



UC California Naturalist

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Today

- The UC CA Naturalist Program so far
 - Goals
 - Modeled on other states
 - Content
 - Curriculum
 - Advanced trainings
 - Citizen Science
 - Regional networks
 - Portal
 - iNaturalist
 - Diversity
 - Tracking and evaluation methods

WHAT IS TAKING CALIFORNIA SO LONG?

UNITED STATES



- CA NATURALIST PROGRAM MODELED AFTER OTHER PROGRAMS WITH SPECIAL THANKS TO MINNESOTA MASTER NATURALIST (ROB BLAIR & AMY RAGER)

We cannot protect and restore California's unique ecology without an environmentally literate, engaged public.

WANTED
NEW CONSTITUENCY



MUST HAVE

- Environmental literacy
- Scientific and social understanding
- Interpretive skills
- Involved in collaborative conservation

UC California Naturalist

Seeks to provide:

- i. clear, concise information about the structure and function of California's ecological communities and current challenges in resource management
- ii. a framework to increase the engagement of California citizens in conservation in their communities
- iii. a portal for existing information developed by scientists and staff of numerous public agencies and non-profit organizations dedicated to preserving California's natural world

By using

- a science curriculum
- hands-on learning
- communication training
- stewardship, citizen science, interpretation.





CALIFORNIA NATURALIST

DISCOVERY • ACTION • STEWARDSHIP



CITIZEN SCIENCE



OUTREACH/EDUCATION



STEWARDSHIP



PROGRAM PARTICIPANTS

LOCAL SPONSORS



▶ CALIFORNIA NATURALIST PROGRAM

• **Discovery Action Stewardship**



LAUNCHING IN 2012

**Santa Rosa JC/Pepperwood*

**UC Santa Cruz Arboretum*

UC Sagehen Field Station

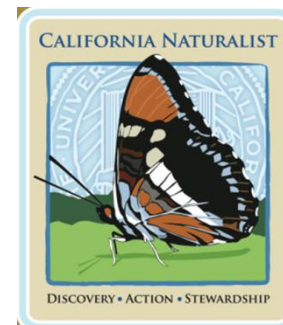
Pacific Grove Natural History Museum

Pasadena City College

Salmon Protection & Watershed Network (SPAWN)

Santa Barbara Botanical Garden

Total number of Naturalists to date: 160



Forthcoming Title for Your Course



JOIN OUR eNEWS LIST

Join our eNews list to stay up to date on announcements related to this and other UC Press titles.

www.ucpress.edu/go/subscribe

Visit <http://ucanr.org/sites/UCCNP/> for more information on the University of California Cooperative Extension California Naturalist program and its mission.

The California Naturalist Handbook

Greg De Nevers, Deborah Stanger Edelman, and Adina Merenlender

The California Naturalist Handbook provides a comprehensive resource for volunteer naturalists and citizen scientists. Designed to be the core textbook for all California Naturalist courses in an innovative new program developed by the University of California Cooperative Extension, the *Handbook* will engage readers and foster a commitment to natural resource conservation, education, and restoration. The *Handbook* is also relevant for other related continuing education classes and extension programs, and will appeal to anyone eager to take an active role in sustaining natural resources.

Providing an engaging introduction to California natural history, this book gives guidance on observation, discovery, communication, stewardship, and conservation related to scientific principles of natural history. It prepares amateur and beginning naturalists with tools for a lifelong dedication to supporting and addressing today's environmental issues.

\$34.95 paper, 978-0-520-27480-8
Spring 2013

Subjects covered include California natural history and geology, native plants and animals, California's freshwater resources and ecosystems, forest and rangeland resources, conservation biology, and the effects of global warming on California's natural communities. The *Handbook* also discusses how to create and use a field notebook, interpret natural resource information, implement citizen science, and create and participate in collaborative conservation efforts.

Greg de Nevers is a botanist and one of California's most experienced naturalists with years of field experience cataloging nature and sharing it with amateur naturalists. Currently, he is a resident biologist at the Audubon Reserve Canyon Ranch, Bolinas Lagoon Preserve.

Deborah Stanger Edelman has an M.S. in Ecology from the University of California at Davis and since 2008 has worked as a part of the University of California Cooperative Extension California Naturalist Program.

Adina Merenlender is a Cooperative Extension Specialist for University of California at Berkeley in the Environmental Science, Policy, and Management Department. She is an internationally recognized conservation biologist working on environmental problem solving at the landscape scale, and coauthor of *Corridor Ecology: The Science and Practice of Linking Landscapes for Biodiversity Conservation*. She is currently based at the Hopland Research and Extension Center in Hopland, CA.



The Curriculum

The UC California Naturalist Handbook, UC Press 2013

By Greg de Nevers, Deborah Stanger Edelman, and Adina Merenlender

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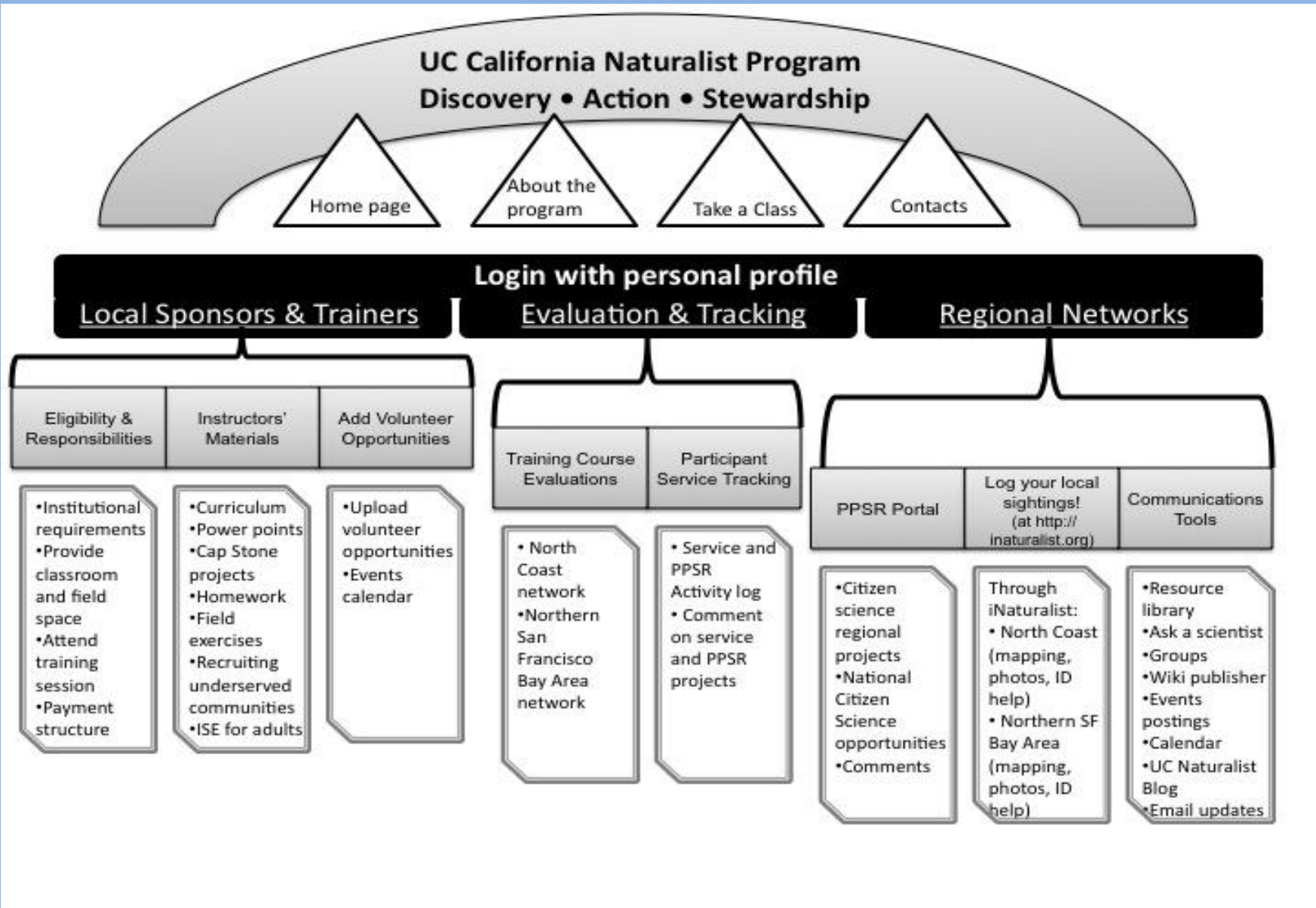
Glossary

Web resources

<http://ucanr.org/sites/UCCNP>

- **Course and advanced training opportunities**
- **Volunteer opportunities**
- **Citizen science opportunities**
- **Environmental science content relevant to California**

Web resources



Citizen Science in the California Naturalist program: Building the nexus between learning and action



Overarching program

- **Integrating PPSR and the CA Naturalist**
- (NSF Informal Science Education Program Pathways Award)
- **Develop and Test an Integrated Model for Naturalist and PPSR Participation**
- **Recruit** a diversity of participants to the California Naturalist program at the two designated research pilot sites.
- **Connect** CA Naturalist participants as volunteers for a variety of local Citizen Science/ Public Participation in Science Research Programs (PPSR).
- **Research** impacts of integrated model of PPSR and naturalist program training on participants science and environmental learning and identity.



Why PPSR?

Public Participation in Scientific Research Programs

- **Benefits for Participants in PPSR Programs**

- Increased science content knowledge and skills (Bonney et al 2009; Brewer 2002; Trumbull et al. 2000)
- Enhanced civic participation and community building (Overdeest et al, 2004)

- **Benefits for Scientists and Conservation Organizations**

- Large amounts of ecological data over large geographic and temporal scales
- Community engagement, political and financial support

Methods

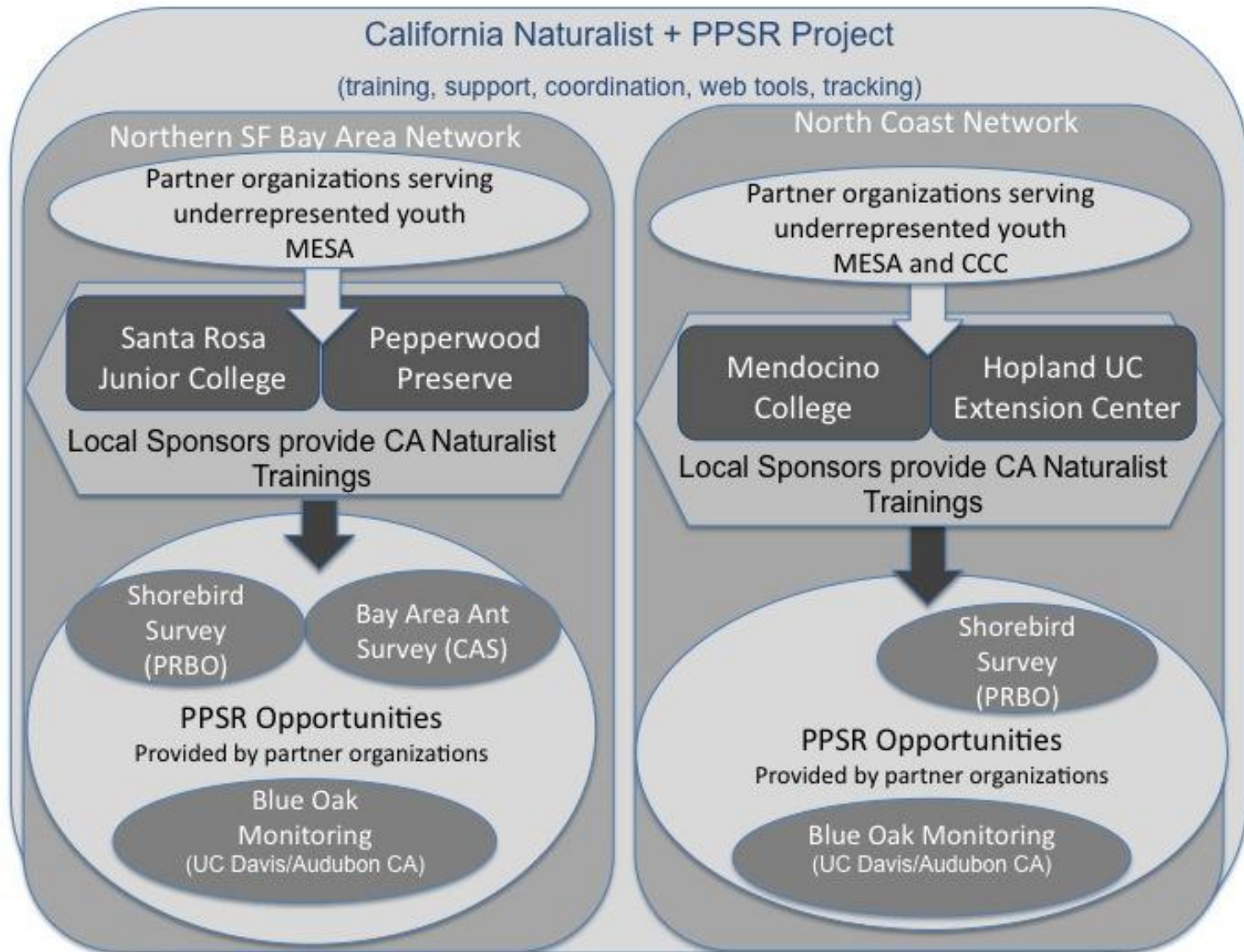
Integrated Model – Naturalist & PPSR Participation

California Naturalist Program Pilot Sites *(Santa Cruz & Santa Rosa)*

- Program Development
 - Developing virtual & real communities
 - PPSR Information Resources
 - iNaturalist Introduction/Training
 - Advanced PPSR Methods Workshop

- Track Participants through Naturalist and PPSR Experiences
 - Pre- and post-course evaluations
 - Class Observations
 - Interviews -- post course, 6 and 12 month follow-up

Integrated Model for Naturalist and PPSR Participation



Regional Network Example



Stewardship

Discovery

Action

SHARE

EMAIL

PRINT

Home

About the program

Citizen Science for CA Naturalists

Take a class

- Pacific Grove Museum of Natural History
- UC Santa Cruz Arboretum
- Pepperwood Preserve & Santa Rosa JC
- Sagehen Creek Truckee
- SPAWN Marin County
- Pasadena Naturalists
- Santa Barbara

Advanced Trainings

Become a sponsor/instructor

Volunteer Monitoring

Meeting the UC ANR Mission

Pacific Grove Museum of Natural History

California Naturalist Certification Program: Pacific Grove Museum of Natural History

The California Naturalist class will introduce you to the wonders of our unique ecology and engage you in the stewardship of California's natural communities. The course will utilize a combination of science curriculum, guest lecturers, field trips and project based learning to immerse you in the natural world of the Monterey Peninsula. Through the course, participants will develop their ability to observe nature and will learn tools to improve these skills. In addition, participants will improve their communication skills by sharing knowledge with other participants and by working on a group project.

The certification classes will be held at the Pacific Grove Museum of Natural History Wednesday evenings in the Spring. There will also be three Saturday field trips and volunteer hours are required to be certified through this sponsor.

More information on dates and costs can be found at <http://www.pgmuseum.org/>



WHAT IS LiMPETS?

ROCKY INTERTIDAL MONITORING

SANDY BEACH MONITORING

TEACHER RESOURCES

STUDENT RESOURCES

DATA ENTRY & RESULTS

DISCOVER YOUR MARINE
SANCTUARIES

CONTACT US

LiMPETS News

New LiMPETS Site at
Vandenberg Airforce Base >

More news >

You are here: [Home](#) > [What is LiMPETS?](#)



What is LiMPETS?

- environmental monitoring and education program for students, educators, and volunteer groups
- monitor the ocean and coastal ecosystems of California's National Marine Sanctuaries to increase awareness and stewardship of these important areas
- Rocky Intertidal Monitoring Program
- Sandy Beach Monitoring Program
- hands-on coastal monitoring experiences to conduct real science and serve as ocean stewards.

Methods of engaging naturalists in citizen science

- Web portal for searching projects
- Scholarships for young underserved
- Direct email with different topics
 - For example, “Water Monitoring opportunities”
 - Monterey Bay Sanctuary Citizen Watershed Monitoring Network
 - Sanctuary Integrated Monitoring Network
 - Snapshot Day (1st weekend in May)
 - First Flush (annual monitoring after first storm in fall), coordinate
 - Urban Watch (June – Oct)
 - Watsonville Wetlands Watch
 - Beach Watch

Searchable Database of PPSR Projects

• LOCAL

- **Beach COMBERS** - trained volunteers survey beached marine birds and mammals monthly at selected sections of beaches throughout the Monterey Bay area.

<http://www.sanctuarysimon.org/monterey/sections/beachCombers/index.php?l=n>

• Regional

- **Bay Area BioAtlas** -partners with iNaturalist's growing community of citizen scientists to collect new records, and coordinate with Calflora's library of 21,000 checklists to ensure these valuable distribution data are available to conservationists.


• National

- **Project Budburst** - a national field campaign designed to engage the public in the collection of important ecological data based on the timing of leafing, flowering, and fruiting of plants so that scientists can use the data to learn more about the responsiveness of individual plant species to changes in climate locally, regionally, and nationally. [can be done independently any time of year, family-friendly] <http://neoninc.org/budburst/index.php>




iNaturalist.org

iNaturalist.org Observations ▾ Species ▾ Projects ▾ Places ▾ People Welcome **moke!** (Sign out) Dashboard ▾




Explore!

Your World!



Learn!

About Life!



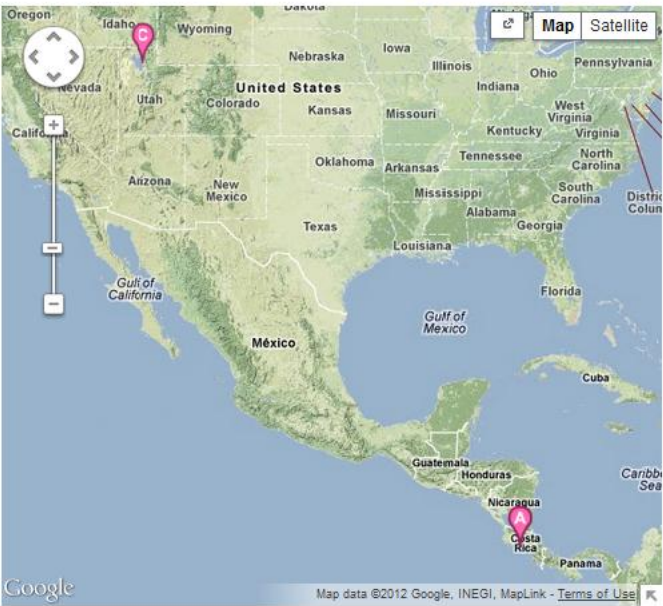
Record!

Add Observations!



Recent additions

- A** *Sarcoramphus papa*
Observer: mariorv
Observed: Dec 26, 2011
Added: Mar. 28, 2012
[View »](#)
- B** *Chondrohierax uncinatus*
Observer: mariorv
Observed: Dec 26, 2011
Added: Mar. 28, 2012
[View »](#)
- C** American Avocet
Observer: jay
Observed: Oct 30, 2011
Added: Mar. 28, 2012
[View »](#)
- D** *Herpetotheres cachinnans*
Observer: mariorv
Observed: Dec 26, 2011
Added: Mar. 28, 2012
[2 photos »](#)

[More »](#)



Map data ©2012 Google, INEGI, MapLink - Terms of Use

Available on the  **App Store** Available in  **Android Market**

[About iNaturalist](#) [Help](#) [Feedback](#) [Terms of Service](#) [Privacy Policy](#) | [Follow us on Twitter & Facebook](#)

Welcome!

to **iNaturalist.org**, where you can **record** what you see in nature, **meet** other nature lovers, and **learn** about the natural world.

[Learn More »](#)

[Add Observations!](#)

Record what you see in nature

Explore the findings of others

Learn about the natural world

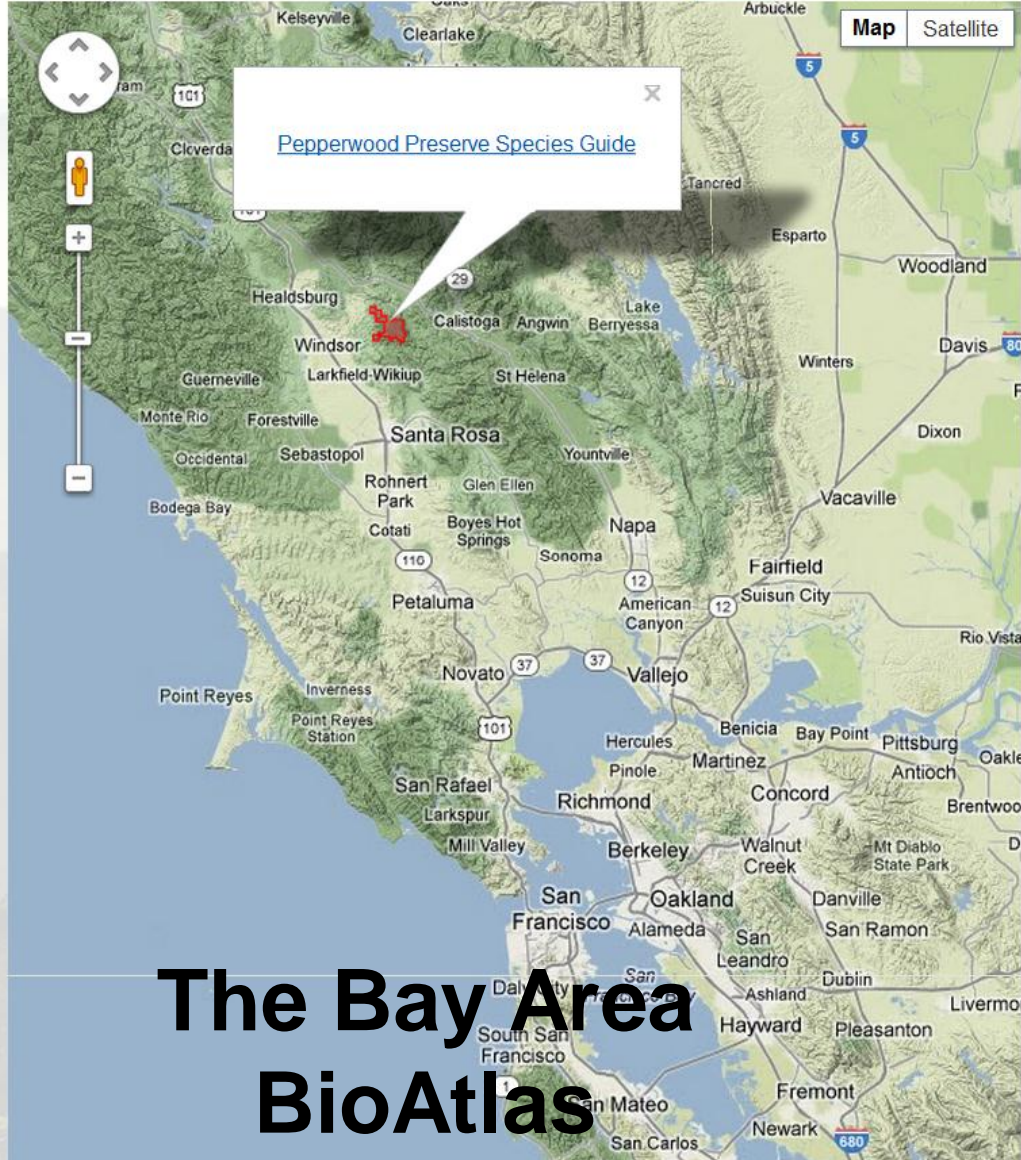
iNaturalist.org encourages the participation of a wide variety of nature enthusiasts, including hikers, birders, park rangers, mushroom foragers, and ecologists.

Through connecting these different perceptions and expertise, iNaturalist hopes to create extensive community awareness of local biodiversity and promote further exploration of the natural world.

Explore! Learn! Record! www.inaturalist.org

Completed Species Guides: 1

powered by
iNaturalist.org  



**The Bay Area
BioAtlas**

Using iNat for Science

- Generating valuable distribution data for conservationists
- Building reserve level species presence & absent
- Monitoring global change
- Investigating your own research question
 - Are earlier recorded species still present (e.g. red legged frogs, spotted skunks).

« Projects

Leave this project



University of California CALIFORNIA NATURALIST

Año Nuevo and surrounds

4 taxa observed ~ [Browse the Año Nuevo species guide](#)

Add Observations



» Observations / Map

Atom / KML / CSV

» Checklist

4 taxa observed

» Top Contributors

- 
loarie
 3 species, 5 observations

[View leaderboard »](#) | [View all members »](#)

» Stats

About

This project is part of the UC California Naturalist Program.

 Like  Send

 loarie created this project on January 31, 2012

Recent Observations [view all »](#)

 **Northern Elephant Seal** *Mirounga angustirostris*

Observer loarie

Date Nov 13, 2011 03:24 AM PST

Place año nuevo state park (Google, OSM)

2 | 2 IDs | [Research Grade](#) [View »](#)



3 photos »

Projects

[Start a new project](#)

[Search](#)

embed a

Projects are a way to pool your observations with other people on iNat. Whether you're interested in starting a citizen science project or just keeping tabs on the birds in a nearby park with your local birding club, Projects are the way to go.

Projects You've Joined



Año Nuevo and Surrounds UC California Naturalist Project

This project is part of the UC California Naturalist Program.



CA Newt Watch

Tracking of annual CA Newt (*Taricha Torosa*) migration in SF East Bay community. Includes rescue efforts of...



The Sampled Red List Index for Plants

The Sampled Red List Index for Plants (SRLI) project is a major global monitoring scheme that is helping us...



Arachnids and Myriapods of North America

In an effort to increase awareness of the 'lesser-studied' terrestrial arthropods, here is a repository for...



Mark West Watershed Biodiversity Project

"Platform to share and communicate observations about specific species to inform us about our watershed bio..."



Global Reptile BioBlitz

There are over 9,000 recognized species of reptile in the world. Many are extremely poorly known and many m...



Jasper Ridge Monitoring Project

The purpose of this project is to gather information about the distribution and abundance of plants and ani...



BadgerMap

BadgerMap is a project to document confirmed habitat and species sightings for American Badger (*Taxidea tax...*



Global Amphibian BioBlitz

Amphibians around the world are rapidly disappearing. To conserve these fascinating creatures, scientists ...

[View all your projects »](#)

Add your observations to a CA Naturalist project

Recruit Naturalists into PPSR programs

• **Strategies:**

- Facilitate partnerships between CA-Naturalist course sponsor organizations and local PPSR program providers
- Offer Advanced Trainings in PPSR
- Integrate PPSR activities and practice into CA Naturalist training courses
- Searchable database of local PPSR projects
- Outreach and recruit trained CA-Naturalists about local PPSR program opportunities



Advanced Trainings in PPSR

- 1-day Workshop designed to better prepare California Naturalists and other interested members of the public to participate in ecological field based research and monitoring.
- Classroom presentation on fundamentals of effective monitoring and research design
- Field activity, in small groups, collecting data on abundance and density of local plants and animals.
- Group work analyzing findings using basic statistics and report back to the larger group



Lessons Learned

- Based on our first year, hard to get a lot of naturalists involved in citizen science following the course
 - Need to fold citizen science experience into course curriculum/field days
 - Need to use iNaturalist during the course hours
- Advanced training is on how to set up your own study not specific to a citizen science project? Important content but may not be popular as an advanced training.

Connecting with Multiple Audiences



Traditional Audiences



Non-Traditional Audiences

Mutual Learning Exchange

Recruit non-traditional audiences to California Naturalist Program

- Strategies: *JR College, University, Scholarships, Social Media, Community Organizations, Local Networks*



Lessons Learned: Informal mixing is working

Goal: participants of different age-groups and backgrounds simultaneously benefit from each others' experiences and skill sets.

Method: Informal interactions in class and the field.

Based on the first exit interviews...

The older participants in the course talked about learning from the content of the course and learning from other participants in the course.

Many of the older participants in the interviews talked about learning from younger participants in the course and enjoying their enthusiasm and even just that they were there.

The younger participants had similar positive feedback about learning from the older and/or experienced participants in the course).


Its social

- Several talked about learning from other by asking questions of their fellow participants and other described learning from others questions to the course instructors. These individuals talked about how the kinds of questions that other asked made them think about issues or topics in a different way or through a different approach.
- All the participants I talked to seemed to enjoy this social nature of the course and a few (mostly older) described the opportunity to spend time with other that share their interests was a highlight of the course.
- One participant said she felt she had found her “litter mates” referring to the feeling of kinship she had with her fellow participants.
- The way that you are part of a community.... I feel that’s a way to keep learning”

DEVISE + Participant info + course feedback

- In addition to data about each naturalists, their motivations for taking the course, knowledge & course evaluation we used some standard evaluation methods.
- “There is always a challenge in using standardized measures, but when appropriate it would allow us to compare across projects.” **Tina Phillips** (Evaluation Program Manager, Department of Program Development and Evaluation, Cornell Lab of Ornithology)
- DEVISE (Developing, Evaluating and Implementing Situated Evaluation Instruments) project, which is focused on creating and testing evaluation instruments to be used by professionals developing PPSR projects.

NEXT STEPS FOR PPSR AND THE CALIFORNIA NATURALIST PROGRAM

- 
- Train-the-trainer
 - Regional modules
 - Statewide meeting
 - Incentives for volunteer hours
 - Expand recruitment for the Naturalist and PPSR programs
 - Interviews – 6 months and 1 year after participation in the Naturalist Program
 - *Track through PPSR Participation*
 - Observations – Continue with new cohort of Naturalists and with Naturalists involved in local PPSR programs
 - Improve and expand surveys



Evaluation Support (Committee of Visitors)

- Two external evaluators (Tina Phillips, Cornell Lab of Ornithology and Joe Heimlich, Ohio State University and Institute for Learning Innovation)
- Two external advisory board (Karen Oberhauser, University of Minnesota and Monarch Larvae Monitoring Project and Robert Blair, University of Minnesota Cooperative Extension and Master Naturalist Program).

SELF-EFFICACY WITH SCIENCE

For each of the following, please rate each statement by placing an X in the appropriate column. Please respond as you really feel, rather than how you think “most people” feel.

Choose one answer on each line.

These statements are about how you feel about <u>learning and understanding science topics</u>	Disagree Strongly	Disagree a little	Agree a little	Agree Strongly
I think I'm pretty good at understanding science topics.				
Compared to other people my age, I think I can quickly understand new science topics.				
It takes me a long time to understand new science topics.				
I feel confident in my ability to explain science topics to others.				

These statements are about how you feel about <u>doing scientific activities</u>	Disagree Strongly	Disagree a little	Agree a little	Agree Strongly
I think I'm pretty good at following instructions for scientific activities.				
Compared to other people my age, I think I can do scientific activities pretty well.				
It takes me a long time to understand how to do scientific activities.				
I feel confident about my ability to explain how to do scientific activities to others.				

These statements are about how you feel about <u>yourself as a scientist</u>	Disagree Strongly	Disagree a little	Agree a little	Agree Strongly
I think I could be a good scientist.				
I have always had a natural talent for doing science.				

SELF-EFFICACY WITH CONSERVATION

For each of the following, please rate each statement by placing an X in the appropriate column. Please respond as you really feel, rather than how you think “most people” feel.

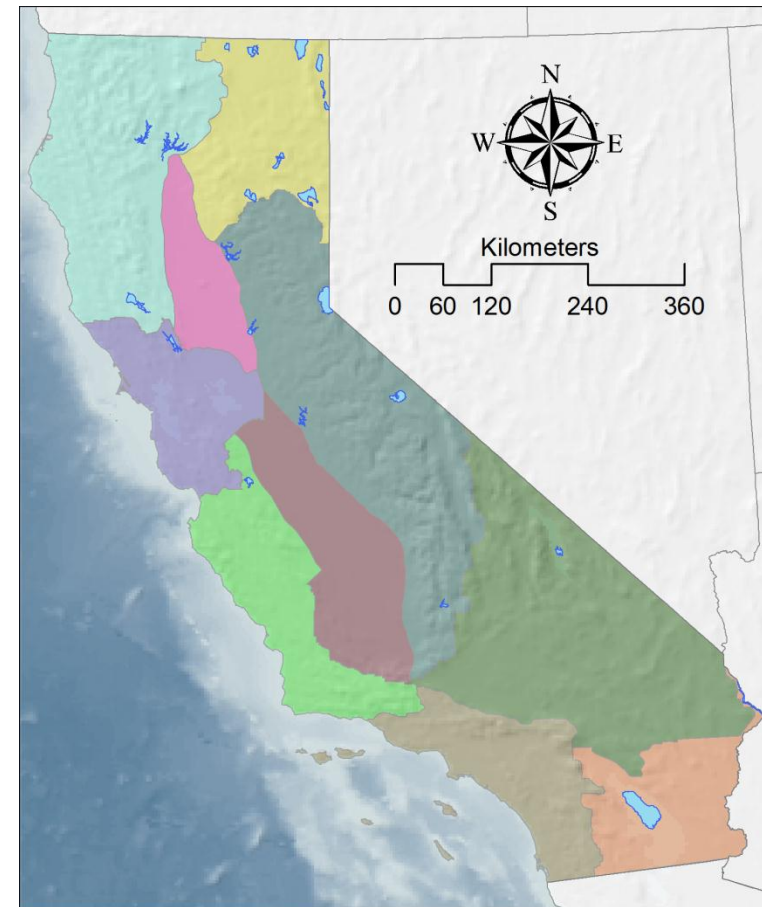
Choose one answer on each line.	Disagree Strongly	Disagree a little	Agree a little	Agree Strongly
I feel confident in my ability to help protect the planet.				
I am capable of making a positive impact on the environment.				
I am able to help take care of nature.				
I believe I can contribute to solutions to environmental problems by my actions.				
Compared to other people, I think I can make a positive impact on the environment.				
I don't think I can make any difference in solving environmental problems.				
I believe that I personally, working as an individual and on my own, can help solve environmental issues.				
I believe that I personally, working with others, can help solve environmental issues.				

California: A global biodiversity hot spot

California is one of the most diverse places on Earth.

- 30,000 species of insects
- 63 of freshwater fish
- 46 amphibians
- 96 reptiles
- 563 birds
- 190 mammals
- more than 8,000 plants

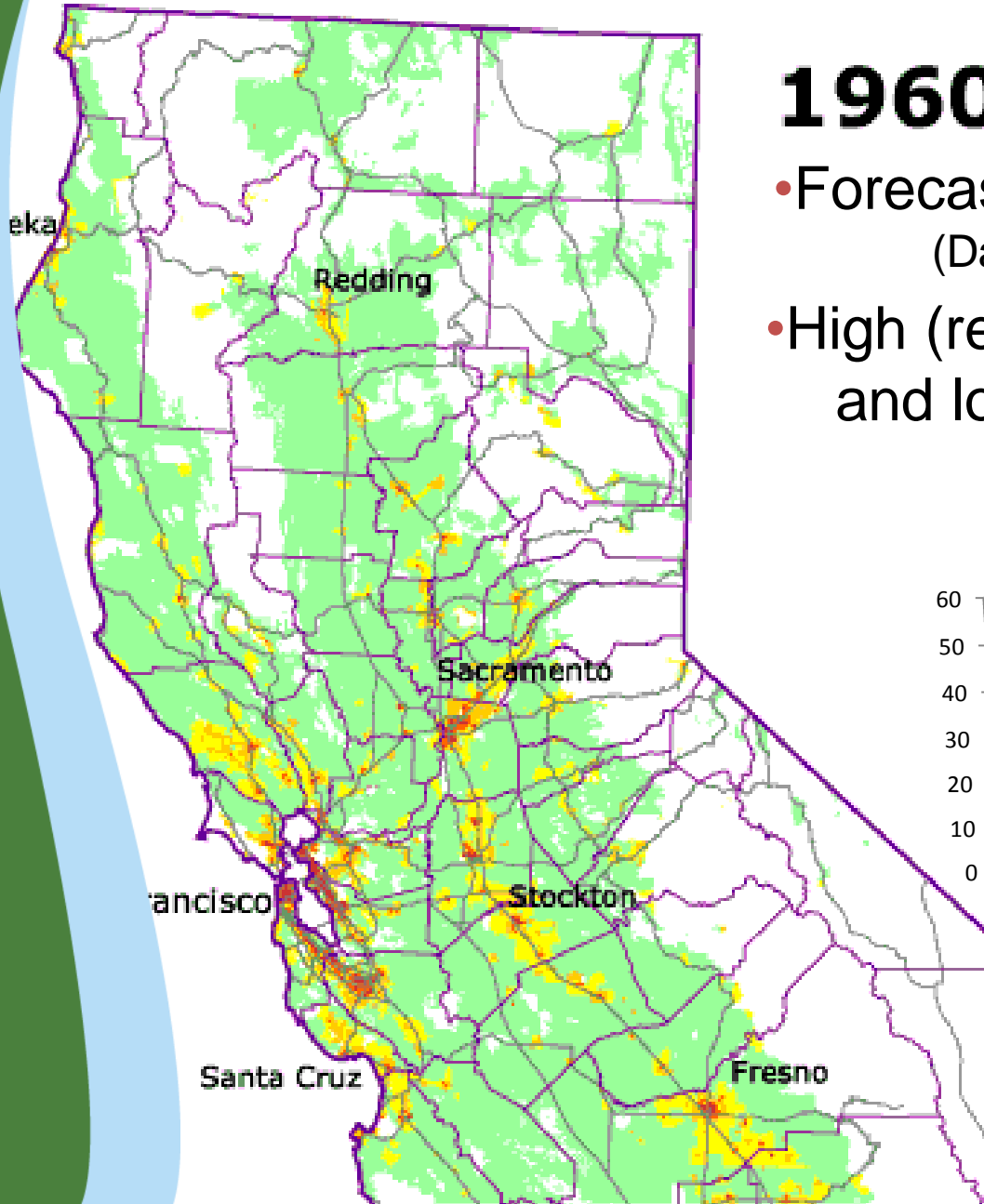
Many are endemic to CA



Bioregions

Bay / Delta	Mojave
Central Coast	Sacramento Valley
Colorado Desert	San Joaquin Valley
Klamath / North Coast	Sierra
Modoc	South Coast

Forecasting development patterns



1960

- Forecasted land use change (David Theobald 2005)
- High (red), medium (orange), and low density (yellow).

population estimate (millions)

