## CALIFORNIA COASTAL COMMISSION

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## SCZ-NOID-0004-17

## (YOUNGER LAGOON RESERVE PUBLIC ACCESS PLAN)

## JULY 12, 2017

## **EXHIBITS**

#### **Table of Contents**

Exhibit 1: Location Map Exhibit 2: Notice of Impending Development # 9 Exhibit 3: Figures 3.11 & 5.6 of Coastal Long Range Development Plan



UC Santa Cruz, Marine Science Campus Coastal Biology Building and Infrastructure Improvements Addendum #1 to the MSC Projects EIR May 2016 Figure

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: http://lrdp.ucsc.edu/

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 9 17-1 Public Access to and Within Younger Lagoon Natural Reserve

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

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

University see CLRDP 8.1.4	Approval		Date	N/A
NOID Pos see CLRDP 8.2.4	ting		Date	6/12/17
Environm see CLRDP 8.1.4	ental Comp	liance (CEQA/NEPA)	Date	N/A
_	CEQA	CEQA document		
	NEPA	NEPA document		
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## Notice of Impending Development 9 17-1

Public Access to and within Younger Lagoon Natural Reserve

## Supporting Information see CLRDP 8.2.5

#### **Table of Contents**

#### Section 1. **Project Report**

see CLRDP 8.1.4 (2)

- 1a **Project Description**
- 1b **CLRDP** Consistency Determination
- **Environmental Compliance Documentation** 1c
- 1d **Technical Reports**
- Consultation Documentation with other Agencies 1e
- 1f Implementing Mechanisms
- **Correspondence Received** 1g
- 1h **Project Manager**

#### Section 2. **University Approval Documentation** see CLRDP 8.1.4 (5)

#### Section 3. **Environmental Compliance Documentation** see CLRDP 8.1.4 (5) (this section used if environmental documentation is extensive)

Section 4. Plans, Specifications, etc. (this section used if project documentation is large format or extensive)

#### Section 5. **Technical Reports** see CLRDP 8.1.4 (2d) (this section used if Technical Reports are extensive)

Exhibit 2 SCZ-NOID-0004-17 2 of 93

## 1. Project Report

#### 1a. NOID 9 17-1 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 NOID to the Coastal Commission to implement a beach access plan for the next five years.

In March 2010, the California Coastal Commission (CCC) approved the University of California's first NOID for Implementation Measure 3.6.3 of (NOID 10-1). 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 Annual Report. The 2017 monitoring report is attached to this NOID (Section 5)

The current NOID (9 17-1) describes the University's plan for continuing the public access program which was initiated in 2010, and the associated monitoring program.

#### Background

Fifty 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 39 reserves that encompass approximately 750,000 acres of protected natural land available for university-level instruction, research, and outreach. 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 living 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 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.

#### 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

Exhibit 2 SCZ-NOID-0004-17 3 of 93 (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 when the property was owned by the Younger family.

Once construction of Long Marine Lab 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 actively to patrol the beach for trespass and to educate the public about the closure. 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 flora fauna as well as beach/dune habitat.

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 and impact ongoing and future research efforts. After CLRDP certification (2009), a Beach Access Management Plan was implemented as outlined in NOID 10-1. Under the Beach Access Management Plan, the YLR beach remained 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 docent-guided tours. Although infrequent, unauthorized uses including trespass and vandalism of the YLR 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 YLR beach as an important outdoor classroom and living laboratory.

#### **Implementation of NOID-10-1**

#### Docent Led Tours

Over the past five years, docent led beach tours through the Seymour Marine Discovery Center (SMDC) have been offered twice monthly. In addition, all of the docent led daily tours run by the SMDC include an informational stop about YLR. Beach tours began in the spring of 2010, and are offered two times per month, including one tour on a weekday and one on a weekend.

The extent of the beach access area varies depending 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 1 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 up on the beach. Tours are led by SMDC 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 SMDC docents during the regular winter docent-training program in 2010, focuses on the unique ecology of the YLR beach.

YLR Beach tours are advertised via the SMDC website: http://seymourcenter.ucsc.edu/visit/behindthe-scenes-tours/ and filled via phone reservation: (831) 459-3800. The SMDC allocates tour spaces and keeps track of all user data. Tours are limited to 12 persons and 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 UCNRS Reserve Use guidelines. Because 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.

The YLR beach access tours are part of broader public education and outreach programming on the Coastal Science Campus offered through the SMDC. Thousands of people visit the SMDC annually, including 8,550 K-12 students last year. The SMDC actively promotes its activities with press releases, social media, and calendar listings throughout the region.

#### 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 five years. The Younger Lagoon Natural Reserve Beach Monitoring Report 2016 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 very 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 10-1 and undertaken over the last five years

> Exhibit 2 SCZ-NOID-0004-17 5 of 93

provided the most extensive survey effort for flora and fauna on the Reserve, resulting 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**

#### Docent-Led Tours

The University is proposing to continue the docent-led beach tour program initiated in spring 2010 for an additional five years. No changes to the tour access area are proposed (see Figure 1). Tours will continue to be offered two times per month, including one tour on a weekday and one on a weekend. The tours will continue to be led by SDMC docents, and will include 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 up on the beach. YLR Beach tours will continue to be advertised on the SMDC website:

http://seymourcenter.ucsc.edu/visit/behind-the-scenes-tours/ and filled via phone reservation: (831) 459-3800. 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.

#### Monitoring Program

We will continue to monitor YLR Beach as required by, and described in, IM 3.6.3; however, we 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.

#### **Biological Monitoring**

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 SMDC, as well as research and education use of YLR, will be recorded and maintained by SMDC 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 **Exhibit 2** 

SCZ-NOID-0004-17 6 of 93 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 2). 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 (Figure 2)

*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 2 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  $4 \times 50$  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 also 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 did 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.

#### Reporting

IM 3.6.3 requires that at five-year intervals post-certification, the University shall submit a Notice of Impending Development (NOID) to the Coastal Commission that both reports on the previous five years of beach access management, and includes all necessary supporting information for a development project to implement a beach access management plan for the next five years. A summary report was submitted in February 2016. We will continue to submit a NOID to the Coastal Commission each 5th year that both reports on the previous five years of beach access management, and includes all necessary supporting information for a development project to implement a beach access management plan for the next five years.



**Figure 1.** 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.

Exhibit 2 SCZ-NOID-0004-17 9 of 93



**Figure 2.** 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.

Exhibit 2 SCZ-NOID-0004-17 10 of 93

#### 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

#### 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

Exhibit 2 SCZ-NOID-0004-17 11 of 93

#### **Birds of Younger Lagoon**

Tundra Swan 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 Northern 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

#### **QUAILS and PHEASANTS**

Exhibit 2 SCZ-NOID-0004-17 12 of 93

#### **Birds of Younger Lagoon**

Ring-necked Phaesant 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 **STARLINGS** 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

#### JUNCOS and LONGSPURS

Dark-eyed Junco Lapland Longspur

# BLACKBIRDS, MEADOWLARKS, and ORIOLES

Bobolink Red-winged Blackbird

> Exhibit 2 SCZ-NOID-0004-17 13 of 93

#### **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 Tricolored Blackbird 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

Exhibit 2 SCZ-NOID-0004-17 14 of 93

#### 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* 

> Exhibit 2 SCZ-NOID-0004-17 15 of 93

FAMILY	Scientific name	Common name
FERNS AND FERN-A	ALLIES	
	E E	
DENINSTAEDITACEA	Dryonteris argute	Coastal wood fern
	Polypodium californicum	California polypody
	Polystichum munitum	Sword Fern
	Pteridium aquilinum var. pubescens	Bracken fern
CONIFERS (GYMNOSPERMS)		
PINACEAE	*Dinus nadiato	Montorou nino
CUPRESSACEAE		
	*Hesperocyparis macrocarpa	Monterey cypress
FLOWERING PLAN	TS (ANGIOSPERMAE - DICOTYLEDO	NEAE)
ADOXACEAE		
	Sambucus nigra	Black elderberry
	Sambucus racemosa var. racemosa	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

### **Appendix III: Younger Lagoon Plants**

Exhibit 2 SCZ-NOID-0004-17 16 of 93

	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 curassavieum	Sassida baliatropa
		Seaside nenotrope
BRASSICACEAE	I	
DIADDICACEAE		
	Barbarea orthoceras	Winter cress
	*Brassica nigra	Black mustard
	*Brassica rapa	Field mustard
	*Cakile maritime	Beach rocket
	*Raphanus sativus	Wild radish
	*Sinapis arvensis	Charlock mustard
CAPRIFOLIACEA	E	
	Symphoricarpos albus	Common snowberry
CARYOPHYLLAC	EAE	
	Spergularia macrotheca	Sand spurry
	*Silene gallica	Common catchfly
CHENOPODIACEA		Calthurt
<u> </u>	Atripiex pătulă	Saltousn
	*Atriplex prostrata	Fat-hen
<u> </u>		
	*Chenopodium album	Lamb's quarters
	<u>^</u>	*
	*Chenopodium macrospermum	Largeseed goosefoot
	Salicornia pacifica	Pickleweed
CONVOLVULACE	SAE	
	Calvetagia occidentalis	Western morning glory
	Calvstegia purpurata	Morning glory
	Calystegia soldanella	Beach morning glory

CRASSULACEAE	1	
	Dudleya farinaosa	Sea lettuce
	Duuleyu furmuosu	
CUCUPPITACEAE		
CUCURDITACEAE	Marah fahacaus	Wild augumber
	Maran Jabaceus	whice cucumber
DIPSACACEAE	*D: 0.11	
	*Dipsacus fullonum	Fuller's teasel
FABACEAE		
	A	Deserved
	Acmispon glaber	Deer weed
	*Conista monspassulana	French broom
	Genisia monspessuiana	
	Luninus albifuons	Silver leef luping
		Vallass back loging
		Yenow bush lupine
	Lupinus bicolor	
	Lupinu nanus	Sky lupine
	*Madiagaa nahuu amba	Dum alayan
	*Medicago polymorpha	N II
	*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
	*C	
	*Geranium dissectum	Cutieat geranium
CDOGGUE ADVACE (		
GRUSSULARIACEAE		
	Ribes divaricatum	Spreading gooseberry
	Ribes sanguineum	Flowering currant
IRIDACEAE		
	Siswinchium bellum	Blue aved 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 perfoliata	Miners lettuce
MUDICACEAE		
MIKICACEAE	Moralla californica	California way myrtle
MYRINACEAE	*Anagallis arvensis	Scarlet pimpernel
NYCTAGINACEAE		
	Abronia latifolia	Yellow sand verbena
	Abronia umbellata ssp. umbellata	Pink sand verbena
ONAGRACEAE		
	Camissonionsis choinanthifolia	Peach avening primrose
	Enilobium brachusarmum	Firewood
		Theweeu
	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
PLANTAGINACEA	E	
		~
	*Plantago coronopus	Cut leaf plantain
	*Plantago lancoclata	English plantain
	Plantago maritima	California seaside plantain
	· · · ·	

Exhibit 2 SCZ-NOID-0004-17 20 of 93

PLUMBAGINACEAE		
TLUMBAOINACEAE	A mu ani a m anitim a	California accepiela
	Armeria maritima	Camorina seapink
POLEMONIACEAE		
	Navarretia squarrosa	Skunkweed
POLYGONACEAE		
		~
	Eriogonum latifolium	Coastal buckwheat
		Dette 1 and 1
	Persicaria punctata	Dotted smartweed
	* Polygonum aviculare	Prostrate knotweed
	*Rumer acetosella	Sheen sorrel
	Kumex aceioseita	Sheep soliter
	*Rumex conglomeratus	Green dock
	Rumex crassus	Willow-leaved dock
	*Rumex crispus	Curly dock
PANUNCUI ACEAE		
KANUNCULACEAE	Panungulus galifornique	California huttoroun
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
	Detentille angening	Desifie silveres d
	Potentilia anserina ssp. pacifica	Pacific silverweed
	kosa caujornica	Cantornia Wild rose
	Kosa gymnocarpa	Wood rose
	Kubus ursinus	California blackberry
	Rubus armeniacus	H1malayan blackberry
RUBIACEAE		
	**Galium sp.	**Bedstraw
SALICACEAE		
	Salix lasiolepis	Arroyo willow

SAPINDACEAE		
		California buckeye
	Aesculus californica	
SCROPHULARIACE	AE	
	Scrophularia californica ssp. californica	Bee plant
SOLANACEAE		
	Solanum amoricanum	American black
	*Solanum nigrum	Black nightshade
	Solution nigram	
URTICACEAE		
UKTICACEAE		
	Urtica dioica ssp. gracilis	Stinging nettle
	Urtica holosericea	Hoary nettle
FLOWERING PLAN	NTS (ANGIOSPERMAE - MONOCOTYLEI	DONEAE)
AGAVACEAE		
AUAVACEAE	Chlorogalum pomoridianum	Soon plant
CVDEDACEAE		
CIFERACEAE	Rolloschoonus maritimus	Draira hulruch
	Bolboschoenus maritimus Bolboschoenus robustus	Seacoast hulrush
	Carex hafordii	Monterey sedge
	Carex abrunta	Slough sodge
	Curex obnupru	
	Cyperus erugiosiis	
	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
1		1

LILIACEAE		
	Triteleia laxa	Ithuriel's spear
MELANTHIACEAE		
	Toricoscordion framontii	Fromont's star lily
DOACEAE		
FUACEAE	A quastia n allana	Dant group
	Agrostis patiens	Shiver group
	*Aira caryophylied	Shiver grass
	*Avena barbaia	Wild oot
	*Avena jalua	
	*Briza minor	Entre quaking grass
	*Brachypoduim distachyon	False brome
	Bromus carinatus	California brome
	*Bromus catharticus	Rescue grass
	*Bromus diandrus	Ringut brome
	*Bromus hordeaceus	Soft chess
	*Bromus madritensis ssp. madritensis	Foxtail chess
		Seaside large mountain
	Bromus marginatus var. maritimus	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
		T
	Koeleria macrantha	June grass
	Malica californica	California malicarasa
	Melica tomoyang	
		1 offey s menca
	*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 plan	ıt	
**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*)

> Exhibit 2 SCZ-NOID-0004-17 25 of 93

#### 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 09-2 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.

Exhibit 2 SCZ-NOID-0004-17 26 of 93 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 Protoction.

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 Wotland 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 Vogetation.

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 09-2) and concur the Project would not result in significant impacts to the Reserve beyond those described above.

Gage Dayton, Administrative Director, UCSC Natural Reserves

5/25/17

## 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 Indomnify and Hold Harmless.

**Cultural Resources** 

Policy 3.9 Conservation of Cultural Resources

IM 3.9.1 Construction Monitoring.

**Hazardous Materials Management** 

June 12, 2017

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** 

IM 3.14.1 Natural Areas Protection.

#### 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.

Exhibit 2 SCZ-NOID-0004-17 28 of 93 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 5.4.1Development of New ParkingIM 5.4.2Lease AgreementsIM 5.4.3Distribution and Intensity of Parking

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.

Exhibit 2 SCZ-NOID-0004-17 29 of 93 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**

- **Building Design** 61
- Campus Street Design 6.2

Parking Design 6.3

6.5 Landscape Design

66 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.

Exhibit 2 SCZ-NOID-0004-17 30 of 93 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.

Exhibit 2 SCZ-NOID-0004-17 31 of 93

#### **<u>1c. Environmental Compliance Documentation</u>** N/A

#### 1d. Technical Reports

See Section 5.

#### 1e. Consultation Documentation with other Agencies

Not required for this NOID

#### **<u>1f. Implementing Mechanisms</u>**

There are no mitigations required by CEQA.

#### 1g. Correspondence Received

None

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Exhibit 2 SCZ-NOID-0004-17 32 of 93

## 2. University Approval Documentation

N/A

## 3. Environmental Compliance Documentation

N/A

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, 2016.

Exhibit 2 SCZ-NOID-0004-17 33 of 93

# **Younger Lagoon Natural Reserve**

# Beach Monitoring Report 2016



Younger Lagoon Fish Research

Elizabeth Howard and Gage Dayton Younger Lagoon Natural Reserve

> Exhibit 2 SCZ-NOID-0004-17 34 of 93
# **Table of Contents**

Overview and Executive Summary	4
Introduction	6
Younger Lagoon Access History	
History of Public Access to Younger Lagoon Beach	6
Beach Access Tours	7
Study Areas	
Younger Lagoon Reserve	
Sand Plant Beach ("Little Wilder")	
Natural Bridges Lagoon	
Methods	
User Data	
Human Beach Use	
Photo Documentation of Younger Lagoon Natural Reserve	
Tidewater Goby Surveys	
Species Composition and Coverage of Beach Dune Vegetation	
Non-avian Vertebrate Monitoring	
Tracks	
Small Mammals	
Invertebrate Monitoring	
Avian Monitoring	
Results	
User Data	
Younger Lagoon Reserve	
Sand Plant Beach (Little Wilder)	
Natural Bridges Lagoon	
Human Use During Survey Efforts	
Photo Documentation of YLR	
Tidewater Goby Surveys	
Species Composition and Coverage of Beach Dune Vegetation	
Track Plate Monitoring	
Small Mammal Trapping	
Invertebrate Monitoring	
Avian Surveys	
Discussion	50
Literature Cited	

# Figures

Figure 1.	Burrowing owl on the beach at Younger Lagoon	10
Figure 2.	Study Areas.	12
Figure 3.	Locations of monitoring points, plots, and regions for YLR beach	15
Figure 4.	Photos captured by remote camera during the Spring 2010 monitoring effort	23
Figure 5.	Mean percent bare ground encountered at each site	29
Figure 6.	Number of native plant species encountered at each site.	33

Figure 7. Species richness of invertebrates	42
Figure 8. Total abundance of invertebrates	43
Figure 9. Younger Lagoon dune map	51

# Tables

Table 1. Younger Lagoon user affiliations	18
Table 2. Younger Lagoon Total Use	19
Table 3. Number of people observed in photo human use monitoring	20
Table 4. Vertebrate species encountered	24
Table 5. Distance from mean high tide to the lowest plant on the beach	28
Table 6. Number and proportion of native and non-native plant species encountered	30
Table 7. Summary of track plate sampling effort at each site.	34
Table 8. Frequency of occurrence, and native species richness, of animals and human use	37
Table 9. Summary of Sherman trapping efforts	38
Table 10. Summary of bird surveys	44

# Appendices

Appendix 1.	Younger Lagoon Photos	3

# **Overview and Executive Summary**

In March 2010, the California Coastal Commission (CCC) 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 controlled 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. That NOID was initially submitted to the CCC in the Fall of 2016; however, it was withdrawn due to CCC staff workload and will be resubmitted in summer of 2017.

This document serves as both a summary report for activities under NOID 10-1 that have taken place since our previous report at the end of fiscal year 2015 and a summary report for the entire 6-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 controlled 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.

Per IM 3.6.3 of the CLRDP (NOID 10-1), the University plans to submit a NOID to the CCC in 2017.

Exhibit 2 SCZ-NOID-0004-17 37 of 93

Exhibit 2 SCZ-NOID-0004-17 38 of 93

# 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 39 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 NOID 10-1 during Fiscal Year (FY) 2015 (July 1, 2015 – June 30, 2016) which surveyed YLR. In addition, because of the upcoming NOID submission, 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 2015-2016.

# 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.

Exhibit 2 SCZ-NOID-0004-17 39 of 93 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 (SMDC).

#### **Beach Access Tours**

Beach access tours are offered two times per month (one tour on a weekday and one on a weekend). The extent of the beach access area varies depending upon the location of plants (i.e. foot traffic is seaward of the dune vegetation) and tidal conditions. Thus, the exact access area is determined by vegetation and tide level and may vary slightly from time to time. The trail provides an interpretive

Exhilit 2 SCZ-NOID-0004-17 40 of 93 experience for visitors that begins with a narrative history of the Natural Reserves, an overview of the lagoon, a walk through a restored coastal scrub habitat with viewing opportunities of the rear dune, and ends up on the beach. Tours are led by SMDC 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 YLR beach, and was first presented to SMDC docents during the regular winter docent training program in 2010. YLR Beach tours began in the spring of 2010 and are advertised via the SMDC website:

http://www2.ucsc.edu/seymourcenter/calendar.html and filled via phone reservation: (831) 459-3800. The SMDC allocates tour spaces and keeps track of all user data. Tours are limited to twelve (12) persons and 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 UCNRS Reserve Use guidelines.

#### Public Education and Outreach Programming on the Coastal Science Campus

The YLR beach access tours are part of broader public education and outreach programming on the Coastal Science Campus offered through the Seymour Marine Discovery Center (Seymour Center).

In FY 2015-16, 64,856 people visited the Seymour Center. The Seymour Center provided marine science education to 285 classes, comprised of 8,550 students, teachers, and adult chaperones. Of the 285 classes served, 85 came from schools classified as Title 1—schools with high numbers of students from low-income families. Scholarships were made available to Title 1 schools, making it possible for 730 students to participate who would not otherwise have had the opportunity to experience a marine research center.

Approximately 55 percent of visiting schools came from Santa Cruz County, including Davenport, the San Lorenzo Valley, and Watsonville. Classes from Santa Clara and San Mateo Counties made up 30 percent. The balance was comprised of students from inland counties, traveling here to learn about their connection to the ocean. Students visited from Contra Costa, San Joaquin, Tuolumne, and San Benito Counties. Teachers often incorporate the Seymour Center into their weeklong marine science field study courses, including a high school class from Wisconsin that has made the Seymour Center a part of their curriculum for the past three years. The Seymour Center, Younger Lagoon Reserve and the Monterey Bay Aquarium continued our partnership supporting high school students in the Watsonville Area Teens Conserving Habitats (WATCH) program. Twenty-four WATCH students from Aptos High School designed and carried out field-based research projects in Younger Lagoon Reserve on topics including endangered fish, aquatic invertebrates, and birds. These students made repeated visits to the Reserve throughout the year.

With nearly as many on the wait list, 108 children ages 7-14, enrolled in nine, weeklong summer science sessions known as Ocean Explorers. Students actively learned about and participated in marine research at the Seymour Center, and our associated Long Marine Laboratory, where participants worked alongside marine mammal researchers and trainers. Participants gained experience with the scientific process, focusing on honing their observation and questioning skills. Ocean Explorers also investigated 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—however, nearly 10 percent traveled from areas as far away as Arizona, Oregon, Washington, Massachusetts, New York, and the

Exhibit 2 SCZ-NOID-0004-17 41 of 93 Philippines for this unique experience. Full and partial scholarships were extended to low-income participants.

The Seymour Center actively promotes its activities with press releases and calendar listings throughout the region. Last year, traditional print ads were placed in Good Times (and their annual Visitor Guide), Monterey Bay Travel Adventures, Summer Magazine, Bookshop Santa Cruz's Reader's Guide, Visit Santa Cruz County's Traveler's Guide, Wildlife Viewing Guide, and Visitor Map, plus the wedding-focused publications Coastal Wedding and Here Comes the Guide. The Seymour Center's activities are also often covered in the local newspaper, the Santa Cruz Sentinel. Online campaigns running throughout the year included SantaCruz.com and SantaCruzParent.com. Public radio ads ran two weeks every month on the NPR-affiliate, KAZU. The Seymour Center continued its long-time contract with Certified Folder, placing rack cards at lodging and attractions throughout the region, as well as the San Jose Airport. Coupons for discounted admissions were available in various formats. The most highly used program is through the many Bay Area municipal libraries. Called Discover and Go, more than 450 families from across the region utilized these discount coupons. The Seymour Center continued to connect with the public through Facebook, Twitter, Instagram, Pinterest, Flickr, and bi-monthly e-blasts. Their most active accounts are Facebook with ~3,500 followers, Twitter with ~600 followers, and Instagram with ~450 followers. Monthly eblasts reached 5,800 people. The Seymour Center website continues to be strongly used—a sample month during the past year: 8,200 sessions; 6,200 users; 22,800 page views.

While part of UC Santa Cruz, the Seymour Center must raise its ~\$1.25 million budget annually (including all operating costs, salaries, and benefits). Earned revenue—admissions, program fees, facility rentals, and the Ocean Discovery Shop—makes up approximately half of its general operating requirements.

Exhibit 2 SCZ-NOID-0004-17 42 of 93



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 20010-2015 (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,

Exhibit 2 SCZ-NOID-0004-17 43 of 93 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 SMDC, as well as research and education use of YLR, were recorded and maintained by SMDC 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,

Exhibit 2 SCZ-NOID-0004-17 46 of 93 deep, shallow, etc.); thus, different numbers of seine hauls were conducted at each site. Species richness was compared among sites.



Exhibit 2 SCZ-NOID-0004-17 47 of 93 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 50m 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<sup>2</sup> 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  $4 \times 50$  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

Ехћіbit 2 SCZ-NOID-0004-17 48 of 93 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 western cliff were surveyed from the eastern edge of the lagoon, and western cliff were surveyed from the eastern edge of the lagoon, and western cliff were surveyed from the eastern edge of the lagoon 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  $\frac{1}{4}$  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 to the edge of the Lagoon at the marine mammal overlook during marine mammal tours at the Seymour Center. Those users (represent 10% of the individuals that attended SMDC tours outside of the YLR beach tours) were provided an overlook of the lagoon, 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 15-16 fiscal year a total of 105 participants went on the Seymour Center docent led Younger Lagoon beach access tours. Since the start of the Seymour Center docent led beach access tours, nearly 117 tours have gone out and more than 541 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 2015-2016. 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

University of California, Davis University of California, Santa Barbara University of California, Santa Cruz

**California State Universities** California State University, Monterey Bay

**California Community College** Cabrillo Community College

**Universities outside California** University of Utah

### K-12 system

Aptos High School Pacific Collegiate School Pajaro Valley High School Yerba Buena High School

### Non-governmental organizations

Audubon Society Land Trust of Santa Cruz County Monterey Bay Aquarium WATCH Program Santa Cruz Bird Club Seymour Marine Discovery Center Watsonville Wetlands Watch

**Governmental Agencies** California State Parks

**Volunteer Groups** UCSC Wilderness Orientation

### Exhibit 2 SCZ-NOID-0004-17 51 of 93

#### Table 2. Younger Lagoon Total Use.

Younger Lagoon Res	serve																							
	UC Home Users D	e Days	UC Away Users [	/ Days	CSU System Users Day	CA C Coll s Users	om'ty. eges 5 Days	Other CA Colleges Users Da	ys	U.S. Colleges Users Days	Ir Coll Users	it'l eges Days	Gov Users	∕'t Days	NG0 Users	)s Days	For-Pro Busines Users D	fit ss ays	K-12 Schoo Users I	ls Days	Othe Users	ers Days	TOT Users	ALS Days
UNIVERSITY-LEVEL	RESEA	RC	н																					
Faculty Research Scientist Graduate Student Undergraduate Student Other SUB-TOTALS	5 0 5 13 0 23	59 0 71 188 0 318	0 1 2 0 1 4	0 10 13 0 15 38	0 0 0 0 0			0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	5 1 7 13 1 27	59 10 84 188 15 356
UNIVERSITY-LEVEL	CLASS	SES																						
Faculty Graduate Student Undergraduate Student Other SUB-TOTALS	13 31 546 1 0 590 1	35 47 706 0 788	0 0 0 0	0 0 0 0	0 0 0 0	0 1 0 0 0 50 0 0 0 51	1 0 50 0 51	0 0 0 0	0 0 0 0	0 0 0 0 0 0 0 0 0 0		0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 1	0 0 1 1	14 31 596 1 642	36 47 1756 1 1840
PUBLIC SERVICE																								
Faculty Research Scientist Graduate Student Undergraduate Student K-12 Instructor K-12 Student Professional Other Docent Volunteer SUB-TOTALS	4 0 6 100 0 2 0 283 0 395	4 0 60 370 0 11 0 283 0 728	0 1 0 0 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 0 0 0 0 0	D C   D C   D C   D C   D C   D C   D C   D C   D C   D C   D C   D C   D C   D C   D C   D C   D C		0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 12 12 0 0 0 0 0 0 1 1 0 0 0 0 1 3 13			0 0 0 0 1 0 0 0 1 0 0 0 1	0 0 0 0 0 0 0 1 0 0 0 1	0 0 0 0 1 52 1 1 55	0 0 0 0 1 766 1 769	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 2 71 0 0 0 0 0 73	0 0 0 6 131 0 0 0 0 137	0 0 0 0 2465 0 5 2470	0 0 0 0 2465 0 50 2515	4 1 6 112 2 71 4 2518 284 6 3008	4 1 60 382 6 131 13 3232 284 51 4164
TOTALS:	1008 2	2834	5	39	0	0 51	51	0	0	13 13	0	0	1	1	55	769	0	0	73	137	2471	2516	3677	6360

#### RESERVE USE DATA Period from July 1, 2015 to June 30, 2016

University of California, Santa Cruz Younger Lagoon Reserve

\*Other includes members of the public who took the SMDC's daily tour. Although all tours include information on YLR, we estimate that 10% of these visitors can be reasonably counted as users.

### 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 – FY15-16.

#### **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 – FY15-16.

# 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 (Table 3; Figures 4-5) and the number of people per photo (15 minute interval standardized for area surveyed) was consistent across sampling periods. Examples of photos captured during a typical monitoring session in 2010 are included as Figure 6.

Site	Month	<sup>1</sup> Total # of people	<sup>1</sup> 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

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

Exhibit 2 SCZ-NOID-0004-17 53 of 93

Site	Month	<sup>1</sup> Total # of people	<sup>1</sup> Ave # of People / 15 minute
Younger Lagoon	February, 2011	2	0.06
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

Exhibit 2 SCZ-NOID-0004-17 54 of 93

Month	<sup>1</sup> Total # of people	<sup>1</sup> Ave # of People / 15 minute
February, 2014	1	0.01
1 2014	1700	21.01
June, 2014	1/23	21.01
June, 2014	239	2.92
June, 2014	2	0.02
August 2014	852	23.68
August 2014	227	2 52
August 2014	227	0.02
1145460, 2011	-	0.02
November, 2014	2131	21.69
November, 2014	146	1.78
November, 2014	2	0.02
January 2015	1990	22.04
January, 2015	1009	23.04
January, 2015	225	2.75
January, 2015	11	0.13
April, 2015	699	7.13
April, 2015	_	_
April, 2015	0	0
<b>F</b> ,	-	-
July, 2015	6	0.02
October, 2015	0	0
February, 2016	0	0
May, 2016	1	0.02
	Month     February, 2014     June, 2014     June, 2014     June, 2014     June, 2014     August, 2014     August, 2014     August, 2014     November, 2014     November, 2014     November, 2014     November, 2014     January, 2015     January, 2015     January, 2015     April, 2015     April, 2015     July, 2015     October, 2015     February, 2016	Month'Total # of peopleFebruary, 20141June, 20141723June, 2014239June, 20142August, 2014852August, 2014227August, 20142131November, 20142131November, 20142January, 20151889January, 2015225January, 201511April, 20156April, 20150July, 20150July, 20150February, 20160May, 20161

<sup>1</sup>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.

Exhibit 2 SCZ-NOID-0004-17 56 of 93

# 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).

	Tidewater Goby	Stickleback	Sculpin	Mosquito Fish	Halibut	CRLF <sup>1</sup>	Bluegill
Anril 9 2010							
Little Wilder	x	x					
Younger Lagoon	X	X					
Natural Bridges	X	X	x				
Nutural Driages	11	11	1				
August 13, 2010							
Little Wilder	Х	Х					
Younger Lagoon	X	X					
Natural Bridges	X	X	Х	Х			
November 18, 2010							
Little Wilder	Х	Х					
Younger Lagoon	Х						
Natural Bridges	Х	Х	Х	Х			
0							
February 23, 2011							
Little Wilder	Х	Х					
Younger Lagoon	Х						
Natural Bridges	Х	Х	Х	Х			
May 12, 2011							
Little Wilder	Х	Х					
Younger Lagoon	Х	Х	Х		Х		
Natural Bridges	Х	Х	Х				
August 8, 2011							
Little Wilder	X	X					
Younger Lagoon	Х	Х					
Natural Bridges	Х	Х					

Table 4. Fish species encountered during sampling efforts.

December 12, 2011

Little Wilder	Х	Х			
Younger Lagoon	Х				
Natural Bridges	Х	Х			
March 8. 2012					
Little Wilder	Х	Х			
Younger Lagoon	X				
Natural Bridges	X	x			
Natural Druges	71	A			
May 15, 2012					
Little Wilder	Х	Х			
Younger Lagoon	Х	Х			
Natural Bridges	Х	Х	Х		
0					
August 29, 2012					
Little Wilder	Х	Х			
Younger Lagoon	Х	Х			
Natural Bridges	Х	Х			
October 23, 2012					
Little Wilder	Х	Х			
Younger Lagoon	Х	Х			
Natural Bridges	Х	Х			
February 2, 2013					
Little Wilder	Х	Х			
Younger Lagoon	Х	Х			
Natural Bridges	Х	Х			
May 6, 2013					
Little Wilder	Х	Х			
Younger Lagoon	Х	Х			
Natural Bridges	Х	Х			
July 16, 2013					
Little Wilder	Х	Х			
Younger Lagoon	Х	Х			
Natural Bridges	Х	Х		Х	
November 14, 2013					
Little Wilder	X	X			
Younger Lagoon	Х	Х			
Natural Bridges					
Fehruary 21 2014					
Little Wilder	x	x			
Younger Lagoon	X	X			
Natural Rridges	X	Δ			
matural Driuges	Δ				

X X

X X

Х

Little Wilder	Х	Х					
Younger Lagoon	Х	Х					
Natural Bridges	Х						
August 11, 2014							
Little Wilder	Х	Х					
Younger Lagoon	Х	Х					
Natural Bridges	Х	Х					
November 25, 2014							
Little Wilder	Х	Х					
Younger Lagoon	Х	Х					
Natural Bridges	Х	Х					
January 26, 2015							
Little Wilder	Х	Х					
Younger Lagoon	Х	Х					
Natural Bridges	Х						
April 13, 2015							
Little Wilder	Х	Х					
Younger Lagoon	Х	Х					
Natural Bridges	Х	Х					Х
July 8, 2015							
Younger Lagoon	Х	Х					
November 4, 2015							
Younger Lagoon	Х	Х					
February 9, 2016							
Younger Lagoon	Х	Х					
May 13, 2016							
Younger Lagoon	Х	Х					
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. 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

Exhibit 2 SCZ-NOID-0004-17 59 of 93 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 (53%) and least at Younger Lagoon (26%) (Table 6).

Exhibit 2 SCZ-NOID-0004-17 60 of 93

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 Summ	er, 11 F	'all, 11	Winter, 12	Spring, 12
Younger Lagoon	56	51	20	42	55	49	9	26	30	28
Sand Plant Beach	33	34	56	56	40	5	1	29	31	38
Natural Bridges	128	130	141	146	146	13	8	155	160	123
Site	Summer, 12	Fall, 12	Winter	, 13 Sprin	g, 13 S	ummer, 13	Fall, 13	3 Winter,	14 Spring,	, 14
Younger Lagoon	47	20	30	3	6	37.3	32.1	26.4	36.	5
Sand Plant Beach	35	38	31	4	-1	48.1	49.9	45.6	24.	2
Natural Bridges	91	75	100	) 7	2	88.9	107.3	8 87.4	83.	2
Site	Summer, 14	Fall, 14	Winter	, 15 Sprin	g, 15 S	ummer, 15	Fall, 15	Winter,	16 Spring,	16
Younger Lagoon	21.4	10	26.	4 19	9.5	19.3	20.5	31.4	42.8	
Sand Plant Beach	27.5	31	24.	5 29	9.2					
Natural Bridges	74.3	89.4	71	75	5.8					



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

Site	Spring, 10	Summer, 10	Fall, <u>1</u> 0	Winter, 11	Spring, 11	Summer, 11	<b>Fall, 11</b>	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	<u> </u>
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%)	

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

Total	5	6	4	6	6	6	5	6
Sito	Summor 14	Fall 14	Winton 15	Spring 15	Summer 15	Fall 15	Winter 16	Spring 16
Site	Summer, 14	Fall, 14	winter, 15	Spring, 15	Summer, 15	Fail, 15	winter, 10	Spring 10
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	Proportion of native and non-native species across all sample periods
Natural Bridges	
Native	47%
Non-native	53%
Total	
Younger Lagoon	
Native	73%
Non-native	26%
Total	
Sand Plant Beach	
Native	68%
Non-native	31%
Total	

### 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 equal across all sites (n = 8). Ground squirrel were not detected at Natural Bridges and deer have not been detected in our track surveys at YLR or Sand Plant Beach (Table 7). It is likely that ground squirrels occur at Natural Bridges and deer have been observed at Younger Lagoon Reserve in the upland habitat and are also likely using upland habitat at Sand Plant Beach; 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.



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

	Rodent <sup>1</sup>	Raccoon	Cottontail	Rohcat	Skunk	Squirrel	Deer	Onossum	Covote	Bicycle	Vehicle	Dog	Human
May 1-2 2010	Rouene	nuccoon	cottontun	Dobcut	JRUIIR	Squirrer	Deer	opossum	doyote	Bicycie	Veniere	005	mumun
Little Wilder	х			Х	Х	х			Х	х			Х
Younger Lagoon	X	х		X	X								X
Natural Bridges	X	X		X	X				Х	х	Х	Х	X
August 11-12, 2010													
Little Wilder		Х		Х	Х							Х	Х
Younger Lagoon	Х	Х	Х	Х		Х							
Natural Bridges	Х	Х	Х									Х	Х
0													
November 17-18,													
2010													
Little Wilder	Х		Х	Х					Х				Х
Younger Lagoon	Х	Х											Х
Natural Bridges	Х	Х		Х							Х	Х	Х
February 8 -9, 2011													
Little Wilder	Х			Х	Х				Х	Х			Х
Younger Lagoon	Х	Х			Х				Х				
Natural Bridges		Х		Х					Х		Х		Х
May 3 - 4, 2011													
Little Wilder	Х		Х	Х									
Younger Lagoon		Х	Х	Х	Х				Х				
Natural Bridges		Х			Х				Х			Х	Х
July 22 - 23, 2011													
Little Wilder	X	X			Х				Х				Х
Younger Lagoon	X	X	X	Х	Х								
Natural Bridges	Х	Х	Х		Х							Х	Х

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

Exhibit 24 SCZ-NOID-0004-17 67 of 93

	Rodent <sup>1</sup>	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
March 8 & 9, 2012						-			-			Ť	
Little Wilder	Х								Х				Х
Younger Lagoon				Х					Х				
Natural Bridges							Х				Х	Х	Х
May 15 & 16, 2012													
Little Wilder	Х		Х	Х									Х
Younger Lagoon	Х	Х		Х					Х				
Natural Bridges	Х			Х				Х				Х	Х
August 16 & 17, 2012													
Little Wilder	Х	Х	Х	Х	Х		Х		Х				Х
Younger Lagoon	Х	Х		Х		Х	Х						
Natural Bridges	Х	Х	Х	Х	Х		Х				Х	Х	Х
October 22 & 23, 2012													
Little Wilder	Х						Х		Х				Х
Younger Lagoon		Х		Х					Х				Х
Natural Bridges			Х		Х		Х				Х		Х
January 16 & 17, 2013													
Little Wilder	Х			Х					Х				Х
Younger Lagoon	Х	Х		Х					Х				Х
Natural Bridges		Х		Х	Х				Х			Х	Х
May 15 & 16, 2013													
Little Wilder	Х			Х	Х								Х
Younger Lagoon	Х	Х		Х					Х				Х
Natural Bridges	Х	Х			Х							Х	Х
July 18 & 19, 2013													
Little Wilder	Х	Х		Х					Х			Х	Х
Younger Lagoon	Х	Х		Х					Х				
Natural Bridges		Х		Х	Х						Х	Х	Х

October 21 & 22, 2013

	Rodent <sup>1</sup>	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
Little Wilder		Х		Х		_			-	-			
Younger Lagoon		Х		Х					Х				Х
Natural Bridges	Х	Х			Х				Х		Х	Х	Х
February10 &11,													
2014													
Little Wilder	Х	Х		Х									Х
Younger Lagoon									Х				Х
Natural Bridges		Х			Х						Х		Х
April 27 & 28, 2014													
Little Wilder		Х		Х					Х				Х
Younger Lagoon		Х							Х				
Natural Bridges		Х		Х	Х						Х	Х	Х
July 30-31, 2014													
Little Wilder		Х		Х					Х				Х
Younger Lagoon		Х		Х					Х				
Natural Bridges		Х			Х		Х		Х		Х	Х	Х
November 4-5, 2014													
Little Wilder				Х					Х			Х	Х
Younger Lagoon		Х		Х					Х				
Natural Bridges		Х					Х				Х		Х
January 26-27, 2015													
Little Wilder	Х								Х				Х
Younger Lagoon	Х	Х		Х			Х						Х
Natural Bridges	Х				Х		Х		Х		Х	Х	Х
April 14-15, 2015													
Little Wilder	Х	Х							Х				Х
Younger Lagoon	Х	Х		Х					Х				

	Rodent <sup>1</sup>	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human
Natural Bridges	Х				Х		Х		Х		Х	Х	Х
July 8-9, 2015													
Younger Lagoon	Х			Х	Х				V				V
October 29-30, 2015									Х				Х
Younger Lagoon		Х		Х									
February 2-3, 2016													
Younger Lagoon		Х							Х				
May3-4, 2016													
Younger Lagoon		Х							Х				
	3	3	3	3	3	2	3	1	3	2	1	2	3
<sup>1</sup> Unidentified sn	all rodent	0	0	5	0		0	-	0			-	0

Table 8. Frequency of occurrence, and native species richness, of animals and human use types through spring 2016 track plate sampling efforts. Actual detections are included parenthetically.

Site	Rodent	Raccoon	Cottontail	Bobcat	Skunk	Squirrel	Deer	Opossum	Coyote	Bicycle	Vehicle	Dog	Human	<sup>1</sup> 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	(14) 56%	(21) 84%	(2)8%	(19) 76%	(7) 28%	(2) 8%	(2) 8%	0%	(16) 64%	0%	0%	0%	(9) 36%	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

<sup>1</sup>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 261 individual small mammals representing four species have been captured during small mammal trapping efforts (Table 9).

Site	Pema <sup>1</sup>	Mica <sup>1</sup>	Reme <sup>1</sup>	Rara <sup>1,2</sup>	TOTAL
April 24 - 25 2010					
Little Wilder	8	5			13
Younger Lagoon	2	5			2
Natural Bridges			3		3
August 11 12 2010					
Little Wilder	5	1.			Q
Younger Lagoon	5	4	1		1
Natural Bridges			1		0
induital Diragoo					U
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
0					
August 8-9, 2011					
Little Wilder	6	2			8
Younger Lagoon	3	2	3		6
Natural Bridges	5	1	5		6

Table 9. Summary of Sherman trapping efforts

Site	Pema <sup>1</sup>	Mica <sup>1</sup>	Reme <sup>1</sup>	Rara <sup>1,2</sup>	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	т 3				3
Natural Bridges	5	4	2		6
		-	_		·
November 5-6, 2013					
Little Wilder	2		1		3
Younger Lagoon	3				3
Natural Bridges		3	1		4
Ianuary 13-14 2013					
Little Wilder	2		Л.		6
Younger Lagoon	2		Ŧ		2
Natural Bridges	2	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	5 1		T		+ 1
Natural Bridges	*		1		1
October 22-23, 2013					
Little Wilder	5	1		1	7

Site	Pema <sup>1</sup>	Mica <sup>1</sup>	Reme <sup>1</sup>	Rara <sup>1,2</sup>	TOTAL
Younger Lagoon	1	4	2		1
Natural Bridges		1	2		3
February 12-13, 2014					
Little Wilder	2	1	1		4
Younger Lagoon Natural Bridges	1	2	1		2
Natural Dridges		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		5		3
Natural Bridges					0
July 9 0 2015					
Younger Lagoon	7		1		8
Tounger Dagoon	/		T		U

Exhibit 2 SCZ-NOID-0004-17 73 of 93

Site	Pema <sup>1</sup>	Mica <sup>1</sup>	Reme <sup>1</sup>	Rara <sup>1,2</sup>	TOTAL
October 29-30, 2015	2		6		8
Younger Lagoon			6		6
<i>February 2-3, 2016</i> Younger Lagoon			3	1	4
<i>May3-4, 2016</i> Younger Lagoon					
TOTAL	134	55	69	3	261

<sup>&</sup>lt;sup>1</sup>Pema = *Peromyscus maniculatus*; Mica = *Microtus californicus*; Rema = *Reithrodontomys megalotis*; Rara = *Rattus norvegicus*. <sup>2</sup>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 9-10). 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.

Exhibit 2 SCZ-NOID-0004-17 74 of 93



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.

Site	AMCR	AMPE	BBPL	BCNH	BASW	BLOY	BLPH	BLTU	BRBL	BRPE	BUHE	CAGO	CAGU	CLSW	CORA	СООТ	DOC
April 24 & 26, 2010																	
Little Wilder		1						1				1		1		1	
Younger Lagoon																	
Natural Bridges									2								
August 11-12, 2010																	
Little Wilder																	
Younger Lagoon						2											1
Natural Bridges	2								19								
November 15 9 16																	
2010																	
Little Wilder																	
Younger Lagoon								1		27						2	
Natural Bridges									1								
																<u> </u>	
February 15 & 16, 2011																	
Little Wilder																	
Younger Lagoon																	5
Natural Bridges	3								2		1		58				
May 3 & 4, 2011																	
Little Wilder	2									8						<u> </u>	
Younger Lagoon																<u> </u>	
Natural Bridges	1						1						3			<u> </u>	6
July 22 & 23, 2011																	
Little Wilder					4		1							4			
Younger Lagoon																	
Natural Bridges	9				4				6								10
March 29 & 30																<u> </u>	<u> </u>
2012																	
Little Wilder													1				
Younger Lagoon									5							3	
Natural Bridges								1									
May 15 & 16 2012															Ex	hibit 2	-
Little Wilder													S	CZ-NO	DID-00	04-17	<b> </b>
		<del> </del>	+	<b> </b>		<b> </b>		<del> </del>	<b> </b>	<b> </b>	<b> </b>	<del> </del>	<b> </b>	<del> </del>	+ 77	of 93	<b>,</b>

Natural Bridges	1								1								
Site	AMCR	AMPE	BBPL	BCNH	BASW	BLOY	BLPH	BLTU	BRBL	BRPE	BUHE	CAGO	CAGU	CLSW	CORA	СООТ	DOC
August 25 & 26, 2012																	
Little Wilder													2		2		
Younger Lagoon		1				1	1						4				
Natural Bridges													1				
November 5& 6, 2012																	
Little Wilder																5	
Younger Lagoon									4							8	
Natural Bridges	2																
January 13&14, 2013																	
Little Wilder																	
Younger Lagoon						1					1					5	
Natural Bridges															1		
May 1 & 2, 2013																	
Little Wilder																	
Younger Lagoon									1			2					
Natural Bridges	2																
July 16-17, 2013																	
Little Wilder				1									1		1		
Younger Lagoon				1			2		7				2				
Natural Bridges							2		1				1				
October 22-23, 2013																	
Little Wilder													1		2		
Younger Lagoon			3				3						2				1
Natural Bridges	2		1							1			3				
February 13-14, 2014																	
Little Wilder												6					
Younger Lagoon								Ī						Ī			
Natural Bridges	1							T						T			
April 27-28, 2014								Ī						Ī			
Little Wilder	3									20							
Younger Lagoon						8				13		2	5	LZ-NC		04-17	

78 of 93

Site	AMCR	AMPE	BBPL	BCNH	BASW	BLOY	BLPH	BLTU	BRBL	BRPE	BUHE	CAGO	CAGU	CLSW	CORA	COOT	DOCO
July 30-31, 2014																	
Little Wilder													10				
Younger Lagoon										18							
Natural Bridges										18							
November 4-5, 2014																	
Little Wilder																2	
Younger Lagoon							2			5						6	
Natural Bridges	11								2							10	
January 26-27, 2015																	
Little Wilder							2					2					
Younger Lagoon										6						9	
Natural Bridges	12						1			27					3		
April 14-15, 2015																	
Little Wilder							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										
			T														
May 3-4, 2016																	
Younger Lagoon					4		2					2					

Site	MEGU	MODO	NOHA	PECO	PIGR	PIGU	REHA	REPH	RWBB	RODO	SAND	SAPH	SNEG	SPSA	SURF	WEG
April 24 & 26, 2010			1					1		Ī	Ī					
Little Wilder			1					1		Ī	Ī					2
Younger Lagoon													2			2
Natural Bridges								2					2			
																<u> </u>
August 11-12, 2010															<u> </u>	<u> </u>
Little Wilder													4			22
Younger Lagoon													4			32
Natural Bridges															<u> </u>	
November 15 & 16, 2010																<u> </u>
Little Wilder																1
Younger Lagoon				15							11			1		4
Natural Bridges	2										140		1	1		17
February 15 & 16, 2011																
Little Wilder																6
Younger Lagoon												1				
Natural Bridges				47									18			6
Mar 2. 0. 4. 2011															<u> </u>	
May 3 & 4, 2011			2			25										
Little Wilder			2			33									+	
Younger Lagoon										1					+	16
Natural Bridges										1						10
Iulv 22 & 23. 2011																<u> </u>
Little Wilder						17							1			1
Younger Lagoon																
Natural Bridges						3				2			2			81
March 29 & 30, 2012	-									-	-					<u> </u>
Little Wilder																
Younger Lagoon				13									2			16
Natural Bridges						2					65		2		<u> </u>	10
May 15 & 16, 2012																<u> </u>
Little Wilder														1	1	4
Younger Lagoon				25		5				1			2	1	1	15
Natural Bridges													2	Ex	hibit 2	4
												S	CZ-NO	DID-0	004-17	<u> </u>
	+	+	+	1	+	+	+	+	+	<del> </del>	ł	+	+	8	) of 93	\$

Site	MEGU	MODO	NOHA	PECO	PIGR	PIGU	REHA	REPH	RWBB	RODO	SAND	SAPH	SNEG	SPSA	SURF	WEGU
August 25 & 26, 2012																
Little Wilder																
Younger Lagoon				35				8		1			1			7
Natural Bridges														1		5
																<u> </u>
November 5& 6, 2012																
Little Wilder																1
Younger Lagoon				14			1			4			2			3
Natural Bridges													2	1	2	
January 13&14, 2013																<u> </u>
Little Wilder																
Younger Lagoon				3	1						38	1	1			
Natural Bridges													1			11
May 1 & 2, 2013																
Little Wilder						8										2
Younger Lagoon		2		9												11
Natural Bridges																23
																<u> </u>
July 16-17, 2013																
Little Wilder						7										1
Younger Lagoon				8		1							4			
Natural Bridges																10
October 22-23, 2013																
Little Wilder																
Younger Lagoon				33									3			150
Natural Bridges													4			110
February 13-14, 2014																
Little Wilder										1						103
Younger Lagoon				8									4			7
Natural Bridges													1			19
																<u> </u>
April 27-28, 2014			1					1		1	1			1		1
Little Wilder						4										24
Younger Lagoon		1				8			1							2
Natural Bridges																18

Exhibit 2 SCZ-NOID-0004-17 81 of 93

Site	MEGU	MODO	NOHA	PECO	PIGR	PIGU	REHA	REPH	RWBB	RODO	SAND	SAPH	SNEG	SPSA	SURF	WEC
July 30-31, 2014																
Little Wilder						3										25
Younger Lagoon						3							3			28
Natural Bridges											7					80
November 4-5, 2014																
Little Wilder									2							3
Younger Lagoon											11		1			10
Natural Bridges											20		4	1		18
January 26-27, 2015																
Little Wilder																25
Younger Lagoon									10							27
Natural Bridges									9				2			175
April 14-15, 2015																
Little Wilder						3										5
Younger Lagoon									5				2			5
Natural Bridges									4				3			21
July 8-9, 2015																
Younger Lagoon						4							2			31
October 29-30, 2015																
Younger Lagoon																6
February 2-3, 2016																
Younger Lagoon						2							3			9
May 3-4, 2016																
Younger Lagoon									1					1		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 11). 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 Seymour Center docent led tours, provides an appropriate level of controlled access that enables people to see and learn about the lagoon habitat while limiting impacts to the system. We recommend that this continue.

<sup>5</sup> Exhibit 2 SCZ-NOID-0004-17 83 of 93



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.

<sup>5</sup>Exhibit 2 SCZ-NOID-0004-17 86 of 93



YLR Beach Photopoint #1. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide



YLR Beach Photopoint #1. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide

<sup>5</sup>/Exhibit 2 SCZ-NOID-0004-17 87 of 93



YLR Beach Photopoint #1. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide



YLR Beach Photopoint #2. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide

5<sup>€</sup>Exhibit 2 SCZ-NOID-0004-17 88 of 93



YLR Beach Photopoint #2. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide



YLR Beach Photopoint #2. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide

<sup>5</sup> Exhibit 2 SCZ-NOID-0004-17 89 of 93



YLR Beach Photopoint #2. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide



YLR Beach Photopoint #3. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide

<sup>5</sup> Exhibit 2 SCZ-NOID-0004-17 90 of 93



YLR Beach Photopoint #3. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide



YLR Beach Photopoint #3. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide

<sup>5</sup>&Exhibit 2 SCZ-NOID-0004-17 91 of 93



YLR Beach Photopoint #3. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide



YLR Beach Photopoint #3. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide

<sup>5</sup>Exhibit 2 SCZ-NOID-0004-17 92 of 93



YLR Beach Photopoint #3. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide



YLR Beach Photopoint #4. April 20, 2016. Photographer: Delaney Wong. Camera: Sony Cyber-Shot DSC-W370/B 14.1 Megapixels, lens fully extended wide

<sup>6</sup>(Exhibit 2 SCZ-NOID-0004-17 93 of 93



CLRDP Chapter 3 19 of 26



CLRDP Chapter 5 43 of 57

Exhibit 3 SCZ-NOID-0004-17 2 of 2