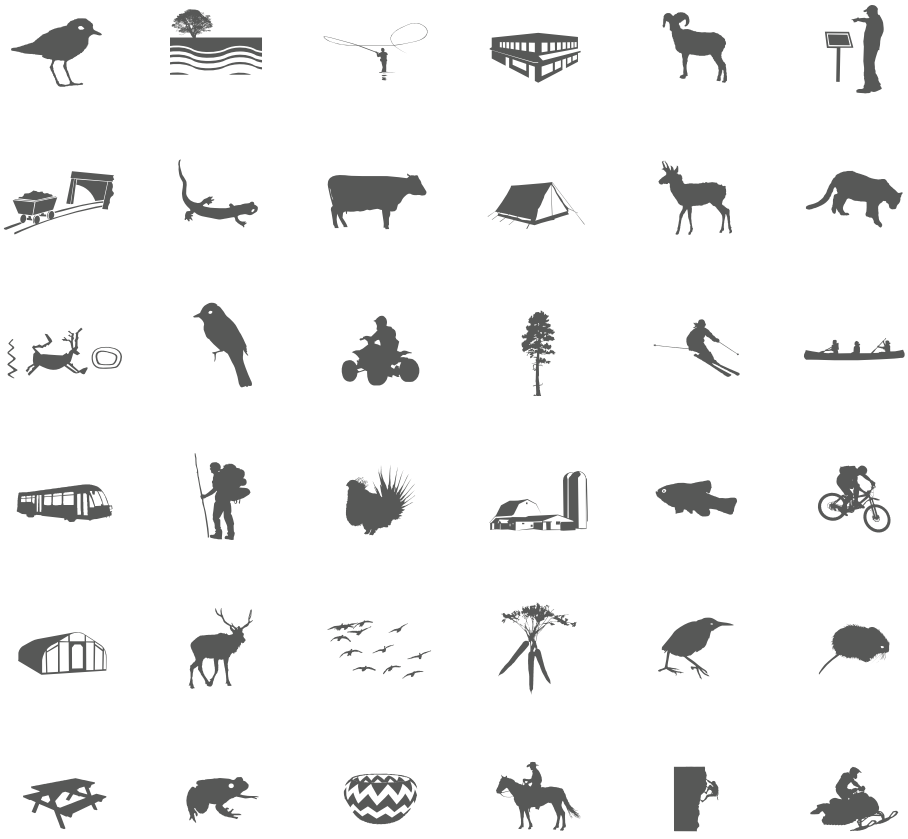
WATERSHED WHISPERERS

Exploring Potential for Water Use, Infrastructure, and Environmental Justice in the Owens Valley and Mono Basin



California State Polytechnic University, Pomona
Department of Landscape Architecture
Sponsor: Metabolic Studio
Principal Investigator: Professor Barry Lehrman

606 Studio Team: Tiernan Doyle, Eric Haley, James Powell, and Devon Santy
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AQUEDUCT FUTURES

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Aqueduct Futures: The Cal Poly Pomona Los Angeles Aqueduct Centennial Project
With financial support from the Metabolic Studio

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ACRONYMS USED IN THIS DOCUMENT

ADA	Americans with Disabilities Act
AF	Acre-Feet
AGR	Agriculture Program Category
AIM	Assessment Inventory and Monitoring
BLM	Bureau of Land Management
CDWR	California Department of Water Resources
CEQA	California Environmental Quality Act
CFS	Cubic Feet per Second
CSA	Community Supported Agriculture
DCR	Massachusetts Department of Conservation and Recreation
DEM	Digital Elevation Model
DEV	Development Program Category
DFIRM	Digital Flood Insurance Rate Maps
DOD	Department of Defense
DWP	Department of Water and Power (shorthand for LADWP)
ECSZ	Eastern California Shear Zone
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESTA	Eastern Sierra Transit Authority
FEMA	Federal Emergency Management Agency
FFA	Future Farmers of America
FIPS	Federal Information Processing Standard
FRAP	Fire and Resource Assessment Program
GBUAPCD	Great Basin Unified Air Pollution Control District
GCM	General Circulation Model
GIS	Geographic Information Systems
GPCD	Gallons per capita per day
HAB	Habitat Rehabilitation Program Category
HAER	Historic American Engineering Record
HYD	Hydrologic Regeneration program category
ICWD	Inyo County Water District
IMP	Interim Management Policy
IPCC	Intergovernmental Panel on Climate Change
LADWP	Los Angeles Department of Water and Power
LID	Low Impact Development
LORP	Lower Owens River Project
LQ	Location Quotient
LTWA	Long Term Water Agreement
MLC	Mono Lake Committee
MOU	Memorandum of Understanding
NCDC	National Climatic Data Center
NEPA	National Environmental Policy Act
NHD	National Hydrology Dataset
NLCD	National Land Cover Database
NPS	National Park Service
NRCS	United States Department of Agriculture National Resource Conservation Service
OHV	Off Highway Vehicle
OVC	Owens Valley Committee
PM-10	Particulate Matter of 10 microns or less in diameter
PoO	Plan of Operations
REA	Rapid Ecoregional Assessment
REC	Recreation Program Category
RV	Recreational Vehicle
SSURGO	Soil Survey Geographic Database
SWRCB	State Water Resource Control Board
TTF	Technical Trail Feature
USFS	United States Department of Agriculture Forest Service
USFWS	United States Department of Fish and Wildlife
USGBC	United States Green Building Council
USGS	United States Geologic Survey
UWMP	Urban Water Management Plan
WGCEP	Working Group for California Earthquake Probabilities
WHSRN	Western Hemisphere Shorebird Reserve Network

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Scott Burns – Mono County Planning Department
Danna Stroud – Sierra Nevada Conservancy
Holly Alpert – Inyo-Mono Regional Water Management Group
Sally Manning – Big Pine Paiute Tribe Environmental Director
Daniel Pritchett – Owens Valley Committee
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Mike Prather – Eastern Sierra Audubon Society
Alan Bacock – Big Pine Paiute Tribe / Owens Valley Committee
Tom LaBonge – Los Angeles City Councilmember
Geoff McQuilkin – Mono Lake Committee

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Figure 1. Grant Lake from the Dam
Photo: Eric Haley 2012

EXECUTIVE SUMMARY

The Los Angeles Aqueduct has been a source of urban growth, wealth, and prosperity, as well as intense animosity, environmental degradation, and extensive legal action for over one hundred years. Since before the Aqueduct's completion in 1913, the multi-faceted relationship between the Eastern Sierra and the City of Los Angeles has perpetuated continued discussion over resource extraction and water usage that extends outward into the greater United States (Libecap 2004). While complex, the issues that demand reexamination of this subject and of the regional impacts of the Aqueduct on its watershed are not new. Groundwater pumping, stream diversions, habitat loss, and economic stasis can be seen as the side effects of large-scale urban water projects across the globe (Glennon 2002). In 1913, Los Angeles was ahead of its time in establishing one of its main water supplies over 200 miles away from the city center (Libecap 2004), but this story has become increasingly familiar as urban areas transform into megalopolises enabled by ever increasing control and regulation over distant water sources (Birch and Wachter 2011). As the 100 year anniversary of the Aqueduct passes, Los Angeles and the Eastern Sierra have the potential to become leaders and curators of sustainable water sourcing and supply that will be an example for other cities throughout the world.

Aqueduct Futures

In response to the centennial anniversary of the Los Angeles Aqueduct's completion, Professor Barry Lehrman of the California State Polytechnic University of Pomona created the Aqueduct Futures Project to explore the next 100 years of water use and development in Southern California. This project took the form of interdisciplinary courses that included community engagement, and developed an exhibit and website aimed at the general public and K-12 schools. The overall goal of these efforts was to advance policy and practices related to the adaptability, resiliency, and

Figure 2. Independence Wellfield Erosion
Photo: James Powell 2013

sustainability of the water infrastructure in Southern California; raise awareness about the water/energy nexus; and explore the cultural and ecological impacts of the Aqueduct.

606 Studio

As part of this larger effort, Professor Lehrman sponsored a team of graduate students from the Masters of Landscape Architecture program at the California State Polytechnic University of Pomona to develop regional strategies for sustainable land use and watershed planning along the northern half of the Aqueduct. Working as part of the program's capstone 606 Studio, this team developed a vision plan for the Owens Valley and Mono Basin watersheds that explores land planning possibilities and alternative futures of the Eastern Sierra region. Recognizing that Los Angeles and the Owens Valley now have the tremendous opportunity to become leaders in the realm of sustainable water supply, cooperative land stewardship, and resource resiliency, this vision plan examines different ways in which these possibilities may be realized and expanded into the future.

Setting the Stage

The project area is located approximately 233 miles northeast of the City of Los Angeles. Bounded on the western side by the peaks of the Sierra Nevada and by the White and Inyo Mountains to the east, the Owens Valley is the deepest valley in the United States. Together with the creeks that drain into Mono Lake, these areas make up the watershed for the Los Angeles Aqueduct. Though the Eastern Sierra provides over half of the water supply of Los Angeles, the local population is sparse, and scattered mainly in small, unincorporated towns that are situated near Highway 395, which runs north-south through the entire area. In total, the study area comprises 4,188 square miles (10,847 sq km) with a population of 34,000 in 2013. This can be compared with the City of Los Angeles, which had a population of 3.82 million in 2011, and occupied 503 square miles (1,302 sq km).

Characters

Land ownership within the study area is concentrated within the hands of three major agencies: the Los Angeles Department of Water and Power (LADWP), which exports the water resources of the area to supply the City of Los Angeles; the United States Department of Interior Bureau of Land Management (BLM), a federal agency which oversees mineral resources and energy production on government land; and the United States Department of Agriculture Forest Service (USFS), which manages timber, water, and recreation resources within the Inyo National Forest. Though they have major impacts on the lands and resources in the area, the decision making and planning processes of these agencies are often disparate and made at a scale that does not reflect the needs of the watershed as a whole.

Processes

The effects of the geography of the Eastern Sierra are not limited to striking scenery alone. Topography and terrestrial processes have created intricate patterns of weather, hydrologic resources, and geologic activity. Specialized plant communities and wildlife species developed to take advantage of the resulting landscapes. Because of the relative isolation of the area, and the specialized conditions, the Eastern Sierra is home to a multitude of rare and endangered plant and animal species that are scarce throughout the rest of California. Though much of the area is kept undeveloped because of federal ownership, a long history of resource extraction that includes mining, water withdrawals, and electricity generation has taken a toll on the land, the effects of which are especially visible in the desiccated springs in the Owens Valley. Resource extraction has affected ecologies of the area by degrading wildlife habitat and causing widespread conversion of vegetation types, but it has also taken a toll on the local communities. Because of the large amount of federal and municipal land ownership in the area, the economy has remained stagnant, privately owned land is virtually non-existent, and the employment sector is dependent on government jobs and a highly seasonal tourism base.

Community

Community outreach was a vital component that helped to shape the final goal, objectives, and deliverables of the project. Outreach was conducted through two community workshops, 12 stakeholder interviews, and an online survey, which was open to residents of the Eastern Sierra for two months. The information gained from these meetings confirmed a great deal of information that had already been obtained through background research, but it also introduced new topics that were of great importance to local communities. After analyzing the content from the community meetings, it became clear that the main areas of planning importance within the Eastern Sierra involved agriculture, town development, wildlife habitat, water resources, and recreation.

Analysis and Program

Uniting research, community workshops, and agency needs within one project required analysis of disparate approaches to and opinions of the Aqueduct. While this presented a complex challenge for the planning process, each way of thinking also brought exciting opportunities. Recognizing this as a strength of the region, the team determined that developing a toolbox of planning strategies for future work would be the most effective deliverable that could be created. The resulting material could then be used by a wide range of decision makers, from community groups to federal landowners, to increase cooperation and create projects that are beneficial for the area on a watershed scale.

After the categories of planning importance had been derived from research and community workshops, the first step in creating this toolbox was analysis of the existing landscape. Using GIS data from a variety of sources, the landscape was broken down into units based on the similarity or differences of their physical attributes. The planning categories of agriculture, town development, wildlife habitat, water resources, and recreation were each assigned generalized physical attributes that defined areas in which the activities could take place. These physical attributes were matched with the landscape units that had been created to map out where these land use types could take place on the ground.

Once the program feasibility categories had been mapped onto the landscape, it became clear that there were areas where more than one program category could take place. These sites of overlap became opportunities to create areas of nuanced design, where planning projects could increase both cooperation among agencies and ecological health throughout the area.

Figure 3. Alabama Hills Arch
Photo: Eric Haley 2012

Guidelines

Due to the delicate nature of the environmental and social processes within the study area, the toolbox was expanded beyond programmatic mapping to include guidelines for the responsible and suitable installation of those land use types. In order to accomplish this, planning guidelines based on sustainable methods, low impact design, and environmentally conscious precedents were developed for each program category. Recognizing that the areas of programming overlap present special opportunities for unified and productive action, the project gives special attention to developing guidelines for the overlap areas. These overlap guidelines provide suggestions for how to make multiple program categories work within one area.

Implementation

In order to make the final document as useful to community and planning groups as possible, the project also developed sample implementation activities that could be undertaken within the study area. These implementations included a variety of smaller scale programming options that would fit within the program categories and help to ameliorate any conflict within the overlap areas. Each implementation activity was coded by the program categories to which it could belong in order to make the planning process easier and more effective.

This vision plan does not provide specific designs or mandates for action. As a student project, this document has no authority to enforce any policy change, and many of the desires of the community were determined to be outside the scope of this vision plan. Instead, this document aims to be a catalyst for cooperation between agencies and communities by providing planning tools and options for the entire watershed of the Los Angeles Aqueduct within a singular project. It is hoped that the common language created by this vision plan's toolkit will help to further the sustainable water use practices already underway, and move the Eastern Sierra and the City of Los Angeles into a new era of accord and leadership in the realm of resource extraction and supply.

The Frog sisters lived at a spring. Rattlesnake, who lived about one mile or more away, planned to steal the spring away from them. He kept very close watch until he had a chance. One afternoon, when the Frog sisters were fast asleep and no one was around, Rattlesnake came down to the spring and drank as much as he could, holding the rest of the water in his mouth. He took every bit of the water in the spring and started for his home. He was about a half-mile away when the Frog sisters woke up and to their surprise found no water in their spring. They immediately investigated and guessed what had become of their water. They pursued Rattlesnake and saw him climbing up the hill. The Frog sisters followed him up the hill as fast as they could. Upon seeing the sisters in pursuit, Rattlesnake increased his speed, but as he ascended the mountain, he became tired, coughed, and spat out some of the water. He continued on his journey until the Frog sisters overtook him, stopped him, tickled him, and made him spit all the water he had in his mouth. The Frog sisters drank the water and took it back to their spring where they deposited the water in its rightful place.

– Paiute fable (as told by Susie Baker in 1935) (Bauer 2012)