CALIFORNIA COASTAL COMMISSION
CENTRAL COAST DISTRICT
725 FRONT STREET, SUITE 300
SANTA CRUZ, CA 95060
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Th7a

SCZ-NOID-0004-20 (UCSC CLRDP NOID NUMBER 11 – YOUNGER LAGOON RESERVE BEACH PUBLIC ACCESS MANAGEMENT PLAN)

OCTOBER 8, 2020 HEARING

EXHIBITS

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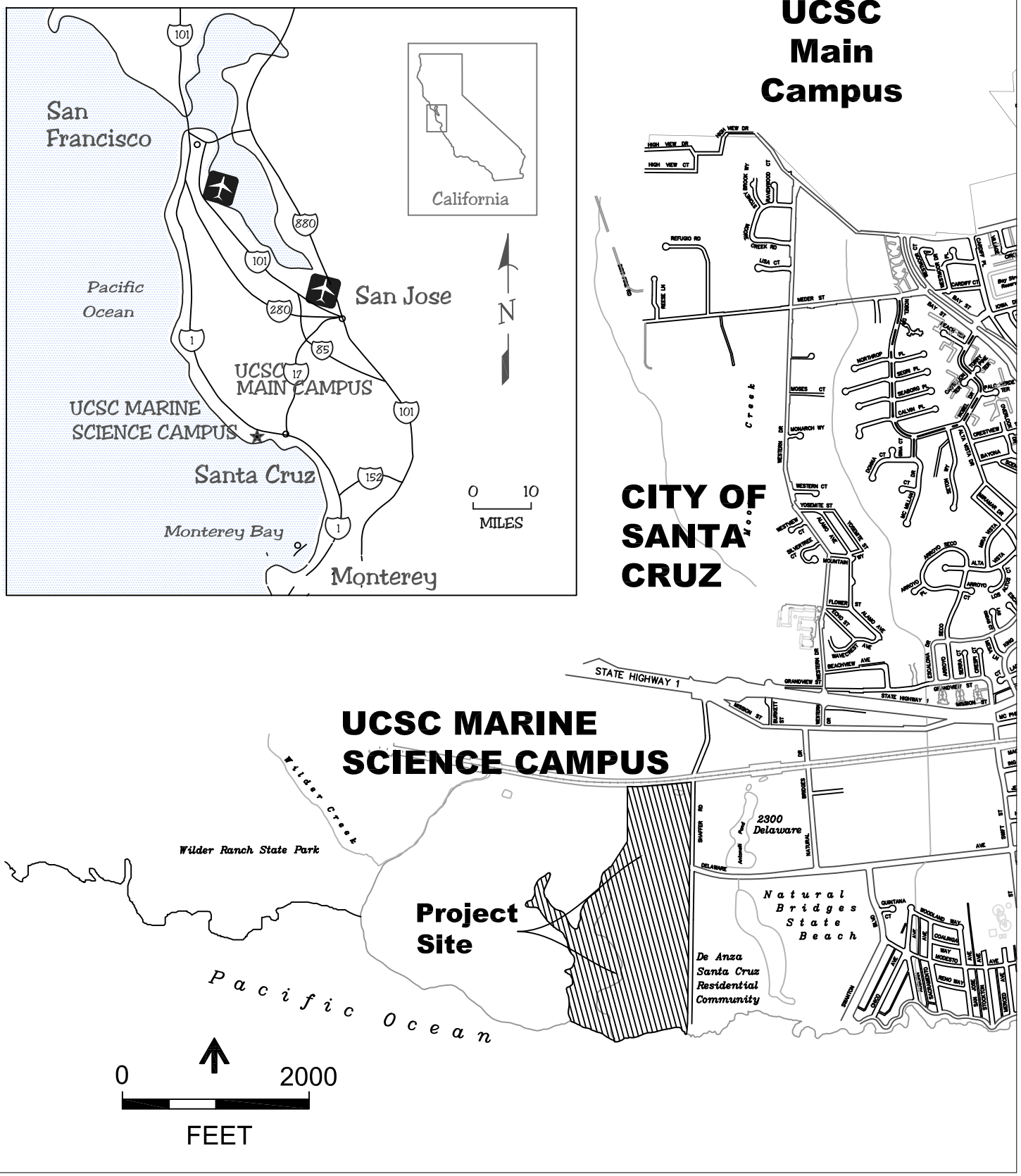
Aerial View of Younger Lagoon Beach and the Marine Science Campus

Note: All photopoint locations are approximate.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T R A N S M I T T A L

Date: **June 30, 2020**

To: **Colin Bowser, Coastal Program Analyst** *(NOID and Supporting Information)*
California Coastal Commission
725 Front Street, Suite 300
Santa Cruz, CA 95060

Re: **Notice of Impending Development 12 (NOID 12 20-1)**
Public Access To and Within Younger Lagoon Natural Reserve
Coastal Science Campus
100 Shaffer Road
Santa Cruz, CA 95060

From: **Jolie Kerns, Director of Campus Planning**
University of California, Santa Cruz
1156 High Street, Barn G
Santa Cruz, CA 95064

Copies of Notice of Impending Development (NOID 12 20-1) transmitted to:

Local Agencies
Director of Planning and Community Development
809 Center Street, Room 206
City of Santa Cruz
Santa Cruz, CA 95060

Director of Planning
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

Residents and Property Owners within 100'
Manager of de Anza Mobile Home Park
2395 Delaware Avenue
Santa Cruz, CA 95060

Barry Swenson Builder (owner of 801 Shaffer Road)
740 Front Street, #315
Santa Cruz, CA 95060

Manager of Pacific Shores
1240 Shaffer Road
Santa Cruz, CA 95060

Union Pacific Railroad
1400 Douglas Street
Omaha, NE 68179

Bob Goode
1464 Upper Park Road
Santa Cruz, CA 95065

Consulted Agencies *not applicable for this NOID*

Interested Individuals

Coastal Science Campus Entities
Institute of Marine Sciences
Attn: Ashley Vizagurra
UC Santa Cruz
115 McAllister Way
Santa Cruz, CA 95060

California Department of Fish and Wildlife
Attn: Laird Henkel
151 McAllister Way
Santa Cruz, CA 95060

National Oceanic and Atmospheric Administration
Attn: Steve Linley
110 McAllister Way
Santa Cruz, CA 95060

UCSC Natural Reserves
Attn: Gage Dayton
Environmental Studies Department
UC Santa Cruz
1156 High Street
Santa Cruz, CA 95064

Caretaker 1
UC Santa Cruz
115 McAllister Way
Santa Cruz, CA 95060

Caretaker 2
UC Santa Cruz
115 McAllister Way
Santa Cruz, CA 95060

Short-term Marine Science Campus Residents *not applicable at this time*

Long-term Marine Science Campus Residents *not applicable at this time*

Notice of Impending Development 12 20-1

A Notice of Impending Development (NOID) provides notice to the public and the California Coastal Commission of UC Santa Cruz' intention to undertake a development project at its Coastal Science Campus (CSC, formerly the Marine Science Campus). In order for a project to be implemented, it must be contemplated by and within the parameters of the Marine Science Campus Coastal Long Range Development Plan (CLRDP). The CLRDP is available at UCSC's McHenry Library, the Santa Cruz Public Library and at: https://lrdp.ucsc.edu/final-clrdp.shtml.

The California Coastal Commission will review the project that is the subject of this NOID and determine if it is consistent with the CLRDP. The California Coastal Commission will provide advanced public notice of the date of the hearing.

Project Summary for NOID 12 20-1
Public Access to and Within Younger Lagoon Natural Reserve

The project is a Younger Lagoon beach access management plan for the next five years.

Supporting Information, which includes more details about this project is available at: http://ppc.ucsc.edu/planning/EnvDoc.html. **A hard copy is available for review at UC Santa Cruz Office of Physical Planning, Development and Operations, 1156 High Street, Barn G, Santa Cruz, CA 95064.**

University Approval
see CLRDP 8.1.4 (5)
Date **January 2010**

NOID Posting
see CLRDP 8.2.4
Date **June 30, 2020**

Environmental Compliance (CEQA/NEPA)
see CLRDP 8.1.4 (5)
Date **October 2009**

_X_ CEQA Categorical Exemption
CEQA document

___ NEPA _____
NEPA document

UC Santa Cruz Project Manager

Name Elizabeth Howard
Phone (831) 459-2455
Email eahoward@ucsc.edu

Coastal Commission Contact

Name Colin Bowser
Phone (831) 427-4863
Email Colin.Bowser@coastal.ca.gov

Notice of Impending Development 12 20-1

Public Access to and within Younger Lagoon Natural Reserve

Supporting Information

see CLRDP 8.2.5

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1. Project Report

1a. NOID 12 (20-1) Project Description

PUBLIC ACCESS TO AND WITHIN YOUNGER LAGOON NATURAL RESERVE (IMPLEMENTATION MEASURE 3.6.3)

Overview

CLRDP Implementation Measure (IM) 3.6.3 requires that the public have access to Younger Lagoon Reserve beach through controlled visits, and that a monitoring program be created to document the condition of native flora and fauna within Younger Lagoon and its beach over a five-year period. IM 3.6.3 also requires that the campus prepare a report at the end of the five-year period which presents the results of the monitoring and a discussion of the potential effect of controlled beach access on flora and fauna at Younger Lagoon. At the end of each five-year period, the University must submit a Notice of Impending Development (NOID) to the Coastal Commission to implement a beach access plan for the next five years (e.g. 2010, 2015, 2020).

In March 2010, the California Coastal Commission approved the University of California, Santa Cruz's (UCSC) first NOID for Implementation Measure 3.6.3 [NOID 2 (10-1)] as consistent with UCSC's approved Coastal Long Range Development Plan.

On September 13, 2018, the California Coastal Commission approved UCSC's NOID 9 (18-1) as consistent with UCSC's approved Coastal Long Range Development Plan with the addition of five staff-recommended special conditions. These included 1) Free Beach Tours, 2) Beach Tour Outreach Plan, 3) Beach Tour Signs, 4) Beach Tour Availability and Monitoring, and 5) Beach Access Management Plan Duration. Because NOID 9 (18-1) was not approved until 2018, special condition 5 required the University to submit the next beach management NOID by June 30, 2020 to get back on the 5-year review schedule.

Due to COVID-19 precautions, the Seymour Center was temporarily closed, and the free beach tour program temporarily suspended in early March 2020. The University will restart the free beach tour program when the Seymour Center reopens (see UC Santa Cruz's Pub. Res. Code section 30611 notification letter to the Commission).

This NOID 12 (20-1) describes the University's beach access plan for the next five years, 2021-2025. The University is proposing that the current beach access plan - including the five special conditions required by NOID 9 (18-1), continue once the Seymour Center reopens. In the interim, the University is proposing to create a free bilingual (English and Spanish) virtual beach tour to continue to provide access to the Younger Lagoon beach.

Background

More than fifty years ago, the University of California Natural Reserve System began to assemble, for scientific study, a system of protected sites that would broadly represent California's rich ecological diversity. Today the UC Natural Reserve System is composed of 41 reserves that encompass approximately 750,000 acres of protected natural land available for university-level instruction, research, and outreach throughout the state. The UC Natural Reserve System supports research and education through its mission of contributing *"to the understanding and wise management of the Earth and its natural systems by supporting university-level teaching, research, and public service at protected natural areas throughout California."* By creating this system of outdoor classrooms and living laboratories, and making it available specifically for long-term study and education, the UC Natural Reserve System supports a variety of disciplines that require fieldwork in wildland ecosystems. UC Santa Cruz administers four UC Natural Reserves: Younger Lagoon, Año Nuevo Island Reserve, Landels-Hill Big Creek Reserve, and Fort Ord Natural Reserve as well as a 400-acre campus reserve at the UC Santa Cruz residential campus.

History of Public Access to Younger Lagoon Beach

This summary provides a coarse overview of the major events that affected beach access at Younger Lagoon. Prior to 1972, Younger Beach was privately owned and closed to the public. The owners (Donald and Marion Younger) actively patrolled for, and removed, trespassers from their property, including the beach. In 1972, the Younger Family donated approximately 40 acres of their property to the University of California for the study and protection of the marine and coastal environment. These lands included Younger Lagoon and Beach (approximately 25 acres), and an adjoining parcel of land (approximately 15 acres) which became the site of the original Long Marine Laboratory. At the time of their donation, Donald and Marion Younger intended that the lagoon, beach and surrounding slopes be protected in perpetuity by the University as a bird sanctuary, and the original coastal development permit for the site (P-1859) deemed that the "lagoon will be managed and preserved as a natural area for waterfowl and terrestrial birds and animals".

In the years between the donation of the property and the start of Long Marine Laboratory construction (1976), the University leased the future Long Marine Laboratory site back to farmers who had been farming the property for the Younger family prior to the donation. During those years, the same no-trespassing rules for the beach were enforced as when the property was owned by the Younger family.

Once construction of Long Marine Laboratory began in 1976, the land was no longer under the watch of the farmers, and public pressure on the beach began to increase. Many Santa Cruz locals remember the next several years at Younger Beach fondly as it became a popular nude beach. The increased public access had a noticeable impact on the flora and fauna of the beach, and was not in accordance with the intention of the original donation by the Younger family. By 1978 discussions had begun between the University and the California Coastal Commission regarding the impact of uncontrolled public access to the beach. In 1981, it was decided that the impacts to Younger Beach were significant and the California Coastal Commission, under permit P-1859, closed uncontrolled access to the beach.

After the approval of the 1981 coastal permit P-1859, the University began actively to patrol the beach for trespass and to educate the public about the closure. After Younger Lagoon Reserve was incorporated into the UC Natural Reserve System in 1986, users were required to fill out applications or contact Natural Reserve staff for specific research, education, or outreach efforts. As the Long Marine Laboratory campus grew, a protective berm and fencing were constructed around the perimeter of the lagoon, and informational 'beach closed' signs were posted on the cliffs above the beach. Over time, trespass decreased and the reduced public access had a noticeable positive impact on flora fauna as well as beach/dune habitat. (See 2009-2010, 2010-2011, 2011-2012, 2012-2013, 2013-2014, 2014-2015, 2016-2017, 2017-2018, and 2018-2019 Younger Lagoon Reserve Annual Reports).

Public access to Younger Lagoon Reserve beach came to the forefront again during the CLRDP negotiation process (2000-2008). At the time negotiations began, Younger Lagoon Reserve supported a rich composition of plant and animal species despite being surrounded by agricultural and urban development. Reserve staff were concerned that any increase in public access could threaten the already heavily impacted habitat and impact ongoing and future research efforts. After CLRDP certification (2009), Beach Access Management Plans were implemented as outlined in UC Santa Cruz's NOID 2 (10-1) and NOID 9 (18-2). Under the current Beach Access Management Plan,

the Younger Lagoon Reserve beach remains closed to unsupervised public access and the reserve has implemented a management and monitoring plan that is consistent with other UC Reserves and includes public access through free docent-guided beach tours. Although infrequent, unauthorized access including trespass and vandalism of the Younger Lagoon Reserve beach continue and put research equipment and sensitive resources at risk. Reserve staff will continue to work hard to protect sensitive resources and maintain the Younger Lagoon Reserve beach as an important outdoor classroom and living laboratory.

Members of the public entering Younger Lagoon Reserve are required to adhere to the UC Natural Reserve System Reserve Use guidelines. Because beach tours are limited to groups with trained docents, no additional signage or fences on the beach have been required. The beach access trail consists of a simple dirt/mulch path that was in place prior to the approval of NOID 2 (10-1). The trail is maintained by clipping overgrown vegetation and maintaining the earthen path and timber steps as needed.

Implementation of NOID 2 (10-1) and NOID 9 (18-1)

Docent Led Tour Program

From 2010 - 2017, docent-led beach tours were offered twice monthly through the Seymour Marine Discovery Center (Seymour Center) per NOID 2 (10-1) (approved in 2010).

In October 2017, in an effort to meet Commissioner requests to increase the number of tours and as part of NOID 9 (18-1) refinement and approval, Seymour Center staff analyzed historic tour data and identified those months during which tour demand was low (October-February), and those months during which there was higher demand (March-September). Based on these data, beginning in January 2018, the University conducted a pilot program with the Seymour Center and began offering tours twice a month during the slower fall and winter months (October-February), and four times a month during the busier spring and summer months (March-September). The total number of tours offered in 2018 was increased from 24 to 38 (offering approximately 60% more tours than the previous NOID 2 (10-1) required).

NOID 9 (18-1) (approved in 2018) formalized the increase in the number of tours offered piloted in 2018, as part of five special conditions of approval. The special conditions included 1) Free Beach Tours, 2) Beach Tour Outreach Plan, 3) Beach Tour Signs, 4) Beach Tour Availability and Monitoring, and 5) Beach Access Management Plan Duration.

Since 2010, the extent of the beach area accessed by the tours has varied depending on tidal conditions and the location of plants, as foot traffic is only permitted seaward of the dune vegetation. Thus, the exact access area may vary slightly from the areas depicted in Figure 2 below and Figure 3.11 of the CLRDP. The trail used to access the beach provides an interpretive experience for visitors that begins with a narrative history of the UC Natural Reserve System, an overview of the lagoon, a walk through a restored coastal scrub habitat with opportunities to view the rear dune, and ends on Younger Lagoon Reserve beach.

Tours continue to be led by Seymour Center docents trained in the natural history and ecology of YLR and provide detailed information about flora, fauna, geology, and the UC Natural Reserve System. Tour curriculum focuses on the unique ecology of the Younger Lagoon Reserve beach.

The free docent-led beach tours are part of broader public education and outreach programming on the Coastal Science Campus, including community events, volunteer stewardship workdays, and hands-on learning opportunities for K-12 students. In addition to the docent-guided beach tours, visual access to the lagoon and back dune is provided to the public via a public overlook along McAllister Way (Figure 1). This overlook (Overlook E) is open to the public and includes interpretative signage that provides information on the free beach tours. In addition to Younger Lagoon Reserve Beach tours, visual access to the Younger Lagoon beach and information about Younger Lagoon Reserve is also provided to all visitors taking the Seymour Center's other docent-guided Reserved and Daily Tours via the Overlook C (Figure 1).

Since 2010, tours have been advertised via a variety of outlets, including press releases, calendar listings, print ads, public radio ads, social media, and the Seymour Center and Younger Lagoon Reserve websites. From 2010-2018, YLR Beach tours were filled via phone reservation. Starting in 2019, free docent-led beach tour sign-ups were made available by phone and at the Seymour Center public admissions counter. Since 2010, the Seymour Center has kept track of all required user data. From 2010-2017, tours were limited to 12 persons. Since 2018, tours were increased to 14 persons with the goal to turn no one away. The free docent-led beach tours are best suited for adults in good physical condition and children over 10 years of age.

Public members entering YLR are required to adhere to the UC Natural Reserve System (NRS) Reserve Use guidelines. Because the free beach tours are limited to groups with trained docents no additional signage or fences have been required. The beach trail consists of a simple dirt/mulch path that was already in place. The trail is maintained by clipping overgrown vegetation and maintaining the earthen path and timber steps as needed.

Figure 1. Younger Lagoon Overlooks. Left panel shows the view from the Overlook E located along McAllister Way. Overlook E is open to the public without reservation and includes interpretative signage that provides information on how to sign-up for the beach tour. Right panel shows the view from the Overlook C, which is accessed by docent-led tours.

Biologcal Monitoring Program

Although Implementation Measure 3.6.3 (IM 3.6.3) of the CLRDP only requires monitoring of the YLR beach, YLR staff, faculty, and a Scientific Advisory Committee (that was jointly appointed by Executive Director, Peter Douglas and Chancellor George Blumenthal) decided to monitor nearby beaches with varying levels of use (Natural Bridges and Sand Plant Beach) during the five-year period starting in 2010 in order to examine differences in the flora, fauna and human use among the three sites. This effort required hundreds of hours of staff and student time, as well as coordination with State Parks staff. The annual survey results were included in annual reports submitted to the Coastal Commission over the past nine years. The Younger Lagoon Natural Reserve Beach Monitoring Report 2019 included in this NOID (Section 5) describes the monitoring program in detail and presents the results of the entire beach monitoring program (Section 5).

Data collected during the first five years of resource monitoring indicated that Younger Lagoon supports a wide variety of native flora and fauna, provides habitat for sensitive and threatened species, supports a unique beach dune community, and is frequently used for teaching and research

In general, native plant species richness was greatest at YLR and Natural Bridges compared to Sand Plant Beach; however, there was quite a bit of annual variation among the sites. A parameter that we quantified in 2012, and is evident from visual observation and photo documentation, is the presence of dune hummocks and downed woody material at YLR, both of which are almost entirely absent at local beaches due to human use. These features provide habitat for plant species such as the succulent plant *dudleya*, which grow on downed woody material and dune hummocks, as well as burrowing owl that use burrows in hummocks and seek shelter beneath downed woody material. The relatively natural state of YLR beach and dune vegetation is unique among most pocket beaches in Santa Cruz County and likely represents a glimpse into what many of the pocket beaches in the greater Monterey Bay area looked like prior to significant human disturbance.

Species lists for birds, mammals, plants, reptiles, amphibians, and fish are included as Appendices I-IV. These lists provide an overview of the flora and fauna that have been recorded at Younger Lagoon over the years. Although there have been numerous surveys of the area, to the best of our knowledge the monitoring project outlined in NOID 2 (10-1) and undertaken over the last ten years provided the most extensive survey effort for flora and fauna on the Reserve, resulting in numerous additions to the Reserve's species lists. Younger Lagoon provides important habitat for numerous animals and supports a rich composition of plant species. The lack of disturbance and low human activity are likely the primary factors that maintain the high diversity in the Lagoon. Track survey and camera trap work have documented bobcat, coyote, deer, and numerous other mammals on the beach; many of these species are likely residents within the Reserve. Track survey results also indicate that several of these mammals are residing (at least occasionally) in the Reserve and use the area as hunting grounds. For example, bobcat sign indicates that this species successfully hunts for roosting pelagic birds within the Reserve boundaries. These observations suggest that although Younger Lagoon is a relatively small area, amidst agriculture and development, this relic habitat is still functioning at a level beyond most developed beaches and lagoons in the region.

The results of the monitoring program indicate that open access to the beach would result in the loss of the unique ecological characteristics of the site, reduce its effectiveness as a research area for scientific study, and likely have a negative impact on sensitive and protected species.

Proposed Project

The University is proposing to continue the existing Beach Access Management Plan for an additional five years. The Beach Access Management Plan is comprised of the free docent led beach tour program and the biological monitoring program.

Free Docent Led Beach Tour Program

Once the Seymour Center is reopened to the public, the University is proposing to continue the existing free docent-led beach tour program - including the five special conditions required by NOID 9 (18-1), for an additional five years with the inclusion of changes required by COVID-19 public health orders (e.g. masking, sanitizing, distancing). In the interim, the University is proposing to create a free bilingual (English and Spanish) virtual beach tour to continue to provide access to the Younger Lagoon beach.

Free Beach Tours

All beach tours will continue to be offered for free (without admission fee). Beach tour sign-ups will continue to be available by phone and at the Seymour Center public admissions counter. Seymour Center staff will continue to track any tour requests that are denied due to lack of tour availability or because tours are fully booked as part of their ongoing monitoring of all visitor programs. Seymour Center staff will continue to record the number of participants that were denied, the number of participants that were wait listed, as well as the date of the request and the date of the tour being requested. The Younger Lagoon Reserve and the Seymour Marine Discovery Center websites will continue to clearly identify that access to the beach is available for free via beach tours.

https://youngerlagoonreserve.ucsc.edu/about-us/index.html
https://youngerlagoonreserve.ucsc.edu/research-teaching-public-service/visit/public-tours.html
https://seymourcenter.ucsc.edu/visit/behind-the-scenes-tours/

Location

The tours will continue to be led by Seymour Center docents, and will include a narrative history of the UC Natural Reserve System, an overview of the lagoon, a walk through a restored coastal scrub habitat with opportunities to view the rear dune, and end on the beach. Because beach tours are limited to groups with trained docents no additional signage or fences will be required. Maintenance of the trail by clipping overgrown vegetation and maintaining the earthen path and timber steps will be continued. No changes to the tour access area are proposed (see Figure 4).

Beach Tour Outreach Plan

Outreach will continue to be conducted according to the following plan:

Venue	Language	Schedule
Seymour Center Website	Younger Lagoon Reserve tours are free and open to the public. Space is limited to 14 participants. Call **831-459-3800**.	Permanent webpage: https://seymourcenter.ucsc.edu/visit/behind-the-scenes-tours/
YLR Website	Younger Lagoon Reserve tours are free and open to the public. Space is limited to 14 participants. Call **831-459-3800**.	Permanent webpages: https://youngerlagoonreserve.ucsc.edu/research-teaching-public-service/visit/public-tours.html
Seymour Center Social Media o Facebook o Twitter o Instagram	Younger Lagoon Reserve tours are free and open to the public. Space is limited to 14 participants. Call **831-459-3800**.	Facebook—Monthly Twitter, Instagram ---Once a quarter
YLR Social Media o Facebook o Instagram	Younger Lagoon Reserve tours are free and open to the public. Space is limited to 14 participants. Call **831-459-3800**.	Once a quarter
Calendar Listings o UCSC Events o Good Times Newspaper (Santa Cruz) o KAZU public radio (Santa Cruz) o Register Pajaronian Newspaper (Watsonville) o The Californian Newspaper (Salinas)	Younger Lagoon Reserve tours are free and open to the public. Space is limited to 14 participants. Call **831-459-3800**. For Spanish language outlets: Las visitas guiadas a la reserva de la laguna Younger son gratuitas y están abiertas al público. El espacio está limitado a 14 participantes. Llame al **831-459-3800**.	Submitted monthly (calendar listings appear at the discretion of the media outlet.) Submitted monthly (calendar listings appear at the discretion of the media outlet.)

o La Network Campesina Radio 107.9 (Salinas)		

Beach Tour Signs

Information on the free beach tours will continue to be displayed "day of" on a large sign in the front window of the Seymour Center, public admissions counter, and front window. "Day of" signage includes the brown and white footprints on wave logo, and the following language "Free Younger Lagoon Reserve Beach Tours Today" (Figure 2). Signage has been added to the information kiosk outside of the Seymour Center and to Overlooks A-F. Overlooks and kiosk signage include the brown and white footprints on wave logo and include the following language "Free Younger Lagoon Reserve Beach Tours, Call (831) 459-3800" (Figure 3).

Figure 2. "Day of" sign design.

Figure 3. Overlooks and kiosk sign design.

Beach Tour Availability and Monitoring

Consistent with observed demand, free docent-led beach tours will be offered at least four times per month (of which at least one per month is a weekday tour and at least two per month are weekend tours) from March 1st through September 30th, and at least two times per month (of which at least one per month is a weekday tour and at least one per month is a weekend tour) otherwise (a minimum of 38 total beach tours per year). In other words, free docent-led beach tours will be offered twice a

month in January and February, four times per month in March, April, May, June, July, August, and September, and twice a month in October, November, and December.

Virtual Bilingual Beach Tours

The University will create a free bilingual (English and Spanish) virtual beach tour to continue to provide public access to the Younger Lagoon beach while the Seymour Center is closed and the free docent led beach tour program suspended due to COVID-19 impacts. The virtual tour will follow the same route and include the same information on the unique history and ecology of the beach that is presented during the free docent-led beach tours. The virtual beach tour will be hosted on the Younger Lagoon Reserve and Seymour Center websites and advertised via social media accounts and newsletters. In addition, the tour will also be shared with local K-12 school groups who use the reserve for hands-on learning but are unable to visit the reserve in person due to COVID-19 impacts.

Biological Monitoring Program

The University will continue to monitor YLR Beach as required by, and described in, IM 3.6.3; however, YLR staff stopped monitoring at Natural Bridges State Beach or Sand Plant Beach in 2015 as the past five years of data collection have provided us with adequate information to assess differences in beach resources. The goal of the monitoring program is to document the presence and distribution of flora and fauna within YLR and to evaluate changes in distribution and density over time.

Variables that will be monitored include: user data, changes as observable in photo documentation, tidewater goby surveys, species composition and seed production of beach dune vegetation, species composition of animals, and abundance of feeding shore birds. Details for each of the aforementioned parameters are described below.

User Data— User data from tours and other outreach and education programming conducted by the Seymour Center, as well as research and education use of YLR, will be recorded and maintained by Seymour Center and YLR Staff.

Human Beach Use— We will use remote cameras to quantify human use of YLR Beach. A camera will be placed along the western edge of Younger Lagoon quarterly with each separate sampling events each consisting of two days. Cameras will be set to automatically take photos at 15 minute intervals. Number of people will be quantified for 15 minute intervals during the day (camera time

will vary across sampling periods due to day length and position; however, we will standardize within each sampling period).

Photo Documentation—Photo point locations have been established at three locations within YLR (Figure 5). These locations were chosen to ensure coverage of all major areas of the beach. Photos will continue to be taken annually during late spring to early summer (May – July). Photos will be taken at these photo points in order to ensure repeatability over time. At each photo point we will collect the following monitoring information:

- Photo point number
- Date
- Name of photographer
- Bearing
- Camera and lens size
- Coordinates
- Other comments

In addition to these three points, a permanent camera has been installed on the west side of the lagoon.

Tidewater Goby Surveys— Tidewater goby surveys will be conducted at YLR Beach quarterly each year. Surveys will be conducted using a 4.5 ft x 9 ft beach seine with 1/8 inch mesh. The objectives of the surveys are to document tidewater goby presence and evidence of breeding activity (determined by the presence of multiple size/age classes). All fish will be identified to species and counted. When individuals exceed ~50 per seine haul, counts will be estimated. Sampling will be conducted with the goal of surveying the various habitats at the lagoon (e.g. sand, sedge, willow, pickleweed, deep, shallow, etc.).

Species Composition and Coverage of Beach Dune Vegetation—Implementation Measure 3.6.3 requires that dune vegetation "*from the lowest (nearest to the mean high tide line) occurring terrestrial plant to 10 meters inland into the strand vegetation*" be surveyed to document species composition, cover, and seed production. Figure 4 shows a potential survey area for dune vegetation; however, the exact location and extent of survey area will vary annually depending upon the location of the "lowest" plant detected each year. Within the survey area we will establish a 50-m east-west

transect across the dune vegetation and measure the distance from the estimated mean high tide line to the "lowest" plant on the beach. Herbaceous species composition will be measured by visual estimation of absolute cover for each species in ten 0.25 m^2 quadrats along the transect. Quadrats will be placed every 5 m on alternating sides of the transect starting at a randomly selected point between 1 and 5 meters (a total of 10 quadrats per transect). A clear plastic card with squares representing 1, 5, and 10% of the sampling frame will be used to help guide visual cover estimations. Species cover (native and exotic), bare ground, and litter will be estimated at 5% intervals. Litter will be specifically defined as residue from previous year's growth while any senescent material that is recognizable as growth from earlier in the current growing season will be counted as cover for that species. After all cover estimates have been made, we will conduct surveys within 2 m of either side of the transect (a 4 × 50 m belt). In the belt transects, individual species will be recorded as either seedlings or greater than 1 year old. The presence of flowers and seeds will also be noted.

Non-avian Vertebrate Monitoring

Tracks— Vertebrate tracks will be measured using raked sand plots quarterly throughout the study period. Tracking stations will be placed throughout the beach area in constriction zones where vegetation is absent. The objective of these surveys will be simply to detect what species use the beach habitat. As such, plot size will vary depending upon the amount of available open sandy area at each location. Track stations will be raked each evening and checked for tracks in the morning. Stations will remain open for two days during each monitoring bout. Tracks will be identified to species when possible. Species composition will be summarized; however, abundance will not be quantified due to the fact that most often tracks cannot be used to identify individual animals (e.g. a single individual could walk across the plot multiple times).

Small Mammals—Sherman live traps will be placed on beach habitat for two nights every quarter of the study period. A total of 30 traps will be placed at each site and sampled for a period of two evenings (60 trap nights per sampling bout). Traps will be set at dusk and collected at dawn. Each trap will be baited with rolled oats and piece of synthetic bedding material will be placed in each trap to ensure animals do not get too cold. Individuals will be identified to species, marked with a unique ear tag, and released at the site of capture.

Invertebrate Monitoring—Terrestrial invertebrates on beach habitat will be monitored by placing one 12 oz plastic container (pit fall traps) at each tracking station (one at each plot) during "non-avian vertebrate monitoring" efforts. Traps will be buried to the lip of the container; terrestrial vertebrates

fall into the trap passively. Traps will be checked each morning and all individuals will be identified and counted.

Avian Monitoring—Ocular surveys of birds on the beach, lagoon, and cliff habitats will be conducted at each site. Survey locations will be selected along one edge of the beach on the cliff. The entire beach area, fore portion of the lagoon, and western cliff will be surveyed from the eastern edge of the lagoon. The top and western face of the rock stack that is located at the beach/ocean edge will also surveyed. Counts will be recorded quarterly throughout the study. Surveys will be conducted in the dawn or dusk hours within approximately 2 hours of sunrise or sunset and of one another. Data from the two days during each sampling effort will be combined and individuals will be identified and counted.

Beach Access Management Plan Duration and Monitoring

Every six months (i.e., by June 30th and December 31st each year), UCSC will submit two copies of a Beach Tour Monitoring Report for Executive Director review and approval.

Every year, UCSC will submit a summary report on the free docent led beach tour program and biological monitoring program as part of the Younger Lagoon Reserve Annual Report.

UCSC will submit a complete NOID, consistent with all CLRDP requirements, to implement its next public beach access management plan at Younger Lagoon Beach (for the period from January 1, 2026 to December 31, 2030) no later than July 1, 2025.

Figure 4. Overview of beach tour route. Visitors on docent led tours will have beach access within the "Beach Access Area." The extent of the beach access area will vary from year to year dependent upon the location of plants (i.e. foot traffic will be seaward of the dune vegetation). The above depiction represents the approximate location of plants in the spring of 2009.

Figure 5. Locations of monitoring points, plots, and regions for YLR beach. The beach monitoring area, survey points, and track stations will vary between years depending upon the high water mark. Dune plant surveys will occur within 10 m of the high water mark as per the CLRDP guidelines.

Appendix I. Younger Lagoon Bird List

Birds of Younger Lagoon

LOONS
Red-throated Loon
Pacific Loon
Common Loon

GREBES
Pied-billed Grebe
Horned Grebe
Red-necked Grebe
Eared Grebe
Western Grebe
Clark's Grebe

FULMARS and SHEARWATERS
Northern Fulmar
Pink-footed Shearwater
Buller's Shearwater
Sooty Shearwater
Black-vented Shearwater

PELICANS and CORMORANTS
Brown Pelican
Double-crested Cormorant
Brandt's Cormorant
Pelagic Cormorant

FRIGATEBIRDS
Magnificent Frigatebird

HERONS and EGRETS
American Bittern
Great Blue Heron
Great Egret
Snowy Egret
Cattle Egret
Green Heron
Green-backed Heron
Black-crowned Night Heron

WATERFOWL
Tundra Swan

OWLS
Barn Owl
Great Horned Owl
Burrowing Owl
Short-eared Owl

SWIFTS
Black Swift
Vaux's Swift
White-throated Swift

HUMMINGBIRDS
Anna's Hummingbird

Rufous Hummingbird
Allen's Hummingbird

KINGFISHERS
Belted Kingfisher

WOODPECKERS

Downy Woodpecker
Northern Flicker
(Common Flicker)

FLYCATCHERS and KINGBIRDS
Western Wood Pewee
Willow Flycatcher
Pacific-slope Flycatcher
Black Phoebe
Say's Phoebe
Ash-throated Flycatcher
Tropical Kingbird
Western Kingbird

LARKS
Horned Lark

SWALLOWS
Tree Swallow
Violet-green Swallow
Northern

Birds of Younger Lagoon

Mute Swan
Snow Goose
Brant
Canada Goose
Green-winged Teal
Mallard
Northern Pintail
Cinnamon Teal
Northern Shoveler
Gadwall
Eurasian Wigeon
American Wigeon
Ring-necked Duck
Greater Scaup
Lesser Scaup
Harlequin Duck
Black Scoter
Surf Scoter
White-winged Scotter
Common Goldeneye
Bufflehead
Hooded Merganser
Red-breasted Duck
Ruddy Duck

VULTURES, HAWKS, and EAGLES

Turkey Vulture
Osprey
White-tailed Hawk
(Black
Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Red-shouldered Hawk
Red-tailed Hawk
Ferruginous Hawk
Rough
Golden Eagle
American Kestrel
Merlin
Peregrine Falcon

QUAILS and PHEASANTS

Ring-necked Phaesant

Rough-winged Swallow
Cliff Swallow
Barn Swallow

JAYS and CROWS

Western Scrub
American Crow
Common Raven

CHICKADEES and BUSHTITS

Chestnut-backed Chickadee
Chickadee
Bushtit

WRENS

Bewick's Wren
House Wren
Marsh Wren

KINGLETS

Golden-crowned Kinglet
Ruby-crowned Kinglet

THRUSHES

Swainson's Thrush

Hermit Thrush
American Robin

WRENTITS

Wrentit

MOCKINGBIRDS and THRASHERS

Northern Mockingbird
Sage Thrasher

WAGTAILS and PIPITS

Yellow Wagtail
American Pipit (Water Pipit)

WAXWINGS and SHRIKES

Cedar Waxwing
Loggerhead Shrike

STARLINGS

Birds of Younger Lagoon

California Quail

RAILS and COOTS

Virginia Rail
Sora
Common Moorhen
American Coot

SHOREBIRDS

Black -bellied Plover
Snowy Plover
Semipalmated Plover
Killdeer
American Oystercatcher
(American Black
Oystercatcher
Black-necked Stilt
American Avocet
Greater Yellowlegs
Lesser Yellowlegs
Willet
Wandering Tattler
Spotted Sandpiper
Whimbrel
Long-billed Curlew
Marbled Godwit
Ruddy Turnstone
Black Turnstone
Surfbird
Sanderling
Western Sandpiper
Least Sandpiper
Baird's Sandpiper
Pectoral Sandpiper
Dunlin
Short-billed Dowitcher
Long-billed Dowitcher
Wilson's Snipe
Common Snipe

PHALARONES

Red-necked Phalarope
Red Phalarope

European Starling

VIREOS

Warbling Vireo

WARBLERS

Orange-crowned Warbler
Yellow Warbler
Yellow-rumped Warbler
Townsend's Warbler
Palm Warbler
Northern Waterthrush
MacGillivray's Warbler
Common Yellowthroat
Wilson's Warbler

BUNTINGS and GROSBEAKS

Indigo Bunting
Dickcissel

TOWHEES and SPARROWS

Spotted Towhee
Canyon Towhee
Chipping Sparrow
Clay-colored Sparrow
Vesper Sparrow
Lark Sparrow
Savannah Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Swamp Sparrow
White-throated Sparrow
Golden-crowned Sparrow
White-crowned Sparrow

JUNCOS and LONGSPURS

Dark-eyed Junco
Lapland Longspur

BLACKBIRDS, MEADOWLARKS, and ORIOLES

Bobolink
Red-winged Blackbird
Tricolored Blackbird

Birds of Younger Lagoon

JAEGERS
Pomarine Jaeger
Parasitic Jaeger

GULLS
Bonaparte's Gull
Heermann's Gull
Mew Gull
Ring-billed Gull
California Gull
Herring Gull
Thayer's Gull
Western Gull
Glaucous-winged Gull
Black-legged Kittiwake
Sabine's Gull

TERNS
Caspian Tern
Elegant Tern
Common Tern
Arctic Tern
Forster's Tern

ALCIDS
Common Murre
Pigeon Guillemot
Marbled Murrelet
Ancient Murrelet
Rhinoceros Auklet

DOVES and PIGEONS
Rock Pigeon
Band-tailed Pigeon
Mourning Dove

Western Meadowlark
Rusty Blackbird
Brewer's Blackbird
Brown-headed Cowbird
Hooded Oriole
Scott's Oriole

FINCHES
House Finch
Pine Siskin
Lesser Goldfinch
Lawrence's Goldfinch
American Goldfinch

WEAVER FINCHES
House Sparrow

Appendix II: Younger Lagoon Mammal List

Mammals of Younger Lagoon
DIDELPHIDAE
Virginia Opossum *Didelphis virginiana*

SORICIDAE
Vagrant Shrew *Sorex sp.*

LEPORIDAE
Brush Rabbit *Sylvilagus bachmani*

SCIURIDAE
California Ground Squirrel *Spermophilus beecheyi*

GEOMYIDAE
Botta's Pocket Gopher *Thomomys bottae*

CRICETIDAE
Western Harvest Mouse *Reithrodontomys megalotis*
Deer Mouse *Peromyscus maniculatus*
Pinyon Mouse *Peromyscus truei*
Dusky-footed Woodrat *Neotoma fuscipes*
California Vole *Microtus californicus*

MURIDAE
Norway Rat *Rattus norvegicus*
House Mouse *Mus musculus*

CANIDAE
Coyote *Canis latrans*
Common Gray Fox *Urocyon cinereoargenteus*

PROCYONIDAE
Common Raccoon *Procyon lotor*

MUSTELIDAE
Long-tailed Weasel *Mustela frenata*
Striped Skunk *Mephitis mephitis*

FELIDAE
Bobcat *Felis rufus*
CERVIDAE
Mule Deer *Odocoileus hemionus*

Appendix III: Younger Lagoon Plants

FAMILY	*Scientific name*	Common name
FERNS AND FERN-ALLIES		
DENNSTAEDTIACEAE		
	Dryopteris argute	Coastal wood fern
	Polypodium californicum	California polypody
	Polystichum munitum	Sword Fern
	Pteridium aquilinum var. pubescens	Bracken fern
CONIFERS (GYMNOSPERMS)		
PINACEAE		
	**Pinus radiate*	Monterey pine
CUPRESSACEAE		
	**Hesperocyparis macrocarpa*	Monterey cypress
FLOWERING PLANTS (ANGIOSPERMAE - DICOTYLEDONEAE)		
ADOXACEAE		
	Sambucus nigra	Black elderberry
	Sambucus racemosa var. racemose	Pacific red elderberry
AIZOACEAE		
	**Carpobrotus edulis*	Iceplant
ANACARDIACEAE		
	Toxicodendron diversilobum	Poison oak
APIACEAE		
	**Conium maculatum*	Poison hemlock
	**Foeniculum vulgare*	Fennel
	Oenanthe sarmentosa	Pacific oenanthe
	Sanicula arctopoides	Footsteps of spring
	Sanicula crassicaulis	Pacific sanicle

ASTERACEAE		
	Achillea millefolium	Yarrow
	Ambrosia chamissonis	Beach bur
	Anaphalis margaritacea	Pearly everlasting
	**Anthemis cotula*	Stinking pineapple weed
	**Artemisia biennis*	Biiennial wormwood
	Artemisia californica	California sagebrush
	Artemisia douglasiana	Douglas' mugwort
	Artemisia pycnocephala	Beach sagewort
	Baccharis glutinosa	Douglas' baccharis
	Baccharis pilularis	Coyote brush
	**Carduus pycnocephalus*	Italian thistle
	**Centaurea melitensis*	Malta star thistle
	**Circium arvense*	Canada thistle
	Circium quercetorum	Brownie thistle
	**Cirsium vulgare*	Bull thistle
	Corethrogyne filaginifolia	Common sandaster
	Cotula coronopifolia	Brass buttons
	**Delairea odorata*	Cape ivy
	Erigeron Canadensis	Horseweed
	Erigeron glaucus	Seaside daisy
	Eriophyllum staechadifolium	Lizard's tail
	Gnaphalium palustre	Western marsh cudweed
	Grindelia stricta	Coastal gum plant
	**Helminthotheca echioides*	Bristly oxtounge
	**Hypocharis glabra*	Smooth cat's ear
	**Hypocharis radicata*	Rough cat's ear
	**Hypocharis glabra*	Bristly ox-tonge
	Jaumea carnosa	Fleshy jaumea
	**Lactuca serriola*	Prickly lettuce
	Madia gracilis	Gumweed
	**Matricaria discoidea*	Pineapple weed
	Pseudognaphalium beneolens	Cudweed
	Pseudognaphalium californicum	Ladies tobacco
	**Pseudognaphilum luteoalbum*	Jersey cudweed
	Pseudognaphalium ramosissimun	Pink everlasting

	Pseudognaphalium stramineum	Cottonbatting plant
	**Senecio cf. elegans*	Purple ragwort
	**Silybum marianum*	Milk thistle
	**Sonchus asper*	Spiny sowthistle
	**Sonchus oleraceus*	Common sowthistle
	Symphyotrichum chilense	California aster
BORAGINACEAE		
	Heliotropium curassavicum	Seaside heliotrope
BRASSICACEAE		
	Barbarea orthoceras	Winter cress
	**Brassica nigra*	Black mustard
	**Brassica rapa*	Field mustard
	**Cakile maritime*	Beach rocket
	**Raphanus sativus*	Wild radish
	**Sinapis arvensis*	Charlock mustard
CAPRIFOLIACEAE		
	Symphoricarpos albus	Common snowberry
CARYOPHYLLACEAE		
	Spergularia macrotheca	Sand spurry
	**Silene gallica*	Common catchfly
CHENOPODIACEAE		
	Atriplex patula	Saltbush
	**Atriplex prostrata*	Fat-hen
	**Chenopodium album*	Lamb's quarters
	**Chenopodium macrospermum*	Largeseed goosefoot
	Salicornia pacifica	Pickleweed
CONVOLVULACEAE		
	Calystegia occidentalis	Western morning glory
	Calystegia purpurata	Morning glory
	Calystegia soldanella	Beach morning glory
CRASSULACEAE		
	Dudleya farinaosa	Sea lettuce

CUCURBITACEAE		
	Marah fabaceus	Wild cucumber
DIPSACACEAE		
	**Dipsacus fullonum*	Fuller's teasel
FABACEAE		
	Acmispon glaber	Deer weed
	**Genista monspessulana*	French broom
	Lupinus albifrons	Silver leaf lupine
	Lupinus arboreus	Yellow bush lupine
	Lupinus bicolor	Miniature lupine
	Lupinu nanus	Sky lupine
	**Medicago polymorpha*	Burr clover
	**Melilotus indicus*	Yellow sweet clover
	**Trifolium angustifolium*	Narrowleaf clover
	Trifolium willdenovii	Tomcat clover
	**Vicia sativa ssp. Sativa*	Common vetch
FRANKENIACEAE		
	Frankenia salina	Alkali heath
GERANIACEAE		
	**Erodium botrys*	Longbeak stork's bill
	**Erodium cicutarium*	Red stemmed filaree
	**Erodium moschatum*	White stemmed filaree
	**Geranium dissectum*	Cutleaf geranium
GROSSULARIACEAE		
	Ribes divaricatum	Spreading gooseberry
	Ribes sanguineum	Flowering currant
IRIDACEAE		
	Sisyrinchium bellum	Blue eyed grass
LAMIACEAE		
	Clinopodium douglasii	Yerba buena
	**Marrubium vulgare*	Common horehound
	Prunella vulgaris	Selfheal

	Stachys bullata	hedge nettle
MALVACEAE		
	**Malva nicaeenis*	Bull mallow
	**Malva parviflora*	Cheeseweed
	Sidalcea malviflora	Checkerbloom
MONTIACEAE		
	Claytonia perfoliate	Miners lettuce
MYRICACEAE		
	Morella californica	California wax myrtle
MYRINACEAE	**Anagallis arvensis*	Scarlet pimpernel
NYCTAGINACEAE		
	Abronia latifolia	Yellow sand verbena
	Abronia umbellata ssp. umbellata	Pink sand verbena
ONAGRACEAE		
	Camissoniopsis cheiranthifolia	Beach evening-primrose
	Epilobium brachycarpum	Fireweed
	Epilobium canum	California fuchsia
	Epilobium ciliatum ssp. watsonii	Willow herb
	Taraxia ovata	Sun cup
OXALIDACEAE		
	Oxalis albicans	Hairy wood sorrel
	Oxalis pes caprae	Bermuda buttercup
PAPAVERACEAE		
	Eschscholzia californica	California poppy
PHRYMACEAE		
	Mimulus aurantiacus	sticky monkey flower
	Mimulus guttatus	seep monkey flower
PLANTAGINACEAE		
	**Plantago coronopus*	Cut leaf plantain
	**Plantago lanceolata*	English plantain
	Plantago maritima	California seaside plantain
PLUMBAGINACEAE		
	Armeria maritima	California seapink

POLEMONIACEAE		
	Navarretia squarrosa	Skunkweed
POLYGONACEAE		
	Eriogonum latifolium	Coastal buckwheat
	Persicaria punctata	Dotted smartweed
	** Polygonum aviculare*	Prostrate knotweed
	**Rumex acetosella*	Sheep sorrel
	**Rumex conglomeratus*	Green dock
	Rumex crassus	Willow-leaved dock
	**Rumex crispus*	Curly dock
RANUNCULACEAE		
	Ranunculus californicus	California buttercup
RHAMNACEAE		
	Frangula californica	California coffeeberry
PORTULACACEAE		
	**Portulaca oleracea*	Purslane
RHAMNACEAE		
	Ceanothus thyrsiflorus	Blueblossom
ROSACEAE		
	Acaena pinnatifida var. californica	California sheepburr
	Fragaria chiloensis	Beach strawberry
	Horkelia californica	Californica horkelia
	Potentilla anserina ssp. pacifica	Pacific silverweed
	Rosa californica	California wild rose
	Rosa gymnocarpa	Wood rose
	Rubus ursinus	California blackberry
	Rubus armeniacus	Himalayan blackberry
RUBIACEAE		
	***Galium sp.*	**Bedstraw
SALICACEAE		
	Salix lasiolepis	Arroyo willow
SAPINDACEAE		
	Aesculus californica	California buckeye

SCROPHULARIACEAE		
	Scrophularia californica ssp. californica	Bee plant
SOLANACEAE		
	Solanum americanum	American black nightshade
	**Solanum nigrum*	Black nightshade
URTICACEAE		
	Urtica dioica ssp. gracilis	Stinging nettle
	Urtica holosericea	Hoary nettle
FLOWERING PLANTS (ANGIOSPERMAE - MONOCOTYLEDONEAE)		
AGAVACEAE		
	Chlorogalum pomeridianum	Soap plant
CYPERACEAE		
	Bolboschoenus maritimus	Praire bulrush
	Bolboschoenus robustus	Seacoast bulrush
	Carex hafordii	Monterey sedge
	Carex obnupta	Slough sedge
	Cyperus eragrostis	Tall cyperus
	Eleocharis macrostachya	Creeping spike rush
	Isolepis cernua	Low bulrush
	Schoenoplectus acutus var. occidentalis	Hardstem bulrush
	Schoenoplectus americanus	3 Square sedge
	Schoenoplectus californicus	California tule
	Schoenoplectus cernuus var. californicus	Low club rush
JUNCACEAE		
	Juncus balticus	Baltic rush
	Juncus bufonius	Toad rush
	Juncus effusus brunneus	Bog rush
	Juncus mexicanus	Mexican rush
	Juncus occidentalis	Western rush
	Juncus patens	Common rush
	Juncus phaeocephalus	Brown-headed rush
LILIACEAE		
	Triteleia laxa	Ithuriel's spear
MELANTHIACEAE		

	Toxicoscordion fremontii	Fremont's star lily
POACEAE		
	Agrostis pallens	Bent grass
	**Aira caryophyllea*	Shiver grass
	**Avena barbata*	Slender oat
	**Avena fatua*	Wild oat
	**Briza minor*	Liittle quaking grass
	**Brachypoduim distachyon*	False brome
	Bromus carinatus	California brome
	**Bromus catharticus*	Rescue grass
	**Bromus diandrus*	Ripgut brome
	**Bromus hordeaceus*	Soft chess
	**Bromus madritensis ssp. madritensis*	Foxtail chess
	Bromus marginatus var. maritimus	Seaside large mountain brome grass
	**Cortaderia jubata*	Jubata grass
	**Cynodon dactylon*	Bermuda grass
	* *Cynosurus echinatus*	Dogtail grass
	Danthonia californica	California oatgrass
	Distichlis spicata	Salt grass
	Elymus glacus	Blue wild rye
	Elymus triticoides	Beardless wild rye
	Festuca californica	California fescue
	**Ehrharta erecta*	Panic veldtgrass
	**Festuca bromoides*	Six weeks fescue
	Festuca rubra	Creeping red fescue
	**Festuca myuros var. myuros*	Rat tail fescue
	* *Festuca perennis*	Italian ryegrass
	**Holcus lanatus*	Velvet grass
	Hordeum brachyantherum	Meadow barley
	**Hordeum murinum ssp. leporinum*	Farmer's foxtail
	Koeleria macrantha	June grass
	Melica californica	California melicgrass
	Melica torreyana	Torrey's melica
	**Polypogon monspeliensis*	Annual rabitsfoot grass
	Stipa lepida	Foothill needlegrass
	Stipa pulchra	Purple needlegrass

THEMIDACEAE		
	Brodiaea elegans ssp. elegans	Harvest brodiaea
TYPHACEAE		
	Sparganium eurycarpum var. greenei,	Simplestem bur-reed
	Typha domingensis	Southern cattail
	Typha latifolia	Broadleaf cattail
*denotes non-native plant		
**denotes species where identification is only to genera.		

Appendix IV: Younger Lagoon Fish, Reptiles, and Amphibians

Fish, Reptiles, and Amphibians of YLR

Tidewater Goby (*Eucyclogobius newberryi*)
Threespine Stickleback (*Gasterosteus aculeatus*)
Sculpin (unknown)

Reptiles

California Legless Lizard (*Anniella pulchra*)
Coast Horned Lizard (*Phrynosoma coronatum*)
Common Garter Snake (*Thamnophis sirtalis*)
Common Kingsnake (*Lampropeltis getulus*)
Gopher Snake (*Pituophis melanoleucus*)
Northern Rubber Boa (*Charina bottae*)
Racer (*Coluber constrictor*)
Ringneck Snake (*Diadophis punctatus*)
Sharp-tailed Snake (*Contia tenuis*)
Southern Alligator Lizard (*Gerrhonotus multicarinatus*)
Striped Racer (California Whipsnake) (*Masticophis lateralis*)
Western Aquatic Garter Snake (*Thamnophis couchi*)
Western Fence Lizard (*Sceloprus occidentalis*)
Western Pond Turtle (*Clemmys marmorata*)
Western Rattlesnake (*Crotalus viridus*)
Western Skink (*Eumeces skiltonianus*)
Western Terrestrial Garter Snake (*Thamnophis elegans*)

Amphibians

California Slender Salamander (*Batrachoseps attenuatus*)
Pacific Treefrog (*Pseudacris regilla*)
California Red-legged Frog (*Rana draytoni)*

1b. CLRDP Consistency Determination

As stated in Policy 1.1 (Development Consistency), "Development shall be deemed consistent with the CLRDP if it is consistent with the provisions of Chapters 5, 6, 7, 8, 9, and Appendices A and B."

The following is a list of all the Policies, Implementation Measures and Figures found in Chapter 5. Those that apply directly to this NOID are highlighted in black and followed with a comment regarding the project's consistency; those that do not are indicated with strikethrough text. In addition, any sections of Chapters 6, 7, 8, 9, and Appendices A and B that apply to this NOID are referenced with comments if relevant or as strikethrough text if they are not pertinent to this project.

CHAPTER 5 Long Range Land Use Development Plan

5.1 Application of the Long Range Land Use Development Plan

Policy 1.1 Development Consistency

The University finds the project contemplated under NOID 12 (20-1) to be consistent with the CLRDP.

IM 1.1.1 Figures of Chapter 5.

This project does not involve physical development, but is "development" as defined in Section 8.1.1 and the Coastal Act as a "…change in …intensity of use of land…" Only Figure 5.6 applies and the project is consistent with that figure.

~~IM 1.1.2 Lease Agreements.~~

~~IM 1.1.3 Federal In-holding and CLRDP.~~

Policy 1.2 University Commitments

The University commitments in the CLRDP have been undertaken

5.2. Land Use

~~Figure 5.1 Building Program~~

~~Figure 5.2 Land Use Diagram~~

~~Figure 5.3 Locational Restrictions for Building Program~~

~~Stable Urban / Rural Boundary~~

Policy 2.1 Maintaining a Stable Urban / Rural Boundary

~~IM 2.1.1 Over sizing of Utility Lines Prohibited.~~

~~IM 2.1.2 Utility Prohibition Zone.~~

Policy 2.2 Strengthening the Urban / Rural Boundary through the Protection of Adjacent Agricultural Resources

IM 2.2.1 Setback of Development and Uses from Adjacent Agricultural Use.

As mentioned in IM 1.1.1, the project does not involve physical development, therefore agricultural setback does not apply.

Policy 2.3 Designing for the Urban Edge

~~IM 2.3.1 Cluster Development.~~

~~IM 2.3.2 Impervious Coverage.~~

~~IM 2.3.3 Windbreak Vegetation~~

~~IM 2.3.4 Buildout Planning.~~

~~IM 2.3.5 Interim Weed Abatement Measures for Undeveloped Land Within Development Zones.~~

Short-term and Caretaker Accommodations

Policy 2.4 Short-term and Caretaker Accommodations

~~IM 2.4.1 Short-Term Accommodation Use Restrictions.~~

~~IM 2.4.2 Caretaker Accommodations.~~

~~IM 2.4.3 Use Conversion.~~

Campus Land Uses Limited to Marine / Coastal Research and Education, Resource Protection, and Public Access

Policy 2.5 Ensuring Appropriate Land Uses on the Marine Science Campus

5.3 Natural Resource Protection

Policy 3.1 Protection of the Marine Environment

~~IM 3.1.1 Seawater System.~~

~~IM 3.1.2 Discharge of Drainage/Storm water.~~

Policy 3.2 Protection and Restoration of Habitat Areas

~~IM 3.2.1 Restoration of Wetlands on the Marine Science Campus.~~

~~IM 3.2.2 Management of Terrace Wetlands.~~

~~IM 3.2.3 Protection and Enhancement of Wildlife Movement.~~

~~IM 3.2.4 Management of Special Status Species Habitat.~~

IM 3.2.5 Protect Habitat Areas From Human Intrusion.

Under the project, the tours will use the existing YLR trails and will be docent-led. Additional wayfinding and interpretive signage are not required.

~~IM 3.2.6 Natural Area Management.~~
~~IM 3.2.7 Management of Water Quality and Drainage Features.~~
~~IM 3.2.8 Maintenance and Monitoring of Terrace Habitats.~~
~~IM 3.2.9 Wetland Buffers.~~
~~IM 3.2.10 Natural Areas Habitat Management.~~
~~IM 3.2.11 CRLF Protection.~~
~~IM 3.2.12 USFWS Consultation Required~~
~~IM 3.2.13 Rodenticides.~~
~~IM 3.2.14 Non-Invasive Native Plant Species Required.~~

Policy 3.3 Use and Protection of Coastal Waters and Wetlands

~~IM 3.3.1 Pre-development Evaluation of Wetland Conditions.~~
~~IM 3.3.2 Update CLRDP With Respect to Wetlands.~~

Policy 3.4 Protection of Environmentally Sensitive Areas (ESHAs)

~~IM 3.4.1 Additional Measures to Protect Habitat Areas.~~
~~IM 3.4.2 Noise Intrusion into Terrace ESHA.~~
~~IM 3.4.3 Noise Intrusion into LR (original YLR).~~
~~IM 3.4.4 Pre-development Evaluation of ESHA Conditions.~~
~~IM 3.4.5 Update CLRDP With Respect to ESHA.~~

Younger Lagoon Reserve

Policy 3.5 Special Protection for the Original Younger Lagoon Reserve

IM 3.5.1 Protection and Enhancement of YLR Habitats.

This project addresses limited access of humans to Younger Lagoon.

IM 3.5.2 Protection of Special Status Species in YLR.

Based on the results of the previous 5-year monitoring program, no special status species are anticipated to be impacted.

IM 3.5.3 Protection of YLR Resources.

Increased visitor use to beach as part of the required actions of IM 3.6.3 has the potential to impact flora and fauna. Only supervised tours will be permitted in order to minimize this potential impact.

IM 3.5.4 Development of Monitoring and Maintenance Program.

Plant, animal, and human activities/presence will be monitored as part of this project.

~~IM 3.5.5 Siting of Windbreak Vegetation.~~

IM 3.5.6 YLR Manager Consultation.

The Administrative Director of the UCSC Natural Reserves and the Field Manager of the Younger Lagoon Natural Reserve have reviewed the scope of the Public Access to and Within Younger Lagoon Natural Reserve Project (NOID 12 20-1) and concur the Project would not result in significant impacts to the Reserve beyond those described above.

Gage Dayton, Administrative Director, UCSC Natural Reserves — Date 6/30/2020

IM 3.5.7 Movement Not Visible From YLR (original YLR)

Monitoring efforts and public use of Younger Lagoon will be visible from the original Younger Lagoon Reserve.

~~IM 3.5.8 Protective Measures for YLR (original YLRR) in Middle Terrace.~~

Policy 3.6 Public Access to and within YLR (original YLR)

IM 3.6.1 Provision of Controlled Access within YLR (original YLR).

The project is consistent with public access polices for the beach and lagoon areas of YLR.

IM 3.6.2 Visual Access to YLR (original YLR).

Visual access to the original YLR is available from existing overlooks.

IM 3.6.3 Public Beach Access within YLR (original YLR).

This project addresses Implementation Measure 3.6.3: *"Public Access to and within YLR."* The project description provides details pertaining to the schedule of tours of the beach at the YLR, parameters for beach access and a program to monitor the effects of human, plant, and animal use/presence on the beach. An assessment of beach area resources and the effect of beach area use and activities on these resources is included.

Coastal Bluffs and Blufftops

Policy 3.7 Protection of Coastal Bluff and Bluff top Areas

~~IM 3.7.1 Bluff Setbacks.~~
~~IM 3.7.2 Coastal Bluff and Bluff top Area Protection and Enhancement Measures.~~
~~IM 3.7.3 Protecting Existing Development from Coastal Erosion.~~

Agricultural Resources

Policy 3.8 Protection of Adjacent Agricultural Resources

~~IM 3.8.1 Cooperation.~~
~~IM 3.8.2 Agreement to Indemnify and Hold Harmless.~~

Cultural Resources

Policy 3.9 Conservation of Cultural Resources

~~IM 3.9.1 Construction Monitoring.~~

Hazardous Materials Management

Policy 3.10 Hazardous Materials Management
~~IM 3.10.1 Hazardous Materials Management.~~
~~IM 3.10.2 Protective Measures for Laydown Yard.~~
Air Quality and Energy Consumption
Policy 3.11 Energy Efficiency in New Construction
~~IM 3.11.1 Energy Efficiency in New Construction.~~
~~IM 3.11.2 Energy Efficiency in Use.~~
Policy 3.12 Air Quality and Energy Conservation through Land Use and Transportation Controls
~~IM 3.12.1 Air Quality and Energy Conservation through On-Campus Short-Term Accommodations.~~
~~IM 3.12.2 Air Quality and Energy Conservation through Controlling Travel Mode Split.~~
~~IM 3.12.3 Air Quality and Energy Conservation through Parking Control.~~
~~IM 3.12.4 Air Quality and Energy Conservation through Alternative Transportation.~~
~~IM 3.12.5 Air Quality and Energy Conservation through Transportation Demand Management.~~
Natural Resource Protection Analysis
Policy 3.13 Natural Resource Protection Analysis Required
Policy 3.14 Permanent Protection
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5.4. Scenic and Visual Qualities
~~Figure 5.4 Development Subareas~~
Policy 4.1 Protection of Scenic Views
~~IM 4.1.1 Location of Development.~~
Policy 4.2 Protection of Scenic Quality
~~IM 4.2.1 Design Standards and Illustrative Campus Build out Site Plan.~~
~~IM 4.2.2 Alteration of Natural Landforms.~~
~~IM 4.2.3 Building and Other Structure Heights.~~
~~IM 4.2.4 Laboratory Buildings.~~
~~IM 4.2.5 Maximum Building Gross Square Footage.~~
~~IM 4.2.6 Maximum Additional Gross Square Footage in Lower Terrace.~~
~~IM 4.2.7 Construction Materials.~~
~~IM 4.2.8 Building Setbacks.~~
~~IM 4.2.9 Building Length Limitations.~~
~~IM 4.2.10 Placement of Utility Lines Underground.~~
~~IM 4.2.11 Windbreak Vegetation.~~
~~IM 4.2.12 Development in Northernmost Portion of Middle Terrace.~~
~~IM 4.2.13 Development Along Edge of Lower Terrace.~~
~~IM 4.2.14 Building Development West of McAllister Way in Lower Terrace.~~
~~IM 4.2.15 Building Development West of McAllister Way in Middle Terrace.~~
~~IM 4.2.16 Building Development Outside of Subareas Prohibited.~~
Policy 4.3 Visual Intrusion and Lighting
~~IM 4.3.1 Visual Intrusion into YLR (original YLR).~~
~~IM 4.3.2 Visual Intrusion into YLR (Terrace Lands).~~
~~IM 4.3.3 All Lighting.~~
~~IM 4.3.4 Building Lighting.~~
~~IM 4.3.5 Street and Trail Lighting.~~
~~IM 4.3.6 Parking Lot and Maintenance Yard Lighting.~~
~~IM 4.3.7 Sign Lighting.~~
~~IM 4.3.8 Lighting Plan Required.~~

5.5. Circulation and Parking
~~Figure 5.5 Circulation and Parking Diagram~~
Auto Circulation
Policy 5.1 Vehicular Access
~~IM 5.1.1 New Circulation System.~~
~~IM 5.1.2 Improve Shaffer Road / Delaware Avenue Intersection~~
~~IM 5.1.3 Shaffer Road Improvements.~~
~~IM 5.1.4 Access for Wildlife Across Shaffer Road (Upper Wildlife Corridor).~~
~~IM 5.1.5 Access for Wildlife Across Shaffer Road (Lower Wildlife Corridor).~~
~~IM 5.1.6 Use of Former Access Road.~~
~~IM 5.1.7 Emergency Access.~~
Travel Mode Split
Policy 5.2 Travel Mode Split
~~IM 5.2.1 Encourage Alternatives to Single-Occupant Vehicle.~~
~~IM 5.2.2 Alternatives to the Single-Occupant Vehicle.~~
Parking
Policy 5.3 Parking for Campus Use and Public Coastal Access
~~IM 5.3.1 All Campus Users Off-Hour Parking.~~

~~IM 5.3.2 Public Coastal Access Parking.~~
~~IM 5.3.3 Campus Entrance Public Coastal Access Parking.~~
~~IM 5.3.4 Middle Terrace Public Coastal Access Parking.~~
~~IM 5.3.5 Lower Terrace Dual Use Parking (Public Coastal Access Parking and Discovery Center Parking).~~
~~IM 5.3.6 Lower Terrace Public Coastal Access Parking.~~
~~IM 5.3.7 Parking Demand Satisfied On-Campus.~~
~~IM 5.3.8 Free and/or Low Cost Public Coastal Access Parking.~~

Parking Supply

Policy 5.4 Parking Supply

~~IM 5.4.1 Development of New Parking~~
~~IM 5.4.2 Lease Agreements~~
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Parking Management

Policy 5.5 Parking Management

~~IM 5.5.1 Permits Required.~~
~~IM 5.5.2 Public Coastal Access Parking.~~
~~IM 5.5.3 Carpools and Vanpools.~~
~~IM 5.5.4 Parking Management Strategy for Special and/or Temporary Events.~~
~~IM 5.5.5 Entrance Kiosk.~~
~~IM 5.5.6 Parking Limitation Seaward of Whale Skeleton.~~
~~IM 5.5.7 Parking Enforcement.~~

Pedestrian and Bicycle Facilities

Policy 5.6 Promotion of Bicycle Use and Walking

~~IM 5.6.1 Sheltered and Secured Bike Parking.~~
~~IM 5.6.2 Bike Parking Outside Buildings.~~
~~IM 5.6.3 Personal Lockers and Showers.~~
~~IM 5.6.4 Coordinated Marketing with City of Santa Cruz.~~
~~IM 5.6.5 Crosswalk Design.~~
~~IM 5.6.6 Siting Buildings for Ease of Access.~~

Transit

Policy 5.7 Promotion of Transit Use

~~IM 5.7.1 Extension of Santa Cruz Municipal Transit District Transit Services.~~
~~IM 5.7.2 Expansion of Shuttle Services.~~
~~IM 5.7.3 Physical Infrastructure for Transit.~~

Transportation Demand Management (TDM) Coordination

Policy 5.8 TDM Coordination

~~IM 5.8.1 Carpool and Vanpool Services.~~
~~IM 5.8.2 TDM Coordination.~~
~~IM 5.8.3 Transportation Information.~~

Traffic Impacts on City Streets

Policy 5.9 Impacts Offset

Circulation and Parking Plan

Policy 5.10 Circulation and Parking Plan Required

5.6. Public Access and Recreation

~~Figure 5.6 Coastal Access and Recreation Diagram~~

Policy 6.1 Public Access to the Marine Science Campus

~~IM 6.1.1 Free Public Access for Visitors.~~
~~IM 6.1.2 Public Access Parking.~~

IM 6.1.3 Public Access Trails.

Access to trails to the beach are described in the project description.

~~IM 6.1.4 Public Access Overlooks.~~

IM 6.1.5 Docent-Led Tours and Education Programs for the Public.

The project provides beach access and docent led tours to the YLR beach.

~~IM 6.1.6 Educational Programs for Pre-College Students.~~
~~IM 6.1.7 Interpretive Information.~~

Policy 6.2 Management of Public Areas

~~IM 6.2.1 Public Use Hours for the Marine Science Campus.~~
~~IM 6.2.2 Public Trail Continuity.~~

IM 6.2.3 Access to Resource Protection Areas.

This project provides public access to the Younger Lagoon Beach area in conformance with the CLRDP.

~~IM 6.2.4 Access to Resource Protection Buffer Areas.~~
~~IM 6.2.5 Access to Coastal Bluffs.~~
~~IM 6.2.6 Access to Laboratories and Research Areas.~~
~~IM 6.2.7 Caretaker Residence and Lab Security.~~
~~IM 6.2.8 Bicycles on the Marine Science Campus.~~
~~IM 6.2.9 Domestic Pets.~~

~~IM 6.2.10 Public Access Signage.~~
~~IM 6.2.11 Off-Campus Trail Connectivity.~~
~~IM 6.2.12 Maintenance of Existing Public Access.~~
IM 6.2.13 Public Access to Younger Lagoon Beach.
The project provides public access to Younger Lagoon Beach in conformance with IM 3.6.3.
Policy 6.3 Public Access and Recreation Plan Required

5.7. Hydrology and Water Quality
~~Figure 5.7 Utilities Diagram~~
Policy 7.1 Productivity and Quality of Coastal Waters
~~IM 7.1.1 Management of Storm water and Other Runoff.~~
~~IM 7.1.2 Water Quality Standards.~~
~~IM 7.1.3 Pre- and Post-Development Flows.~~
~~IM 7.1.4 Pre-Development Drainage Patterns Defined.~~
~~IM 7.1.5 Pre-Development Drainage Peak Flow Rates Defined.~~
~~IM 7.1.6 Groundwater Recharge.~~
~~IM 7.1.7 Seawater System (Seawater Containment)~~
~~IM 7.1.8 Irrigation and Use of Chemicals for Landscaping.~~
~~IM 7.1.9 Wastewater.~~
~~IM 7.1.10 Elements of the Storm water Treatment Train.~~
~~IM 7.1.11 Runoff Containment for Laydown Yard and Food Service Washdown Areas.~~
~~IM 7.1.12 Location of Treatment Train Components.~~
~~IM 7.1.13 Permeable Hardscape.~~
~~IM 7.1.14 Ocean Discharge.~~
~~IM 7.1.15 Drainage System Interpretive Signs.~~
~~IM 7.1.16 Design of Vegetated Storm water Basins.~~
~~IM 7.1.17 Designation of Treatment Train.~~
Policy 7.2 Long-Term Maintenance and Monitoring
~~IM 7.2.1 Drainage System Monitoring and Maintenance.~~
~~IM 7.2.2 Storm water System Natural Features Maintenance.~~
~~IM 7.2.3 Drainage System Sampling.~~
~~IM 7.2.4 Long-Term Maintenance of Storm wate r System.~~
Policy 7.3 Drainage Discharge Points
~~IM 7.3.1 Discharge to the Original Younger Lagoon Reserve.~~
~~IM 7.3.2 Discharge Siting and Design.~~
Policy 7.4 Drainage Plan Required

5.8 Utilities
Policy 8.1 Provision of Public Works Facilities
~~IM 8.1.1 Sizing of Utilities.~~
~~IM 8.1.2 Seawater System.~~
Policy 8.2 Protection of Biological Productivity and Quality of Coastal Waters When Providing Public Works Facilities
~~IM 8.2.1 Installation of New Utility Lines and Related Facilities.~~
~~IM 8.2.2 Seawater System.~~
~~IM 8.2.3 Evaluation of Western Utility Corridor.~~
Policy 8.3 Water Conservation Required
Policy 8.4 Impacts to City Water and Sewer Systems Offset
Policy 8.5 Utility Plan Required

CHAPTER 6 Design Guidelines
~~6.1 Building Design~~
~~6.2 Campus Street Design~~
~~6.3 Parking Design~~
~~6.5 Landscape Design~~
~~6.6 Lighting Design~~
~~6.7 Signage Design~~
~~6.8 Fence / Barrier Design~~

CHAPTER 7 Illustrative Campus Buildout Site Plan and Preliminary Designs
Paths used for tours and research are already in place. Beyond normal maintenance, there will be no additional buildout.

CHAPTER 8 Development Procedures

This NOID and the public notification process is submitted in conformance with the requirements of the CLRDP.

CHAPTER 9 Capital Improvement Program

The beach monitoring and guided tours to the beach are consistent with Chapter 9 requirements.

APPENDIX A Resource Management Plan

The proposed project is consistent with the RMP and Younger Lagoon Natural Reserve polices.

APPENDIX B Drainage Concept Plan

The proposed project would have no impervious surface and thus would not affect storm water runoff.

1c. Environmental Compliance Documentation

See attached

1d. Technical Reports

See Section 5.

1e. Consultation Documentation with other Agencies

Not required for this NOID

1f. Implementing Mechanisms

There are no mitigations required by CEQA.

1g. Correspondence Received

None

1h. UC Santa Cruz Project Manager

Elizabeth Howard phone: 831-459-2455 email: eahoward@ucsc.edu

2. University Approval Documentation

See attached

3. Environmental Compliance Documentation

See attached

4. Plans, Specifications, etc.

(this section used if project documentation is large format or extensive)

N / A

5. Technical Reports

See attached: Younger Lagoon Natural Reserve Beach Monitoring Report, 2019.

6. Correspondence

N / A

2. University Approval Documentation

January 8, 2010

VICE CHANCELLOR THOMAS VANI
Business and Administrative Services

Re: NOID 10-1
Public Access to and Within Younger Lagoon Reserve

Dear Tom:

Notice of Impending Development (NOID) 10-1 Public Access to and Within Younger Lagoon Reserve is an atypical project. As described in IM 3.6.3 in the CLRDP, it would provide for controlled public access to the Younger Lagoon Beach and does not involve physical development. However, this "project" is considered "development" as defined in Section 30106 of the California Coastal Act and Section 8.1.1 of the Coastal Long Range Development Plan because the "project" would result in a "...change in the intensity of use of water, or access thereto...". Applying The Regents' delegated authority for approval of projects, the cost of this project is below the $750,000 threshold and therefore you have the authority to certify the CEQA action and approve the project.

For your consideration, the University's Environmental Classification Form and the "Project Report" prepared for this NOID 10-1 are attached. The Project Report, which has been prepared in consultation with the Office of the President and Office of General Counsel. The Project Report includes a detailed description of the project.

Physical Planning and Construction recommended approval:

Frank Zwart, AIA Campus Architect
Associate Vice Chancellor Physical Planning and Construction

1/12/10
Date

Reviewed by

JB (initials)
John Barnes
Director of Campus Planning

Drafted by: J Barnes
Reviewed by: K. Drumm

ITEM FOR ACTION

FOR VICE CHANCELLOR, BUSINESS AND ADMINSTRATIVE SERVICES APPROVAL

NOID 10-1 PUBLIC ACCESS TO AND WITHIN THE YOUNGER LAGOON NATURAL RESERVE

Associate Vice Chancellor for Physical Planning and Construction recommends that, upon review and consideration of the potential for environmental consequences of the proposed Public Access to and Within the Younger Lagoon Natural Reserve (the Project) as described in the Project Report of Notice of Impending Development 10-1, and in accordance with University Delegation of Authority, the Vice Chancellor of Business and Administrative Services of the Santa Cruz campus:

1. Determine the Public Access to and Within the Younger Lagoon Natural Reserve Project to be Categorically Exempt under the California Environmental Quality Act (CEQA), as described in the Project Report (see Section 1c); the Environmental Compliance Documentation; and

2. Approve the Public Access to and Within the Younger Lagoon Natural Reserve Project

The Project would not result in any significant environmental impacts. The University has determined that the Project is Categorically Exempt from the provisions of CEQA under exemptions: Class 1 (Existing Facilities), Class 6 (Information Collection) and Class 22 (Educational Programs) as shown in the Project's Environmental Impact Classification form (see Section 1c Environmental Compliance Documentation).

APPROVED

Tom Vani
Vice Chancellor, Business and Administrative Services

1.12.2010
Date

1c. Environmental Compliance Documentation

UNIVERSITY OF CALIFORNIA **ENVIRONMENTAL IMPACT CLASSIFICATION**

(revised)

Campus or Field Statio Santa Cruz **Project Account:** _____

Project Title **PUBLIC ACCESS TO AND WITHIN YLR (Revised)**

For purposes of compliance with the California Environmental Quality Act of 1970 (CEQA), and Amended University of California Procedures for Implementation of CEQA, this project has been reviewed and initially classified as indicated below. Please check (X) as appropriate. Include project description and appropriate local map.

X I. EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

When it can be seen with certainty that there is no possibility the action will result in physical changes to the environment or the action is specifically exempted by statute, the project is classified as exempt from CEQA.

X II. CATEGORICALLY EXEMPT

This project falls under the indicated Class of Exemption and there is no significant effect on the environment.

- X Class 1: Existing Facilities
- ___ Class 2: Replacement or Reconstruction
- ___ Class 3: New Construction of Small Structures
- ___ Class 4: Minor Alterations to Land
- ___ Class 5: Alterations in Land Use Limitations
- X Class 6: Information Collection
- ___ Class 7: Regulatory Protection of Natural Resources
- ___ Class 8: Regulatory Protection of the Environment
- ___ Class 9: Inspection
- ___ Class 10: Loans
- ___ Class 11: Accessory Structures
- ___ Class 12: Surplus Government Property Sales
- ___ Class 13: Acquisition for Conservation
- ___ Class 14: Minor Additions to Schools
- ___ Class 15: Minor Land Divisions
- ___ Class 16: Transfer of Ownership of Land to Create Parks
- ___ Class 17: Open Space Contracts
- ___ Class 18: Designation of Wilderness Areas
- ___ Class 19: Annexation of Existing Facilities and Lots
- ___ Class 20: Changes in Organization of Local Agencies
- ___ Class 21: Regulatory Enforcement Actions
- X Class 22: Educational Programs
- ___ Class 23: Normal Operation
- ___ Class 24: Regulations of Working Conditions
- ___ Class 25: Transfer of Ownership of Land to Preserve Open Space
- ___ Class 26: Acquisition Housing for Housing Assistance
- ___ Class 27: Leasing New Facilities
- ___ Class 28: Small Hydroelectric Projects
- ___ Class 29: Cogeneration Projects
- ___ Class 30: Minor Actions to Prevent Hazardous Substance Release
- ___ Class 31: Historic Resource Restoration/Rehabilitation
- ___ Class 32: In-fill Development Projects

___ III. INITIAL STUDY

This project is not Exempt from CEQA or Categorically Exempt; an Initial Study is to be prepared to determine if the project may have a significant effect on the environment that has not been substantially and adequately analyzed in a certified program EIR.

Checklist____ Narrative____

___ IV. ENVIRONMENTAL IMPACT REPORT (EIR)

It is known that the project will have a significant effect on the environment and has not been adequately and substantially analyzed in a certified program EIR.

PROJECT DESCRIPTION: The project would implement CLRDP IM 3.6.3 to provide controlled public access to Younger Lagoon Natural Reserve through docent-guided tours, in conjunction with vegetation and wildlife monitoring. Visitors would use existing trails and timber steps under the supervision of a knowlegeable docent. Effects upon vegetation and wildlife of increased visitation would be monitored over a five-year period through periodic documentation of species composition and seed production of beach dune vegetation, and species composition and abundance of animals present. Data collection methods will include periodic photo documentation, camera traps, track surveys, and population and density counts for various plant and animal species. Although increased visitation has the potential to affect wildlife and vegetation, the project has no potential to result in significant environmental effects because access will be limited and supervised. Concurrent biological data collection will provide input in future decisions regarding on-going public access to the reserve, to avoid significant environmental effects.

V. Does this project conform to the approved CLRDP? X YES ___NOT APPLICABLE

VI Sally Morgan — Prepared by — 10/16/09 — Date

Local Approved by: Thomas Vani — 10.20.09 — Date

VI OFFICE OF THE PRESIDENT

COMMENTS:

_____ Concur with Classification

_____ Do not Concur

_____ Signed — Date

_____ Date

NOID 12 (20-1) was posted on the Coastal Science Campus on June 30, 2020. Posting locations included UCSC's Ocean Health Building, Seymour Center, Coastal Biology Building, NOAA Southwest Fisheries Science Center, CDFW Facility, the campus entrance, and entrance to De Anza Trail. A picture of the posting at the campus entrance is included here.

Younger Lagoon Reserve

Beach Monitoring Report

2019

***Watsonville Area Teens Conserving Habitats* (WATCH) *Program* Participants at Younger Lagoon**

Elizabeth Howard and Gage Dayton
Younger Lagoon Reserve

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Overview and Executive Summary

In March 2010, the California Coastal Commission (Coastal Commission) approved the University of California's Notice of Impending Development Implementation for Implementation Measure 3.6.3 of the CLRDP (NOID 10-1). NOID 10-1 requires that (through supervised visits) the public have access to Younger Lagoon Reserve beach and that a monitoring program be created and implemented to document the condition of native flora and fauna within Younger Lagoon and its beach. The monitoring plan was to be implemented over a 5-year time period. At the end of the 5-year period (Winter 2015) results were to be compiled and included in a report that summarizes and discusses the potential effect of controlled beach access on flora and fauna at Younger Lagoon and submitted as a NOID to the CCC.

The campus began implementing the public access plan and monitoring program in spring 2010, and submitted the report on the results of the monitoring to the Coastal Commission in February of 2016 as part of the Younger Lagoon Reserve Annual Report. The campus submitted NOID 9 (16-2) Public Access to and Within Younger Lagoon Reserve to the Coastal Commission in December 2016. At the request of local coastal staff, the campus withdrew NOID 9 (16-2) resubmitted it as NOID 9 (17-1) in June 2017. The campus presented NOID 9 (17-1) at the July 2017 CCC and although CCC staff found the NOID consistent with the CLRDP, a Commissioner requested the University provide significantly more tours to the beach and that children be allowed for free. The campus withdrew NOID 9 (17-1), made changes to address these requests, and resubmitted it as NOID 9 (18-1) in August 2018.

On September 13, 2018, the Coastal Commission approved UC Santa Cruz's NOID 9 (18-1) as consistent with UCSC's approved Coastal Long Range Development Plan with the addition of five staff-recommended special conditions. These included 1) Free Beach Tours, 2) Beach Tour Outreach Plan, 3) Beach Tour Signs, 4) Beach Tour Availability and Monitoring, and 5) Beach Access Management Plan Duration. Within 30 days of the approval (i.e., by October 13, 2018), UCSC was required to submit a plan for implementation of the special conditions to the Executive Director of the California Coastal Commission. The plan for implementation of the special conditions was submitted to the Executive Director of the California Coastal Commission on October 15, 2018. UCSC received feedback from Coastal Commission staff on the plan, and a revised plan for implementation of the special conditions was submitted to the Executive Director of the California Coastal Commission on December 15, 2018. The revised plan for implementation of the special conditions was approved by the Executive Director on January 30, 2019. Special Condition 4 requires that at least every six months (i.e., by June 30th and December 31st each year), UCSC shall submit two copies of a Beach Tour Monitoring Report for Executive Director review and approval. Although the revised plan for implementation of the special conditions was approved by the Executive Director on January 30, 2019, UCSC began implementing some of the special conditions prior to final approval of the implementation plan. UCSC's initial report on the implementation of these special conditions for the period of January 1, 2019 through June 30, 2019 was submitted on June 28, 2019. Upon review, local Coastal Commission staff requested more detail regarding the implementation of Special Condition 2. UCSC's revised report on the implementation of the special conditions for the period of January 1, 2019 through June 30, 2019 was submitted on September 5, 2019. The report for the period of July 1, 2019 through December 31, 2019 will be submitted by December 31, 2019.

This document serves as both a summary report for activities under NOIDs 2 (10-1) and 9 (18-1) that have taken place since our previous report at the end of fiscal year 2018 and a summary report for the entire 9-year monitoring program. All year's results are included. Data collected indicate that Younger Lagoon Reserve (YLR) supports a wide variety of native flora and fauna, provides habitat for sensitive and threatened species, supports a very unique beach dune community, and is extensively used for research and education. In general, in comparison to the other local beaches surveyed native plant species richness is greatest at YLR and Natural Bridges; however, there is quite a bit of annual variation among the sites. A parameter that we quantified in 2012, and is evident from visual observation and photo documentation, is the presence of dune hummocks and downed woody material at YLR, both of which are almost entirely absent at local beaches due to human use. These features provide habitat for plant species such as the succulent plant dudleya, which grow on downed woody material and dune hummocks at YLR, as well as burrowing owls that use burrows in hummocks and seek shelter beneath downed woody material at YLR. The relatively natural state of YLR beach and dune vegetation is unique among most pocket beaches in Santa Cruz County and likely represents a glimpse into what many of the pocket beaches in the greater Monterey Bay area looked like prior to significant human disturbance. Open access to the beach would likely result in the loss of the unique ecological characteristics of the site and certainly reduce its effectiveness as a research area for scientific study. Controlled beach access through the Seymour Center docent led tours, provides an appropriate level of supervised access that enables people to see and learn about the lagoon habitat while limiting impacts to the system. We recommend that this continue.

Although only required to monitor the YLR beach, YLR staff, faculty, and the Scientific Advisory Committee decided to monitor nearby beaches with varying levels of use (Natural Bridges and Sand Plant Beach) during the first 5-year period in order to examine differences in the flora, fauna and use among the three sites. This effort required hundreds of hours of staff and student time, as well as coordination with State Parks staff. As reported in the 2015 YLR Beach Monitoring Report, beginning in the summer of 2015 and moving forward, YLR staff will continue to monitor YLR as required in IM 3.6.3; however, we will no longer monitor at Natural Bridges State Beach or Sand Plant Beach as the previous 5 years of data collection have provided us with adequate information to assess beach resources.

Introduction

Over 50 years ago, the University of California Natural Reserve System (UCNRS) began to assemble, for scientific study, a system of protected sites that would broadly represent California's rich ecological diversity. Today the UC Natural Reserve System is composed of 41 reserves that encompass approximately 750,000 acres of protected natural land available for university-level instruction, research, and public service. The University of California Natural Reserve System supports research and education through its mission of contributing "*to the understanding and wise management of the Earth and its natural systems by supporting university-level teaching, research, and public service at protected natural areas throughout California*." By creating this system of outdoor classrooms and laboratories and making it available specifically for long-term study and education, the NRS supports a variety of disciplines that require fieldwork in wildland ecosystems. UC Santa Cruz administers four UC Reserves: Younger Lagoon Natural Reserve, Año Nuevo Island Reserve, Landels-Hill Big Creek Reserve, and Fort Ord Natural Reserve.

The objective of the beach monitoring program is to document the presence and distribution of flora and fauna within Younger Lagoon Natural Reserve (YLR) and to evaluate changes in distribution and density over time. Additionally, YLR staff decided to monitor nearby beaches with varying levels of use (Natural Bridges and Sand Plant Beach) in order to examine differences in the flora and fauna among the three sites. Importantly, the data collected in this study provides a quantitative assessment of various attributes (species composition, abundance, etc.) but it is realized that the sites vary significantly from one another and that there is no replication. Thus, although these data comparisons are informative there are significant constraints that make meaningful statistical comparisons between the sites impossible. As such, results shouldn't necessarily be used to create strict prescriptions.

This report is a report for activities under NOIDs 2 (10-1) and 9 (18-1) during Fiscal Year (FY) 2018-2019 (July 1, 2018 – June 30, 2019) which surveyed YLR. In addition, although we are no longer monitoring Natural Bridges and Sand Plant beaches, we have included all year's results from all sites in this report in order to show the entire effort to date. Data for each monitoring objective have been added to previous year's data; thus, the results for this reporting period have been combined with all previous findings. As a result, this report provides a running summary of our findings starting from the inception of the study and running through the end of FY 2018-2019.

Younger Lagoon Access History

History of Public Access to Younger Lagoon Beach

Prior to 1972, Younger Beach was privately owned and closed to the public. The owners (Donald and Marion Younger) actively patrolled for, and removed, trespassers from their property, including the beach. In 1972, the Younger Family donated approximately 40 acres of their property to the University of California for the study and protection of the marine environment. These lands included Younger Lagoon and Beach (approximately 25 acres), and an adjoining parcel of land (approximately 15 acres) which became the site of the original Long Marine Laboratory (LML). At the time of their donation, Donald and Marion Younger intended that the lagoon, beach and surrounding slopes be protected in perpetuity by the University as a bird sanctuary.

In the years between the donation of the property and the start of LML construction (1976), the University leased the future LML site back to farmers who had been farming the property for the Younger family prior to the donation. During those years, the same no trespassing rules for the beach were enforced as they had been when the property was owned by the Younger family.

Once construction of LML began in 1976, the land was no longer under the watch of the farmers, and public pressure on the beach began to increase. Many Santa Cruz locals remember the next several years at Younger Beach fondly as it became a popular nude beach. The increased public access had a noticeable impact on the flora and fauna of the beach, and was not in accordance with the intention of the original donation by the Younger family. By 1978 discussions had begun between the University and the California Coastal Commission regarding the impact of uncontrolled public access to the beach. In 1981, it was decided that the impacts to Younger Beach were significant and the California Coastal Commission, under coastal permit P-1859, closed uncontrolled access to the beach.

After the approval of coastal permit P-1859, the University began to actively patrol the beach for trespass, educate the public about the closure, and use the site for research and education. After YLR was incorporated into the UCNRS in 1986, users were required to fill out applications, or contact NRS staff, for specific research, education, or outreach efforts. As the LML campus grew, a protective berm and fencing were constructed around the perimeter of the lagoon, and informational 'beach closed' signs were posted on the cliffs above the beach. Over time, trespass decreased and the reduced public access had a noticeable positive impact on the flora and fauna of the beach.

Public access to YLR beach came to the forefront again during the CLRDP negotiation process (2000-2008). At the time negotiations began, YLR supported a rich composition of plant and animal species despite being surrounded by agricultural and urban development. Reserve staff were concerned that any increase in public access could threaten the already heavily impacted habitat. At the time of CLRDP certification (2010), all parties agreed to the Beach Access Management Plan outlined in NOID 10-1. Under the Beach Access Management Plan, the YLR beach remains closed to unsupervised public access and the reserve is implementing a management and monitoring plan that includes docent-guided tours.

Because of the importance of maintaining a natural and pristine environment (Figure 1) and protecting scientific studies and equipment, uncontrolled access to YLR is not allowed. Uncontrolled use of YLR is likely to have a negative impact on native coastal flora and fauna that inhabit the reserve, hamper research endeavors, and impact the area for future scientific and educational endeavors. Rather than an open public access policy, users are required to fill out applications, or contact NRS staff, for specific research, education, or outreach efforts. In 2010 YLR began hosting docent-guided tours that are offered by the Seymour Marine Discovery Center (Seymour Center).

Beach Access Tours

From 2010 - 2017, docent-led beach tours were offered twice monthly through the Seymour Marine Discovery Center (Seymour Center). Starting in January 2018, tours are offered twice a month during the slower fall and winter months (October-February), and four times a month during the busier spring and summer months (March-September), for a total of 38 tours per year. From 2010-2018, these tours were offered free with admission to the Seymour Center, Starting in 2019, these tours are now offered

for free. In addition, all of the docent led daily tours run by the Seymour Center (approximately 1,500 tours annually) include an informational stop about YLR that includes visual access to the beach.

The extent of the beach access area varies depending on tidal conditions and the location of plants, as foot traffic is only permitted seaward of the dune vegetation. Thus, the exact access area may vary slightly from the areas depicted in Figure 2 below and Figure 3.11 of the CLRDP. The trail provides an interpretive experience for visitors that begins with a narrative history of the UC Natural Reserve System (UCNRS), an overview of the lagoon, a walk through a restored coastal scrub habitat with opportunities to view the rear dune, and ends on the beach. Tours are led by Seymour Center docents trained in the natural history and ecology of YLR and provide detailed information about flora, fauna, geology, and the UCNRS. Tour curriculum, which was first presented to the Seymour Center docents during the regular winter docent-training program in 2010, focuses on the unique ecology of the YLR beach.

In addition to the docent-guided beach tours, visual access to the lagoon and back dune is provided to the public via Overlook E along McAllister Way. Overlook E is open to the public from dawn to dusk. Visual access to the Younger Lagoon beach and information about Younger Lagoon Reserve is also provided to all visitors taking the Seymour Center's docent-guided Reserved and Daily Tours via the Overlook C. Last year, nearly 25,000 visitors took these tours.

Public Education and Outreach Programming on the Coastal Science Campus

Seymour Marine Discovery Center

The free docent guided beach tours are part of broader public education and outreach programming on the Coastal Science Campus offered through the Seymour Center. Every year, nearly 70,000 people visit the Seymour Center, and nearly 15,000 visitors take docent-guided tours. The Seymour Center provides marine science education to hundreds of classes, comprised of thousands of students, teachers, and adult chaperones from across the country. Many of the classes served come from schools classified as Title 1—schools with high numbers of students from low-income families. Scholarships are made available to Title 1 schools, making it possible for students to participate who would not otherwise have the opportunity to experience a marine research center. Teachers often incorporate the Seymour Center into their weeklong marine science field study courses.

Every year, dozens of children ages 7-14, enroll in weeklong summer science sessions known as Ocean Explorers. Students actively learn about and participate in marine research at the Seymour Center and Long Marine Laboratory, where participants work alongside marine mammal researchers and trainers. Participants gain experience with the scientific process, focusing on honing their observation and questioning skills. Ocean Explorers also investigate the coastal environment at field sites around Monterey Bay, including rivers and watersheds, sandy beaches, rocky intertidal areas, and kelp forests by kayak. Young participants generally come from Santa Cruz, Santa Clara, and San Mateo Counties. Full and partial scholarships are extended to low-income participants.

While part of UC Santa Cruz, the Seymour Center must raise its ~$1.5 million budget annually (including all operating costs, salaries, and benefits) from earned revenue, private donors and grants. Earned revenue—admissions, program fees, facility rentals, and the Ocean Discovery Shop—makes up approximately half of its general operating requirements.

The Seymour Center actively promotes its activities with press releases and calendar listings throughout the region. Every year, traditional print ads are placed in newspaper and magazines. The Seymour Center's activities are also often covered in the local newspaper, the Santa Cruz Sentinel. Public radio ads run throughout the year on the NPR-affiliate, KAZU.

Coupons for discounted admissions are available in various formats. The most highly used program is through the many Bay Area municipal libraries. Called Discover and Go, hundreds of families from across the region utilize these discount coupons. The Seymour Center continued to connect with the public through Facebook, Twitter, Instagram, Pinterest, Flickr, and bi-monthly e-blasts.

Watsonville Area Teens Conserving Habitat (WATCH)
Last year, the Seymour Center, Younger Lagoon Reserve and the Monterey Bay Aquarium again partnered to support high school students in the Watsonville Area Teens Conserving Habitats (WATCH) program. WATCH students from Aptos High School design and carry out field-based research projects in Younger Lagoon Reserve on topics including endangered fish, aquatic invertebrates, and birds. These students make repeated visits to the Reserve throughout the year. Find out more at: https://www.montereybayaquarium.org/education/teen-programs/watsonville-area-teens-conserving-habitats-watch

Community Bioblitz
Last year, Younger Lagoon Reserve and the California Academy of Sciences again partnered to host an annual Younger Lagoon Reserve Bioblitz. A bioblitz is a community event that brings together a wide variety of people – citizen scientists - to rapidly inventory the living organisms found in a particular place. The Younger Lagoon Reserve Bioblitz is held during the spring, and is open to members of the public. Participants explored the lagoon and beach areas as part of this event. A link to the page advertising this community event can be found here:
https://www.inaturalist.org/projects/younger-lagoon-reserve-bioblitz-2019

Volunteer Stewardship Days
Last year, Younger Lagoon Reserve hosted numerous volunteer stewardship days. These events are advertised on social media and open to the public. Volunteer stewardship days provide members of the public with the opportunity to learn about the reserve and its unique habitats, wildlife, research, restoration, and teaching programs while giving back.

Figure 1. Burrowing owl on the beach at Younger Lagoon.

Study Areas

Flora, fauna, and human use were monitored at Natural Bridges State Park, Younger Lagoon Reserve, and Little Wilder/Sand Plant Beach from 2010-2015 (Figure 2). These three sites have similar characteristics (all have beach and lagoon habitat), are within close proximity to one another, and experience varying levels of human use. Although site characteristics are similar in many ways, they are also different in many ways, and these differences likely influence species composition. Three of the primary differences among the sites are human use levels, composition of adjacent upland habitat, and the overall size of the beach and wetland areas. Starting in FY 2015-2016 and moving forward, only Younger Lagoon Reserve has been and will continue to be monitored.

Younger Lagoon Reserve

Younger Lagoon Reserve is located in Santa Cruz County, approximately 4.5 miles from the main UC Santa Cruz campus; adjacent to the UC Santa Cruz Long Marine Laboratory. One of the few relatively undisturbed wetlands remaining on the California Central Coast, Younger Lagoon Reserve encompasses a remnant Y-shaped lagoon on the open coast just north of Monterey Bay. For most of the year, the lagoon is cut off from the ocean by a sand barrier. During the winter and spring months, the sand barrier at the mouth of Younger Lagoon breaches briefly connecting the lagoon to the ocean. The lagoon system provides protected habitat for 100 resident and migratory bird species. Approximately 25 species of water and land birds breed at the reserve, while more than 60 migratory bird species overwinter or stop to rest and feed. Opossums, weasels, brush rabbits, ground squirrels, deer mice, coyote, bobcat, woodrat, raccoon, and skunk are known to occupy the lagoon; gray and red foxes as well as mountain lion have also been sighted. Several species or reptiles and amphibians, including the California Red-legged Frog, also are found in the Reserve. Reserve habitats include salt and freshwater marsh, backdune pickleweed areas, steep bluffs with dense coastal scrub, pocket sand beach, grassland, and dense willow thickets.

Sand Plant Beach ("Little Wilder")

Sand Plant Beach is located in Santa Cruz County, approximately 1.5 miles west of YLR adjacent to Wilder Ranch State Park. Sand Plant Beach is approximately 23 acres and includes a pocket beach, dunes, cliffs and lagoon. It is open to the public for recreational use from dawn until dusk, 365 days a year; however, requires a hike to get to it and thus experiences less human use than many of the more accessible beaches in Santa Cruz. The surrounding Wilder Ranch State Park covers approximately 7,000 acres and allows human, bike and equestrian access. Much of the interior lagoon/upland habitat has been modified for agricultural production and/or ranching over the past century. Today most of the vegetation that persists inland of the lagoon is dominated by freshwater emergent vegetation and willow thickets. Major wetland restoration projects have increased native flora and fauna in the area (Friends of Santa Cruz State Parks, 2010).

Natural Bridges Lagoon

Natural Bridges Lagoon is located in Santa Cruz County, approximately 0.5 miles east of YLR on the urban edge of the city of Santa Cruz CA in Natural Bridges State Park. Natural Bridges Lagoon, beach, and State Park encompasses approximately 63 acres and includes a wide pocket beach, lagoon, cliffs, and diverse upland habitat (scrub, grass, iceplant, willow thicket, live oak, eucalyptus, and cypress). The park is world-renowned for its yearly migration of monarch butterflies and famous natural bridge. Natural Bridges State Park allows human access as well as dogs that are on leash and

remain on paved roads and in parking lots (Friends of Santa Cruz State Parks, 2010). The beach is a popular destination at all times of the year; however, it is especially popular in the spring, summer, and fall months.

Figure 2. Study Areas.

Methods

User Data

User data from tours conducted by the Seymour Center, as well as research and education use of YLR, were recorded and maintained by Seymour Center and YLR Staff. User data from educational programs and fee collection are recorded and maintained by California State Parks staff for Natural Bridges State Parks. No user data was available for Sand Plant Beach.

Human Beach Use

We used remote cameras to quantify human use quarterly througout the study peroiod. Cameras were placed along the eastern edge of Sand Plant Beach and Natural Bridges Beach from FY 2010-2011 – FY 2014-2015 and at the western edge of Younger Lagoon from FY 2010-2011 – present with each separate quarterly sampling events each consisting of two days. Cameras were set to automatically take photos at 15 minute intervals. Number of people were quantified for 15 minute intervals during the day (camera times varied across sampling periods due to day length and postion; however, were standardized within each sampling period). The total survey area varied between sites and among individual sampling efforts due the placement of the camera and available habitat for human users at the time of the survey (i.e. often less beach area surveyed at Sand Plant Beach compared to Younger Lagoon and Natural Bridges). In order to control for area, specific regions of photos were chosen and number of individuals within each region were counted; thus, the number of people counted per unit area and time was standardized. We used the largest survey area during each sampling period to standardize use within each specific region of the beach during each sampling effort. Thus, if a particular site had more or less habitat monitored, the number of individuals was standardized across sites making comparisons comparable.

Photo Documentation of Younger Lagoon Natural Reserve

Photo point locations were established at four locations within YLR (Figure 3). These locations were chosen to ensure coverage of all major areas of the beach. Photos were taken once during the reporting period. At each photo point we collected photo point number, date, name of photographer, bearing, and camera and lens size.

Tidewater Goby Surveys

Tidewater goby surveys were conducted quarterly throughout the study period. Surveys were conducted using a 4.5 ft x 9 ft beach seine with 1/8 inch mesh. The objectives of the surveys were to document tidewater goby presence and evidence of breeding activity (determined by the presence of multiple size/age classes). All fish were identified to species and counted. When individuals exceeded ~50 per seine haul, counts were estimated. Sampling was conducted with the goal of surveying the various habitats within each site (e.g. sand, sedge, willow, pickleweed,

deep, shallow, etc.); thus, different numbers of seine hauls were conducted at each site. Species richness was compared among sites.

Figure 3. Locations of monitoring points, plots, and regions for YLR beach. Monitoring areas varied between sampling efforts depending upon the high water mark, vegetation patterns, and water levels.

Species Composition and Coverage of Beach Dune Vegetation

Dune vegetation from the lowest (nearest to the mean high tide line) occurring terrestrial plant to 10 meters inland into the strand vegetation was surveyed quarterly throughout the study period. The exact location and extent of the area surveyed each time varied depending upon the location of the "lowest" plant detected during each sampling effort. At each location we established a 50-m east-west transect across the dune vegetation and measured the distance from the estimated mean high tide line to the "lowest" plant on the beach. Herbaceous species composition was measured by visual estimation of absolute cover for each species in ten 0.25 m^2 quadrats along the transect. Quadrats were placed every 5 m on alternating sides of the transect starting at a randomly selected point between 1 and 5 meters (a total of 10 quadrats per transect). A clear plastic card with squares representing 1, 5, and 10% of the sampling frame was used to help guide visual cover estimations. Species cover (native and exotic), bare ground, and litter were estimated at 5% intervals. Litter was specifically defined as residue from previous year's growth while any senescent material that was recognizable as growth from earlier in the current growing season was counted as cover for that species. After all cover estimates had been made, we conducted surveys within 2 m of either side of the transect (a 4 × 50 m belt). In the belt transects, individual plants were recorded as either seedlings or greater than 1 year old. Presence of flowers and seeds was also noted.

Non-avian Vertebrate Monitoring

Tracks

Vertebrate tracks were measured using raked sand plots at each site quarterly throughout the study period. Tracking stations were placed throughout the beach area in constriction zones where vegetation was absent. The objective of these surveys was simply to detect what species use the beach habitat. As such, size of plot varied from approximately depending upon the amount of available open sandy area at each location. Track stations were raked each evening and checked for tracks in the morning. Stations remained open for two days during each monitoring bout. Tracks were identified to species when possible. Species composition was summarized; however, abundance was not quantified due to the fact that most often tracks cannot be used to identify individual animals (e.g. a single individual could walk across the plot multiple times).

Small Mammals

Sherman live traps were placed for two nights every quarter of the study period - a total of 30 traps were placed used (60 trap nights per sampling bout). Traps were set at dusk and collected at dawn. Each trap was baited with rolled oats and piece of synthetic bedding material was placed in each trap to ensure animals did not get too cold. Individuals were identified to species, marked with a unique ear tag, and released at the site of capture.

Invertebrate Monitoring

Terrestrial invertebrates on beach habitat were monitored by placing 12 oz plastic containers (pit fall traps) at each tracking station (one at each corner of the plot) during tracking efforts. Traps were buried to the lip of the container and checked each morning and all individuals were collected, identified, and counted.

Avian Monitoring

We conducted ocular surveys of birds on the beach, lagoon, and cliff habitats quarterly throughout the study period. Survey locations were selected along one edge of the beach on the cliff. At Sand Plant Beach the entire beach area, fore portion of the lagoon, and western cliff were surveyed from the eastern edge of the lagoon (FY 2010-2011 – FY 2014-2015). At YLR the entire beach area, fore portion of the lagoon, and western cliff were surveyed from the eastern edge of the lagoon and the top and western face of the rock stack that is located at the beach/ocean edge was surveyed (FY 2010-2011 – present). At Natural Bridges surveys were conducted from the eastern edge of the beach on the cliff adjacent to De Anza Mobile Home Park or from the beach to the west; fore lagoon and approximately the western ¼ of the beach area (including beach/ocean interface) was included in the survey area (FY 2010-2011 – FY 2014-2015). Survey areas were chosen with the goal of surveying approximately the same area and types of habitat. Counts were recorded quarterly throughout the study. Surveys were conducted in the dawn or dusk hours within approximately 2 hours of sunrise or sunset and of one another. Data from the two days during each sampling effort were combined and individuals were identified and counted.

Results

User Data

Younger Lagoon Reserve

There were a wide variety of public and non-profit research and educational groups that used Younger Lagoon (Table 1). The greatest user group for YLR was undergraduate education, a breakdown of all user groups is included in Table 2. The greatest user group was “other” which consists primarily of public tour groups attending daily tours at the Seymour Center. Those users were provided an overlook of the beach, interpretive information via docent led tours, and opportunities to read interpretive material presented on signs about the reserve; however, did not access the beach. During the 18-19 fiscal year a total of 222 participants went on the free Seymour Center docent led Younger Lagoon beach tours, an increase of more than 10% over the previous year. Since the start of the Seymour Center docent led beach access tours, 203 tours have gone out and more than 1,038 visitors have participated. The beach access tours are part of a broad offering of public outreach and education programming on the Coastal Science Campus managed by the Seymour Center, including K-12 school visits to the Seymour Center, the Ocean Explorers Summer Camp, Bay Area Libraries Discover and Go Program, as well as print, web, social media, and radio campaigns.

Despite ongoing staff efforts towards public outreach and education, some unauthorized uses of Younger Lagoon Reserve, including trespass and vandalism occurred in FY 2018-2019. Thus far, no significant damage to ecologically sensitive habitat areas, research sites, research equipment, or facilities has occurred. Reserve staff will continue their public outreach and education efforts, and continue to partner with UCSC campus police to ensure the security of the reserve and protect sensitive resources and ongoing research.

Table 1. Younger Lagoon user affiliations.

University of California Campus	**Non-governmental organizations**
University of California, Berkeley	Bird School Project
University of California, Santa Cruz	California Academy of Sciences
University of California, Los Angeles	California Environmental DNA
	California Naturalist Program
California State Universities	Monterey Bay Aquarium WATCH Program
California Polytechnic State University, San Luis Obispo	Santa Cruz Bird Club
California State University, San Jose	Seymour Marine Discovery Center
	Watsonville Wetlands Watch
California Community College	
Cabrillo Community College	**Governmental Agencies**
	Army Corps of Engineers
Universities outside California	
University of Utah	
	Volunteer Groups
K-12 system	UCSC Wilderness Orientation
Aptos High School	Enviroteers
Half Moon Bay High School	
Pajaro Valley High School	
Watsonville High School	

Table 2. Younger Lagoon Total Use.

RESERVE USE DATA Academic year: 2018-2019

Campus: University of California, Santa Cruz
Reserve: Younger Lagoon Reserve

	UC Home		UC Other		CSU System		CA Comm College		Other CA College		Out of State College		International University		Government		NGO/Non-Profit		Business Entity		K-12 School		Other		Total	
	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs	Users	UDs
UNIVERSITY- LEVEL RESEARCH																										
Faculty	4	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	77
Research Scientist/Post Doc	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Graduate Student	9	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	180
Undergraduate Student	42	534	21	645	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	1179
K-12 Student	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	12	0	0	1	12
Professional	9	104	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	106
Volunteer	0	0	1	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	64
SUBTOTAL	65	896	24	711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	12	0	0	90	1619
UNIVERSITY - LEVEL INSTRUCTION (CLASS)																										
Faculty	12	19	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	21
Graduate Student	11	19	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	22
Undergraduate Student	510	1763	24	24	25	25	18	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	577	1830
K-12 Student	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10
Professional	1	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	50
SUBTOTAL	534	1851	36	36	27	27	19	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	616	1933
OTHER																										
Faculty	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Research Scientist/Post Doc	1	1	1	1	0	0	0	0	0	0	0	0	0	0	40	40	1	1	0	0	0	0	0	0	43	43
Graduate Student	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
Undergraduate Student	56	56	40	40	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	97	98
K-12 Instructor	0	0	70	280	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	55	99	0	0	128	385
K-12 Student	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	705	0	0	100	705
Professional	14	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	65	0	0	1	1	1	1	26	83
Other	2	4	35	35	0	0	0	0	0	0	0	0	0	0	0	0	31	721	0	0	0	0	27934	27934	28002	28694
Docent	128	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	35	163	163
Volunteer	0	0	0	0	0	0	0	0	0	0	18	18	0	0	0	0	1	24	0	0	0	0	100	100	119	142
SUBTOTAL	207	211	146	356	0	0	0	0	0	0	19	20	0	0	40	40	46	817	0	0	156	805	28070	28070	28684	30319
TOTAL	**806**	**2958**	**206**	**1103**	**27**	**27**	**19**	**19**	**0**	**0**	**19**	**20**	**0**	**0**	**40**	**40**	**46**	**817**	**0**	**0**	**157**	**817**	**28070**	**28070**	**29390**	**33871**

*Other includes members of the public who took the SMDC's docent-led tours. All daily tours in FY 2018-2019 visited the Younger Lagoon / Marine Mammal Overlook and received information about the reserve.

Sand Plant Beach (Little Wilder)

Sand Plant Beach is located adjacent to Wilder State Park and is frequented by Wilder State Park visitors along a coastal bluff trail. Because of the size of Wilder Ranch State Park (over 7,000 acres, with over 35 miles of trails) and its multiple points of access, it is unknown exactly how many people visit Sand Plant Beach each year. However, even though it requires a hike it is one of the more popular beaches along this section of Wilder Ranch as there is relatively easy access along the coastal bluff trail. We surveyed Sand Plant Beach from FY10-11 – FY14-15.

Natural Bridges Lagoon

We did not obtain user data for Natural Reserves during the survey period; however, more than 925,000 people are estimated to have visited Natural Bridges State Park in 2005 (Santa Cruz State Parks 2010). The proportion of those visitors that use the beach and lagoon habitat is unknown. It is likely that the number of visitors remains in this range from year to year. We surveyed Natural Bridges Lagoon from FY10-11 – FY14-15.

Human Use During Survey Efforts

Although we are no longer monitoring Natural Bridges and Sand Plant beaches, we continue include results in order to have standalone reports that include all data going forward. Number of users at YLR beach during the survey efforts varied among beach as well as between sampling dates. However, the pattern of total use and the number of people per photo (15 minute interval standardized for area surveyed) was consistent across sampling periods (Table 3). Examples of photos captured during a typical monitoring session in 2010 are included as Figure 4.

Table 3. Number of people observed in photo human use monitoring.

Site	Month	[1]Total # of people	[1]Ave # of People / 15 minute
Natural Bridges	May, 2010	313	3.13
Sand Plant	May, 2010	92	1.21
Younger Lagoon	May, 2010	2	0.28
Natural Bridges	August, 2010	224	2.69
Sand Plant	August, 2010	15	0.17
Younger Lagoon	August, 2010	0	0
Natural Bridges	November, 2010	207	2.07
Sand Plant	November, 2010	7	0.17
Younger Lagoon	November, 2010	1	0.02
Natural Bridges	February, 2011	185	2.64
Sand Plant	February, 2011	10	0.25
Younger Lagoon	February, 2011	2	0.06

Site	Month	[1]Total # of people	[1]Ave # of People / 15 minute
Natural Bridges	May, 2011	236	2.8
Sand Plant	May, 2011	13	0.38
Younger Lagoon	May, 2011	5	0.18
Natural Bridges	July, 2011	795	2.44
Sand Plant	July, 2011	7	0.25
Younger Lagoon	July, 2011	0	0
Natural Bridges	December, 2011	49	0.63
Sand Plant	December, 2011	39	1.16
Younger Lagoon	December, 2011	0	0
Natural Bridges	April, 2012	442	6.93
Sand Plant	April, 2012	120	2.05
Younger Lagoon	April, 2012	0	0
Natural Bridges	May, 2012	624	2.67
Sand Plant	May, 2012	14	0.19
Younger Lagoon	May, 2012	0	0
Natural Bridges	October, 2012	210	4.84
Sand Plant	October, 2012	83	1.06
Younger Lagoon	October, 2012	3	0.04
Natural Bridges	January, 2013	100	4.90
Sand Plant	January, 2013	24	0.81
Younger Lagoon	January, 2013	9	0.11
Natural Bridges	May, 2013	615	19.81
Sand Plant	May, 2013	21	0.52
Younger Lagoon	May, 2013	0	0
Natural Bridges	July, 2013	560	25.42
Sand Plant	July, 2013	29	0.96
Younger Lagoon	July, 2013	5	0.06
Natural Bridges	November, 2013	3.44	13.04
Sand Plant	November, 2013	6	0.19
Younger Lagoon	November, 2013	12	0.15
Natural Bridges	February, 2014	71	6.37
Sand Plant	February, 2014	6	0.20
Younger Lagoon	February, 2014	1	0.01

Site	Month	[1]Total # of people	[1]Ave # of People / 15 minute
Natural Bridges	June, 2014	1723	21.01
Sand Plant	June, 2014	239	2.92
Younger Lagoon	June, 2014	2	0.02
Natural Bridges	August, 2014	852	23.68
Sand Plant	August, 2014	227	2.52
Younger Lagoon	August, 2014	2	0.02
Natural Bridges	November, 2014	2131	21.69
Sand Plant	November, 2014	146	1.78
Younger Lagoon	November, 2014	2	0.02
Natural Bridges	January, 2015	1889	23.04
Sand Plant	January, 2015	225	2.75
Younger Lagoon	January, 2015	11	0.13
Natural Bridges	April, 2015	699	7.13
Sand Plant	April, 2015	-	-
Younger Lagoon	April, 2015	0	0
Younger Lagoon	July, 2015	6	0.02
Younger Lagoon	October, 2015	0	0
Younger Lagoon	February, 2016	0	0
Younger Lagoon	May, 2016	1	0.02
Younger Lagoon	July, 2016	0	0
Younger Lagoon	November, 2016	0	0
Younger Lagoon	February, 2017	0	0
Younger Lagoon	April, 2017	0	0
Younger Lagoon	August, 2017	19	0.16
Younger Lagoon	October, 2017	6	0.05
Younger Lagoon	February, 2018	0	0
Younger Lagoon	May, 2018	27	0.22
Younger Lagoon	July, 2018	11	0.09
Younger Lagoon	November, 2018	14	0.15
Younger Lagoon	February, 2019	62	0.65
Younger Lagoon	May, 2019	0	0

[1]Standardized by area surveyed.

Figure 4. Photos captured by remote camera during the Spring 2010 monitoring effort. Top to bottom: Sand Plant Beach, Natural Bridges, and Younger Lagoon.

Photo Documentation of YLR

Photos were taken one time during each reporting period. Photos for this year's report are included as Appendix 1.

Tidewater Goby Surveys

Although we are no longer monitoring Natural Bridges and Sand Plant beaches, we continue include results in order to have standalone reports that include all data going forward. Evidence of breeding (multiple size classes) continued to be observed at YLR during the reporting period (Table 4).

Table 4. Fish species encountered during sampling efforts.

	Tidewater Goby	Stickleback	Sculpin	Mosquito Fish	Halibut	CRLF [1]	Bluegill
April 9, 2010							
Little Wilder	X	X					
Younger Lagoon	X	X					
Natural Bridges	X	X	X				
August 13, 2010							
Little Wilder	X	X					
Younger Lagoon	X	X					
Natural Bridges	X	X	X	X			
November 18, 2010							
Little Wilder	X	X					
Younger Lagoon	X						
Natural Bridges	X	X	X	X			
February 23, 2011							
Little Wilder	X	X					
Younger Lagoon	X						
Natural Bridges	X	X	X	X			
May 12, 2011							
Little Wilder	X	X					
Younger Lagoon	X	X	X		X		
Natural Bridges	X	X	X				
August 8, 2011							
Little Wilder	X	X					
Younger Lagoon	X	X					
Natural Bridges	X	X					
December 12, 2011							
Little Wilder	X	X					
Younger Lagoon	X						
Natural Bridges	X	X					
March 8, 2012							
Little Wilder	X	X					
Younger Lagoon	X						
Natural Bridges	X	X					
May 15, 2012							
Little Wilder	X	X					
Younger Lagoon	X	X					
Natural Bridges	X	X	X				
August 29, 2012							
Little Wilder	X	X				X	

Younger Lagoon	X	X			X
Natural Bridges	X	X			
October 23, 2012					
Little Wilder	X	X			
Younger Lagoon	X	X			
Natural Bridges	X	X			
February 2, 2013					
Little Wilder	X	X			
Younger Lagoon	X	X			
Natural Bridges	X	X			
May 6, 2013					
Little Wilder	X	X			X
Younger Lagoon	X	X			X
Natural Bridges	X	X			
July 16, 2013					
Little Wilder	X	X			X
Younger Lagoon	X	X			
Natural Bridges	X	X	X		
November 14, 2013					
Little Wilder	X	X			
Younger Lagoon	X	X			
Natural Bridges					
February 21, 2014					
Little Wilder	X	X			
Younger Lagoon	X	X			
Natural Bridges	X				
May 2, 2014					
Little Wilder	X	X			
Younger Lagoon	X	X			
Natural Bridges	X				
August 11, 2014					
Little Wilder	X	X			
Younger Lagoon	X	X			
Natural Bridges	X	X			
November 25, 2014					
Little Wilder	X	X			
Younger Lagoon	X	X			
Natural Bridges	X	X			
January 26, 2015					
Little Wilder	X	X			
Younger Lagoon	X	X			

Natural Bridges	X			
April 13, 2015				
Little Wilder	X	X		
Younger Lagoon	X	X		
Natural Bridges	X	X		X
July 8, 2015				
Younger Lagoon	X	X		
November 4, 2015				
Younger Lagoon	X	X		
February 9, 2016				
Younger Lagoon	X	X		
May 13, 2016				
Younger Lagoon	X	X		
July 20, 2016				
Younger Lagoon	X	X		
November 17, 2016				
Younger Lagoon	X	X		
March 1, 2017				
Younger Lagoon				
May 3, 2017				
Younger Lagoon	X	X		
August 9, 2017				
Younger Lagoon	X	X		
November 9, 2017				
Younger Lagoon	X	X		
February 9, 2018				
Younger Lagoon	X	X		
May 2, 2018				
Younger Lagoon	X	X		
July 16, 2018				
Younger Lagoon	X	X		
November 18, 2018				
Younger Lagoon	X			
February 21, 2019				
Younger Lagoon				

May 14, 2019							
Younger Lagoon	X	X				X	
No. of sites	3	3	2	2	1	2	1

[1]CRLF = California Red-legged Frog (*Rana draytonii*). Tadpoles have been observed at Little Wilder. Tadpoles, juveniles, young of year, and adults have been observed at YLR and Little Wilder.

Species Composition and Coverage of Beach Dune Vegetation

Although we are no longer monitoring Natural Bridges and Sand Plant beaches, we continue include results in order to have standalone reports that include all data going forward. Evidence of reproduction (flowers, seeds, and seedlings) of native and non-native vegetation has been detected at all three sites. Distance from mean high tide to the lowest plant on the beach was consistently greatest at Natural Bridges and lowest at Sand Plant Beach and Younger Lagoon (Table 5). Plant cover was generally higher at Sand Plant and Younger Lagoon (as exhibited by proportion of bare ground) but varied across sampling efforts (Figure 5).

Native plant species richness was consistently greatest at Younger Lagoon; however, it varied across sampling periods (Figure 6). Mean proportion of non-native species was greatest at Natural Bridges (69%) and least at Younger Lagoon (33%) (Table 6).

Table 5. Distance (m) from mean high tide to the lowest plant on the beach.

Site	Spring, 10	Summer, 10	Fall, 10	Winter, 11	Spring, 11	Summer, 11	Fall, 11	Winter, 12	Spring, 12
Younger Lagoon	56	51	20	42	55	49	26	30	28
Sand Plant Beach	33	34	56	56	40	51	29	31	38
Natural Bridges	128	130	141	146	146	138	155	160	123

Site	Summer, 12	Fall, 12	Winter, 13	Spring, 13	Summer, 13	Fall, 13	Winter, 14	Spring, 14
Younger Lagoon	47	20	30	36	37.3	32.1	26.4	36.5
Sand Plant Beach	35	38	31	41	48.1	49.9	45.6	24.2
Natural Bridges	91	75	100	72	88.9	107.3	87.4	83.2

Site	Summer, 14	Fall, 14	Winter, 15	Spring, 15	Summer, 15	Fall, 15	Winter, 16	Spring, 16
Younger Lagoon	21.4	10	26.4	19.5	19.3	20.5	31.4	42.8
Sand Plant Beach	27.5	31	24.5	29.2				
Natural Bridges	74.3	89.4	71	75.8				

Site	Summer, 16	Fall, 16	Winter, 17	Spring, 17	Summer, 17	Fall, 17	Winter, 18	Spring, 18
Younger Lagoon	36.6	46.3	19.5	37.3	22.3	39.3	32	29

Site	Summer, 18	Fall, 18	Winter, 19	Spring, 19
Younger Lagoon	28	22	23	24.7

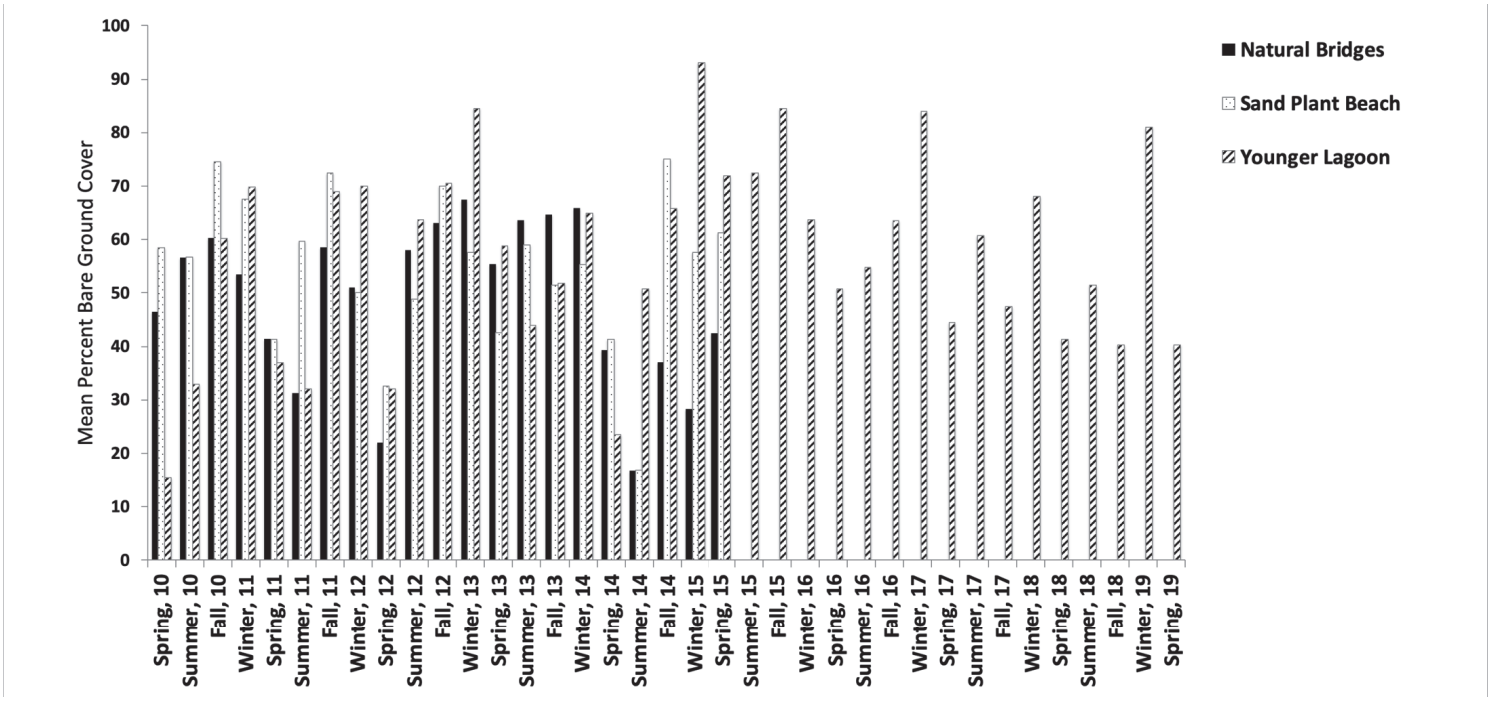

Figure 5. Mean percent bare ground encountered at each site.

Table 6. Number and proportion of native and non-native plant species encountered during surveys. Mean is calculated across all samples.

Site	Spring, 10	Summer, 10	Fall, 10	Winter, 11	Spring, 11	Summer, 11	Fall, 11	Winter, 12	Spring, 12
Natural Bridges									
Native	7 (41%)	8 (44%)	9 (60%)	8 (44%)	9 (43%)	6 (67%)	8 (62%)	9 (47%)	11 (48%)
Non-native	10 (59%)	10 (56%)	5 (40%)	10 (66%)	12 (57%)	9 (33%)	5 (38%)	10 (53%)	12 (52%)
Total	17	18	14	18	21	15	13	19	23
Younger Lagoon									
Native	11 (85%)	11 (85%)	11 (85%)	11 (73%)	12 (80%)	13 (81%)	9 (82%)	6 (50%)	6 (43%)
Non-native	2 (15%)	2 (15%)	2 (15%)	4 (27%)	3 (20%)	3 (19%)	2 (18%)	6 (50%)	8 (57%)
Total	13	13	13	15	15	16	11	12	14
Sand Plant Beach									
Native	7 (88%)	7 (63%)	7 (70%)	8 (80%)	7 (88%)	7 (88%)	9 (82%)	3 (33%)	4 (40%)
Non-native	1 (12%)	2 (37%)	3 (30%)	2 (20%)	1 (12%)	1 (12%)	2 (18%)	6 (67%)	6 (60%)
Total	8	9	10	10	8	8	11	9	10

Site	Summer, 12	Fall, 12	Winter, 13	Spring, 13	Summer, 13	Fall, 13	Winter, 14	Spring, 14
Natural Bridges								
Native	5 (35%)	10 (59%)	7 (88%)	9 (56%)	7 (37%)	6 (35%)	6 (43%)	10 (50%)
Non-native	9 (65%)	7 (41%)	8 (12%)	6 (44%)	12 (63%)	11 (65%)	8 (57%)	10 (50%)
Total	14	17	15	16	19	17	14	20
Younger Lagoon								
Native	12 (67%)	7 (88%)	9 (69%)	12 (75%)	13 (72%)	14 (74%)	10 (83%)	12 (67%)
Non-native	6 (33%)	1 (12%)	4 (31%)	4 (25%)	5 (28%)	5 (26%)	2 (17%)	6 (33%)
Total	18	8	13	16	18	19	12	18
Sand Plant Beach								
Native	2 (40%)	3 (50%)	4 (100%)	4 (67%)	6 (100%)	6 (100%)	5 (100%)	5 (83%)
Non-native	3 (60%)	3 (50%)	0 (0%)	2 (33%)	0 (0%)	0 (0%)	0 (0%)	1 (17%)

Total	5	6	4	6	6	6	5	6

Site	Summer, 14	Fall, 14	Winter, 15	Spring, 15	Summer, 15	Fall, 15	Winter, 16	Spring 16
Natural Bridges								
Native	5 (42%)	5 (45%)	4 (33%)	5 (31%)				
Non-native	7 (58%)	6 (55%)	8 (67%)	11 (69%)				
Total	12	11	12	16				
Younger Lagoon								
Native	9 (69%)	5 (62%	10 (67%)	10 (67%)	11 (73%)	2 (67%)	5 (100%)	10 (83%)
Non-native	4 (31%)	3 (38%)	5 (33%)	5 (33%)	4 (27%)	1 (33%)	0 (0%)	2 (17%)
Total	13	8	15	15	15	3	5	12
Sand Plant Beach								
Native	4 (50%)	4 (40%)	5 (50%)	4 (33%)				
Non-native	4 (50%)	6 (60%)	5 (50%	8 (67%)				
Total	8	10	10	12				

Site	Summer, 16	Fall, 16	Winter, 17	Spring, 17	Summer, 17	Fall, 17	Winter, 18	Spring, 18
Younger Lagoon								
Native	10 (83%)	8 (57%)	3 (60%)	13 (68%)	12 (70%)	13 (76%)	12 (70%)	9 (82%)
Non-native	2 (17%)	6 (43%)	2 (40%)	6 (32%)	5 (30%)	4 (24%)	5 (30%)	2 (18%)
Total	12	14	5	19	17	17	17	11

Site	Summer, 18	Fall, 18	Winter, 19	Spring, 19
Younger Lagoon				
Native	9 (82%)	8 (57%)	8 (57%)	9 (67%)
Non-native	2 (18%)	2 (43%)	2 (43%)	3 (33%)
Total	11	10	10	12

Site	Proportion of native and non-native species across all sample periods
Natural Bridges	

Native	**47%**
Non-native	**53%**
Total	
Younger Lagoon	
Native	**74%**
Non-native	**26%**
Total	
Sand Plant Beach	
Native	**68%**
Non-native	**31%**
Total	

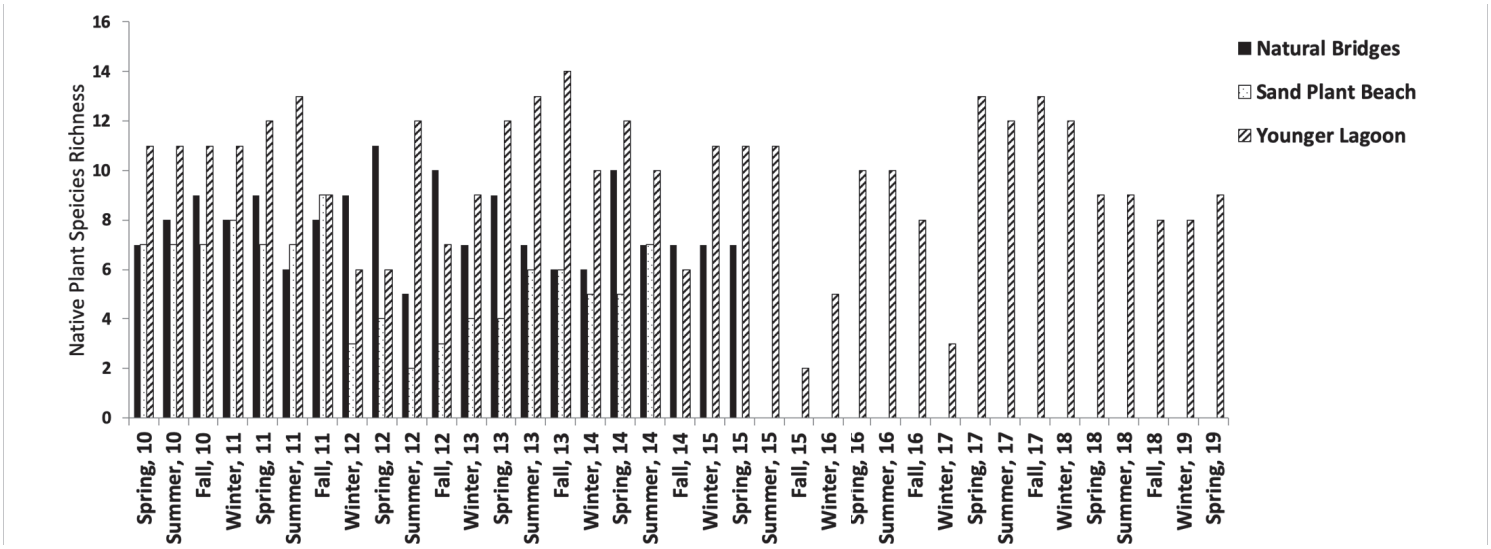

Figure 6. Number of native plant species encountered at each site.

Track Plate Monitoring

Although we are no longer monitoring Natural Bridges and Sand Plant beaches, we continue include results in order to have standalone reports that include all data going forward. Native species richness of mammals detected in raked sand plots was across all three sites (n = 8). Ground squirrel were not detected at Natural Bridges and opossum have not been detected in our track surveys at Sand Plant Beach or Younger Lagoon Reserve (Table 7). It is likely that ground squirrels occur at Natural Bridges and opossum are likely using upland habitat at Sand Plant Beach and Younger Lagoon Reserve; however, they were not detected in our survey efforts. Dogs and bicycles were detected at Natural Bridges and Sand Plant Beach and vehicles were detected at Natural Bridges (Table 7). Frequency of detection and species richness for each species is summarized in Table 8.

Table 7. Summary of track plate sampling effort at each site.

	Rodent[1]	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
May 1-2, 2010													
Little Wilder	X			X	X	X			X	X			X
Younger Lagoon	X	X		X	X								X
Natural Bridges	X	X		X	X				X	X	X	X	X
August 11-12, 2010													
Little Wilder		X		X	X							X	X
Younger Lagoon	X	X	X	X		X							
Natural Bridges	X	X	X									X	X
November 17-18, 2010													
Little Wilder	X		X	X					X				X
Younger Lagoon	X	X											X
Natural Bridges	X	X		X							X	X	X
February 8 -9, 2011													
Little Wilder	X			X	X				X	X			X
Younger Lagoon	X	X			X				X				
Natural Bridges		X		X					X		X		X
May 3 - 4, 2011													
Little Wilder	X		X	X									

	Rodent[1]	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
Younger Lagoon		X	X	X	X				X				
Natural Bridges		X			X				X			X	X
July 22 - 23, 2011													
Little Wilder	X	X			X				X				X
Younger Lagoon	X	X	X	X	X								
Natural Bridges	X	X	X		X							X	X
March 8 - 9, 2012													
Little Wilder	X								X				X
Younger Lagoon				X					X				
Natural Bridges							X				X	X	X
May 15 - 16, 2012													
Little Wilder	X		X	X									X
Younger Lagoon	X	X		X					X				
Natural Bridges	X			X				X				X	X
August 16 - 17, 2012													
Little Wilder	X	X	X	X	X		X		X				X
Younger Lagoon	X	X		X		X	X						
Natural Bridges	X	X	X	X	X		X				X	X	X
October 22 - 23, 2012													
Little Wilder	X						X		X				X
Younger Lagoon		X		X					X				X
Natural Bridges			X		X		X				X		X
January 16 -17, 2013													
Little Wilder	X			X					X				X
Younger Lagoon	X	X		X					X				X
Natural Bridges		X		X	X				X			X	X
May 15 - 16, 2013													
Little Wilder	X			X	X								X
Younger Lagoon	X	X		X					X				X
Natural Bridges	X	X			X							X	X

	Rodent[1]	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
July 18 - 19, 2013													
Little Wilder	X	X		X					X			X	X
Younger Lagoon	X	X		X					X				
Natural Bridges		X		X	X						X	X	X
October 21- 22, 2013													
Little Wilder		X		X									
Younger Lagoon		X		X					X				X
Natural Bridges	X	X			X				X		X	X	X
February10-11, 2014													
Little Wilder	X	X		X									X
Younger Lagoon									X				X
Natural Bridges		X			X						X		X
April 27-28, 2014													
Little Wilder		X		X					X				X
Younger Lagoon		X							X				
Natural Bridges		X		X	X						X	X	X
July 30-31, 2014													
Little Wilder		X		X					X				X
Younger Lagoon		X		X					X				
Natural Bridges		X			X		X		X		X	X	X
November 4-5, 2014													
Little Wilder				X					X			X	X
Younger Lagoon		X		X					X				
Natural Bridges		X					X				X		X
January 26-27, 2015													
Little Wilder	X								X				X
Younger Lagoon	X	X		X			X						X
Natural Bridges	X				X		X		X		X	X	X
April 14-15, 2015													

	Rodent[1]	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
Little Wilder	X	X							X				X
Younger Lagoon	X	X		X					X				
Natural Bridges	X				X		X		X		X	X	X
July 8-9, 2015													
Younger Lagoon	X			X	X								
									X				X
October 29-30, 2015													
Younger Lagoon		X		X									
February 2-3, 2016													
Younger Lagoon		X							X				
May3-4, 2016													
Younger Lagoon		X							X				
July 12-13, 2016													
Younger Lagoon		X		X									
November 9-10, 2016													
Younger Lagoon		X		X					X				
March 1-2, 2017													
Younger Lagoon	X	X		X									
April 25-26, 2017													
Younger Lagoon		X					X		X				X
August 2-3, 2017													
Younger Lagoon					X				X				
October 25-26, 2017													
Younger Lagoon		X					X		X	X			X
February 7-8, 2018													
Younger Lagoon	X			X	X								X

	Rodent[1]	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
May 1-2, 2018													
Younger Lagoon	X								X				
July 12-13, 2018													
Younger Lagoon	X			X					X				X
November 7-8, 2018													
Younger Lagoon	X	X					X		X				X
February 20-21, 2019													
Younger Lagoon	X	X							X				
May 15-16, 2019													
Younger Lagoon	X			X					X				X
	3	3	3	3	3	2	3	1	3	3	1	2	3

[1]Unidentified small rodent.

Table 8. Frequency of occurrence, and native species richness, of animals and human use types through spring 2019 track plate sampling efforts. Actual detections are included parenthetically.

Site	Rodent	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human	[1]Native sp. Richness
Little Wilder	(15) 71%	(10) 48%	(4) 19%	(15) 71%	(6) 29%	(1) 6%	(2) 10%	0%	(15) 71%	(2) 10%	0%	(3) 14%	(19) 91%	8
Younger Lagoon	(21) 60%	(23) 65%	(2) 6%	(25) 71%	(9) 25%	(2) 6%	(5) 14%	0%	(26) 74%	(1) 3%	0%	0%	(15) 43%	8
Natural Bridges	(9) 43%	(15) 71%	(4) 19%	(9) 43%	(13) 62%	0%	(8) 38%	(1) 5%	(9) 43%	(1) 5%	(14) 67%	(16) 76%	(21) 100%	8

[1]Bicycle, vehicle, dog, and human excluded.

Small Mammal Trapping

Although we are no longer monitoring Natural Bridges and Sand Plant beaches, we continue include results in order to have standalone reports that include all data going forward. A total of 281 individual small mammals representing four species have been captured during small mammal trapping efforts (Table 9).

Table 9. Summary of Sherman trapping efforts

Site	Pema[1]	Mica[1]	Reme[1]	Rara[1,2]	**TOTAL**
April 24 -25, 2010					
Little Wilder	8	5			**13**
Younger Lagoon	2				**2**
Natural Bridges			3		**3**
August 11-12, 2010					
Little Wilder	5	4			**9**
Younger Lagoon			1		**1**
Natural Bridges					**0**
November 15-16, 2010					
Little Wilder	5	1			**6**
Younger Lagoon				1	**1**
Natural Bridges		3	1		**4**
February 15-16, 2011					
Little Wilder	5				**5**
Younger Lagoon	6	5	0		**11**
Natural Bridges			2		**2**
April 29-30, 2011					
Little Wilder	4				**4**
Younger Lagoon	1				**1**
Natural Bridges					**0**
August 8-9, 2011					
Little Wilder	6	2			**8**
Younger Lagoon	3		3		**6**
Natural Bridges		1	5		**6**

Site	Pema[1]	Mica[1]	Reme[1]	Rara[1,2]	**TOTAL**
March 30, 2012					
Little Wilder	6				**6**
Younger Lagoon	1		1		**2**
Natural Bridges		5	2		**7**
May 15-16, 2012					
Little Wilder	4	1			**5**
Younger Lagoon	3				**3**
Natural Bridges		5			**5**
August 25-26, 2012					
Little Wilder	4				**4**
Younger Lagoon	3				**3**
Natural Bridges		4	2		**6**
November 5-6, 2013					
Little Wilder	2		1		**3**
Younger Lagoon	3				**3**
Natural Bridges		3	1		**4**
January 13-14, 2013					
Little Wilder	2		4		**6**
Younger Lagoon	2				**2**
Natural Bridges		2	1		**3**
May 1-2, 2013					
Little Wilder	1		1		**2**
Younger Lagoon	3		2		**5**
Natural Bridges		5			**5**
July 16-17, 2013					
Little Wilder	3		1		**4**
Younger Lagoon	1				**1**
Natural Bridges			1		**1**
October 22-23, 2013					
Little Wilder	5	1		1	**7**
Younger Lagoon	1				**1**

Site	Pema[1]	Mica[1]	Reme[1]	Rara[1,2]	**TOTAL**
Natural Bridges		1	2		**3**
February 12-13, 2014					
Little Wilder	2	1	1		**4**
Younger Lagoon	1		1		**2**
Natural Bridges		2			**2**
April 28-29, 2014					
Little Wilder	4	1			**5**
Younger Lagoon	3		1		**4**
Natural Bridges	1				**1**
July 30-31, 2014					
Little Wilder	1	1			**2**
Younger Lagoon	2				**2**
Natural Bridges	1		1		**2**
November 4-5, 2014					
Little Wilder	3	1			**4**
Younger Lagoon	4				**4**
Natural Bridges	2	1	3		**6**
January 26-27, 2015					
Little Wilder	3		1		**4**
Younger Lagoon	4		5		**9**
Natural Bridges			3		**3**
April 14-15, 2015					
Little Wilder	2		3		**5**
Younger Lagoon	3				**3**
Natural Bridges					**0**
July 8-9, 2015					
Younger Lagoon	7		1		**8**

October 29-30, 2015				
Younger Lagoon	2	6		**8**
February 2-3, 2016				
Younger Lagoon		6		**6**
May 3-4, 2016				
Younger Lagoon		3	1	**4**
July 12-13, 2016				
Younger Lagoon		4		**4**
November 9-10, 2016				
Younger Lagoon	2	1		**3**
March 1-2, 2017				
Younger Lagoon	2	1		**3**
April 25-26, 2017				
Younger Lagoon		1		**1**
August 2-3, 2017				
Younger Lagoon				**0**
October 25-26, 2017				

Site	Pema[1]	Mica[1]	Reme[1]	Rara[1,2]	**TOTAL**
Younger Lagoon	1	1	2		**4**
February 8-9, 2018					
Younger Lagoon	2				**2**
May 1-2, 2018					
Younger Lagoon	1		2		**3**
July 12-13, 2018					
Younger Lagoon	6				**6**
November 7-8, 2018					
Younger Lagoon	7		2		**8**
February 20-21, 2019					
Younger Lagoon	5		2	1	**8**
May 14-15, 2019					
Younger Lagoon	4				**4**
TOTAL	**164**	**56**	**84**	**4**	**309**

[1]Pema = *Peromyscus maniculatus*; Mica = *Microtus californicus*; Rema = *Reithrodontomys megalotis*; Rara = *Rattus norvegicus*. [2]Escaped before positive ID; however, suspected to be Norway Rat.

Invertebrate Monitoring

Although we are no longer monitoring Natural Bridges and Sand Plant beaches, we continue include results in order to have standalone reports that include all data going forward. Over all, Younger Lagoon consistently had the greatest number of individuals captured; however, patterns of species richness varied among sampling sessions (Figures 7-8). This may have been at least partially due to trapping methodology and disturbance as raccoons and perhaps coyote disturbed sample cups during some of the sampling efforts. Individuals were identified as distinct taxa; however, at the time of the writing of this report they have not been taxonomically keyed out.

Avian Surveys

Although we are no longer monitoring Natural Bridges and Sand Plant beaches, we continue include results in order to have standalone reports that include all data going forward. Avian species varied among sites and sampling dates (Table 10); however, number of species and abundance were consistently greatest at Natural Bridges and Younger Lagoon.

Figure 7. Species richness of invertebrates across all beaches

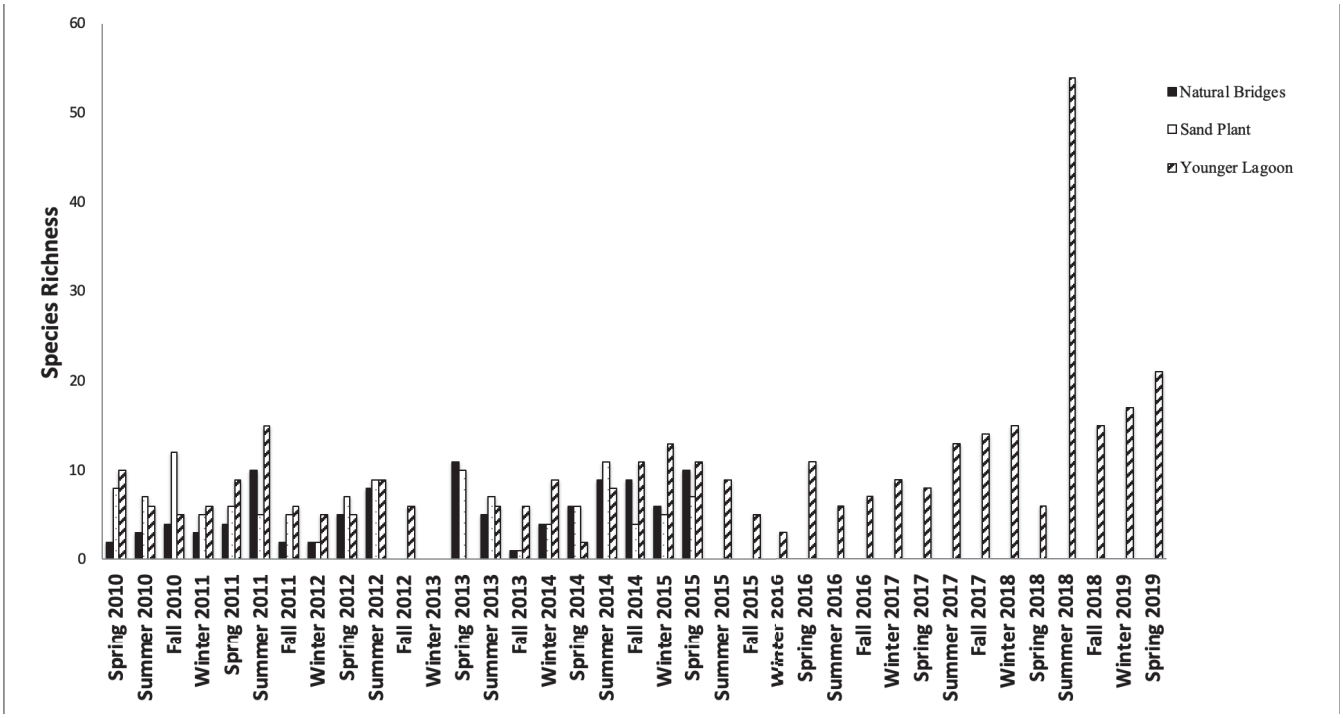

Figure 8. Total abundance of invertebrates at Natural Bridges, Sand Plant Beach, and Younger Lagoon beaches.

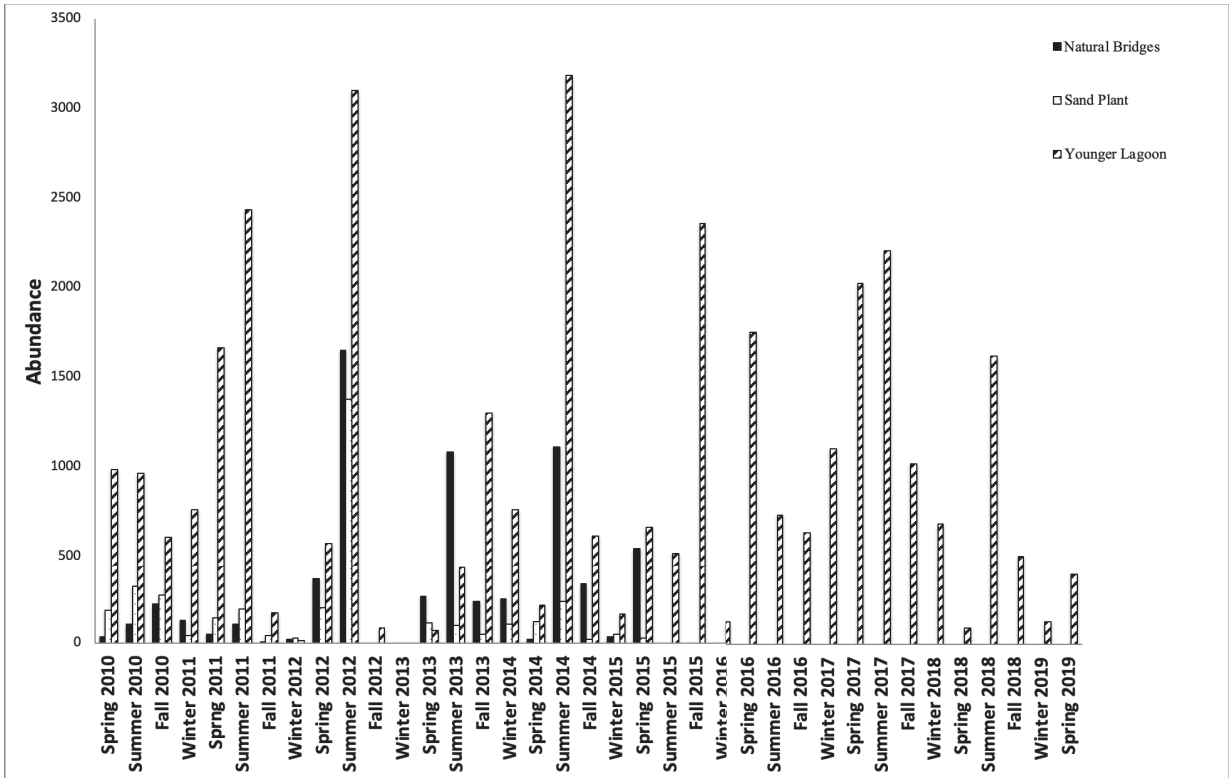

Table 10. Summary of bird surveys at Sand Plant Beach, Younger Lagoon, and Natural Bridges beaches.

Site	AMCO	AMGR	AMPE	BBPL	BEWR	BONH	BASW	BLOY	BLPH	BLTU	BRAC	BRBL	BRPE	BUHE	BUSH	CAGO	CASU	CLRW	COHA	COOT	COYE	DCCO	DUFF	EUST	GLGP	GRHE	GREG	GRTE	HEGU	HOFI
April 24 & 26, 2010																														
Sand Plant																														
Younger Lagoon																														
Natural Bridges												2																		
August 11-12, 2010																														
Sand Plant																													1	
Younger Lagoon								1														1		1					3	
Natural Bridges		2										10					1													
November 15 & 16, 2010																														
Sand Plant																														
Younger Lagoon										1			27							2			5	1		1				
Natural Bridges												1														1	2		24	
February 13 & 14, 2011																														
Sand Plant																														
Younger Lagoon																						1								
Natural Bridges		3										2		1			88													
May 2 & 4, 2011																														
Sand Plant		2											8																	
Younger Lagoon																														
Natural Bridges		1							1								3					6					1			
July 22 & 23, 2011																														
Sand Plant								4		1									4										9	
Younger Lagoon																														
Natural Bridges		9						4					8									10							40	
March 29 & 30, 2012																														
Sand Plant																	1													
Younger Lagoon																				1				2						
Natural Bridges										1																		2		
May 15 & 16, 2012																														
Sand Plant																														
Younger Lagoon								1					2											2						
Natural Bridges		1											1																	
August 25 & 26, 2012																														
Sand Plant																	2		2											
Younger Lagoon			1					1		1							4													
Natural Bridges																	1													
November 58, 5, 2012																														
Sand Plant																				6										
Younger Lagoon													4							10										
Natural Bridges		6																												
January 3 & 4, 2013																														
Sand Plant																														
Younger Lagoon								1						1						6										
Natural Bridges																			1							1				
May 2 & 3, 2013																														
Sand Plant																														
Younger Lagoon												1				2								2						
Natural Bridges		2																									2			
July 15-17, 2013																														
Sand Plant						1											1		1											
Younger Lagoon						1			2				7				2									1				
Natural Bridges									2				1				1									1			11	
October 22-23, 2013																														
Sand Plant																	1		3											
Younger Lagoon				5					5								2					1		1					326	
Natural Bridges		2		9										1			2												3	
February 13-24, 2014																														
Sand Plant																	5													
Younger Lagoon																											1			
Natural Bridges		1																									1			
April 27-30, 2014																														
Sand Plant		3											23																	
Younger Lagoon								6					17				2													
Natural Bridges		2						2					13				7	6				8					1			
July 30-31, 2014																														
Sand Plant																	10										1		10	
Younger Lagoon													18														4			
Natural Bridges													19																19	
November 4-5, 2014																														
Sand Plant																				2									6	
Younger Lagoon									6				5							6										
Natural Bridges		11										2								10							1		8	
January 26-27, 2015																														
Sand Plant									2								3													
Younger Lagoon													8							8										
Natural Bridges		12							1				27						2								1			
April 14-15, 2015																														
Sand Plant									1								2			1										
Younger Lagoon									2											3										
Natural Bridges													6							7										

Site	AMIO	AMOR	AMPE	BRFL	BRWR	BOVH	BATW	BUSY	BLPH	BLTU	BRAC	BRBL	BRPE	BUHE	BUSH	CAGO	CAGU	CEEW	CORA	COOT	COYE	DOCO	DUBP	EUST	GOLP	GRHE	GREG	GRTE	HEGU	HOPI
July 8-9, 2015																														
Younger Lagoon						1	4																							
October 19-24, 2015																														
Younger Lagoon									1				4				2													
February 1-7, 2016																														
Younger Lagoon									1																2					
May 3-4, 2016																														
Younger Lagoon							4		2								2												1	
July 11, 2016																														
Younger Lagoon							2		1			10					2											1		
November 9-10, 2016																														
Younger Lagoon									2			1																1		
March 1-2, 2017																														
Younger Lagoon									1								2											1		
April 25-26, 2017																														
Younger Lagoon		1																6							2					
August 2-3, 2017																														
Younger Lagoon							6	3	2			6																1		3
October 19-24, 2017																														
Younger Lagoon									1			6		2																
February 7-8, 2018																														
Younger Lagoon									1			2		1												1				2
May 2-3, 2018																														
Younger Lagoon							5	2	2			5	1																	
August 13-14, 2018																														
Younger Lagoon							6					2					1											3		
November 7-9, 2018																														
Younger Lagoon					1				11		23		40		1											1				
February 18-21, 2019																														
Younger Lagoon	4								2						12	4						1								1
May 14-15, 2019																														
Younger Lagoon							4					2					2	52							1					

Site	BELL	LEGA	LOCU	MALL	MANO	MEGU	MIDO	NOMA	PEDO	PEPA	PIGN	PIDU	RHIA	RIPH	RWBB	ROJO	SAND	SAPH	SNEG	SLOP	SPEA	SURF	VDEW	WEGU	WEEA	WHMY	YEWA	Richeas
April 24 & 26, 2010																												
Sand Plant				2																				2				1
Younger Lagoon				2															2					2				2
Natural Bridges	3														2				2									2
August 13-12, 2010																												
Sand Plant																												1
Younger Lagoon	3		3	10															4					33				9
Natural Bridges	3																							2				5
November 10 & 14, 2010																												
Sand Plant																								1				2
Younger Lagoon						1			20								11			1				41				5
Natural Bridges	4				2												140		1	1				19		1		11
February 15 & 19, 2011																												
Sand Plant				2																				6				2
Younger Lagoon																		3						1				2
Natural Bridges			3	4					42										16					6		16		10
May 3 & 4, 2011																												
Sand Plant				4				2				10												6		1		2
Younger Lagoon																												4
Natural Bridges	9		4	4	1											1								10		7		13
July 22 & 23, 2011																												
Sand Plant												17							1					1				7
Younger Lagoon																												1
Natural Bridges				7								3				1			2					11		1		11
March 29 & 31, 2012																												
Sand Plant				5																								2
Younger Lagoon	3			10						10									2					30		2		5
Natural Bridges				10	3							2					65		2					10		5		8
May 15 & 16, 2012																												
Sand Plant																								4		5		2
Younger Lagoon	3			2						20		5				1			2					30				10
Natural Bridges				6															2									4
August 25 & 26, 2012																												
Sand Plant	2																											2
Younger Lagoon				4						20					6		1		1					2				10
Natural Bridges	5			1																1				5	1			6
November 58, 9, 2012																												
Sand Plant																								1				2
Younger Lagoon	5								24				3				4		2					3		10		9
Natural Bridges	6			9															2		1	2				12		9
January 12&14, 2013																												
Sand Plant																												3
Younger Lagoon									21		1						38	2	1									3
Natural Bridges												1							1					11				4
May 1 & 2, 2013																												
Sand Plant												6												2				2
Younger Lagoon				2			2		9															11		2		3
Natural Bridges				4																				23		2		5
July 16-17, 2013																												
Sand Plant												2																4
Younger Lagoon	2			20					8			1							4									10
Natural Bridges	3																							10				7
October 20-21, 2013																												
Sand Plant																												2
Younger Lagoon	4				1				33										3					150		20		13
Natural Bridges				2															4					130		24		3
February 13-14, 2014																												
Sand Plant				2													1							183				4
Younger Lagoon				1					8										4					7		10		3
Natural Bridges				2															1					10		24		1
April 27-29, 2014																												
Sand Plant				5								4												24		2		5
Younger Lagoon	3			8								8				1								2		2		4
Natural Bridges	3			4																				10		7		11
July 30-31, 2014																												
Sand Plant	4											3												25		2		8
Younger Lagoon	2			2								3							3					20		1		3
Natural Bridges	5																9							80		7		6
November 4-5, 2014																												
Sand Plant																2								3				4
Younger Lagoon																	11		1					30		8		7
Natural Bridges	4																20		4	1				38				10
January 26-27, 2015																												
Sand Plant				2																				25				4
Younger Lagoon				4												13								17		1		7
Natural Bridges				2												9			2					175		3		10
April 14-15, 2015																												
Sand Plant				2								3												5				6
Younger Lagoon	3															1			2					5				5
Natural Bridges																4			3					15		9		9

Fire	FELL	LESA	LOCU	MALL	MANO	MEGU	MODO	NOHA	PEDO	PEPA	PIGA	PIDU	RIHA	RIPH	RWBB	SADO	SAND	SAPH	SNEG	SLOP	SPGA	SURF	VOLW	WEGU	WEEA	WHIM	YEWA	Richeas
July 8-9, 2015																												
Younger Lagoon	3			2								4							2					31				7
October 19-24, 2016																												
Younger Lagoon																								6				6
February 1-7, 2016																												
Younger Lagoon				3								2							3					9		4		7
May 3-4, 2014																												
Younger Lagoon	3			3											1						11			10				10
July 11, 2014																												
Younger Lagoon				2															1					9				7
November 9-10, 2016																												
Younger Lagoon	6														5									6				6
March 1-2, 2017																												
Younger Lagoon										1					6				1					9		1		10
April 25-26, 2017																												
Younger Lagoon				4											3									2		4		6
August 2-3, 2017																												
Younger Lagoon	3																											3
October 19-24, 2017																												
Younger Lagoon	6																		1		1			10				7
February 7-8, 2018																												
Younger Lagoon	6														7									9				8
May 2-3, 2018																												
Younger Lagoon	4														3											2		3
August 13-14, 2018																												
Younger Lagoon		3		1						6									4					6				6
November 7-9, 2018																												
Younger Lagoon	6										1								3	1				16				11
February 18-21, 2019																												
Younger Lagoon				4				3											3	2	1			9			3	13
May 14-15, 2019																												
Younger Lagoon	3			15				3		3							1				3			9				13

Site	AMCR	AMPE	BBPL	BCNH	BASW	BLOY	BLPH	BLTU	BRAC	BRBL	BRPE	BUHE	CAGO	CAGU	CLSW	CORA	COOT	DOCO	DUSP	EUST	GCSP	GRHE	GREG	GRTE	HEGU	HOFI
Sand Plant														10									1		10	
Younger Lagoon											18												4			
Natural Bridges											18														15	
November 4-5, 2014																										
Sand Plant																	2								6	
Younger Lagoon							2				5						6									
Natural Bridges	11									2							10						1		9	
January 26-27, 2015																										
Sand Plant							2						2													
Younger Lagoon											6						9									
Natural Bridges	12						1				27					3							1			
April 14-15, 2015																										
Sand Plant							1						2				1									
Younger Lagoon							2										1									
Natural Bridges											6						7									
July 8-9, 2015																										
Younger Lagoon				2	4																					
October 29-30, 2015																										
Younger Lagoon							1				4			2												
February 2-3, 2016																										
Younger Lagoon							1													2						
May 3-4, 2016																										
Younger Lagoon					4		2						2												1	
July 12, 2016																										
Younger Lagoon					3		1			12				2									1			
November 9-10, 2016																										
Younger Lagoon							2				1												1			
March 1-2, 2017																										
Younger Lagoon							1							3									1			
April 25-26, 2017																										
Younger Lagoon	1														6					2						
August 2-3, 2017																										
Younger Lagoon					8	2	2		8														1		2	6
October 25-26, 2017																										
Younger Lagoon							1		6		2															
February 7-8, 2018																										
Younger Lagoon							1		2		2										1				3	
May 2-3, 2018																										
Younger Lagoon					5	2	2		5	1																

Site	KILL	LOCU	MALL	MAGO	MEGU	MODO	NOHA	PECO	PIGR	PIGU	REHA	REPH	RWBB	RODO	SAND	SAPH	SNEG	SPSA	SURF	WEGU	WESA	WHIM	Richness
April 24 & 26, 2010																							
Sand Plant			2																	2			1
Younger Lagoon			3														2			2			3
Natural Bridges	1											2					2						2
August 11-12, 2010																							
Sand Plant																							1
Younger Lagoon	2	1	10														4			32			9
Natural Bridges	1																			3			5
November 15 & 16, 2010																							
Sand Plant																				1			2
Younger Lagoon								15							11			1		4			8
Natural Bridges	4				2										140		1	1		17		1	11
February 15 & 16, 2011																							
Sand Plant			2																	6			2
Younger Lagoon																1							2
Natural Bridges		3	4					47									18			6		19	10
May 3 & 4, 2011																							
Sand Plant			4				2			35										5		1	7
Younger Lagoon																							0
Natural Bridges	7	4	4	1										1						16		7	12
July 22 & 23, 2011																							
Sand Plant										17							1			1			2
Younger Lagoon																							0
Natural Bridges			7							3				2			2			83		1	11
March 29 & 30, 2012																							
Sand Plant			1																				2
Younger Lagoon	1		8					13									2			16		2	9
Natural Bridges			10	3						2					65		2			10		5	9
May 15 & 16, 2012																							
Sand Plant																				4		5	2
Younger Lagoon	3		2					25		5				1			2			15			10
Natural Bridges			6														2						4
August 25 & 26, 2012																							
Sand Plant	3																						3
Younger Lagoon			4					35				8		1			1			7			10
Natural Bridges	5		1															1		5	1		6
November 5& 6, 2012																							
Sand Plant																				1			2
Younger Lagoon	5							14			1			4			2			3		10	9
Natural Bridges	4		9														2	1	2			12	7
January 13&14, 2013																							
Sand Plant																							0
Younger Lagoon								3	1						38	1	1						8
Natural Bridges																	1			11			4
May 1 & 2, 2013																							
Sand Plant										8										2			2
Younger Lagoon			3			2		9												11		2	8
Natural Bridges			4																	23		2	5
July 16-17, 2013																							
Sand Plant										7													4
Younger Lagoon	2		25					8		1							4						10
Natural Bridges	1																			10			7
October 22-23, 2013																							
Sand Plant																							2
Younger Lagoon	4			1				33									3			150		26	13
Natural Bridges			2														4			110		24	8
February 13-14, 2014																							
Sand Plant			2											1						103			4
Younger Lagoon								8									4			7		10	5
Natural Bridges			2														1			19		24	5
April 27-28, 2014																							
Sand Plant			6							4										24		2	6
Younger Lagoon	3		6							8			1							2		2	5
Natural Bridges	1		4																	18		7	11
July 30-31, 2014																							

Site	KILL	LOCU	MALL	MAGO	MEGU	MODO	NOHA	PECO	PIGR	PIGU	REHA	REPH	RWBB	RODO	SAND	SAPH	SNEG	SPSA	SURF	WEGU	WESA	WHIM	Richness
Sand Plant	4									3										25		2	8
Younger Lagoon	2		2							3							3			28		1	8
Natural Bridges	3														7					80		7	6
November 4-5, 2014																							
Sand Plant													2							3			4
Younger Lagoon															11		1			10		8	7
Natural Bridges	4														20		4	1		18			10
January 26-27, 2015																							
Sand Plant			2																	25			4
Younger Lagoon			4										10							27		1	7
Natural Bridges			2										9				3			175		3	10
April 14-15, 2015																							
Sand Plant			2								3									5			6
Younger Lagoon	1												5				2			5			6
Natural Bridges													4				3			21		9	7
July 8-9, 2015																							
Younger Lagoon	2		2							4							2			31			7
October 29-30, 2015																							
Younger Lagoon																				6			4
February 2-3, 2016																							
Younger Lagoon			3							2							3			9		4	7
May 3-4, 2016																							
Younger Lagoon	1		3										1					1		8			10
July 12, 2016																							
Younger Lagoon			3														1			2			7
November 9-10, 2016																							
Younger Lagoon	6												5							6			8
March 1-2, 2017																							
Younger Lagoon								1					6				1			2		1	10
April 25-26, 2017																							
Younger Lagoon			4										2							2		4	8
August 2-3, 2017																							
Younger Lagoon	1																						8
October 25-26, 2017																							
Younger Lagoon	6																1	1		10			7
February 7-8, 2018																							
Younger Lagoon	6												7							3			8
May 2-3, 2018																							
Younger Lagoon	4												9									2	8

Discussion

Data collected indicate that Younger Lagoon Reserve (YLR) supports a wide variety of native flora and fauna, provides habitat for sensitive and threatened species, supports a very unique beach dune community, and is extensively used for research and education.

A parameter that we have mapped, and is evident from visual observation and photo documentation, is the presence of dune hummocks and downed woody material at YLR, both of which are almost entirely absent at Sand Plant Beach and Natural Bridges (Figure 9). It is likely that the hummocks and woody material are absent at Natural Bridges and Little Wilder due to human trampling, collection, and burning. These features provide habitat for plant species such as the succulent plant dudleya, which grow on downed woody material and dune hummocks at YLR, as well as burrowing owls that use burrows in hummocks and seek shelter beneath downed woody material at YLR.

Although Younger Lagoon does experience human use, the intensity and number of users is small. Additionally, users of the YLR beach are educated about the reserve, unique natural features, and are not allowed to collect woody material or trample dune vegetation. The relatively natural state of YLR beach and dune vegetation is unique among the three sites and most pocket beaches in Santa Cruz County and likely represents a glimpse into what many of the pocket beaches in the greater Monterey Bay area looked like prior to significant human disturbance.

Open access to the beach would likely result in the loss of the unique ecological characteristics of the site and certainly reduce its effectiveness as a research area for scientific study. Controlled beach access through the free Seymour Center docent led tours, provides an appropriate level of supervised access that enables people to see and learn about the lagoon habitat while limiting impacts to the system. We recommend that this continue.

Figure 9. Younger Lagoon dune map. Survey data and resulting elevation model output shows topographic features on Younger Lagoon Beach.

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Appendix 1. Younger Lagoon Photos.

YLR Beach Photopoint #1. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #1. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #1. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #2. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #2. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #2. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #2. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #3. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

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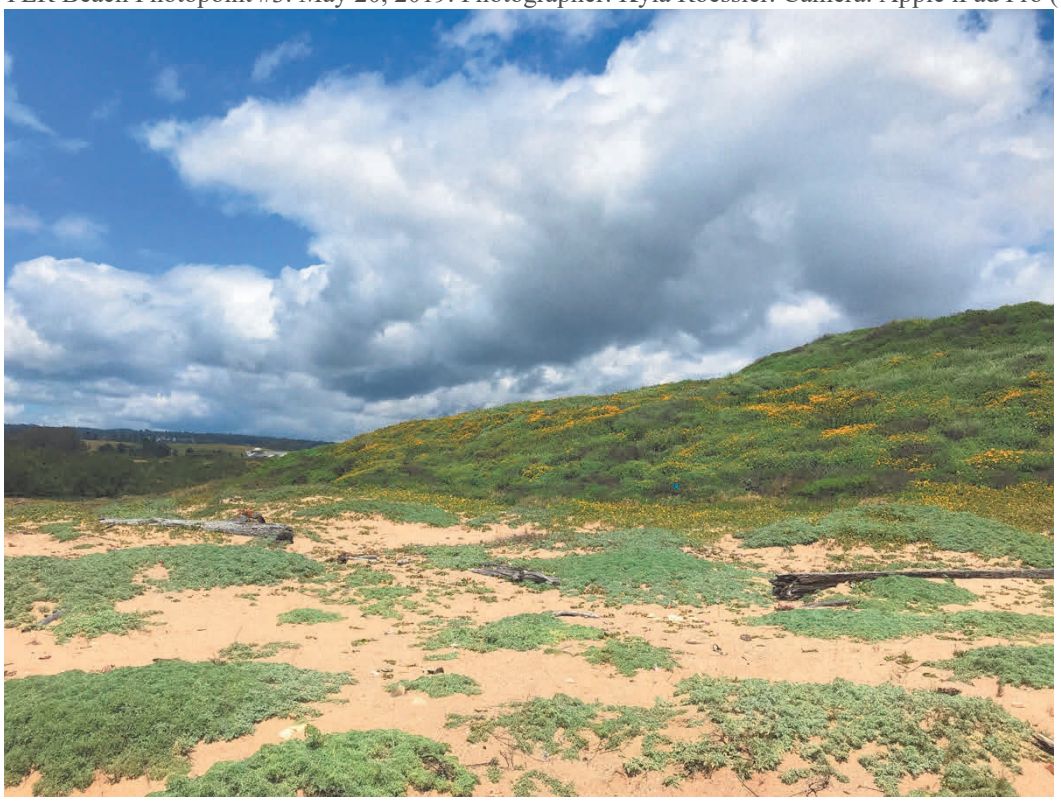
YLR Beach Photopoint #3. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)



YLR Beach Photopoint #3. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #3. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

YLR Beach Photopoint #4. May 20, 2019. Photographer: Kyla Roessler. Camera: Apple iPad Pro (10.5)

Fig 3.11 Biotic Resources

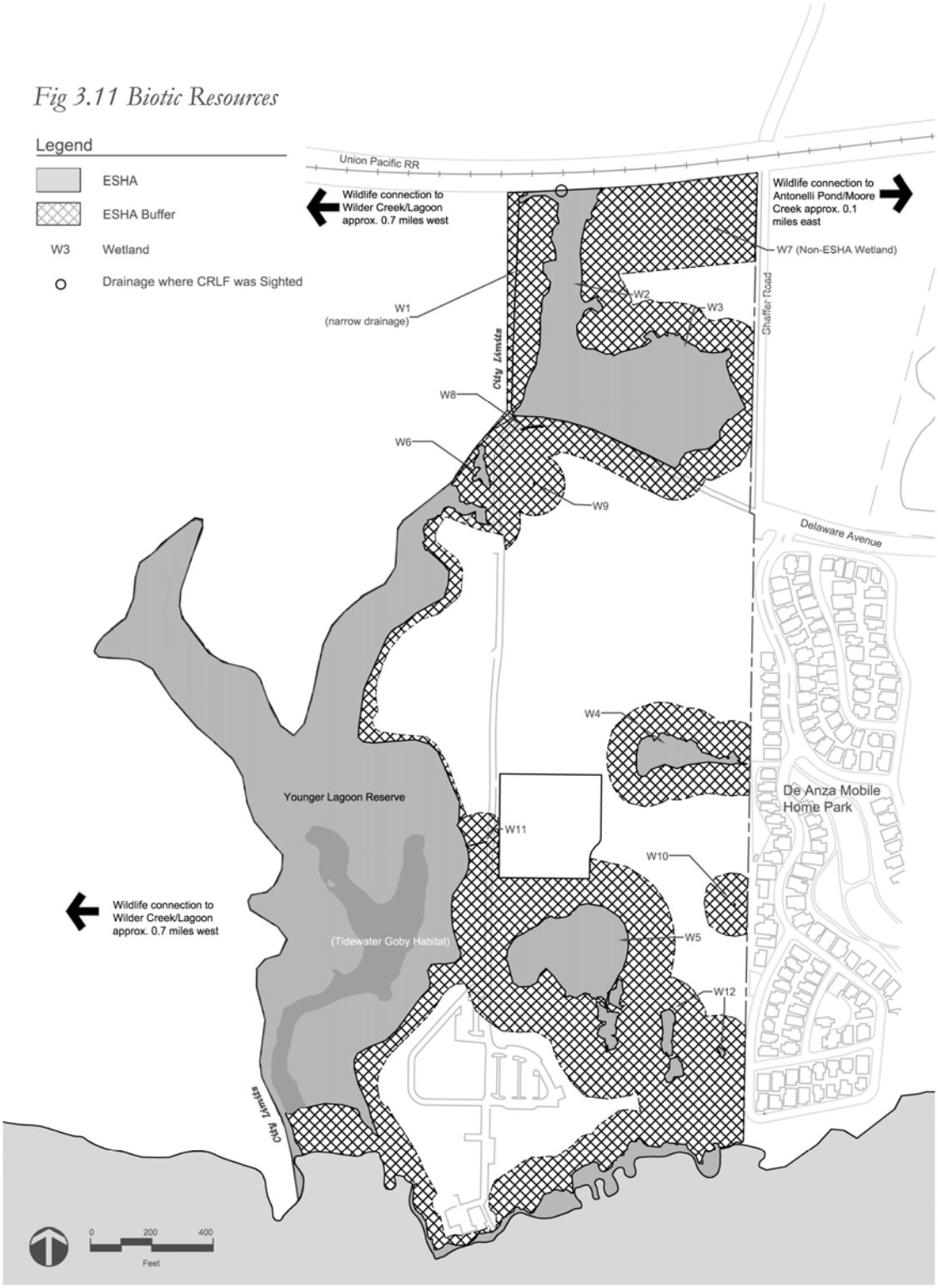


Fig. 5.6 Coastal Access and Recreation Diagram