Naomi Stern
Senior Internship
Professor Karen Holl
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Background to Younger Lagoon Reserve: A Socio-political Perspective

Introduction

Younger Lagoon Reserve (YLR) is a 72 acre (29 hectare) protected natural area surrounded by a diverse mix of agricultural and urban land uses. YLR is part of the University of California Natural Reserve System (UCNRS). Founded in 1965, the UC NRS is a network of protected lands that are used for research, education and public service. Today there are 39 reserves spanning approximately 750,000 acres of rare or endangered ecosystems in California (UC Natural Reserve 2012). UC Santa Cruz manages four reserves: Año Nuevo Island Reserve, Fort Ord Natural Reserve, Landels-Hill Big Creek Reserve in Big Sur, and Younger Lagoon Reserve.

Located only half a mile north from one of the most popular beaches in Santa Cruz, Natural Bridges State Park, and near Highway 1, YLR land is highly visible to the public. YLR's habitat types include such as seasonal freshwater wetlands, coastal prairie, and coastal scrub. Throughout its history, this land and its ecology have been continuously transformed by the social, economic, and political issues of the time. Today, adjacent to the reserve are highly visited tourist attractions and official government agencies, as well as world-class marine laboratories. The history of land use conversion and public policy at YLR influences the managerial restoration decisions made to protect it. Developing an understanding of the political systems

that impact Younger Lagoon provides insight into the restoration that interns and volunteers take part in.

The goal of this document is to present background information regarding YLR that is helpful in understanding the requirements of restoration at the reserve. First, I give a brief overview of the complex and extensive history of YLR ranging from pre-colonization to current urbanization. Next I describe the current stakeholders for YLR and their involvement in the Coastal Long Range Development Plan. To do this I summarize relevant environmental policy at the federal, state and local levels. Last, I discuss future restoration goals and timelines for YLR.

Historical Analysis

Hunt (2009) wrote a thorough overview of the history of YLR, which is summarized here. Prior to the arrival of Spaniards in the 16th century over 10,000 Indians lived in Central California between Big Sur and the San Francisco Bay Area (Cartier, 1991). In 1542 Juan Rodriguez Cabrillo is recorded to have landed in the Monterey Bay and claimed the area for Spain (Hunt 2009). Several other Spanish expeditions brought explorers, sketch artists, and eventually missionaries to the area. In 1791 the Santa Cruz Mission was established and was known for its bountiful agricultural production due to good climate and fertile soil (Hunt 2009). From an early age the notion of private property and ownership affected how the land in California was used and developed.

After Mexico achieved independence from Spain in 1821 land in California was divided up into “Ranchos”, which generally were small-scale farms belonging to settlers or people with Spanish-speaking parentage. During the early 1840s the land

that is today Santa Cruz was granted to the Castro/Bolcoff family, a large family with many land holdings throughout California. Santa Cruz property stayed in this ownership throughout California becoming a state and through the beginning of the California Gold Rush, which brought huge numbers of new settlers to the area. This was a period of both environmental changes such as a switch to primarily wheat and barley production, as well as to increased parcelization of Santa Cruz. Evidence suggests that in the early 1850's the land that is known as Younger Lagoon was sold to Eli Moore and became a private land holding. During this time Santa Cruz resources were primarily utilized for agriculture and were settled by Chinese and Western immigrants.

During the Moore ownership of the YLR terrace the land was used to farm Brussels sprouts and tilled for agricultural use (Hunt 2009). The terrace lands were sold to the Walti-Shilling Company in 1922 which established a cattle slaughterhouse on the north end of the property. A pipe was constructed that carried waste products from the slaughterhouse to the ocean. As early as 1928 aerial photos of the terrace show wetland areas, which farmers recalled "dredging" as part of their treatment of the land. In 1970 the Santa Cruz Youth Commission requested that the Santa Cruz Water Commission evaluate the wastewater coming out of the slaughterhouse. Meanwhile the 29 acres that make up the lagoon and original Long Marine Lab facilities had been passed onto Donald and Marion Younger who donated the land to the University of California, Santa Cruz in 1972. The lagoon was incorporated into the UCNRS in 1986. The Water Commission ordered the slaughterhouse to cease discharging its waste into the ocean in 1971. In

1978 the Walti-Shilling Company sold the terrace lands to a holding company owned by Wells Fargo. Wells Fargo left the land unmanaged and stopped "dredging" the wetlands. When Wells Fargo attempted to develop the land into housing they were met with resistance from the citizens of Santa Cruz, who wanted to protect that land as open space, the California Coastal Commission, and the University of California that had since established the Long Marine Laboratory. In 1999 the University of California bought the 59 acres of terrace lands from Wells Fargo with the intent of expanding the education and academic activities established by the Seymour Center and Long Marine Laboratories (Hunt 2009).

After purchasing the property, the University of California began the process of creating a Coastal Long Range Development Plan (CLRDP) for the property. A CLRDP is a comprehensive physical development and land use plan that governs development, land use, and resource protection; similar to a Local Coastal Plan (LCP). The CLRDP for UCSC's Marine Science Campus is the foundational document to facilitate reviews of future projects as they are proposed for the site and is similar to the Long Range Development Plans that guide growth goals and objectives at all UC campuses.

After years of study and negotiation the California Coastal Commission approved the CLRDP for the Marine Science Campus in 2008. The CLRDP includes plans to develop 10 acres of the terrace lands with teaching, research, and public access facilities. In order to shield Environmentally Sensitive Habitat Areas (ESHAs), including the sensitive wetland habitats that exist on the property, the CLRDP requires the protection and restoration of all of the habitat outside of the 10 acres of

developable lands on the Marine Science Campus. As part of the CLRDP agreement, these 47 acres of undevelopable lands are to be protected in perpetuity.

The adoption of the CLRDP by the University of California, and subsequent certification by the California Coastal Commission, resulted in the delegation to the University of California the authority to authorize most on-Campus development consistent with the plan without a coastal development permit, subject to Commission oversight.

The CLRDP does not directly govern the National Oceanic and Atmospheric Administration (NOAA) Fisheries facility, a federal establishment on 2.5 acres of federal land near the center of the Marine Science Campus. The Plan also does not directly govern areas where the Coastal Commission retains direct coastal permit and other development review authority, such as on public tidelands.

Prior to the certification of the CLRDP, faculty and staff from UCSC worked with UC Office of the President (UCOP) staff and the UC Natural Reserves (NRS) Faculty Advisory Committee to examine the feasibility of incorporating the 47 acres of undevelopable terrace lands into the NRS rather than having a third party conservation easement holder manage the lands. In 2008, with the understanding that the site would be used for research, education, outreach, and restoration and funded at a level sufficient to meet management obligations, the UCNRS and UCSC agreed to incorporate these additional lands into the NRS as part of YLR – a requirement of the CLRDP. In order to accomplish CLRDP restoration and management obligations, UCSC committed to permanent funding for staffing the reserve and to funding a 20-year restoration program.

Cost estimates to complete the restoration work required under the CLRDP were initially obtained from outside contractors. These costs estimates were potentially prohibitive (i.e. very expensive) and UCSC staff and faculty discussed the concept of funding YLR staff and faculty to implement and oversee the restoration efforts. As a result of that process, Physical Planning & Construction (PPC) led an effort to create a cost model that used in-house expertise, students, and faculty rather than outside contractors. The estimated costs were significantly lower. Additionally, this model specifically incorporated research and education into the restoration and management work; thus, meeting the core mission of UC. As a result, it was concluded that YLR staff, faculty, and students should spearhead the restoration and maintenance effort guided by a Scientific Advisory Committee (SAC) made up of restoration experts from Central California (also a requirement of the CLRDP). The specifics of this agreement are detailed in the 2008 Agreement Relating to the Marine Science Campus Natural Areas and Younger Lagoon.

The Agreement outlines restoration obligations and funding needs, and provides an estimate of costs for the entire 20-year restoration period. The campus agreed to provide adequate funding for the restoration management and compliance with the Resource Management Plan. YLR agreed to oversee and implement the long-term management of the undeveloped lands and YLR itself.

Policy Considerations for CLRDP and the Marine Science Campus

During the late 1960's and early 1970's very public displays of devastating environmental quality issues led to a string of political acts that sought to address these issues preemptively (Adler et al., 1993). During the creation of the CLRDP the University of California had to comply with several environmental laws, including the California Environmental Quality Act (CEQA), the Coastal Act, the Clean Water Act (CWA), and the Endangered Species Act (ESA), to ensure the protection of resources before, during, and after development of the Marine Science Campus. These policies together are intended to ensure that the sensitivity of the land and its resources are being taken into account by developers. In order for the CLRDP to be approved it was required to consider the sensitive habitats, endangered species, and coastal proximity that make this site distinct.

UCSC's Marine Science Campus, including YLR, is within the jurisdictional area of the California Coastal Commission (CCC) which administers the federal Coastal Zone Management Act of 1972. Due to its location within the California Coastal Zone, all development activities on the campus must comply with the requirements of the Coastal Act. The California Coastal Commission (CCC) was formed when the California Coastal Act was approved through state voter initiative in 1972 and made permanent in 1976 by the state legislature (Klyza et. al, 2011). The main goal of the Coastal Act is to protect and manage the coastlines natural resources with sustainable guidelines. The CCC has regulatory control over all development and growth that is within the coastal zone. The coastal zone varies in width of the coastline from a couple of feet to a few miles (CCC, 2012).

The CCC issues all building permits for construction at YLR and is the major regulatory body that influences the management of YLR, including the setting of restoration goals and success criteria and beach monitoring. YLR staff must submit an annual report outlining progress on restoration goals, reserve-use and required monitoring activities to the CCC each year.

Included in the CLRDP is a detailed Resource Management Plan (RMP). The overall goals of the RMP are to maintain and protect open spaces, sensitive biotic elements, and control public access. Within these goals are specific plans for each type of habitat on the terrace lands. For each goal there are multiple features that have set performance standards, and time periods for monitoring. For each monitoring period there is a next step action that is based on the findings of the performance study. This ensures that all targets are being met or adequately addressed in the timeframe allotted for this project. An appointed Scientific Advisory Committee (SAC) guides the restoration at Younger Lagoon Reserve. The SAC is composed of qualified restoration professionals and academicians who meet frequently to advise and consult with reserve staff. At the time of the writing of this document Environmental Studies department chair Karen Holl was also the chair of the SAC. Other SAC members Lisa Stratton, Director of Ecosystem Management, Cheadle Center for Biodiversity and Ecological Restoration, UC Santa Barbara, Tim Hyland, Resource Ecologist, California State Parks, and Bryan Largay Conservation Director, Land Trust of Santa Cruz County.

CEQA was established in 1970 (Fulton, 2005) and is intended as a means of ensuring that developers are assessing all environmental impacts of a project

adequately. CEQA encourages environmental protection by "requiring state and local agencies to prepare multidisciplinary environmental impact analyses and to make decisions based on those studies' findings regarding the environmental effects of the proposed action" (Bass et al., 1999). The term "environment" is generally defined as the physical conditions that exist including, but not limited to, land, air, water, fauna, flora, noise, and historical or aesthetic significance. If a proposed project has potentially significant impacts to any of these factors an Environmental Impact Report (EIR) must be prepared and circulated to interested parties for feedback and revision.

One of the first steps in the development of the CLRDP was the creation of an Environmental Impact Report (EIR), a document which analyzes potential significant effects on the environment related to a project (Bass et. al, 1999). The Final 2004 CLRDP Environmental Impact Report (FEIR) was completed in 2004, with addendums added as recently as 2010. The FEIR assesses the potential environmental effects, on and off campus, related to the implementation of the Final 2008 CLRDP. It also responds to significant environmental issues raised in the review and consultation process.

Another major piece of legislation that influences restoration of YLR is the Clean Water Act (CWA) of 1972 that created more stringent regulation regarding water quality in the United States (Andreen, 2004). The CWA, administered by the U.S. Army Corps of Engineers, enforces limitations on point-source pollution that could affect rivers, lakes, and streams. As a result of the CWA and a subsequent Memorandum of Understanding in 1990, the U.S. has a no-net loss of wetland

habitats policy. YLR has 13 jurisdictional wetlands on the terrace lands and Younger Lagoon itself. All but one are considered "environmentally sensitive habitat areas" (CLRDP). The additional protections enforced through the CWA had to be included during the environmental assessment process and the CLRDP to ensure that development did not impact the quality of the water in this area. For example, Section 404 of the CWA prohibits the discharge of dredging material into wetlands, the kind that can potentially arise from construction work (Andreen, 2004). Buffer zones were established around the wetlands to hopefully offset any negative impacts from construction and account for seasonal and annual changes in wetland boundaries (e.g. expansion of wetlands in wet years or seasons and shrinking of wetlands in dry years or seasons). The Resource Management Plan outlines specific management actions for the buffer zones along with the wetlands themselves. The CWA has been influential in the protection of wetlands areas at YLR through an in-depth system of permitting.

The other main federal and state habitat protection comes from the Endangered Species Act (ESA). Younger Lagoon Reserve is habitat for the federally endangered Tidewater Goby and the federally threatened California red-legged frog which has been found in wetland areas on the Marine Science Campus. The U.S. Endangered Species Act is administered by the U.S. Department of Fish and Wildlife and is meant to protect the wellbeing of endangered species. There are several additional California ESA listed bird species of concern including: the white-tailed kite, northern harrier hawk, burrowing owl, merlin, and peregrine falcon, and many other species of non-raptor birds (CLRDP, 2007). Threatened and endangered

species make YLR protected under both federal and state laws and subject to further development restrictions.

Following the approval and certification of the CLRDP in 2008 restoration on the terrace lands at YLR began. Funding received from the University of California has allowed for the growth of the internship program that meets the goals of the Natural Reserve System and addresses the Restoration Management Plan for the site.

CLRDP Implementation and Restoration Management

At the time of writing of this document, the UCSC Natural Reserves (UCSC NRS) is a unit within UCSC's Division of Physical and Biological Sciences (PBSci). The main UCSC NRS offices are on the central campus in the Environmental Studies Department. YLR staff also have the use of office space on the Marine Science Campus. In 2012, a Memorandum of Understanding (MOU) between the Institute for Marine Science (IMS), Ecology and Evolutionary Biology Department (EEB) and the UCSC NRS formalized this use of space. Gage Dayton is the administrative director for all of the UCSC Natural Reserves. Dayton works closely with Don Croll who is faculty director for the UCSC Natural Reserves (Howard, interview). Together they are the main channel of communication between the University of California Office of the President (UCOP) NRS offices and the other four UCNRS reserves operated by UCSC. YLR has two full time staff members, Reserve Manager Elizabeth Howard and Restoration Steward, Tim Brown. Other campus resources involved with the restoration at YLR include the Greenhouses, operated by Jim Velzy, which is the main staging area for plant propagation, the Arboretum, and the Site

Stewardship program. Working closely with on-campus resources allows for the ease of resource sharing and internship recruitment.

YLR provides an outstanding outdoor classroom and living laboratory that supports a diverse array of experiential learning opportunities for UCSC undergrads. These experiences have profound impacts on students' lives, both professionally and personally. As a direct result of having sufficient funding and full time staff on site, the level of academic and public engagement at YLR has climbed significantly. Since the approval of the CLRDP, undergraduate internships and class use of the reserve have grown every year, with an average of 50 undergraduate internships per year, including senior internships, and 10 undergraduate classes visiting the reserve each year. The internship program and restoration work has been highlighted in a number of campus and community outreach efforts.

Bordering YLR are a number of neighbors who have a varying degree of involvement. To the west is a private landowner who operates a Brussels sprout farm, and to the east is the De Anza Mobile Home Park. To the north the landholders range from the Union Pacific Railroad Company, private property which houses the non-profit Homeless Garden Project, university land, and the Santa Cruz Land Trust (CLRDP, 2007). Other significant relationships include the Monterey Bay Unified Air Pollution Control District, the City of Santa Cruz, the California Native Plant Society, and the Santa Cruz County Regional Transportation Commission. All of the agencies submitted comments during the circulation period of the Draft Environmental Impact Report that were incorporated into the final CLRDP (FEIR). Legally, UCSC must keep all of these agencies notified about upcoming construction and other

important permitting information. Despite the certification of the CLRDP YLR must continue to promote healthy neighborhood relations through transparent actions and informative education materials.

There are many challenges—both environmental and political— to restoration of YLR. One physical challenge remains the starting conditions at YLR that included virtually no native seed back or existing native grass or forb cover. This makes it difficult to reach success criteria as originally outlined in the Resource Management Plan (Howard, interview). The RMP recommended the creation of even more detailed Specific Resource Plan (SRP) by the SAC meant to address new research or vegetation experience on the site and provide some flexibility in restoration (CLRDP, 2008). The SRP was completed in 2010 and took into account baseline and reference site surveys. Climate change also creates some uncertainty regarding the success of the reestablished native plants. Plants that may have not needed much care after the first year or two may need more hands on care for longer or may fail entirely if temperature and rainfall patterns are significantly altered. The possibility of further budget cuts remains an issue although to date there has been an adequate level of support for the restoration from the UCSC campus.

The Resource Management Plan spans a 20-year period divided into two seven-year phases and one six-year phase. YLR is currently in the first seven-year phase of restoration. The RMP establishes monitoring timelines for each ranges of measures (habitat types, erosion hazards, special-status wildlife species) to ensure that they are being accounted for (CLRDP 2008). Recently, YLR completed the first

round of compliance monitoring for the site that involved monitoring of restoration sites planted in the first year of restoration to see if goals were being met. They successfully met all the standards outlined in the RMP. According to Elizabeth Howard, Reserve Manager, the reserve staff is on target to have fifteen acres restored or already in native habitat by the end of Phase One. Howard's aim is to restore two and a half acres every year, so the entire restoration will be completed in the allotted 20 years. The continued success of restoration at YLR can be made possible through continued student involvement and community support.

YLR is in a unique place, with a diverse history of landowners and users. The political decision-making process and management plan are parts to a larger strategy that make up the overall restoration project of YLR. As equally important as developing an understanding of these human interactions is learning the ecology of restoration at YLR. Having accurate and current knowledge of the habitat quality at YLR is essential for ensuring that proper management strategies are used. In following chapters aspects of ecological restoration relevant to YLR management will be discussed.

Further Readings and Resources

Andreen, William. (2004). "Water Quality Today- Has the Clean Water Act Been a Success?" Alabama Law Review. 537-93. Vol. 55. Print.

I found this source helpful when examining the Clean Water Act and its progress since it was passed. The review covers the basics of what the CWA has been successful in and then critiques how it could be improved. The review also gives opinions about what environmental law needs to focus on now in order to further protect natural resources.

Bass, R., Herson, A., Bogdan, K. (1999). *CEQA Deskbook*. Solano Press Books: California.

This source covers CEQA law and practices. It provides step-by-step procedures regarding the environmental review process and the requirements of each stage. I found the chapters on the background and implementation of CEQA as well as the preparation and review chapter valuable to this research topic. This source is used frequently as a teaching aide and lays out the procedures in a straightforward manner. Overall I found this source very useful in helping me understand the interworking of the EIR process.

Cartier, Robert. (1991). *An Overview of Ohlone Culture.*

This short article is focused on the lives of Ohlone Indians prior to Spanish occupation. It gives readers information about cultural practices as well as some basic human ecological interactions. I found this article helpful while learning about what human stewardship of the YLR was like before modern development.

Commission, California Coastal. (2012) "California Coastal Commission:Why It Exists and What It Does." San Francisco. Print.

This is a promotional pamphlet, also available online, that gives the reader a basic overview of the California Coastal Commission and the work they do. Further reading on the would be needed if one wanted to find a review of how the formation of the CCC has affected coastal environmental health. I found this resource helpful for this project because it effectively lays out information in an easily accessible fashion.

Hunt, L. (2009). *Narrative History of Younger Lagoon Reserve*.

Laurel Hunt is a graduate of UCSC and worked as an intern and field assistant at YLR while she was a student. She researched and wrote this article as part of a senior internship in collaboration with Professor Karen Holl. This essay provides an extension overview of the history of YLR from a historical ecology perspective. Hunt

consults county records and land deeds to track the land ownership and property entitlements to YLR back to the 1500's.

This source provides a complete and well-researched history of YLR land and adequate analysis regarding its various uses. The information in this essay allowed me to more thoroughly understand background YLR land policy actions.

Fulton, W., Shigley, P. (2005). *Guide to California Planning Third Edition*. Solano Press Books: California.

This books content covers provide a foundational understanding of California Land Use policy and the planning process. Part Six specifically covers natural resources protection and CEQA regulatory framework. Guides are a good source for developing an overall understanding of California policies and the methodologies behind them.

McGrory Klyza, Christopher, and Paula Ford-Martin. (2011). "Coastal Zone Management Act (1972)." 4 ed. Detroit: Gale, 336-39. Vol. 1. Print.

This resource gives a short overview of the Coastal Zone Management Act and the subsequent policy additions. It is important to know the basic history of Acts like these in order to develop an understanding of how those changes affected environmental assessment as a whole. From this source I was able to identify that YLR is protected by the CZMA because of its wetland habitats.

UCSC Environmental Assessment Group. (January 2004). *UCSC Marine Science Campus CLRDP DEIR.* http://ppc.ucsc.edu/cp/projects/11407/planning/clrdp-deir.pdf.

This is the Draft EIR approved for the Marine Science Campus. This source provides the project description, environmental analysis, and proposed mitigation measures for this development project. This DEIR adequately covers existing conditions at the time of its drafting as well as descriptions of potential impacts from development. I found the Project Summary, Environmental Setting Impacts and Mitigation Measures, and Agencies and Persons Contacted Chapters the most useful for this project. This DEIR is thorough although slightly outdated due to economic and political developments since its approval in 2004.

UC Santa Cruz. (December 2008). *Marine Science Campus Coastal Long Range Development Plan*.
http://ppc.ucsc.edu/cp/projects/11407/cp/projects/11407/planning/clrdp08

This is the complete Coastal Long Range Development Plan for the Marine Science Campus (CLRDP) located at YLR. Included in this document is the Resource Management Plan that outlines management goals and monitoring for habitat types at The Marine Science Campus.

University of California Natural Reserve System. Younger Lagoon Reserve. November 2012. Web.

The UCNRS webpage offers basic information about each reserve as well as current updates. The UCNRS catalogs the division of management of the reserves by campus.

Acronym List

CEQA- California Environmental Quality Act
CCC- California Coastal Commission
CLRDP- Coastal Long Range Development Plan
CWA- Clean Water Act
EEB- Ecology and Evolutionary Biology
EIR- Environmental Impact Report
ESA- Endangered Species Act
ESHA- Environmentally Sensitive Habitat Area
FEIR- Final Environmental Impact Report
IMS- Institute for Marine Science
LCP- Local Coastal Plan
MOU- Memorandum of Understanding
NOAA- National Oceanic Atmospheric Administration
NOP- Notice of Preparation
NRS- Natural Reserve System
PBSci- Physical and Biological Science Division
PPC- Physical Planning and Construction
RMP- Resource Management Plan
SAC- Scientific Advisory Committee
SRP- Specific Resource Plan
UCNRS- University of California Natural Reserve System
UCOP- University of California Office of the President
UCSC- University of California Santa Cruz
UCSC NRS- University of California Santa Cruz Natural Reserve System
YLR- Younger Lagoon Reserve