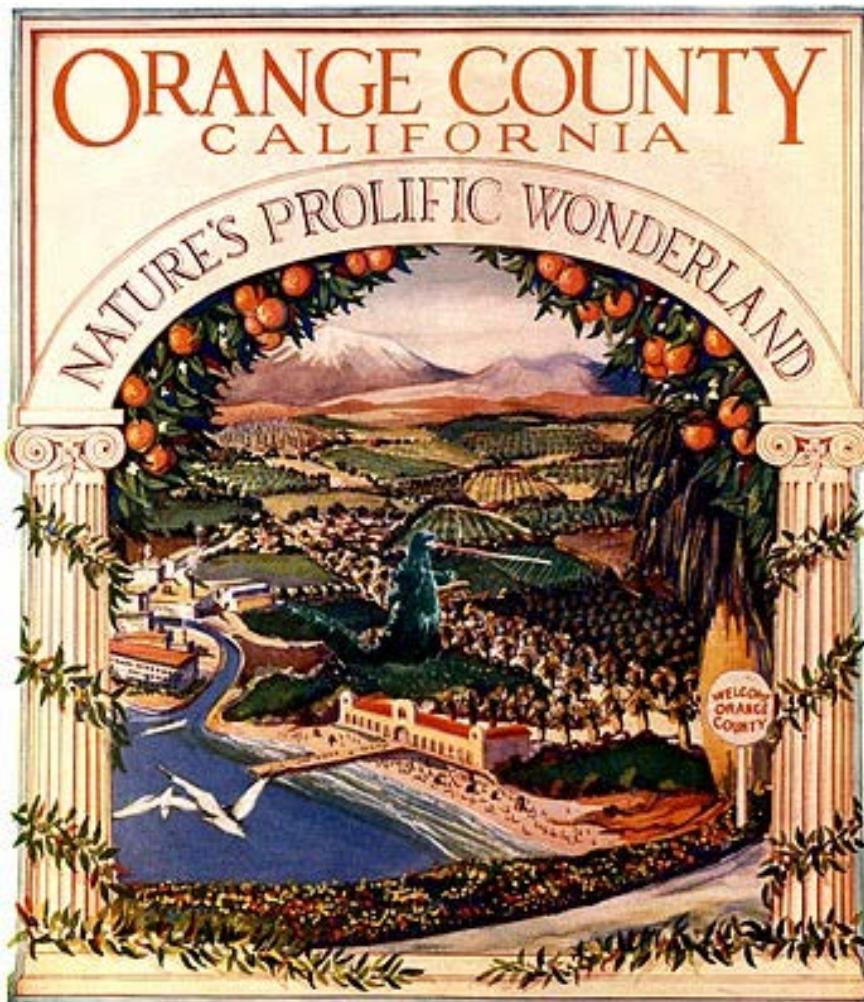
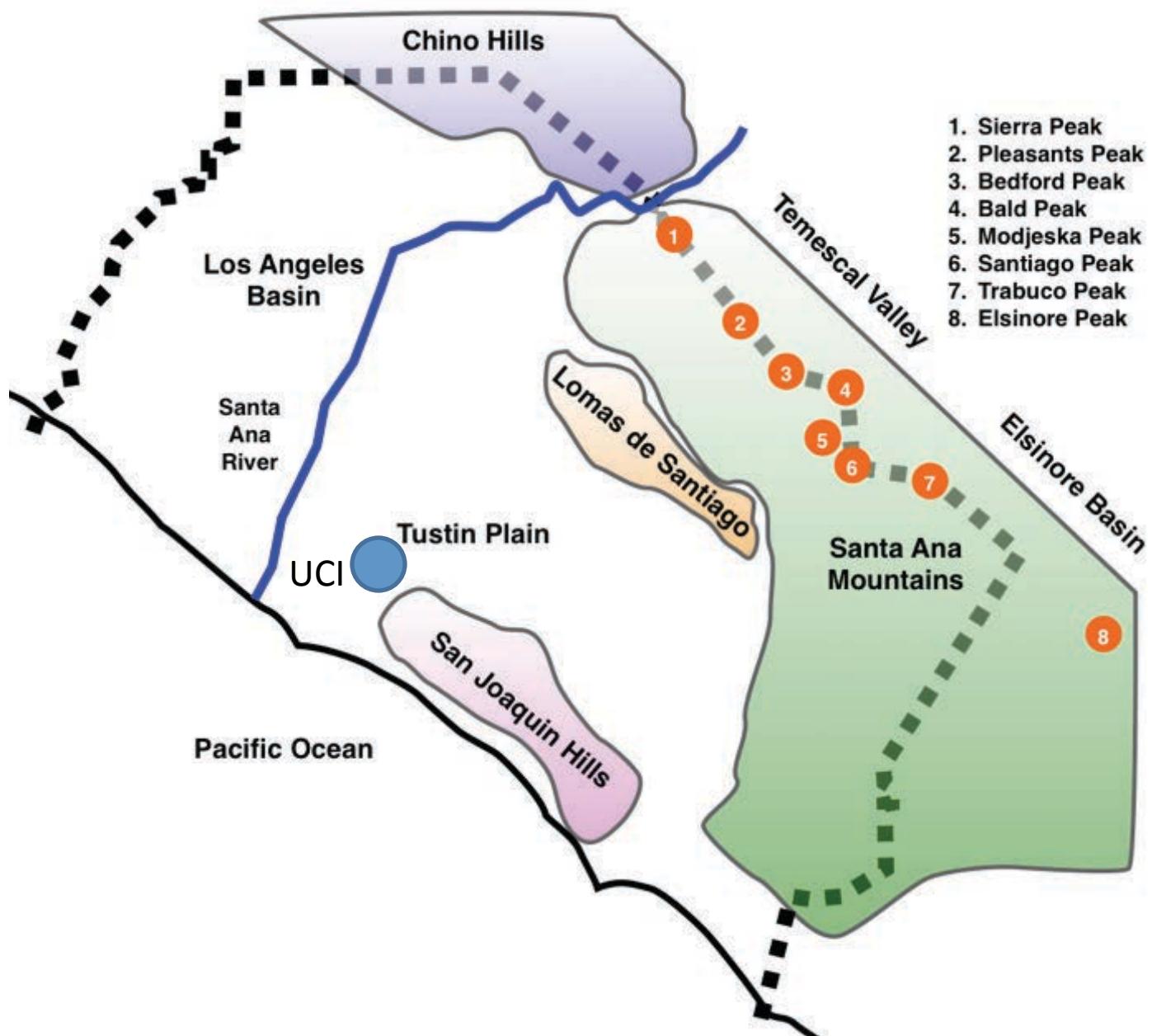


Ecological Research in Orange County: Origins and Future



Ecological Workshop – UC Irvine
Center for Environmental Biology
January 27, 2012



Key geomorphic feature – the Santa Ana Mountains



Santiago and Modjeska Peaks



San Joaquin Hills



Key hydrologic feature – the Santa Ana River



Like the Los Angeles and San Gabriel Rivers, the river often changed its channels near the coast, creating extensive wetlands



Balboa Peninsula formed by the 1862 flood of the Santa Ana River



Balboa Island - 1921



Floods of 1938-39
50% of Orange County underwater
construction of the Prado Dam and
channelization of the river



The Euro-American Era



In July 1769, Gaspar de Portola led an expedition into what is now Orange County; journal records by Father Juan Crespi are the first descriptions of the region.

July 27, 1769 – first account of a California earthquake; the Santa Ana River was named Rio de los Temblores

The Era of the Spanish Ranchos



Don Jose Andres Sepulveda (1801-1875) Sepulveda owned the **Rancho San Joaquin**, the 50,000 acres of land granted by the Mexican government in 1842. His legendary equestrian skills were only surpassed by his flair for fashionable clothing.

At one time, Don Jose Sepulveda was one of the richest men in California by selling beef to hungry miners during the Gold Rush. But when devastating drought and years of extravagance finally caught up with Sepulveda in 1864, mounting debt forced him to sell his land to James Irvine and his partners. These land holdings were increased to more than 100,000 acres.

Plein air school of art – centered in Laguna Beach
captured the landscapes of orange County



William Wendt – 1865-1946



William Griffith 1866-1940
Laguna Canyon



Edgar Payne (1883-1947)
San Juan Capistrano



Benjamin Chambers Brown – 1865-1942



Carl Schmidt - 1885-1969
Irvine's Ranch, Laguna Beach



Edgar Payne – ca. 1940 eucalyptus school

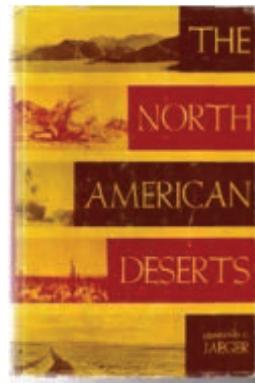
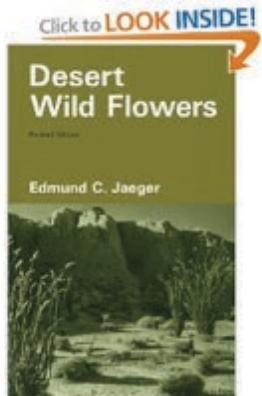
The Modern Era of Ecological Studies



Paleontological studies from the Santa Ana Mountains
were published as early as 1918
Terrestrial research began 70 years ago

Newport Bay - work on marine biology and paleontology began being published in the 1920s

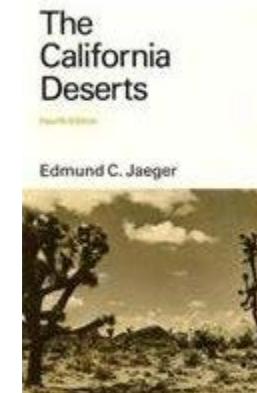


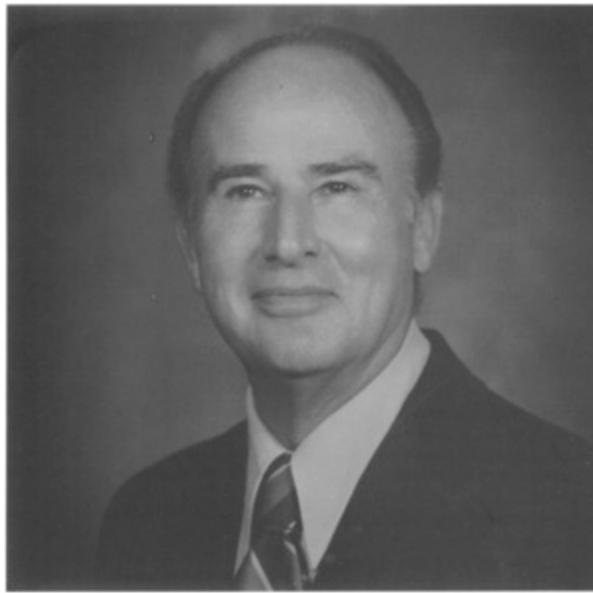


Edmund C. Jaeger (1887-1983)

Iconic desert naturalist;
author of many popular books on
desert organisms

Graduated from Occidental College
in 1918 and began teaching at
Riverside City College; major
influence on many young students





One of these students was
Willis E. Pequegnat (1904-1994)

Ph.D. UCLA, Dept. of Zoology – 1942
**The Biota of the Santa Ana
Mountains.**

Published in J. Entomol. Zool., 42:1
-84 (1951).

- Distinguished career in marine ecology
- Pomona College (1940-1960), and Kerkoff Marine Laboratory of Cal Tech in Corona del Mar.
- Among the first to apply SCUBA and underwater photography to marine ecological research.
- Research Associate at Scripps
- Best known for his work with crustacean ecology.
- Finished his career at Texas A & M.

1965 – Dick Vogl (Cal State Los Angeles)
began ecological research in Orange County



Santa Ana Mountains



Upper Newport Bay

First quantitative descriptive studies of plant communities

University of California moves to Orange County



In 1960 the Irvine Company sold the University of California 1,000 acres (400 ha) of land for one dollar to establish a new campus and President Lyndon Johnson dedicated the campus in 1964. Instruction began in October 1965 with 1589 students and 119 faculty.

UCI Graduation - 1968



UC Irvine campus - November 1969

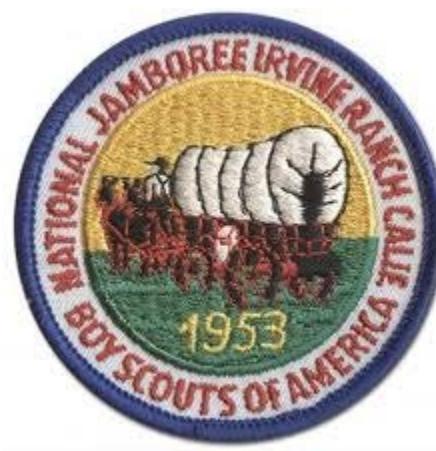


N.B. the city of Irvine only was established in 1975

International Boy Scout Jamboree – Irvine Ranch 1953



First American Corp

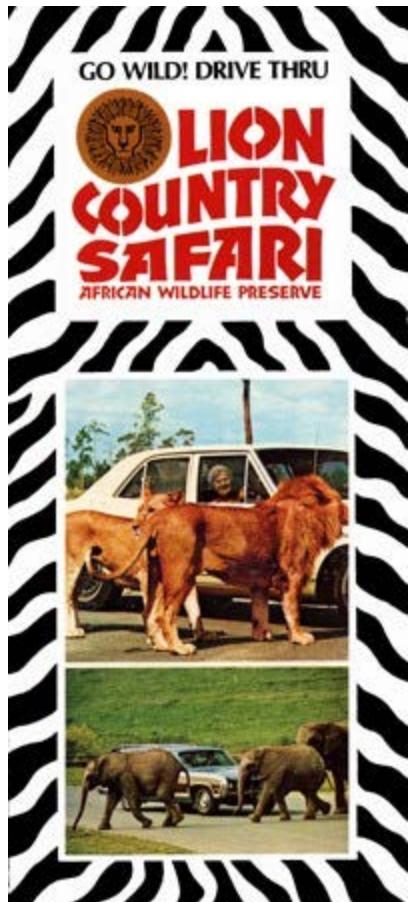


Buffalo Ranch 1955-59 - first private lease of Irvine Ranch lands



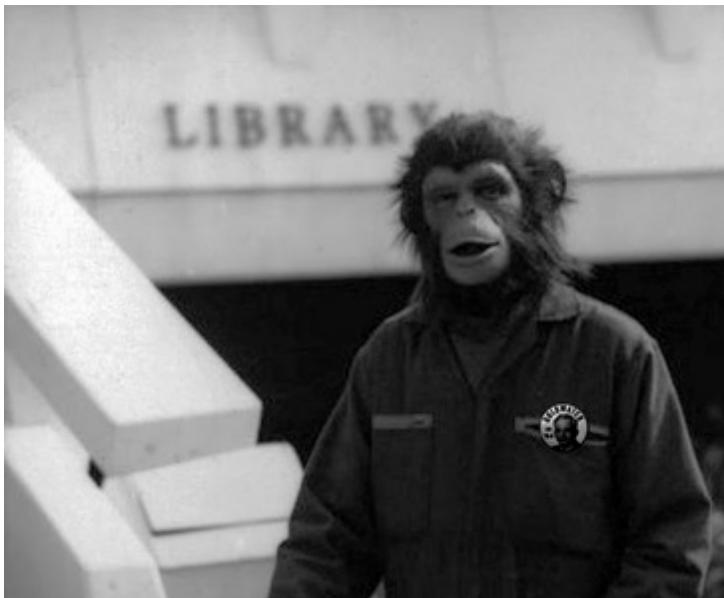
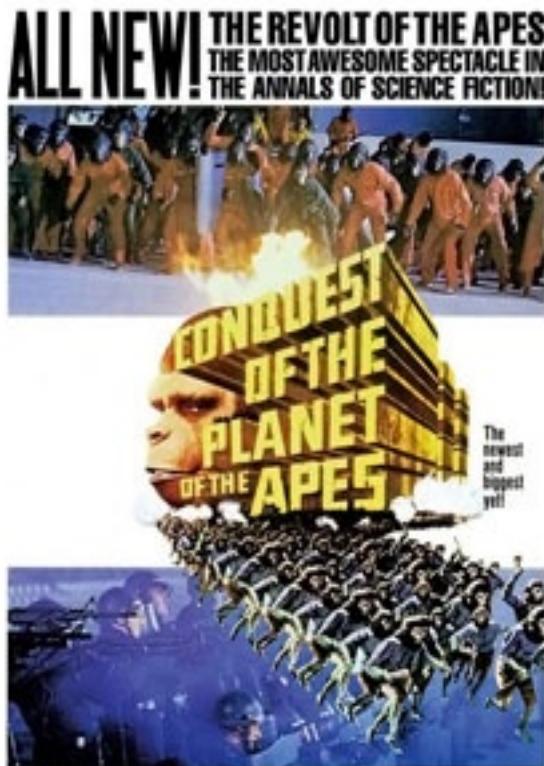
Later became offices for William Pereira, the chief architect for UC Irvine

Lion Country Safari - Irvine – 1970-84



A quarter of a century before the dawn of Viagra, American men found hope in the prowess of an aging Lothario named Frasier.

UC Irvine Wildlife Conquest of the Planet of the Apes - 1972





UNIVERSITY *of* CALIFORNIA · IRVINE

Department of Population and Environmental Biology

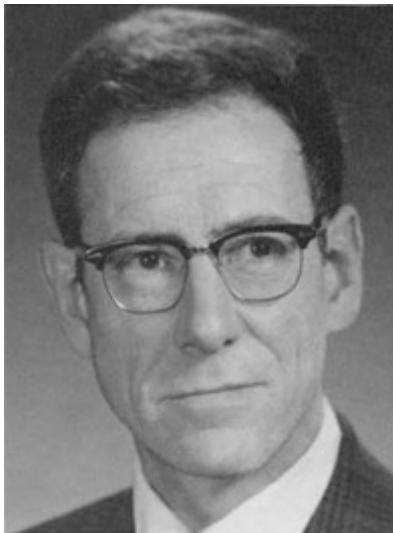
Founding Chairman (1965) – Arthur Boughey
British ecologist with work in Zimbabwe



Peter Dixon – Chairman 1969-76; retired 1991

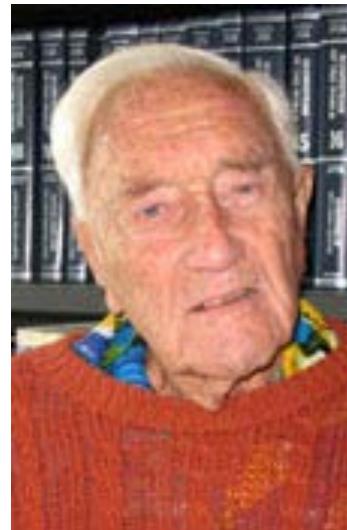
co-founder and developer with Jan Scherfig of the UCI Water Resources Laboratory in the School of Engineering

Two high profile founding faculty members



Robert Whittaker
1920-1980

A handwritten signature of Robert Whittaker.



David Goodall
1914-

Whittaker arrived at the peak of his fame in plant community ecology; a major SOCAL project on a gradient analysis of the San Jacinto Mountains was begun but never completed

Goodall is an ecosystem ecologist who later headed the IBP Desert Biome program in the 1970s; now retired in Australia

Opportunities for ecological work on campus in the San Joaquin Marsh and the San Joaquin Hills.

At the same time, strong student interest in field ecological experience.



Challenge: How to get undergraduate students involved in intensive field experiences in a variety of California ecosystems

1971 – Development of the “Supercourse” 16-unit package of courses in spring quarter

Dick MacMillen – Physiological Animal Ecology (4 units)

Peter Atsatt – Field Botany (4 units)

Phil Rundel – Physiological Plant Ecology (4 units)

Independent Research (4 units)



Three week-long field trips – coast, desert, Sierra Nevada; at each site a group project and individual projects were carried out.

1997 Supercourse at White Mountains Research Station

Week 1. Orientation to the Owens and Mono Basins, from Mono Lake (Mono County) to Owens Lake (Inyo County): Local experts in fish and game management..

Week 2. Applied Conservation Biology: Water and Land Management Los Angeles Department of Water and Power, and local cattle rancher.

Week 3. Field Ecology: Terrestrial Ecosystems and Communities. Faculty from UC Irvine, UC San Diego.

Week 4. Applied Conservation Biology: Water and Land Management. Experts from BLM, Inyo County Water Department, California Attorney General's Office.

Week 5. Field Ecology: Aquatic Ecosystems and Communities. Faculty from UC Irvine, Claremont Colleges (Emeritus).

Week 6. Applied Conservation Biology: Mono and Owens Lakes. Experts from U.C. Sierra Nevada Aquatic Research Laboratory, and Great Basin Air Pollution Control District. Black Toad and Bat Census, WMRS staff.

Week 7. Physiological Ecology: Regulation. Energy, Temperature, Nitrogen, Water. Faculty from UC Riverside, UC Irvine.

Week 8. Physiological Ecology: Respiration of Aquatic and Terrestrial Animals. Faculty from UC Irvine, UC San Diego.

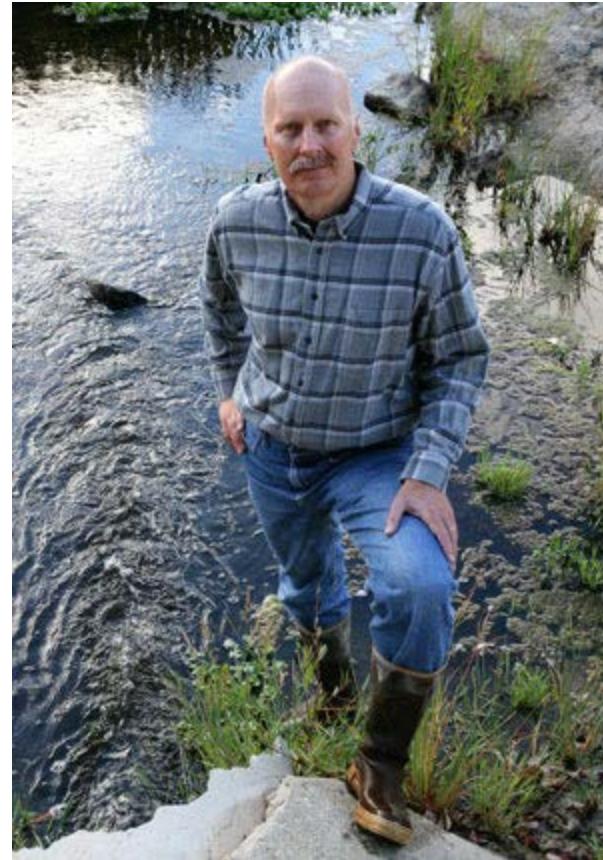
Week 9. Independent Research Projects. WMRS staff.

Week 10. Independent Research Projects, and Poster Session. WMRS staff.

UCI undergraduates who went on to contribute to UCLA



Victoria Sork – Dean of Life Sciences



Rich Ambrose – Chair of Environmental
Science and Engineering

Plant Ecophysiology

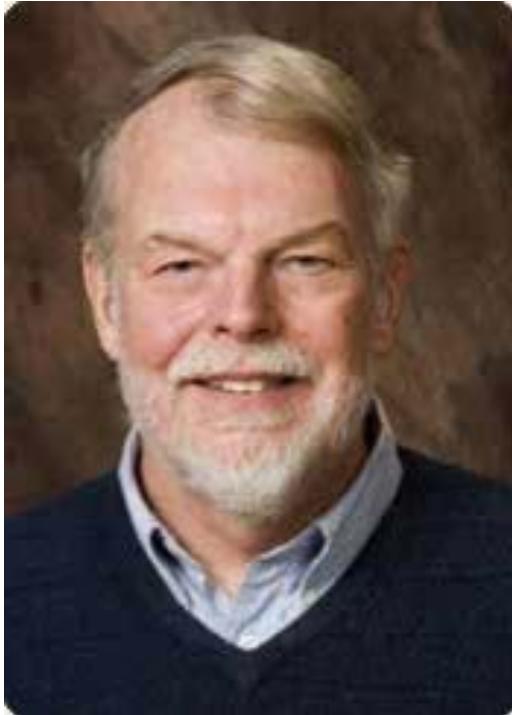


Barbara Bond – Oregon State
Director of the Andrews Forest LTER



Rick Meinzer
US Forest Service

Global Change Biology



Peter Meserve
Northern Illinois Univ.



Nate Stephenson - USGS



Paul Ewald – Amherst Univ.
Ecology of disease transmission



Mark Hay – Georgia Tech
Marine Biology

Plant Ecology and Population Biology

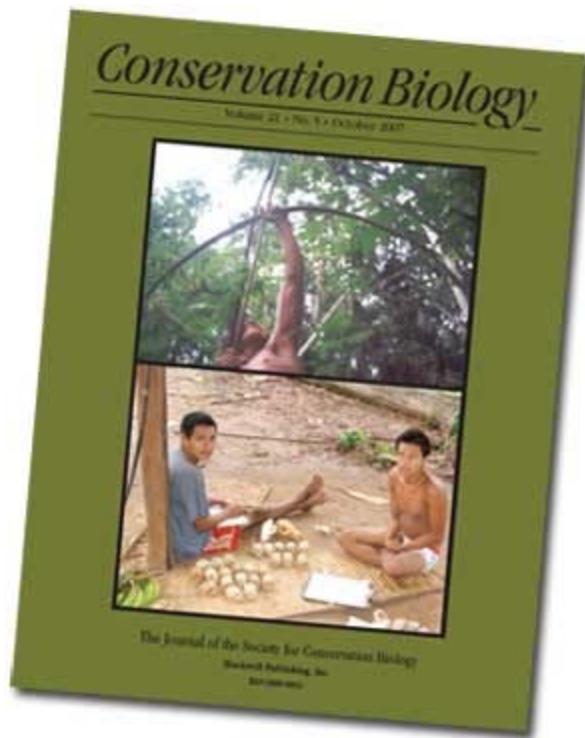


Don Strong – UC Davis
Editor of Ecology



Johanna Schmidt – Brown Univ.
National Academy Sciences
(Summer program undergraduate)

The Foundation of Modern Conservation Biology

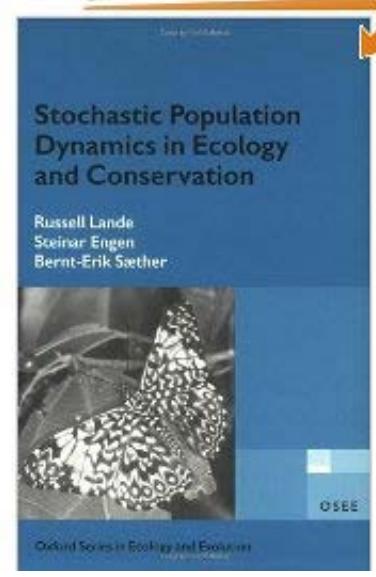
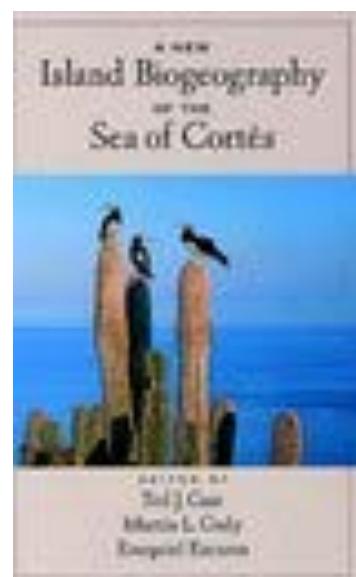
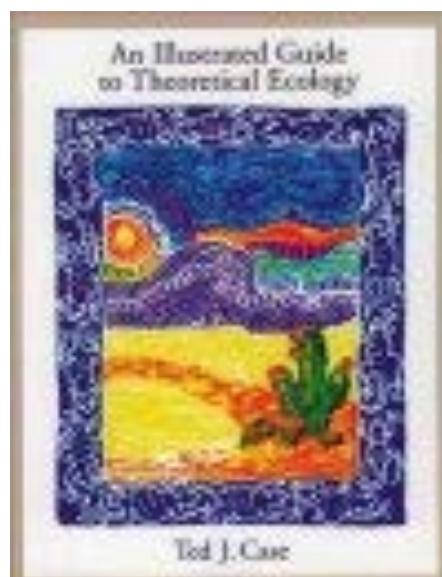
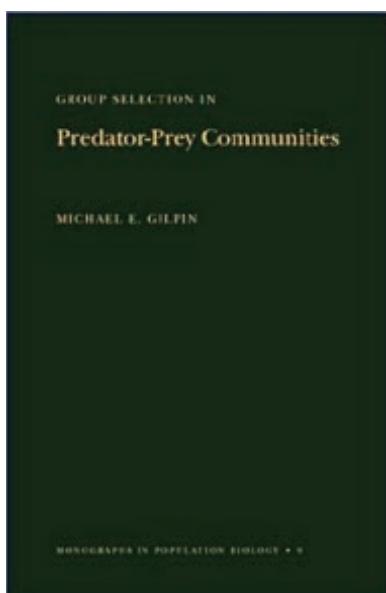
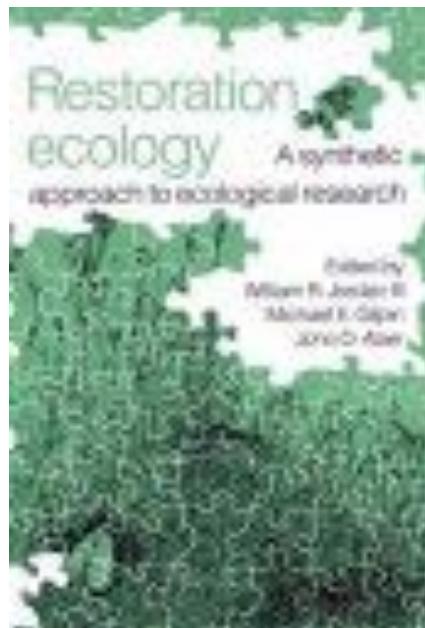
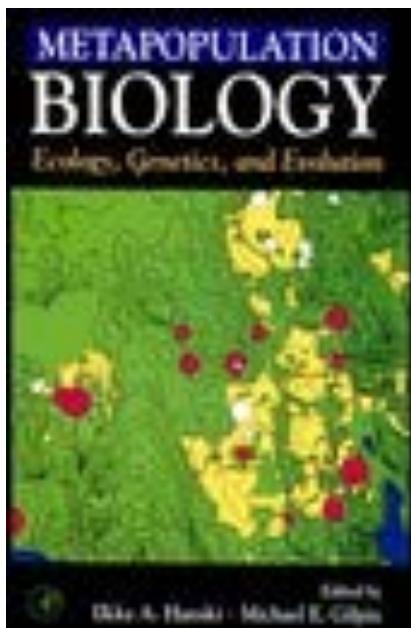


The origin of this field in the late 1970s and early 1980s at UC San Diego was heavily influenced by three former UCI graduate students and undergraduates.

Michael Gilpin
Ted Case
Russ Lande

Baja California – spring break 1970





CLICK INSIDE!



Peter Kareiva – Chief Scientist for the TNC
National Academy of Sciences

Irvine Ranch National Natural Landmark

established in 2006



NNLs are designated by the U.S. Secretary of the Interior for natural areas in both public and private ownership. They are recognized as outstanding examples of the natural heritage of the country .

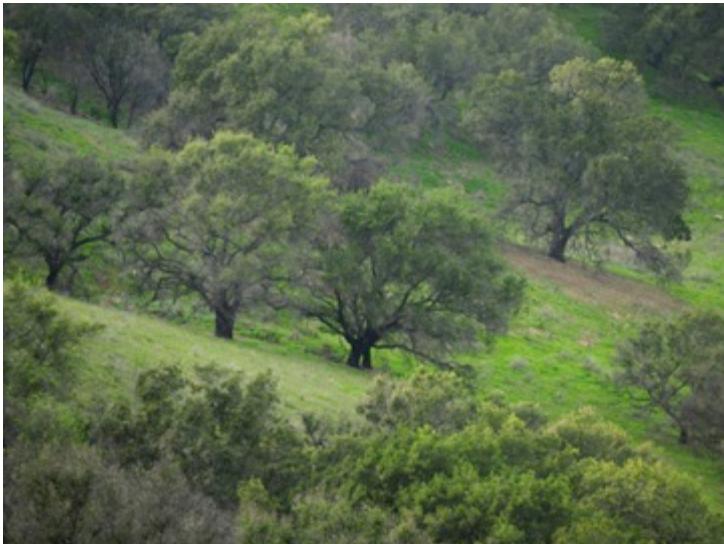
Irvine Ranch Conservancy established in 2005.



Outstanding illustration of the complex geologic history of the southwestern continental margin of North America; continuous record from Late Cretaceous through the Pleistocene

Diversity of species-rich habitats: sage scrub, chaparral, native grasslands, and woodlands; rare stands of Tecate cypress





Limestone Canyon



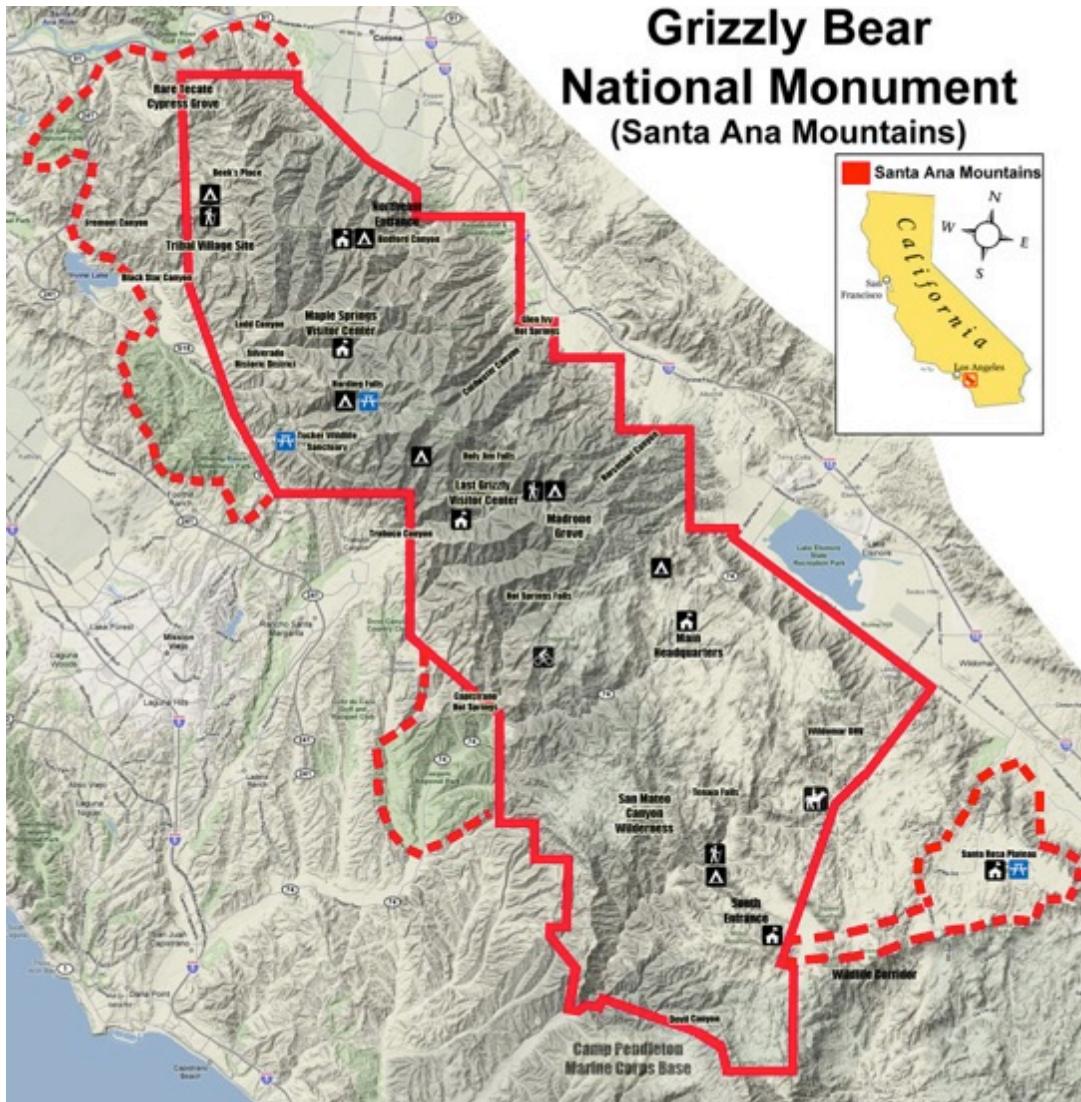
Fremont Canyon



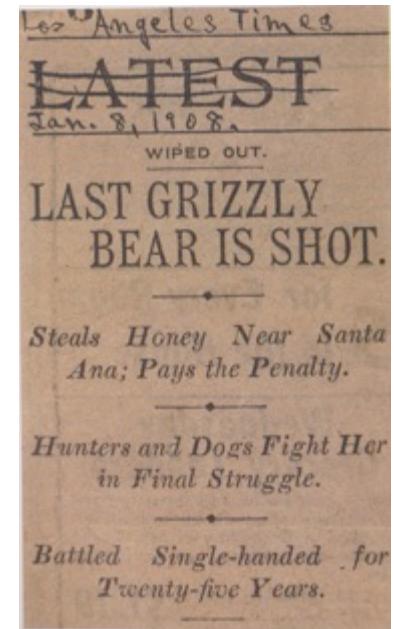


Orange County's Central and Coastal NCCP/HCP Reserve System

Recent proposals for the Grizzly Bear National Monument centered on the Santa Ana Mountains



Grizzly Bear National Monument (Santa Ana Mountains)

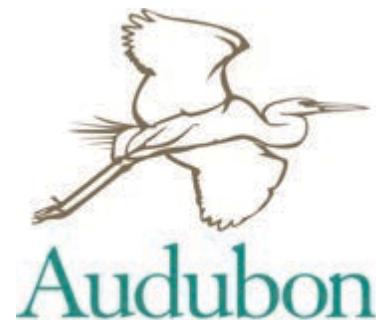


“A HIGHER STANDARD OF STEWARDSHIP”

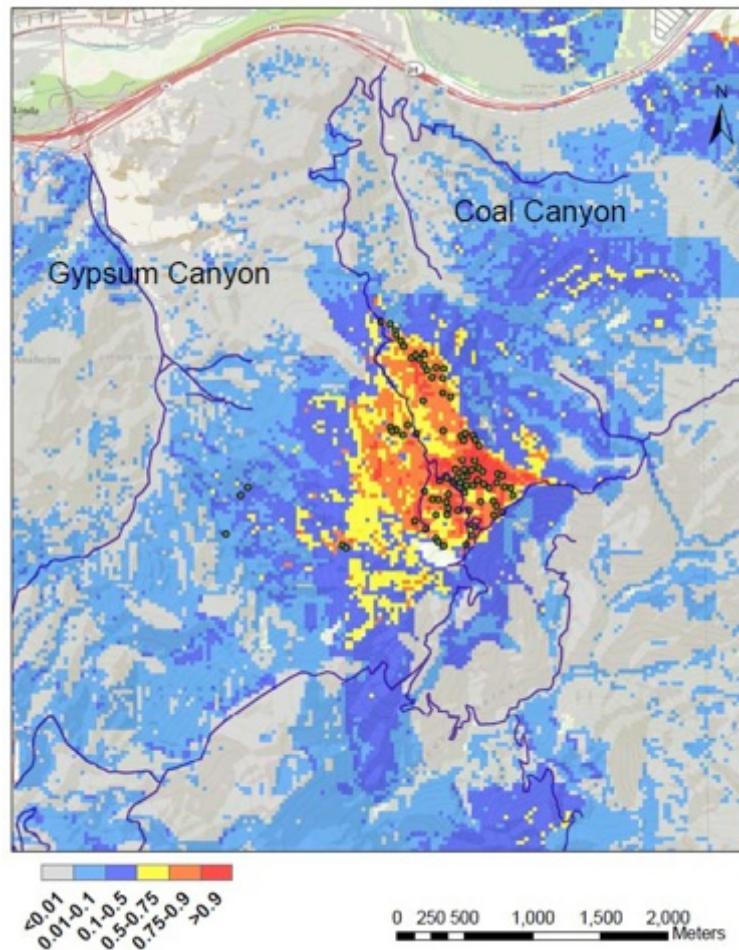
Environmental monitoring

Research and restoration

New metrics
of ecosystem
function



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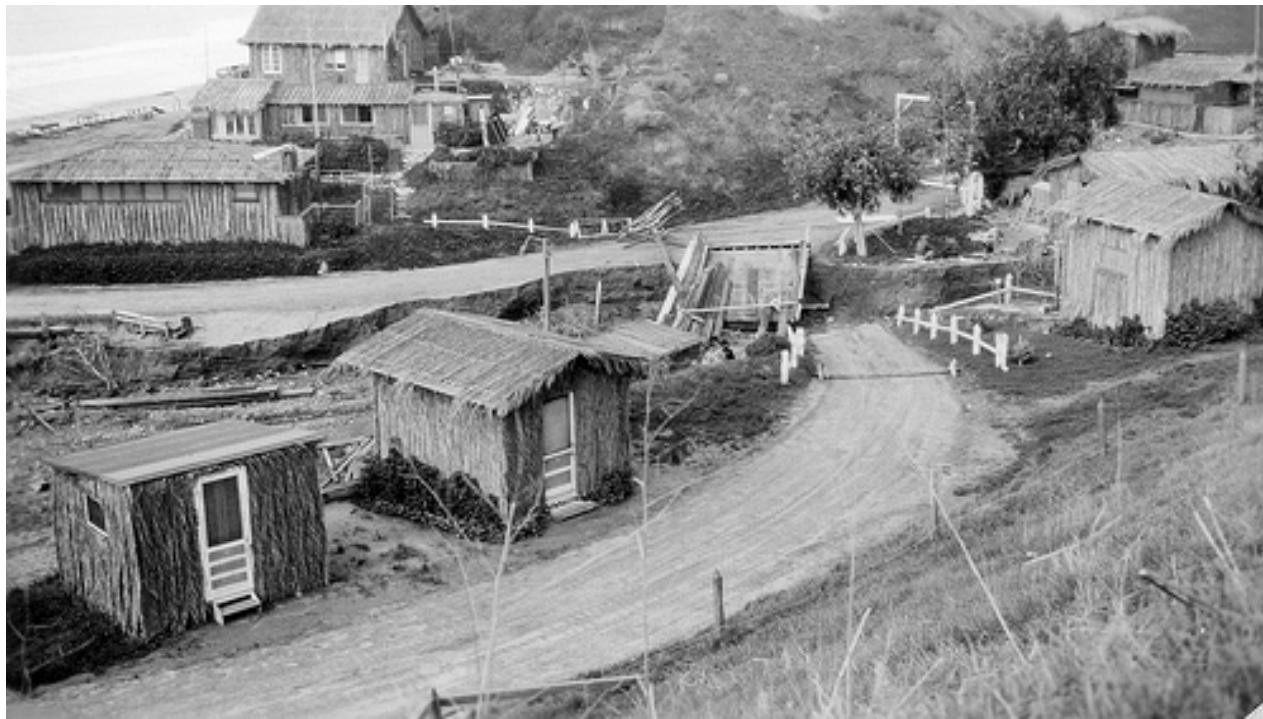
CALIFORNIA BEACHES





Atwood Mar 3, 1938





Crystal Cove flood damage 1937



1916 flood – Santa Ana



Upper Newport Bay saltworks ca. 1950



Newport Bay 1913



Newport Beach coastline south of Balboa - 1915

BALBOA ISLAND, CALIFORNIA—56





BALBOA CAL.



Bell Canyon, Starr Ranch

Photo Scott Gibson



Cleveland National Forest, Santa Ana Mountains

Photo Scott Gibson

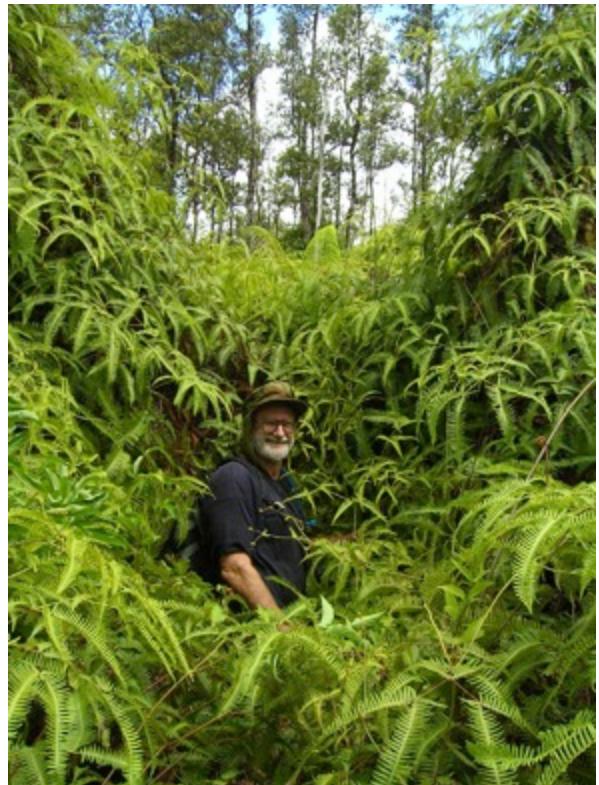


Balboa Island - 1921





Main Beach, Laguna 1920



Bill Mautz – U. of Hawai'i

YOUR SOUTH COAST WILDERNESS





Bell Canyon, Starr Ranch

Photo Scott Gibson



International Boy Scout Jamboree 1953