Development. Santa Cruz, CA. Prepared for Campus Facilities, Environmental Assessment Group, and University of California. Santa Cruz, CA.

Jones & Stokes. 2002a. Draft California Red-Legged Frog Site Assessment of the University of California, Santa Cruz Lower Campus. San Jose, CA. Prepared for the Office of Current Planning Department, University of California. Santa Cruz, CA.

———. 2002b. UCSC Growth and Stewardship Planning Environmental Issues Analysis, Phase 2 Report. San Jose, CA. Prepared for Sasaki Associates. San Francisco, CA.

———. 2003. Campuswide Biological Resources Report. San Jose, CA. Prepared for the Office of Current Planning Department, University of California. Santa Cruz, CA.

Kershner, J.L. 1997. Monitoring and Adaptive Management. In J.E. Williams, C.A. Wood, and M.P. Dombeck (eds.), *Watershed Restoration: Principles and Practices*. American Fisheries Society. Bethesda, MD.

Knisely, C.B. and J.M. Hill. 1989. Human impact on *Cicindela dorsalis dorsalis* at Flag Ponds, Maryland. Final report to USFWS, Annapolis Field Office.

Knisley, C.B. and T.D. Schultz. 1997. *The Biology of Tiger Beetles and a Guide to the Species of the South Atlantic States*. Virginia Museum of Natural History, Special Publication No. 5. 209 pp.

Larochelle, A. 1974. *The Food of Cicindelidae of the World*. *Cicindela* 6(2):21–43.

Licht, L. E. 1974. Survival of Embryos, Tadpoles, and Adults of the Frogs *Rana aurora aurora* and *Rana pretiosa pretiosa* Sympatric in Southwestern British Columbia. Canadian Journal of Zoology 52(5):613–627.

Moore Rubell Yudell Architects & Planners, Joni L. Janecki & Associates Inc. Landscape Architects, and Bowman & Williams Consulting Civil Engineers. 2001. Inclusion Area D Master Plan and Design Concepts Excerpts for Requests for Qualifications. (Accessed online via the UCSC planning website at <www2.ucsc.edu/ppc/current/iad.html>.)

Morgan, R. 1989. Letter re: Botanical Survey, Inclusion Area D. Dated 30 August 1989 and addressed to Graham Bice, Environmental Assessment Group.

Mori, Bryan M. 1997. Terrace Point Red-Legged Frog Assessment, Santa Cruz, CA. Prepared for ATC Realty Sixteen, Inc.

Nolan, Zinn, and Associates. 2002. Letter re: Report on Biotic (Seep) Area Investigation, Inclusion Area D, University of California, Santa Cruz, California. Dated 25 June 2002 and addressed to Dean Fitch, UCSC Office of Environmental Planning.

Norris, R.M., and Webb, R.W. 1990. *Geology of California*. 2nd edition. John Wiley & Sons. New York, NY.

Natural Resources Conservation Service. 2002. Letter report, Subject: Soils Occupied by the Ohlone Tiger Beetle. Dated 28 May 2002 and addressed to Kelli Camara, USDA-NRCS. Capitola, CA.

Pearson, D.L. 1988. Biology of Tiger Beetles. Annual Review of Entomology 33:123–147.

Pearson, D.L. and A.P. Vogler. 2001. *Tiger Beetles, the Evolution, Ecology, and Diversity of the Cicindelids*. Cornell University Press. Ithaca, NY. 333 pp.

Rathbun, G.B., and J. Schneider. 2001. Translocation of California Red-Legged Frog (*Rana aurora draytonii*). Wildlife Society Bulletin 29(4):1300–1303.

Reis, D.K. 1999. Habitat Characteristics of California Red-Legged Frog (*Rana aurora draytonii*): Ecological Differences Between Eggs, Tadpoles, and Adults in a Coastal Brackish and Freshwater System. Master's thesis, San Jose State University. San Jose, CA.

Shelford, V. 1907. Preliminary Note on the Distribution of the Tiger Beetles (Cicindela) and its Relation to Plant Succession. *Biological Bulletin* 14:9–14.

Shelford, V. 1909. Life histories and larval habits of the tiger beetles (Cicindelidae). Journal of the Linnean Society of London (*Zoology*) 30:157–184.

Soil Conservation Service, U.S. Department of Agriculture. 1980. *Soil Survey of Santa Cruz County, California*. U.S. Government Printing Office.

Storer, T. I. 1925. A Synopsis of the Amphibians of California. University of California Publications in Zoology 27:1–342.

Turnbull, W., D. Lyndon, M. Buchanan, J. Culver, R.T. Hester, S. Marzuola, B.R. Brubaker, M. Friedman, and T. Nemeth. 1991. Inclusion Area Study. Prepared for University of California, Santa Cruz. Santa Cruz, CA.

University of California, Santa Cruz. 1988. Long Range Development Plan. Available at: <http://www2.ucsc.edu/ppc/lrdp/graphical/figures/ lrdp.html>. Accessed: June 12, 2002.

———. 2003. Draft Environmental Impact Report, Emergency Response Center Project. Prepared by University of California, Santa Cruz EAG. Santa Cruz, California.

———. 2004. Draft Environmental Impact Report, Ranch View Terrace Faculty and Staff Housing Project. Prepared by Impact Sciences for the University of California, Santa Cruz. Berkeley, California. January 21.

U.S. Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Red-Legged Frog. Federal Register 61:25813.

———. 1999. Programmatic Formal Endangered Species Act Consultation of Issuance of Permits Under Section 404 of the Clean Water Act or Authorizations Under the Nationwide Permit Program for Projects that May Affect the California Red-Legged Frog. Letter to Art Champ, Calvin Fong, and Richard Schubel, Regulatory Branch Chiefs, U.S. Army Corps of Engineers, Sacramento, San Francisco, and Los Angeles Districts. From Diane Noda and Wayne White, Field Supervisors, Ventura and Sacramento Offices, U.S. Fish and Wildlife Service.

———. 2000. Draft Recovery Plan for the California Red-Legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service. Portland, OR.

———. 2001. Endangered and Threatened Wildlife and Plants: Endangered Status for the Ohlone Tiger Beetle *(Cicendela ohlone)*. Federal Register 66:50340–50349.

———. 2001. Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the California Red-Legged Frog. Federal Register 66:14626.

———. 2002. Recovery Plan for the California Red-Legged Frog *(Rana aurora draytonii)*. U.S. Fish and Wildlife Service. Portland, OR.

U.S. Fish and Wildlife Service, and National Marine Fisheries Service. 1996. *Endangered Species Habitat Conservation Planning Handbook*. Washington, DC. (Amended in 2000.)

Walters, C.J. 1986. *Adaptive Management of Renewable Resources*. Macmillan Press. New York, NY.

Warrick, S. F., ed. 1982. *The Natural History of the UC Santa Cruz campus*. (Environmental Field Program Publication No. 11.) Santa Cruz, CA: University of California, Santa Cruz.

Willis, H.L. 1967. Bionomics and Zoogeography of Tiger Beetles of Saline Habitats in the Central United States (Coleoptera: Cicindelidae). University of Kansas Science Bulletin 47:145–313.

Wright, A.H., and A.A. Wright. 1949. *Handbook of frogs and toads of the United States and Canada*. Comstock Publishing Company. Ithaca, NY.

# Personal Communications

Allaback, Mark. Herpetologist. Biosearch Wildlife Surveys. February 6, 2002 – telephone conversation; February 11, 2002 – meeting.

Bernau, Christof. Former greenhouse manager. University of California, Santa Cruz Arboretum. April 2002 – phone conversation.

Fusari, Margaret. Professor of biology and director of UCSC natural reserves. February 11, 2002 – meeting.

Holtz, Jen. UCSC Campus Animal Control Officer. May 20, 2003 – phone conversation

Knisley, Barry. Professor of biology and tiger beetle specialist. Randolph Macon College. June, 2003 – meeting.

Leap, Jim. Director. University of California, Santa Cruz Farm. January 31, 2002 – phone conversation.

Orton-Palmer, Amelia. Chief, Division of Santa Cruz and San Benito Counties, U.S. Fish and Wildlife Service. December 11, 2002 – meeting.

Raven, Dean. Grazing Program Manager. University of California, Santa Cruz. November 2003 – phone conversations.

Reis, Dawn. Herpetologist. Ecosystems West Consulting Group. February 11, 2002 – meeting.

Appendix A

# California Red-Legged Frog Habitat Assessment

Appendix B

# Ohlone Tiger Beetle Habitat Assessment

Appendix C

# Acronyms

Appendix C

# Acronyms and Abbreviations

| | |
|---|---|
| AUM | animal-unit-months |
| CC&Rs | codes, covenants, and restrictions |
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| CFR | Code of Federal Regulations |
| CRLF | California red-legged frog |
| EA | environmental assessment |
| EIR | environmental impact report |
| ERC | Emergency Response Center |
| ESA | federal Endangered Species Act |
| Farm | UCSC Center for Agroecology and Sustainable Food Systems |
| FFE | fund functioning as an endowment |
| FONSI | Finding of No Significant Impact |
| FR | Federal Register |
| HCP | habitat conservation plan |
| IA | Implementing Agreement |
| IAA | Inclusion Area A |
| IAD | Inclusion Area D |
| LML | Long Marine Laboratory |
| LPG | liquid propane gas |
| LRDP | Long Range Development Plan |
| Management Area | Ohlone Tiger Beetle Management Area |
| NCCP | Natural Community Conservation Plan |
| NEPA | National Environmental Policy Act |
| NRCS | Natural Resource Conservation Service |
| OTB | Ohlone tiger beetle |
| PG&E | Pacific Gas and Electric Company |
| ppt | parts per thousand |
| PRV | pressure regulating valve |
| ROD | Record of Decision |
| SCS | Soil Conservation Service |
| Service | U.S. Fish and Wildlife Service |
| UBC | Uniform Building Code |
| UC Regents | Regents of the University of California |
| UC | University of California |
| UCOP | University of California Office of the President |

| | |
|---|---|
| UCSC | University of California, Santa Cruz |
| USC | U.S. Code |

Appendix D

# List of Preparers

Appendix D
# List of Preparers

## Preparers

### University of California

Charlie Eadie, UCSC Director of Campus and Community Planning
Dean Fitch, UCSC Project Manager
Chris Aldecoa, UCSC Senior Planner
Alan Waltner, Esq., Office of General Counsel, UC Office of the President, Legal Review

### Jones & Stokes

Paul Cylinder, Ph.D., Principal-in-Charge
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Shannon Bane, Wildlife Biologist and Project Coordinator
Marcia Irving, Wildlife Biologist and Botanist
Steve Avery, Wildlife Biologist
Debbie Bloom, Graphic Artist
Brent Bouldin, Editor
Corrine Ortega, Publications Specialist
Kelly Frad, Reproduction

### The Law Offices of Cheryl Tillotson, Esq.

Cheryl Tillotson, Esq., Legal Review

### Entomological Consulting Services, Inc.

Richard Arnold, Ph.D., Entomologist

Appendix E

# License Agreement with Grazing Operator

**Note:** UCSC is revising the current grazing license agreement to match the conditions in the HCP. This revised agreement will be included as Appendix E of the final HCP.

LICENSE AGREEMENT

This agreement is entered into this _____ day of _____ by and between THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, a California corporation, hereinafter referred to as "University," and _____, hereinafter referred to as "Licensee."

W I T N E S S E T H

WHEREAS, University owns certain real property located in the County of Santa Cruz, State of California, which is held or used for University and University-oriented purposes in connection with the Santa Cruz campus of the University of California, and

WHEREAS, it is contemplated that certain of said real property will not be developed by University in the immediate future, particularly those 190 acres as shown on the University of California, Santa Cruz Grazing Map, which is attached hereto as Exhibit A and by this reference incorporated herein, and

WHEREAS, Licensee desires to use said 190 acres for the grazing of cattle, and

WHEREAS, the use of said 190 acres for such purposes and under such conditions as are enumerated in the accompanying Exhibits A, B-1 and B-2 would be in the best interests of safety and good property management and of mutual benefit to University and Licensee;

NOW, THEREFORE, University and Licensee agree as follows:

1.University hereby grants to Licensee a revocable license to enter upon and use for cattle grazing purposes the 190 acres of real property shown upon Exhibit A (Grazing Map) as Grazing Area #1-84 acres, and Grazing Area #2-82 acres, Grazing Area #3-11.5 acres, and Grazing Area #4-12.5 acres.

Grazing Area #2 includes 8.5 acres and Grazing Area #4 includes 12.5 acres designated in the UC Santa Cruz Long Range Development Plan as Campus Habitat Reserve and is subject to an Implementing Agreement between the United States Fish & Wildlife Service and The Regents of the University of California.

If Licensee does not place cattle on the University premises to the extent authorized by the Grazing Schedule (Exhibit B-2), University may require Licensee to have the grass mowed to an agreed upon height for the purposes of fire hazard reduction and habitat management.

2.This agreement shall commence on _____ and shall continue in effect until terminated or amended as provided herein.

3.In consideration of the receipt and enjoyment of the license granted hereunder, Licensee agrees to pay the University an annual fee of _____ per month for four months. If the Licensee voluntarily elects not to graze then the Licensee shall nevertheless pay to the University the full license fee specified herein. Full payment of _____ per year shall be made in advance on or before _____ of each year.

4.Licensee shall graze its livestock in accordance with the Grazing Schedule (Exhibit B-2) or as designated by the University Representative. The licensee is not allowed to have livestock in the

portion of Grazing Area #2 or Grazing Area #4 designated as Campus Habitat Reserve before May 15 or after October 15 of each year without specific written authorization from the University.

Licensee shall be limited to grazing livestock in the portion of Grazing Area #2 and Grazing Area #4 designated as Campus Habitat Reserve to a maximum of four months unless the licensee has specific written authorization to extend the grazing duration from the University.

Licensee shall limit the number of livestock grazed in an Area and the period of their grazing so that the authorized annual allotment of Animal Unit Months ("AUMs") as established in the Grazing Schedule (Exhibit B-2) shall not be exceeded. A Utilization Index or Residual Dry Matter index for the vegetation management in the portion of Grazing Area #2 designated as Campus Habitat Reserve will be used to assist in determination of livestock grazing intensity. At any given time, the stocking rate in the occupied Area (Exhibit A) shall not exceed the baseline herd size for the Area by more than 30% in order to meet vegetation management goals.

Stocking rates in the portion of Grazing Area #2 and Grazing Area #4 designated as Campus Habitat Reserve will be dictated by the Utilization Index or Residual Dry Matter index for the vegetation management as described in the Habitat Conservation Plan for Ranch View Terrace. This index will supercede any AUM requirements or limitations in this area at all times. If the vegetation management goals in the Campus Habitat Reserve are reached in any given year, Licensee shall within ten days of written notice from University remove all of the livestock from the subject Reserve as necessary to fulfill the habitat management obligations of the Implementing Agreement and Habitat Conservation Plan.

In the interest of sound land management, it may be necessary under extenuating conditions to increase or decrease the number of AUMs originally allotted in this Agreement.

Should the allotment of AUMs be exceeded without authorization by University, Licensee shall within ten days of written notice from University remove all of such number of livestock as are necessary to comply with the maximum capacity authorized by the University.

If Licensee exceeds the allotment of AUMs without authorization, it shall pay to University within two weeks of demand twice the fee provided in this License for each AUM or portion thereof grazed in excess of said authorized number, such amount being hereby agreed upon as the minimum damage to University from such excess usage.

Payment to University for additional AUMs will be assessed on a pro-rated basis as will refunds to Licensee for AUM reductions. Any such modifications to the number of authorized AUMs shall be based on University's determination, and agreed to by Licensee. If Licensee fails to agree, University shall have the right to terminate this Licensee immediately.

5.Licensee shall supply to University within two weeks of demand such information as University desires as to the kind and quantity of supplemental feed used and the number, kind, and weight-class and/or age-class of livestock which Licensee may have or may have had upon the premises at any time. Failure to comply or misrepresentation of facts shall be deemed a breach of this Agreement. Supplemental feed shall be used on Grazing Area #2 and Grazing Area #4 only to provide supplemental nutrition (i.e., to supplement vegetation quality) and not to offset reduced vegetation quantity, to avoid overgrazing in these areas. Feeding stations will not be placed in or

within 100 feet of the portion of Grazing Area #2 or Grazing Area #4 designated as Campus Habitat Reserve.

6.University agrees to provide Licensee with water for livestock from existing and additional outlets or troughs or other sources designated by University, as described in Exhibits B-1, and B-2, subject to the availability of suitable distribution systems and water supply, as well as the convenience of University. University does not guarantee to provide for any particular amount of continuous water supply.

7.University shall provide fencing, as indicated on Exhibit A. The cost of said fencing shall be provided as follows:

Materials and labor for fence maintenance shall be supplied and paid for by the Licensee. Licensee shall be responsible for inspection and maintenance of fencing before and during the period of the License in order to assure containment of cattle and calves placed on premises. Upon termination of the License, Licensee shall restore the fencing to its original condition, normal wear and tear excepted. If cattle break through the fencing and have to be "rounded up" and returned to a secure area and/or the fence has to be repaired, Licensee shall be billed for this service at a rate of $250.00 per cow per occurrence, or the University rate, whichever is higher. University at such times will attempt to contact Licensee but shall be entitled to take, on behalf of and for the account of Licensee, all steps necessary to limit damage to property and injury to persons.

8.Access by Licensee to the premises shall be only through such gate or gates and by such means as from time to time are designated by University and shall be restricted to Licensee, its agents and employees, upon approval of University.

9.The authorized representatives of University shall have the right at all times to enter upon the licensed premises.

10.Licensee shall take all reasonable precautions in the exercise of Licensee's rights under the License to protect the health and safety of all persons and to minimize danger from all hazards to life and property, and shall comply with all health, safety and fire protection regulations and requirements of University.

11.Licensee assumes the entire responsibility and liability for losses, expenses, damages, demands and claims in connection with or arising out of injury (including death) or damage or alleged damage to property resulting from the usage or occurring upon the premises sustained or alleged to have been sustained in connection with or to have arisen out of the performance of this Agreement by Licensee, its agents, servants, and employees, and shall indemnify and hold harmless University, its officers, agents and employees from any and all liability for such losses, expenses, damages, demands and claims and shall, at University's for such losses, expenses, damages, demands and claims and shall, at University's request, defend any suit or action brought against them or any of them based on any alleged injury or damage and shall pay all damages, costs and expenses, including attorney's fees, in connection therewith or resulting therefrom.

12.Licensee, in support of its obligations under 11, above, shall insure its activities in connection with this Agreement and shall obtain, keep in force and maintain insurance as follows:

·Comprehensive Form or Farm-owner's Form General Liability Insurance (automobile owned/non-owned, contractual, products and completed operations coverages included) with a combined single limit of no less than $1,000,000 per occurrence. If such form of coverage would not be available then:

·Commercial Form General Liability Insurance with limits as follows:

| | | |
|---|---|---|
| (a) | General Aggregate | $2,000,000 |
| (b) | Products/Completed Operations | $2,000,000 |
| (c) | Personal and Advertising Injury | $1,000,000 |
| (d) | Each Occurrence | $1,000,000 |

However, if such insurance is written on the claims made form, following termination of this Agreement coverage shall survive for a period of no less than five years. Coverage shall provide for a retroactive date o placement coinciding with the effective date of this Agreement.

·Business Auto Liability Insurance for owned and scheduled, non-owned, or hired automobiles with a combined single limit no less than $1,000,000 per occurrence.

·Property Insurance, including theft of Licensee's equipment and livestock located on or around University property subject to approval by University.

·Workers' Compensation and Employers' Liability Insurance in a form and amount covering Licensee's full liability under Workers' Compensation Insurance and Safety Act of the State of California as amended from time to time.

·Such other insurance in such amounts as from time to time may be reasonably required by the mutual consent of University and Licensee against other insurable risks relating to performance under this Agreement.

It is expressly understood, however, that the coverage required herein shall not in any way limit the liability of Licensee.

13. Licensee shall be responsible for any damage to property of University that may be caused by the exercise of Licensee's rights hereunder. Licensee shall not commit waste on or in any manner change the contour or conditions of the licensed premises and shall use reasonable precautions to prevent damage to fences, roads, and paved areas and other improvements through and about said premises.

·University may, upon ten days written notice to Licensee, terminate this Agreement in whole or in part for the default of Licensee or for the convenience of University. In the event of partial termination by University, commencing with the date of such termination, the annual use fee payable by Licensee shall be pro-rated on the basis of the AUMs terminated. In the event of termination of the entire Agreement by University, the final use fee payable by Licensee shall be pro-rated based on the number of months eliminated from the final 12-month period.

·Licensee may, upon 30 days written notice to University, terminate this Agreement, for the default of University or for the convenience of Licensee. In the event of termination for the default of University, the final use fee payable by Licensee shall be pro-rated on the basis of the number of months eliminated from the final 12-month period, and Licensee waives all other claims which it may have against University.

·Upon termination of this Agreement, Licensee shall be responsible for promptly restoring the premises to as good a condition as they were in at the commencement of this Agreement, damages beyond the control of Licensee or due to fair wear and tear excepted, and for promptly removing from said premises all its equipment and other of its property of every kind whatsoever. In the event of Licensee's failure to so restore the premises and so remove its property within 60 days of the date of termination, then, at the option of University, University may at Licensee's expense so restore said premises and remove Licensee's property without liability to University.

·Licensee shall not sublicense under or assign or sell this Agreement or any interest therein, in whole or in part, nor shall it grant or attempt to grant any rights in the licensed premises or any part thereof, nor shall it become associated with any other person directly or indirectly as partner or otherwise in regard to Licensee's interest in, to or under this Agreement, without the prior written consent of University.

·University reserves all rights of way through, over, upon and across said premises and every part thereof for roads, power, telephone and telegraph lines, pipelines and other easements, whether similar to those enumerated or not. Each and all of the rights hereby reserved shall inure to the benefit of University and to the successors, assigns, and permittees of University.

This Agreement is made expressly subject to all licenses, leases and contracts which University has heretofore granted and may hereafter grant.

·POSSESSORY INTEREST TAX: This License may create a possessory interest subject to property taxation and Licensee may be subject to payment of property tax levied on such interest.

·This Agreement constitutes the entire agreement and understanding between the parties and supersedes any prior or contemporaneous agreement or understanding, whether oral or written, between the parties concerning the subject matter hereof. This Agreement may not be altered or amended except by a further writing signed by both parties.

| | |
|---|---|
| THE REGENTS OF THE UNIVERSITY OF CALIFORNIA | LICENSEE |
| By: _____ | By: _____ |
| ASSOCIATE SECRETARY | |

UC Santa Cruz Grazing License Agreement
Exhibit B-1

The words “animal-unit-month” (AUM) as used in this lease shall mean the utilization of the leased premises by one animal, 6 months and older, for one month. For computing the consumption of the authorized AUM of feed, the relative feed requirements of the various kinds of livestock permitted to be kept in the leased premises shall be as follows:

| Kind of Livestock | AUM |
|---|---|
| Steer, 2 years old or 1000 pounds of more | 1 |
| Cow or Cow and calf (calf up to 6 months) | 1 |
| Bull | 1 |
| Weaned calf | 1 |
| Horse | 1 ½ |
| Others as determined | |

As the kind or kinds of livestock change during any lease-year, thus changing the AUM factor in the foregoing table, the new factor shall be effective upon the date on which the change in kind is agreed to have occurred.

Appendix F

# License Agreement with Developer

**Note:** The entire license agreement will be available when finalized and upon request. What follows below is the relevant portion of the license agreement to the HCP and specifies the developer's responsibilities with regards to the HCP. The section below has been finalized.

To enable construction of the Ranch View Terrace Project, the UC Regents will enter into a Development Agreement and License with the project developer, Valeo Ranch View Terrace I, L.P., a Delaware limited partnership. As specified in the HCP, the developer is responsible for implementing several components of the HCP conservation strategy, termed "environmental mitigation measures" in the Development Agreement and License. These requirements are referenced in Section 5.5 of the Development Agreement and License:

> "EIR and HCP Mitigation Measure Responsibilities. Homebuilder shall perform, or cause to be performed for its account, the environmental mitigation measures set forth in the chart of Mitigation Measure Responsibilities which is attached hereto as Exhibit I. In addition to the measures outlined in Exhibit I, Homebuilder shall comply with all remaining measures identified in the Ranch View Terrace Habitat Conservation Plan ("HCP") and the Ranch View Terrace Final Environmental Impact Report ("EIR") as they may apply, directly or indirectly, to the Project."

Exhibit I of the Development Agreement and License is included in this appendix of the HCP.

Appendix F

# Exhibit I of Development Agreement and License

The following table summarizes those mitigation measures related to the Ranch View Terrace Faculty and Staff Housing project that are the direct responsibility of the Developer to implement. These measures have been extracted directly from the Ranch View Terrace Draft Habitat Conservation Plan (HCP), Ranch View Terrace Draft Environmental Impact Report (EIR), and communications with UCSC Campus Planning staff.

In addition to the measures outlined in this table, the Developer is to comply with all remaining measures identified in the aforementioned documents.

| Item No. | Mitigation Measure | Timing | Source |
|---|---|---|---|
| 1 | Ensure construction superintendents attend training on California red-legged frog (CRLF) and all construction personnel attend training for Ohlone tiger beetle (OTB).<br><br>Training will be provided by UCSC biological consultant. On-site monitor (construction superintendent) will ensure construction personnel are trained concerning both species. | within first week of construction activities | Draft Habitat Conservation Plan (HCP) pp. 5-3 and 5-12 |
| 1A | Designate and document one on-site monitor to be responsible for daily review of Developer's mitigation measure responsibilities<br><br>The designated on-site monitor will be present during all construction activities.<br><br>On-site monitor will ensure all construction personnel are trained. | Designation and documentation made prior to construction activities | Draft Habitat Conservation Plan (HCP) pp. 5-3 and 5-12 |

| | | | |
|---|---|---|---|
| 2 | Install and maintain temporary fences and signs, as required, around perimeter of construction site to exclude construction equipment but allow passage of frogs to upland habitat | Prior to construction activities (install) and throughout construction (maintain) | Draft HCP pp. 5-3 and 5-12 |
| 3 | Ensure construction personnel watch for CRLF and OTB and notify on-site monitor if either species is found on site. On-site monitor will notify the University and order crews to stop work until an approved biologist ensures there are no species within the construction site | throughout construction | Draft HCP pp. 5-3 and 5-12 |
| 4 | Avoid standing water on the site deeper than 4 inches, if this occurs for more than a week, on-site monitor will notify biologist to survey pond for CRLF | throughout construction | Draft HCP p. 5-4 |
| 5 | Remove/contain all trash on site to deter CRLF predators | throughout construction | Draft HCP p. 5-3 |
| 6 | Install permanent fencing and signs around perimeter of Ranch View Terrace site to discourage pedestrian traffic from entering undeveloped portions of Inclusion Area D Preserve | prior to occupancy | Draft HCP pp. 5-5 and 5-13 |
| 7 | Install permanent fencing and signs, as required, along the east and north sides of Inclusion Area D preserve (western edge of utility corridor) and ensure that existing fencing on west and south sides is in good repair to minimize access from off-site | prior to occupancy | Draft HCP p. 5-13 |
| 8 | Identify plans for energy dissipaters and other improvements at Bay Street channel | Prior to final engineering design (approximately Jul.-Sept. 2004) | Draft Environmental Impact Report (EIR) pp. 2.0-8 and 4.8-22 (MEASURE 8-1) |
| 9 | Halt all construction within a 10-meter radius if potential cultural resources are discovered. Notify UCSC for archaeologist review before resuming work | throughout construction | Draft EIR pp. 2.0-7 and 4.5-13 (MEASURE 5-1) |
| 10 | Halt all construction within a 10-meter radius if potential human remains are discovered. Notify UCSC for their contact of County Coroner who may notify Native American representative for review before resuming work | throughout construction | Draft EIR pp. 2.0-7 and 4.5-16 (MEASURE 5-2) |
| 11 | Protect existing piezometers B1, B2, B3, PH-5A, PH-5B & PH-5C (all on-site, near northern seep), B6 (in southern seep) and B7 (midway between seeps) or have replaced by hydrologist if disturbed | throughout construction | Draft EIR pp. 2.0-9, 4.8-25 and Fig. 4.8-2 (MEASURE 8-2a) |

| | | | |
|---|---|---|---|
| 12 | Ensure hydrologist, hydrogeologist or geotechnical engineer inspect utility trenches prior to construction of baffles | throughout construction | Draft EIR<br>pp. 2.0-9 and 4.8-26<br>(MEASURE 8-2d) |
| 13 | No construction activities (i.e., installation of gas utility line) shall be allowed within monarch habitat (Arboretum grove adjacent to west side of project site) during the monarch winter roosting season | Oct.-Feb., annually | Draft EIR<br>p. 4.4-34, HCP EA 2-15 |
| 14 | Conduct pre-construction archaeological survey of location where entrance road and utility corridor are to be built to ensure no significant impact on cultural resources | Prior to construction | UCSC Campus Planning |
| 15 | Coordinate with University staff and consultants for pre-construction, seasonal, and on-going surveys, trainings, inspections and other measures as required by the referenced HCP and EIR and summarized in the attached Mitigation Measure Schedule Planning guide. | throughout construction | UCSC Campus Planning |

Sources referenced:

- Jones & Stokes, “Draft Habitat Conservation Plan, Ranch View Terrace, University of California, Santa Cruz,” July 2004, “Draft Environmental Assessment RVT,” July 2004
- Impact Sciences, “Draft Environmental Impact Report, Ranch View Terrace Faculty and Staff Housing Project, University of California, Santa Cruz,” January 21, 2004
- UCSC Campus Planning