

Resources

UPDATE

Everyone Can Be a Scientist

by Erin Snyder

Citizen science defines itself: science done by citizens. This is not a new concept; early naturalists John Muir, Charles Darwin and John James Audubon were all citizen scientists. Today, mobile apps make it easy for people to participate in science, primarily in the collection of data and observations. Citizen science usually involves volunteers observing, collecting, and submitting data to professional scientists or online programs. Birdwatching and weather records are examples of common activities that become citizen science when submitted to scientific entities.

A Google search yields 17 million sites for citizen science. There is something for everyone who wants to be a scientist, a citizen scientist.

“Citizen science is the involvement of the public in scientific research – whether community-driven research or global investigations.” Citizen Science Association

How will citizen science affect the future of scientific research?

“Citizen science bridges gaps by harnessing the power of people who are motivated by curiosity, a desire to advance research, or a concern about environmental conditions in their communities, then connecting them to projects that benefit from their energy and dedication.” —Citizen Science Alliance



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Riverside-Corona Resource Conservation District

RCRCD provides resource management assistance to private and public landusers and conducts land treatment, education, and volunteer programs to steward natural resources. RCRCD promotes the sustainable use of natural resources for each land-use, including native habitats, urban/suburban areas, and agriculture.

New Citizen Science Collaboration

by Erika Presley

The Riverside-Corona Resource Conservation District (RCRCD) is collaborating with a variety of partners to develop the *Santa Ana Watershed Citizen Science Program*. This exciting initiative is a community-based effort to organize and train citizen scientists to collect data for air, water, soils, wildlife, vegetation, and more. Researchers and conservation practitioners will then be able to use the data to better understand, protect and restore the watershed. Keeping the watershed healthy and functioning is a team effort, and this program will help pull the big picture of our watershed into focus.

The program seeks to coordinate citizen science efforts that are already taking place, as well as to create new projects that will help fill the gaps in the watershed. Citizen science centers, called “outposts”, will be created at existing sites, such as at nature centers. Outposts will provide information, resources, tools, and training for those who wish to participate in local projects. RCRCD’s Land Use Learning Center and Sycamore Creek Interpretive Center are outposts.



Rick Whyude helps Shani Pynn gather flow data at Tequesquite Creek.

If you would like to host an outpost somewhere in the Santa Ana River watershed, or to simply get involved with citizen science, please contact Erika Presley at presley@rcrcd.org or (951) 683-7691, Ext. 223. Learn more and share your citizen science adventures on Facebook at: Santa Ana Watershed Citizen Science Network.

Watershed Stewardship

The Santa Ana River watershed, the largest in Southern California, is home to more than 6 million people. The watershed supplies clean drinking water, moderates flooding, provides wildlife habitat, restores underground water supplies, and much more.

Because many areas within the watershed are densely populated, people impact the health of the watershed. Urban runoff laden with pesticides, trash, fertilizers and other pollutants severely impacts water quality and ecosystem functions. The actions of upstream users impact the quality of life for downstream users and the health of the watershed. Keeping this connection in mind is important for improving both the overall ecological function of the watershed and the quality of life of its residents.

By educating communities about human impacts and the benefits of a healthy watershed, and by engaging people and communities in citizen science, we hope to inspire an ethic of stewardship among the people who live, work and play in the Santa Ana River watershed.



Lower Santa Ana River below Prado dam.

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Help Protect our Forests

Be on the lookout for invasive beetles.

by Shani Pynn

You may have heard there is a new beetle in town and this one, the Polyphagous Shot Hole Borer (PSHB), is a farmer. It is a type of ambrosia beetle that is the Johnny Appleseed of the beetle world. The insect brings its food (a fungus) with it to grow in the trees it infests. Unfortunately, this means that once a tree has been attacked, the fungus will continue to harm it, even if the beetles are killed. The borer attacks urban, agricultural, and wildland trees, so the symptoms of a sick tree can vary. PSHB attacks some species of avocados, oaks, willows, palms, and many others.

With so many tree species in danger, citizen scientists can help track the spread of the Polyphagus Shot Hole Borer by noticing and reporting infested trees. Look for round holes in the wood that are about the size of the tip of a ball point pen, stains or white powder near the hole, and sickly or dying back branches. For more information about identifying infested trees, see the field guide at: <http://eskalenlab.ucr.edu/handouts/fusariumdiebackfieldguide.pdf>

If you think you may have seen an infested tree, please report it to the County Ag Commissioner or to UC Riverside at eskalenlab@gmail.com. You can also help by reporting observations to the "SCARAB" (Scientific Collaboration for Accessible Research for Borers) citizen science project on iNaturalist at <http://www.inaturalist.org/projects/scarab>. Find instructions for reporting at <http://scienceland.wikispaces.com/SCARAB>.



Photo enlarged. Beetle is smaller than a sesame seed, and it produces tiny holes in bark/wood.

J.P. BAKER & S.E. BAMBERG, NORTH CAROLINA

Norco Habitat Restoration

The Riverside-Corona Resource Conservation District, in cooperation with the City of Norco, has begun restoring native habitat along the Santa Ana River west of Hamner Ave. to north of the intersection of Shadow Canyon Circle and Sunset Court. Invasive, non-native plants are being removed, including the bamboo like Giant Reed, also known as *Arundo donax*. *Arundo* quickly invades and congests waterways, creating a high fire hazard, especially during Santa Ana Winds. *Arundo* grows rapidly using massive amounts of water and displaces native plants that are needed by wildlife for food and nesting sites. Native willows, cottonwood trees, and smaller plants will be planted to restore gallery forests, shrublands, and meadows that were originally present along the waterway.

The restoration project began in October, 2016 and will continue for five years. Currently, a crew is bulldozing and chipping plant stalks, which may periodically increase noise levels during the day for homes immediately adjacent to the river.

After a year of treatment, re-planting will increase the natural variety of plants, improving food and shelter for native wildlife. During the subsequent four years, the project area will be monitored for regrowth of invasive plants and for water quality. To prevent regrowth, targeted spraying of any re-sprouting *Arundo* will be done with a special herbicide that does not harm wildlife and is approved for use by the EPA. Should you have questions or concerns about improving wildlife habitat along the river, please contact Shani Pynn, Habitat Restoration Specialist at pynn@rcrcd.org or (951) 683-7691 ext. 204.



Invasive *Arundo* congests the Santa Ana River.

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Citizen Science is for the Birds

by Diana Ruiz

Did you know that bluebirds build their nests in holes, or cavities in tree trunks?

Unfortunately, many natural nesting sites, such as snags (dead trees), have been removed from cities.

Did you know that there are fewer empty cavities for bluebirds to use, since populations of invasive birds have grown?

That's why the Riverside-Corona Resource Conservation District (RCRCD) has been coordinating bluebird nest box monitoring for the past 16 years. Volunteers provide nesting sites for cavity-nesting birds by hanging boxes high in trees over grassy locations. The citizen scientists then check boxes weekly from February through July. It takes about an hour a week to monitor three to five boxes for nests, eggs, and baby birds.

The data that is collected are provided to Cornell University at NestWatch.org and to the Southern California Bluebird Club at <https://bluebirdssc.wordpress.com/>. From those organizations, it is shared with the North American Bluebird Society (NABS) and the California Bluebird Recovery Program.

During the 2016 breeding season, RCRCD citizen scientists monitored 25 nest boxes at several locations around Riverside. As a result, 225 Western bluebirds were born and fledged.

Many thanks to our 2016 bluebird volunteers, for helping cavity-nesting birds return from decline in Southern California: Lee Johnson, Charlie Foust and California School for the Deaf Students.

Since 2000, RCRCD volunteers have monitored Bluebird nest boxes that have fledged over 2450 Western Bluebirds and more than 350 other cavity nesting species including Ash-throated Flycatchers, Tree Swallows, Bewick's Wrens, Acorn Woodpeckers and Mountain Chickadees.

If you would like to start your own bluebird nest box project, refer to: <https://bluebirdssc.wordpress.com/getting-started/recommended-nest-box-plans/> (Note: It's very important that the entry hole be the correct size, so that larger, invasive birds cannot enter and use the nest box.)

For more information, or if you are interested in volunteering and using RCRCD's materials, please contact Erin Snyder, at snyder@rcrcd.org or (951) 683-7691, Ext 207.



PHOTO BY DIANA RUIZ



To learn about preserving dead and dying trees for wildlife, visit <http://cavityconservation.com/>

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PHOTO BY CODY SWINBER



Be a Nature Spotter!

by Diana Ruiz

Have you seen a cool looking bug? Did you want to know more about it? Need help identifying a native plant that you've seen in the hills, like at Mt. Rubidoux or Sycamore Canyon?

Catch a photo of wildlife, like a lizard or bird, and submit your observations to Nature Spotter. Download the free Riverside Nature Spotter app on a smartphone, or use a camera and email your observation to naturespotter@riversideca.gov. Submissions will be identified (if needed), mapped, and stored at www.inaturalist.org/projects/riverside-citizen-science. Note: Try to get a clear shot with close ups, if possible.

While visiting iNaturalist, search for other Riverside area projects, such as Seeking All Southern California Stinkbugs that was developed in partnership with UC Riverside scientists. If you're into stink bugs, you can participate through Nature Spotter and find records at: www.inaturalist.org/projects/seeking-all-southern-california-stinkbugs. Follow local citizen science efforts and others on Facebook at: Riverside Citizen Science



Operation Resilient Trees 2.0

by Diana Ruiz

Volunteers have been helping scientists study the cooling benefits of different tree species in Riverside since 2015. The project of Earthwatch Institute is called Operation Resilient Trees. Citizen scientists collect data about tree condition, size, location, and understory, so that UC Riverside scientists can study the data and correlate it to high altitude aerial photos taken by NASA.

Earthwatch conducted a workshop on August 8, 2016 to verify that our citizen scientists are using proper data collection techniques. Those who were certified are now able to lead data collections and train others.

To learn more about the Urban Resiliency Program see <http://earthwatch.urbanresiliency.org/get-involved/>.

The Resilient Trees project is looking for participants to help collect tree data. If you would like to get involved with data collection and learning about local trees, please contact Erin Snyder at (951) 683-7691, Ext 207.

We have all the materials needed for citizen scientists to use.



Arlington High School's Envirothon team, under the direction of teacher Sheri Harris, collected data for Resilient Trees.



On October 22, 2016, certified citizen scientists led a group of 17 volunteers in data collection at Fairmount Park as part of the first "I Love Riverside" day of giving.

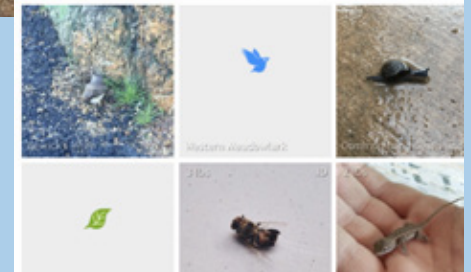
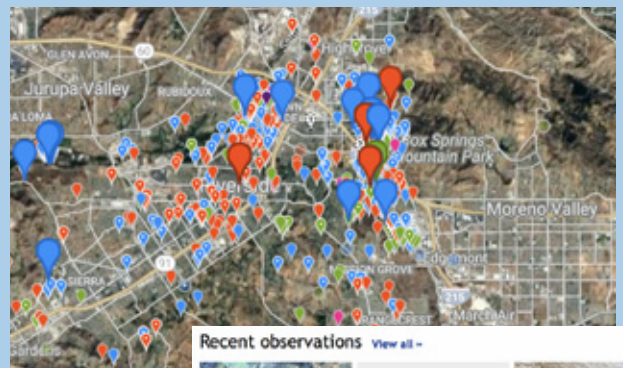
1. Where do my photos go?

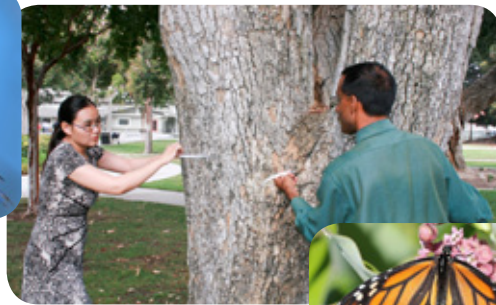


2. Your photos are placed into our Riverside Citizen Science online database at www.inaturalist.org/projects/riverside-citizen-science.

Stats	
Totals	Most Observations
1157 Observations »	naturespotter 330 observations

3. This information can be shared and viewed by other nature spotters.





Citizen Science Projects Are Everywhere

SciStarter <https://scistarter.com/page/CitizenScience.html>

Citizen Science Central - Cornell Lab of Ornithology <http://citizenscience.org/>

Cornell University in Ithaca, New York has long been a repository for individual bird observation records. Cornell's NestWatch program at www.NestWatch.org is a nationwide monitoring program designed to track status and trends in the reproductive biology of birds, including when nesting occurs, number of eggs laid, how many eggs hatch, and how many hatchlings survive. The Cornell database is used to study the current condition of breeding bird populations and how they may be changing over time as a result of climate change, habitat degradation and loss, expansion of urban areas, and the introduction of non-native plants and animals.

Citizen Science Association <http://citizenscience.org/> (In partnership with Cornell)

The Citizen Science Association unites expertise from educators, scientists, data managers, and others to power citizen science. Join and help speed innovation by sharing insights across disciplines.

Citizen Science Alliance www.citizensciencealliance.org/

The CSA is a collaboration of scientists, software developers, and educators who collectively develop, manage and utilize internet-based citizen science projects. Their projects can be found at **Zooniverse**: <https://www.zooniverse.org/>

National Audubon Society <http://www.audubon.org/conservation/science>

National Geographic Society <http://nationalgeographic.org/encyclopedia/citizen-science/>

National Wildlife Federation <https://www.nwf.org/Wildlife/Wildlife-Conservation/Citizen-Science.aspx>

Scientific American <http://www.scientificamerican.com/citizen-science/>

Smithsonian Institute <https://www.si.edu/Volunteer/CitizenScience>

Environmental Protection Agency <https://www.epa.gov/citizen-science>

Public Library of Science <http://blogs.plos.org/citizensci/>

A non-profit organization of scientists committed to making the world's scientific and medical literature freely accessible to scientists and to the public.

California Academy of Sciences <http://www.calacademy.org/citizen-science>

A renowned scientific and educational institution dedicated to exploring, explaining and sustaining life on Earth.

Citizen Science for the Federal Government <https://www.citizenscience.gov/>

Official government website designed to accelerate the use of crowdsourcing and citizen science across the U.S. government.

Reptiles and Amphibians of Southern California (RASCals) <http://herpatlas.sdnhm.org/>

Western Monarch Count <http://www.westernmonarchcount.org/>

Celebrate Urban Birds <http://celebrateurbanbirds.org/>

Lost Ladybug Project <http://lostladybug.org/>

California Roadkill Observation System www.wildlifecrossing.net/california/user/register

Earthwatch www.earthwatch.org

Tequesquite Community Garden at Ryan Bonaminio Park Visit the Riverside Monarch Butterfly project at Tequesquite Community Garden to learn about the Monarch lifecycle and its stewardship. Visit the Facebook Page: Riverside Monarch Butterfly Sanctuary for more information.

Resources for Learning

The Riverside-Corona Resource Conservation District facilitates natural resource conservation through education, collaboration, and technical assistance.

Sycamore Creek Interpretive Center (SCIC)

Visit the Sycamore Creek Interpretive Center (SCIC) Mondays and Wednesdays from 10 AM - 2 PM (closed holidays) at 11875 Indian Truck Trail in Temescal Valley, CA (intersection of Campbell Ranch Road and Indian Truck Trail). For more information about SCIC, please contact us at those times at (951) 277-0219 or at the RCRCDD main office: (951) 683-7691, Ext 223. www.rcrcdd.org/#Sycamore_Creek_Interpretive_Center

Free Homeschool Programs

Homeschool Environmental Ed programs: two Monday's per month at RCRCDD's Sycamore Creek Interpretive Center for grades 1-6. Please call the Center at (951) 277-0219 to register your child. For a schedule or more information, email SCIC@rcrcdd.org. See address above.

- February 27** Water Resources-Clean Water for Fancy Finn
- March 13** Renewable and non-renewable resources-The Lorax
- March 27** Renewable and non-renewable resources-Renewable or Not?
- April 10** Beginning Botany-Parts of the plants
- April 24** Beginning Botany-Parts of the Flower
- May 8** Southern California Habitats
- May 22** Species at Risk-Endangered and Extinct species

Free Materials from RCRCDD

The Riverside-Corona Resource Conservation District provides free conservation education materials to schools, youth groups, and homeschooling families who live or work within RCRCDD boundaries. We also provide mini-grants for school gardens, up to \$250. Find order forms, a mini-grant application, and additional school gardening resources on our website at http://www.rcrcdd.org/#For_Youth.

A variety of publications about local natural resource concerns can be found at http://rcrcdd.com/#RCRCDD_Publications

Grow RIVERSIDE for Colleges and High Schools

There will be an agricultural poster opportunity for students at the 2017 GrowRIVERSIDE conference March 30-31, 2017, La Sierra University. Learn more at www.growRIV.com #GrowRIVERSIDE

Ag in the Classroom Ag Resources for kindergarten through high school: <http://agclassroom.org/> learnaboutag.org

Environmental Education Collaborative (EEC)

Find local educational opportunities at the Environmental Education Collaborative's online website and Facebook page. Subscribe to their newsletter for periodic updates. EEC serves San Bernardino and Riverside Counties. www.enviroedcollaborative.com <https://www.facebook.com/groups/EECollaborative/>

California Regional Environmental Education Community (CREEC)

Subscribe to the California Regional Environmental Education Community's (CREEC) Region 10 newsletter for regional opportunities, updates, and resources, from the California Department of Education's STEM (Science Technology Engineering and Math) Office. <http://creec.org/>

Extraordinary Ideas from Ordinary People: the History of Citizen Science, currently an exhibit at the NAT (San Diego Natural History Museum). <http://www.sdnhm.org/exhibitions/current-exhibitions/extraordinary-ideas/>

Inland Urban Forest Council <http://inlandurbanforestcouncil.org/>

Riverside Land Conservancy (951) 788-0670 www.riversidelandconservancy.org

Inland Empire Waterkeeper <http://www.iewaterkeeper.org/>

Audubon Society <http://www.sbvas.net/>

California Native Plant Society <http://riverside-sanbernardino.cnps.org/index.php>



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District Conservationist

All RCRCD programs and services are offered on a nondiscriminatory basis, without regard to race, national origin, religion, age, gender, or orientation.

Upcoming Events

The Third Annual Environmental Education Collaborative Symposium
Strengthening Connections in our Environmental Education Web

THURSDAY, FEBRUARY 23, 2017 8:00 AM–5:00 PM
The Western Science Center, 2345 Searle Parkway, Hemet, CA 92583
Early Registration: \$45/person includes continental breakfast, lunch and entrance to WSC museum
Must RSVP/Register in advance at www.eeccymposium2017.eventbrite.com

The Second Annual Citizen Science for Conservation in Southern California Symposium

SATURDAY, MARCH 4, 2017. 8:00 AM–6:00 PM
Aquarium of the Pacific, 100 Aquarium Way, Long Beach, CA 90802
Anyone involved or interested in citizen science is invited and encouraged to attend this symposium. Fee: \$20; includes: Aquarium admission, parking, light breakfast and appetizers at the reception. Register online <http://www.aquariumofpacific.org/events/info/cscscs>, or (562) 590-3100.

Riverside/San Bernardino/San Diego Regional Agritourism Summit

WEDNESDAY, MARCH 29, 2017. 8:30 AM–4:00 PM
A day for sharing, learning and planning together at La Sierra University, 4500 Riverwalk
For information: <http://ucanr.edu/survey/survey.cfm?surveynumber=19483>

Grow RIVERSIDE

MARCH 30-31, 2017. 10:00 AM–8:00 PM
La Sierra University, 4500 Riverwalk For information: www.growRIV.com #GrowRIVERSIDE

Riverside Community Garden Council Meetings

Third Monday of each month. 6:30PM–8:30PM
RCC Alumni House, 3564 Ramona Drive For information: nmelquiades@yahoo.com

Riverside Food Systems Alliance Meetings

First Thursday of each month. 3PM
Riverside City Hall, second floor. For information: rfsainfo@gmail.com