



Camp Ocean Pines  
1473 Randall Dr.  
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[www.campoceanpines.org](http://www.campoceanpines.org)

## UC California Naturalist Program

*7-Day Training Immersive*  
February 3-10, 2017

### **Begin/End date and times:**

- "Get to know YOU" dinner and evening meeting on Friday, Feb 3 at 6pm.
- Lectures and field trips begin Saturday, Feb 4, 2017 at 9am.
- Course ends Friday, February 10 at 3pm.

### **Meeting days/times:**

- Daily lectures and field seminars beginning at breakfast 8am, ending lecture 8pm.

### **Classroom Location:**

- Camp Ocean Pines, 1473 Randall Dr., Cambria, CA 93428

### **Course Description:**

- The Coastal Institute California Naturalist training course at Camp Ocean Pines in Cambria will introduce you to the unique ecology and natural history of the central coast of California in San Luis Obispo county. The 40-hour course combines science curriculum, guest lecturers, field trips and project-based learning focused on the natural world of California. Coursework and activities will engage students in the theory and practice of citizen science and direct stewardship. Participants earn the California Naturalist certificate for attending lectures, field seminars, taking field notes, and completing a Capstone Project.

### **Student Learning Outcomes:** By the end of this course, students should be able to:

- Describe the role of the scientific method in understanding natural history.
- Relate knowledge of natural history to becoming a naturalist and an environmental steward.
- Integrate knowledge about the interconnectedness of abiotic and biotic factors and their influence on the natural history of the central coast of CA.
- Demonstrate skills in making and recording natural history observations in various formats.
- Apply knowledge of the central coast ecosystems to local and global environmental issues.
- Understand and communicate the role of citizen science in informing the natural resources management decision making processes.

### **Capstone Project & Oral Presentation:**

- As a requirement of the course, participants complete and present a Capstone Project. Participants can work individually or in teams to design and implement their Capstone Project. Before completion of the course, students give a 5-10 minute oral presentation of their Capstone Project. Capstone Project requirements can be satisfied in many ways, including

stewardship, education, interpretation, citizen science and program support.

**Naturalist Field Notebook:**

- Naturalists document their field observations with notes and sketches in a detailed Field Notebook. It is a course requirement to keep a Field Notebook during the course. Participants are also required to record observations in an online field data collection and social networking tool called iNaturalist.

**Service Volunteering**

- Participants participate in habitat restoration, citizen science, and non-profit conservation program support as part of the Camp Ocean Pines California Naturalist course. California Naturalists are encouraged to complete 40 hours of volunteer service each year as part of being a California Naturalist. By logging 40 or more hours per year into the online Volunteer Management system, the naturalist receives a special annual lapel pin each year!

**Participation and Attendance:**

- Attending class meetings and field trips and completing the Capstone Project and presentation is required to obtain the California Naturalist certificate. One absence from either a lecture or field seminar is allowable. Students with additional absences must arrange with the Instructor for opportunities to make-up missed meetings and field trips.

**Credit:**

- There is a paperwork process available if you want 4 units of college credit for an extra \$80

**Required Text:**

- The California Naturalist Handbook, UC Press, 2013.

**The Coastal Institute  
At  
CAMP OCEAN PINES  
California Naturalist Training Course  
February 2017  
Course Syllabus**

**Friday, February 3**

<b>Intro Dinner</b>	<b>Day 0</b>	<b>Arrive, settle in, night sky</b>		
<b>Time</b>	<b>Place</b>	<b>Activity</b>	<b>Leader</b>	<b>Correlation</b>
5-5:30pm	Camp	Meet and greet	Staff - All	
5:30-6:30pm	Camp	Dinner	Staff - All	
6:30-7:30pm	Camp	Move in	Staff - All	
7:30-10pm	Camp	Make Friends, Relax, Night sky	Staff - All	

**NOTES:**

## Saturday, February 4

First Day	Day 1	Intro to program, intro to CA natural history, journaling, iNaturalist, kayaking, estuary, interpretation, geology, intro to capstone		Chapters 1, 8, 2, 3
Time	Place	Activity	Leader	Correlation
8-8:30	Camp	Breakfast		
8:30-9	Camp	Welcome circle	Chris	
9:00-10:30	Camp	<b>Lecture 1: The CA Natural Program.</b> History and purpose of the UC California Naturalist Program, CA bioregions, early naturalists, what it means to be a CA Naturalist	Chris Cameron	Chapter 1 - Intro
10:30-10:45am	Camp	Break		
10:45-Noon	Camp	<b>Lecture 2: The CalNat Program at Camp Ocean Pines.</b> Review of weekly timetable and program requirements: capstone, citizen science, field notebooks, reading/homework, volunteering, interpretation, iNaturalist practice	Chris Cameron	Chapter 1 - Intro
12-12:30	Bus	Drive to MB, eat sack lunch on bus, raptor census		
12:30-3pm	Morro Estuary	<b>Field Study 1: Kayaking in Morro Estuary.</b> Learning watersheds, structure and function of estuaries, dune formation and ecology, geology of Morro Rock, open ocean sandy beach ecology, plants and animals of the estuary and dune systems.	John Menke	
3:30-4pm	MB State Park Museum	Break and snack		
4-5:30pm	MBSP Museum + White's point	<b>Lecture 3: Algae.</b> Introduction to kelp/algae.	Faylla Chapman	Chapter 4 – Primary production
5:30-6pm	Bus	Drive to camp	Chris Cameron	
6-6:30pm	Camp	Dinner		
6:30-8pm	Camp	<b>Lecture 4: Geology.</b> Cosmology, creation and make-up of the earth, plate tectonics, formation of ranges, rock cycle, geology & climate, soil creation, local geology.	David Chipping	Chapter 2 - Geology, Climate, and Soils
8-8:30pm	Camp	Intro to Capstone	Chris Cameron	

### Lecture 1: The California Naturalist Program (1.5 hrs)

- **Guest Expert:** Chris Cameron, Executive Director of Camp Ocean Pines
- **Reading:** Chapter 1- Introduction to California Natural History and the World of Naturalists
- **Goals:**
  - o to learn the benefits California Naturalist program and how the program works.
  - o to understand what is unique about California's natural history, human history, ecology and landscape.
  - o to understand what naturalists do and why it is important.
  - o to understand the role of naturalists, scientists, and the methods of science, in explaining the workings of the natural world
  - o to understand the work of the Coastal Institute at Camp Ocean Pines

- **Objectives:**
  - o identify two historically important naturalists.
  - o describe the characteristics of an effective naturalist.
  - o name three factors that make California's ecology unique.

### Lecture 2: The CalNat Program at Camp Ocean Pines (1.5 hrs)

- **Guest Expert:** Chris Cameron, Executive Director of Camp Ocean Pines
- **Reading:** Chapter 1- Introduction to California Natural History and the World of Naturalists
- **Topics:** Capstone, citizen science, field notebooks, reading/ homework, volunteering, interpretation. Intro to and practicing the use of iNaturalist application.
- **Goals:**
  - o to learn how to keep a naturalist's Field Notebook and journal.
  - o to experience the enjoyment of learning about the natural history of California through the California Naturalist program
  - o to learn the basics of the iNaturalist App as a naturalist tool
  - o to explore the advantages of citizen science for participants and the advancement of science
  - o to learn to use and maintain a field notebook and journal
  - o to understand the reasons why California has a relatively high biodiversity
  - o to learn how citizen science helps the individual, our society, and science
- **Objectives:**
  - o describe the role of a naturalist in our society
  - o explain the importance of the Endangered Species Act
  - o use a field notebook to record observations made during each day
  - o make and upload first iNaturalist observation
  - o define citizen science and provide examples of ways to get involved

### Field Study 1: Kayaking in Morro Estuary (3 hrs)

- **Guest Expert:** John Menke, teacher/professor, retired.
- **Topics:** Learning watersheds, structure and function of estuaries, dune formation and ecology, geology of Morro Rock, open ocean, sandy beach ecology, plants and animals of the estuary and dune systems.
- **Goals:**
  - o to understand the structure and function of an estuary
  - o to understand the formation of coastal dunes
  - o to understand the geological history of Morro Rock
  - o To understand the uniqueness of the plants and animals of the estuary and dune ecosystems
- **Objectives:**
  - o explain how dunes form in the Morro Bay estuary
  - o draw a map of the estuary and its surrounding physical features
  - o list the two major primary producers in estuaries
  - o explain how nutrients enter the estuarine system

### Lecture 3: Kelp and macro algae

- **Lecturer:** Faylla Chapman, professor, researcher, teacher, retired
- **Reading:** Chapter 4 - plants (algae)
- **Topics:** collecting, identifying, pressing marine algae
- **Goals:**
  - o to understand the structure and function of a kelp bed
  - o to understand the diversity of the red, brown, and green divisions of algae
- **Objectives:**

- o press some species of macro algae to form an herbarium for later study
- o describe the relationship of sea otters, sea urchins, and species of kelp

#### **Lecture 4: Geology (1.5 hrs)**

- **Guest Expert:** David Chipping, professor emeritus, Cal Poly, President CA Native Plant Society
- **Reading:** Chapter 2- Geology, Climate, and Soils
- **Topics:** Cosmology, creation and make-up of the earth, plate tectonics, formation of ranges, rock cycle, geology & climate, soil creation, local geology.
- **Goals:**
  - o to understand the geological history of California
  - o to understand the climate patterns of California
  - o to understand how the geologic history of California created the current landscape.
  - o to understand how the geologic history of the Central Coast created the current landscape.
  - o to understand how the landscape influences the ecology of California.
  - o to understand how the landscape influences the ecology of the Central Coast
  - o to be aware of the role that nutrient cycles and soils play in shaping plant communities.
  - o
- **Objectives:**
  - o describe the rock cycle
  - o differentiate between convergent, divergent, and transform plate tectonic movement,
  - o and how they relate to the formation of the coast of San Luis Obispo County
  - o describe how the topography of California influences climate within the state.
  - o discuss how the resulting climate and soil variations influence the ecology of California.
  - o discuss how local climate and soil variations influence the ecology of the Central Coast
  - o name a soil type found locally and its impact on the local ecology.
  - o draw the carbon and nitrogen cycles and explain their importance. Describe how agriculture has affected soils, water and land use in California.

#### **NOTES:**

## Sunday, February 5

Second Day	Day 2	Traditional environmental knowledge, scientific method, Linnaean classification, rocky intertidal, tides, marine food webs, iNaturalist, field notebooks, citizen science activity, water		Chapters 4, 5
Time	Place	Activity	Leader	Correlation
8-9am	Camp	Breakfast, review reading		
9-12pm	Fiscalini Ranch, Cambria	<b>Field Study 2: Rocky reef intertidal</b> (on Fiscalini Ranch, causes of tides, global wind patterns, and causes of global currents, marine food web, intertidal invertebrate and kelp/alg ID, field notebooks, iNaturalist observations). <b>Field Study 3: Citizen Science – Sampling Intertidal Zone.</b> (overview of the program, data gathering on invertebrates, along an intertidal transect, field notebooks, iNaturalist observations)	John	animals, climate, water, citizen science
12:30-1:30pm	Bus	Return to camp for hot lunch		
1:30-2:30pm	Camp	<b>Lecture 5: Scientific method.</b> Hypothesis, experiment, test	John	role of naturalists
2:30-4pm	Camp	<b>Lecture 6: Traditional Environmental Knowledge (TEK).</b> Native American presence and activity on this site, resource use, stories, material culture	Chris	Traditional environmental knowledge
4-5:30pm	Camp	<b>Lecture 7: Plants:</b> (parts of a plant, pollination, seed dispersal, plant communities, sclerophyllous, Mediterranean climate, fire, climate change and plants)	Miranda Canestro	Chapter 4 - Plants
5:30-6:30pm	Camp	Dinner		
6:30-8pm	Camp	<b>Lecture 8: Forest</b>	Sarah Bisbing	Chapter 5 -Forests

### Field Study 2: Rocky Intertidal Ecology (1.5 hrs)

- **Guest Expert:** John Menke, teacher/professor, retired
- **Reading:** Chapters 4 and 6 - Plants (algae) and Animals
- **Topics:** on Fiscalini Ranch, causes of tides, global wind patterns, and causes of global currents, marine food web, intertidal invertebrate, and kelp/algae ID, field notebooks, iNaturalist observations.
- **Goals:**
  - o to understand the the structure and function of a rocky reef marine ecosystem
  - o to understand the causes of zonation in the intertidal zone
  - o to understand the role of macro algae in near coast ecosystems
  - o list four roles that animals play in a rocky reef community, and how the roles are related
  - o to understand how the interaction of the earth, moon, and the sun causes tides
- **Objectives:**
  - o differentiate between producers and consumers in marine ecosystems
  - o list three methods organisms use to survive in heavy surf environments
  - o list two causes of intertidal donation
  - o describe a food chain that begins with macro algae
  - o describe two major forces that cause tides

**Field Study 3: Citizen Science – Sampling Intertidal Zone (2 hrs)**

- **Guest Expert:** John Menke, teacher/professor, retired
- **Reading:** Chapter 8 - Interpretation, Collaboration, and Citizen Science
- **Topics:** overview of the program, data gathering on invertebrates and macro algae along an intertidal transect and in quadrats, field notebooks, iNaturalist observations
- **Goals:**
  - o to understand and practice the concept of “citizen science.”
  - o to learn how intertidal communities can be sampled
  - o to learn how the use of iNaturalist helps to define the range of some species in CA
  - o to learn why intertidal communities are sampled
- **Objectives:**
  - o identify five species and send the information on their location to the iNaturalist site
  - o identify two algal species from each of the major divisions of macro algae
  - o explain why the current along the California coast moves north to south
  - o explain why a transect sampling method is often used in the intertidal zone
  - o describe one marine and one terrestrial food chain

**Lecture 5: Scientific method: (1.5 hrs)**

- **Lecturer:** John Menke, teacher/professor, retired
- **Reading:** Chapter 1 - Role of Naturalists
- **Topics:** hypothesis, testing
- **Goals:**
  - o to understand the role of naturalists, scientists, and the methods of science, in explaining the workings of the natural world
  - o to carry out a test of a hypothesis on habitat selection by a species of marine snail
- **Objectives:**
  - o describe the general steps in the scientific method
  - o explain the terms independent, dependent, and controlled variables
  - o explain the importance of replication to the testing of a hypothesis

**Lecture 6: Traditional Environmental Knowledge (1.5 hrs)**

- **Lecturer:** Chris Cameron, Executive Director of Camp Ocean Pines
- **Reading:** Chapter 1 - California Natural History and the Role of Naturalists
- **Topics:** Native American presence and activity on this site, resource use, stories, material culture
- **Goals:**
  - o to understand and appreciate the viewpoint of Traditional environmental knowledge
  - o to understand the pre-Columbian cultural history of this area
  - o to understand the time line and scope of the cultural and world view change from traditional to western, and evaluate our present perspectives
- **Objectives:**
  - o describe some uses of native plants and animals by the Chumash and Salinan tribes
  - o list three technologies they used in daily life

**Lecture 7: Plants (1.5 hrs)**

- **Guest Expert:** Miranda Canestro, professor, researcher
- **Reading:** Chapter 4 – Plants
- **Topics:** parts of a plant, pollination, seed dispersal, plant communities, sclerophyllous, Mediterranean climate, fire, climate change and plants
- **Goals:**

- o to become familiar with the plants and plant communities of the Central Coast.
- o to understand how plants function, reproduce and adapt.
- o to understand differences among native, non-native, invasive, and noxious plants.
- o to understand impact of human and natural disturbance on plant communities.
- **Objectives:**
  - o list and identify by sight ten plants that are common on the Central Coast by their common names and learn their scientific names.
  - o list three plant community types on the Central Coast
  - o pick one plant in each of the local community types listed above and describe its adaptations to its environment.
  - o sketch the parts of a flowering plant, and explain how it reproduces.
  - o define and describe the effects of native, non-native, invasive, and noxious plants.
  - o describe what plants require in order to produce carbohydrates
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### Lecture 8: Forest Ecology (1.5 hrs)

- **Guest Expert:** Forestry Professional
- **Reading:** Chapter 5 - Forests
- **Goals:**
  - o to understand how a forest functions
  - o to become familiar with the Monterey pine and oak forests of the Central Coast.
  - o to understand the role of fire in forests
  - o to understand impact of human and natural disturbance on forests
- **Objectives:**
  - o identify the two common trees that make up the forest on the Central Coast by their common names and learn their scientific names.
  - o identify three insects related to the Monterey pine forest.
  - o sketch Monterey pine and explain how it reproduces.

### NOTES:

## Monday, February 6

Third Day	Day 3	Sandy beach ecology, plankton study, citizen science, field notebooks, plants		Chapter 2, 3, 4, 5, 6, 7
Time	Place	Activity	Leader	Correlation
8-9am	Camp	Breakfast, pack lunch, review reading		
9-9:30	Bus	Drive to San Simeon – raptor census	Chris	animals
9:30-12:30	San Simeon Cove	<b>Field Study 4: Citizen Science:</b> Plankton: sampling a population San Simeon pier: plankton, primary productivity, sampling, analyzing samples. Sandy beach ecology	Carolyn Skinder	geology, water, animals
12:30-1pm	San Simeon	Lunch at the cove		
1-3:00pm		<b>Field Study 5: Hearst Ranchlands – Range management</b>	Ben or Royce Larson	
3-3:30pm	Bus	Drive back to camp	Chris	
3:30-5:30pm	Camp	Free time. Capstone check in and plans. Nap, iNaturalist observations, field notebook sketching	Chris	
5:30pm-6:30pm	Camp	Dinner at Camp	Chris	
6:30-8:30pm	Camp	<b>Lecture 9: Water</b> , climate, marine. (water molecule, freshwater, ice, snow pack, aquifer, internal basins, alkaline, lakes, stream classification and input, watersheds, water cycle, floodplain, estuaries, intertidal zones, plankton, marine food webs, anadromous fish, dams, water law, future water problems). Ocean currents.	Kat Montgomery	Chapter 3 - Water

### Field Study 4a: Citizen Science – Plankton: sampling.

- **Trip Leader:** John Menke, teacher/professor, retired
- **Guest Speaker:** Carolyn Skinder, NOAA
- **Activities:** At San Simeon pier: plankton, primary productivity, sampling, analyzing samples
- **Goals:**
  - o to understand the role of sanctuaries, national parks, marine protected areas, national forests, etc. in preserving the ecosystems of California
  - o to understand the role of plankton in marine ecosystems
- **Objectives:**
  - o differentiate between a marine sanctuary and a marine protected area, and between a national park and a national forest
  - o describe why the Monterey Bay National Marine Sanctuary was created
  - o describe how plankton are sampled, and water quality is tested
  - o differentiate between phytoplankton and zooplankton
  - o differentiate between holoplankton and meroplankton
  - o describe a food chain that begins with phytoplankton

### Field Study 4b: Sandy beach ecology

- **Trip Leader:** John Menke, teacher/professor, retired
- **Activities:** Walk along the sandy beach
- **Goals**
  - o to understand the structure and function of a sandy beach community
  - o to understand the California Current Ecosystem food webs, predator/prey relationships and

trophic levels.

- o to be able to identify the economic and social importance of wildlife species in the California Current Ecosystem.
- **Objectives**
  - o describe a food chain in a sandy beach community
  - o list and identify by sight 10 marine vertebrates and invertebrates that are common in the California Current Ecosystem, three by their common and scientific names.
  - o pick a marine species native to your area and describe three ways in which it is adapted to the local environment.
  - o describe a marine food web and identify the predators and prey.
  - o list five marine species of economic and social importance in your area, at least two of which must be invertebrates, and describe their current status

### Field Study 5: Hearst Ranch (2 hours):

- **Lecturer:** Royce Larson – UC Nat Resource Advisor
- **Reading:** Chapter 5 - Forest, Woodland, and Range Resources and Management
- **Topics:** Coastal range management
- **Goals:**
  - o to understand the structure and function of a coastal grassland
  - o to understand why a mosaic of habitats forms on the slopes of the Santa Lucia hills
- **Objectives:**
  - o list a couple factors which favor grassland formation and maintenance

### Lecture 9: Water (2 hrs)

- **Lecturer:** Kat Montgomery, Director, Coastal Institute at Camp Ocean Pines
- **Reading:** Chapter 3 – Water
- **Topics:** water molecule, freshwater, ice, snow pack, aquifer, lakes, streams, watersheds, anadromous fish, dams, water law, water cycle, saltwater, estuaries, intertidal zones, plankton, marine food webs, ocean currents, biological/chemical/physical inputs
- **Goals:**
  - o to understand the water molecule and water cycle
  - o to identify parts of a watershed
  - o to describe the economic, ecological, and social functions of water resources
  - o to explain the concept of hydrogeomorphology and the influence of freshwater and saltwater on landscape structure (streams, rivers, coastlines, etc.)
  - o to understand the different inputs that affect bodies of water
  - o to become exposed to water management, water quality, and water distribution issues in California (specifically the central coast communities)
  - o to develop a basic understanding of ocean movement: waves vs. currents
  - o to understand how the ocean interacts with our freshwater rivers, streams, and estuaries
- **Objectives:**
  - o describe the water cycle and three ways that humans have altered it on the central coast
  - o pick a water resource (wetland, stream, lake, etc.) and identify three of its important functions
  - o identify and draw the boundaries of a watershed on a topographic map
  - o explain the difference between non-point source and point-source pollution and give an example of each
  - o name three uses of the primary water source in your area and discuss any conflicts that arise over these uses
  - o name the local ocean currents and describe their impact
  - o identify the closest estuary to your home and describe its importance

**NOTES:**

**Tuesday, February 7**

Fourth Day	Day 4	Plants, forests, animals, kelp		Chapters 4, 5, 6
Time	Place	Activity	Leader	Correlation
8-9am	Camp	Breakfast, pack lunch, review reading		
9-9:30	Bus	Bus to Fiscalini Ranch	Chris	
9:30-12	Fiscalini Ranch	<b>Field Study 6: Fiscalini Ranch.</b> Forest, grassland, intertidal, open ocean, nutrient cycling, carbon sequestration	Dennis Sheridan	water, geology, soil, plants, forest, animals
12-1:30	Bus	Lunch and drive back to camp	Chris	
1:30-3pm	Camp	<b>Lecture 10: Interpretation.</b> Giving an interpretive talk or nature walk. How to engage people and lead effective meetings. Organizational collaboration. Supporting citizen science. Importance of museum displays, collections, and gift stores in interpretation.	Michele Roest	Chapter 8 - Interpretation
3-5:30pm	Camp	Free time, capstone, notebooks, etc.	All	
5:30-6:30pm	Camp	Dinner	All	
6:30-8pm	Camp	<b>Lecture 11: Animals.</b> Animal energetics, food webs/pyramids, hibernation, endo-ectothermic, parental care, exoskeletons, evolutionary groups, invert vs vertebrates, amphibians, bird adaptations, reptiles, monotreme/marsupial/placental mammals, wild vs domestic vs introduced.	John and Dennis Sheridan	Chapter 6 - Animals

**Field Study 6: Fiscalini Ranch**

- **Lecturer:** Dennis Sheridan, naturalist
- **Reading:** Chapter 5 – Forest, Woodland, Range Resources and Management
- **Topics:** Forest life cycles, decomposers, mushrooms, insects, invertebrates, grassland, nutrient cycling, native uses of plants
- **Goals:**
  - o to appreciate the ecological and economic value of forests.
  - o to understand the role of fire in forest regeneration.
  - o to understand the various benefits that forests provide.
  - o to understand the challenges of balancing society's conflicting desires for forests.
  - o to understand the structure and function of a forest community of plants and animals
  - o to understand the water (hydrological) cycle, and the concept of a watershed
  - o to comprehend the importance of the mutualistic relationship between trees and mycorrhizae
  - o to understand nutrient cycling in an ecosystem
  - o to comprehend the relationships of producers, consumers, and decomposers in a forest ecosystem
- **Objectives:**
  - o name 10 local trees and 10 local shrubs.
  - o describe the forest types common to California.
  - o describe at least four benefits that forests provide to society, two economic and two ecological, and discuss how forest fragmentation affects these benefits.
  - o diagram the stages of decomposition of organic material in a forest floor

- o diagram the water cycle
- o explain why precipitation in California is greater on the western slopes of mountain ranges than on the eastern slopes of the mountains, and greater in the north than in the south

### Lecture 10: Interpretation (1.5 hrs)

- **Guest expert:** Michele Roest, science education consultant
- **Reading:** Chapter 8- Interpretation, Communication, and Citizen Science Interpretation:
- **Topics:** Giving an interpretive talk or nature walk. How to engage people and lead effective meetings. Organizational collaboration. Supporting citizen science. Importance of museum displays, collections, and gift stores in interpretation.
- **Goals:**
  - o to understand the basic principles of nature interpretation.
  - o to learn techniques for presenting to and communicating with different kinds of audiences.
  - o to explore the advantages of citizen science for participants and the advancement of science.
- **Objectives:**
  - o describe three principles of successful interpretation.
  - o define and develop a theme for an interpretive project.
  - o describe how you would adapt a program for use with two different audiences.
  - o list two things to remember about speaking at a public meeting and three things that can help make a program more successful.

### Lecture 11: Animals (1.5 hrs)

- **Lecturer:** John Menke, teacher/professor, retired
- **Reading:** Chapter 5 – Animals
- **Topics:** Animal energetics, food webs/pyramids, hibernation, endo-ectothermic, parental care, exoskeletons, evolutionary groups, invert vs vertebrates, amphibians, bird adaptations, reptiles, monotreme/marsupial/placental mammals, wild vs domestic vs introduced.
- **Goals:**
  - o to recognize the evolutionary relationships among animals.
  - o to understand how animals are adapted to their environments.
  - o to understand the concepts of food webs, predator/prey relationships and trophic levels; that is, the transfer of energy and matter from one trophic level to another
  - o to identify the economic and social importance of wildlife species in your area.
- **Objectives:**
  - o list and identify by sight 10 vertebrates and invertebrates that are common in your biome, three by their common and scientific names.
  - o pick an animal in your area and describe three ways it's adapted to the local environment.
  - o describe a food web and identify the predators and prey.
  - o list five wildlife species of economic and social importance in your area, at least two of which must be invertebrates, and describe their current status.

### NOTES:

**Wednesday, February 8**

Fifth Day	Day 5	Plant restoration, condor recovery, ESA, keystone species, elephant seals, marine mammals, range management, energy, global change		Chapters 6, 7
Time	Place	Activity	Leader	Correlation
8-9am	Camp	Breakfast, pack lunch, review reading	John	
9-9:30	Bus	Drive to Piedras Blancas – raptor census	Chris	animals
9:30-11:00	Piedras Blancas Lighthouse	<b>Lecture 12: Condor</b> recovery and telemetry practice	Richard Neidhardt	animals, global change, interpretation
11:15-12:45	Piedras Blancas Lighthouse	<b>Lecture 13: Native plant</b> recovery and site walk to observe accomplishments	Carole Adams	plants, global change, interpretation
12:45-1:30pm	Field	Lunch and walk around to observe plant recovery, marine mammals	All	
1:30-3:30	E Seal Vista Overlook	<b>Lecture and Field 7: Elephant seal</b> recovery and sketching in journals	Chris Cameron and John Menke	animals, global change, interpretation
3:30-4pm	Bus	Drive back to camp	Chris	
4-5:30pm	Camp	Free Time for journals, capstones, iNaturalist, naps	All	
5:30-6:30	Camp	Dinner	All	
6:30-8pm	Camp	<b>Lecture 14: Energy</b> and Global Environmental Issues: Causes of environmental disruption	John	Chapter 7 - Energy and Global Environmental Issues

**Lecture 12: Condor recovery (1.5 hours)**

- **Lecturer:** Richard Neidhardt, founder of Pinnacles Condor Society, volunteer
- **Topics:** History and biology of the California condor
- **Goals**
  - o to understand the history of the condor in North America
  - o to understand the causes of the near extinction of the North American condor, and the programs which helped restore condors to some of their native range
- **Objectives**
  - o describe the foraging habit of condors
  - o describe how the Endangered Species Act helped to save the condors from probable extinction
  - o describe how telemetry works

**Lecture 13: Native plant recovery (1.5 hours)**

- **Lecturer:** Carol Adams – Piedras Blancas docent
- **Topics:** native plant restoration at the Piedras Blancas lighthouse
- **Goals**
  - o to describe how invasive plant species were removed and replaced by native coastal plant species

- o to understand the pattern of loss of diversity in communities due to the introduction of invasive species
- **Objectives**
  - o list some of the invasive plant species in the Piedras Blancas area
  - o state how many of the invasive species were introduced
  - o list some of the native species of plants that were restored to the area

### Field Study 7: Elephant seal recovery and sketching (2 hours)

- **Lecturer:** Chris Cameron and John Menke
- **Topics:** the physiology, behavior, and migratory pattern of the northern elephant seal
- **Activities:** Field sketching elephant seals
- **Goals:**
  - o To practice field sketching techniques
  - o To understand the history of elephant seals, their life cycle, and their pattern of migration
  - o To understand the reasons for the historic decline and present increase of northern elephant seals
  - o To understand the lifecycle, migrations, and social behavior of the elephant seal
  - o To understand how marine mammals are adapted to their environments.
  - o To be able to identify the economic and social importance of marine mammals on the central coast.
- **Objectives:**
  - o describe the reasons for the historic decline and present increase of northern elephant seals
  - o describe the lifecycle, migrations, and social behavior of the elephant seal
  - o list and identify by sight 5 marine mammals that are commonly seen on the Central Coast, and identify 2 by their scientific names.
  - o pick a marine mammal native to your area and describe three ways in which it is adapted to its environment.
  - o describe a marine food chain which includes the northern elephant seal
  - o draw one or more elephant seals and, on the same paper, make notes on their behaviors
  - o describe the pattern of migration of the elephant seals at the Piedras Blancas rookery

### Lecture 14: Energy and Global Environmental Issues (1.5 hrs)

- **Lecturer:** John Menke, teacher/professor, retired
- **Reading:** Chapter 7-Energy and Global Environmental Issues
- **Topics:** Causes of environmental disruption (impact/damage); energy sources
- **Goals**
  - o to consider how human activities and resource use affect the global environment
  - o understand some of the sources of energy for humans, and how the use of each impacts the environment
- **Objectives**
  - o pick one pressing global environmental issue, how it impacts environments, and describe two different ways the damage might be mitigated
  - o explain the relationship between population growth and resource use
  - o explain the relationship between affluence (disposable income) and resource use
  - o explain how some technologies have a greater impact on ecosystems than other technologies

## NOTES:

**Thursday, February 9**

Sixth Day	Day 6	UC reserves, Ken Norris, range management, ponds and fresh water streams, wrap up		Chapter 1, 3, 4
Time	Place	Activity	Leader	Correlation
8-9am	Camp	Breakfast	All	
9:30-11am	Rancho Marino Reserve	<b>Field Study 8: Rancho Marino UC Reserve</b> (forest & range management, grassland, UC Reserves, who is Ken Norris?, local projects, field notebooks, iNaturalist observations, fresh water macroinvertebrates in the pond)	Don Canestro	marine management, grassland restoration, forest management, pond macro invertebrates.
11am-3pm	Field	Free time for Capstone Projects, independent work, hot lunch at camp	All	
3-5:30pm	Santa Rosa and San Simeon creeks	<b>Optional Field Study 9: Riparian zones.</b> Stream makeup and movement. Aquatic insects, anadromous fish.	Chris Cameron	water, plants, animals, environmental issues
5:30-6pm	Camp	Dinner	All	
6-8pm	Camp	<b>Lecture 15: Wrapping it up with a Coastal view.</b> Hunters/gatherers to farmers/herders. Fisheries, mariculture resource management, human caused problems and human solutions. (effects of fisheries on the populations of fishes, and invertebrates; history of the southern sea otter population (exploitation and protection), sustainable mariculture, kelp bed structure and function, resource management (tidal), oyster farm, human caused change, etc.)	John Menke	Book Wrap Up

**Field Study 8: Rancho Marino UC Reserve (1.5 hrs)**

- **Lecturer:** Don Canestro, manager of the Rancho Marino UC Reserve
- **Reading Chapter 5** - Forest, Woodland, Range Resources and Management
- **Topics:** Forest & range management, grassland, UC Reserves, who is Ken Norris?, local projects, field notebooks, iNaturalist observations, fresh water macro-invertebrates in the pond
- **Goals**
  - o to understand the structure and function of a coastal grassland
  - o to understand the function of the UC Reserve system
  - o to understand the methods by which scientists better understand the physical world
  - o
- **Objectives**
  - o describe some of the scientific studies carried out at the Rancho Marina UC Reserve
  - o explain the functions of the many UC Reserves
  - o sample a pond to determine the diversity of aquatic insects and other organisms

**Field Study 9: Riparian Ecosystem (2.0 hrs)**

- **Lecturer:** Chris Cameron, Executive Director of Camp Ocean Pines
- **Reading Chapter 3** - Water
- **Topics:** aquatic insects, stream classification, salmon lifecycle, stream restoration, etc.
- **Goals**
  - o to understand stream ecology (riparian ecosystems)

- o to understand the life cycle and role of salmonid species in coastal streams, and the
  - o rehabilitation of the streams they utilize
  - o comprehend the history of early human use of resources in coastal California
- **Objectives**
    - o identify 3 common plants of the riparian ecosystem
    - o sample a stream to discover the diversity of aquatic insects
    - o describe the necessity of fresh water for human life and relate to the primary food sources and settlements of the Chumash tribe

### Lecture 15: Wrapping it up with a Coastal View.

- **Lecturer:** John Menke
- **Reading:** Chapter 7- Energy and Global Environmental Issues
- **Topics:** Hunters/gatherers to farmers/herders. Fisheries, mariculture, resource management, human caused problems and human solutions. (effects of fisheries on the populations of fishes, and invertebrates; history of the southern sea otter population (exploitation and protection), sustainable mariculture, kelp bed structure and function, resource management resource management (tidal), oyster farm, human caused change, etc.)
- **Goals:**
  - o to understand the inferred effects of global climate change on the ecosystems of California
  - o To understand how the human use of ecosystem resources has changed over time
  - o to comprehend that management of fisheries is really management of humans, so that sustainable use can be achieved
  - o to understand how species of marine organisms can be farmed (mariculture)
  - o understand why kelp beds are a very important nursery for many marine species
- **Objectives:**
  - o describe two observed effects of climate change on species in California
  - o list three marine species which are farmed in California
  - o describe the role of mariculture in food production
  - o describe what caused the sea otter, and the northern elephant seal to almost go extinct a little over a century ago
  - o outline how has the Marine Mammal Act and other legislation protected some species from extinction

### NOTES:

**Friday, February 10**

Seventh Day	Day 7	Capstone presentations, administration, celebration		
Time	Place	Activity	Leader	Correlation
8-9am	Camp	Breakfast	All	
9-10am	Camp	Wrapping up, evaluations, administration	Chris & John	
10-12pm	Camp	Capstone presentations	Chris & John	
12-1pm	Camp	Lunch	All	
1-2pm	Camp	Certificates, celebration, next steps	Chris & John	
2-3pm	Camp	Pack and Depart	All	

**Presentation of Capstone Projects**

- **Presenter:** Chris Cameron, Executive Director of Camp Ocean Pines
- **Activities:** Presentation of capstone projects, presenting certificates & pins
- **Goals:**
  - o To wrap-up the class and answer final questions about class content, volunteer hours and any other aspects of the California Naturalist program.
  - o To provide time for student presentation of Capstone Projects.
  - o To complete the end of class evaluation and assessment.
- **Objectives:**
  - o Present capstone projects
  - o Complete evaluations and final paperwork
  - o Celebrate the successful completion of another great CA Naturalist class!

**NOTES:**

## **Camp Ocean Pines Field Trips**

**Morro Bay** – estuary, kayaking, dune geology/ecology, mudflats, oysters, igneous geology, nature/city impact

### **Rocky intertidal:**

- Lampton Cliffs
- Otter Cove on Fiscalini Ranch
- Leffingwell Landing
- North San Simeon

**Fiscalini Ranch** – forest, rocky reef intertidal, coastal bluffs, grassland, steelhead stream

**San Simeon Cove** – a facility w/ bathrooms, beach, hike, birds, pines, water, geology

**Peidras Blancas Lighthouse:** BLM land, rookery, marine mammals, peregrine, land rehab of non-native plants

**Rancho Marino** – land management, range, coastal bluffs, intertidal, stream, forest understory, pine transect