

The Heliograph



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Official Newsletter of the Sonoran Desert Network

Designing the Desert Research Learning Center *Sustainability in Practice*

When SODN moved into the Desert Research Learning Center (DRLC) a couple of years ago, we got a lot more than just new office space. Our buildings are surrounded by 40 acres of Sonoran Desert lands that have thus far seen limited use. But now that we've gotten the interior spaces in functional working order, we're also turning our attention to the outside.

For the past year, we have been working with high school students from the Arizona College Preparatory Academy, Tucson's Watershed Management Group (WMG), and a graduate student from the University of Arizona to gen-

erate ideas for improvement of the developed areas around the office. Some of those ideas have included:

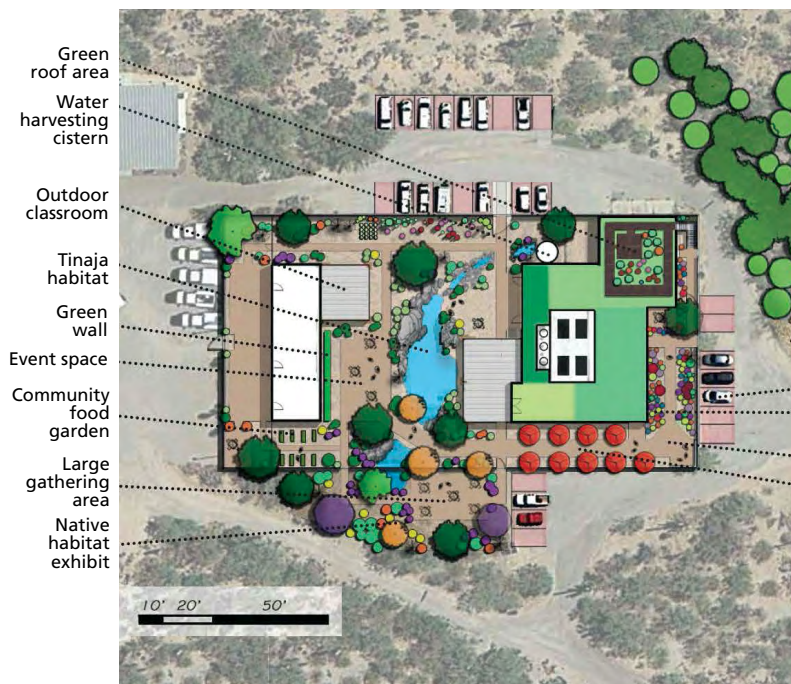
- A **native frog pond/tinaja**
- **Orchard of heritage trees** from Tumacácori NHP
- Gray-water passive system
- Rainwater catchment system
- Outdoor classroom/gathering areas
- Address property erosion issues
- Pollinator garden
- Native food garden
- Community garden
- Self-led outdoor interpretive exhibit
- Native plant propagation for park restoration

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For the past several months, volunteer Cory Ziolkowski, a recent graduate in landscape architecture, has been incorporating those ideas into designs that will help us "activate" those outside spaces to serve the needs and philosophy of the network and DRLC. Cory's design (see below) aims to transform the present area around the SODN offices into

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DRAWINGS AND RENDERINGS BY CORY ZIOLKOWSKI



Landscape architect's rendering of green wall.



Landscape architect's rendering of entrance area.

Project Updates

Desert Research Learning Center

Starting next month, work will begin on the first two phases of the DRLC landscaping project ([see article](#)). First, heavy equipment will be used to demolish urbanite (cement slabs) and grade the land to create low areas for passive watering of vegetation from gray and rain water. After that, students from middle-school to college age will assist with fine grading of soil and help to plant salvaged and native vegetation. Phase 2 will involve the installation of large, steel rain-harvesting tanks. These initial projects will be led by Tucson's Watershed Management Group, which conducts all project activities as workshops for the interested public to learn about these alternative land/property management techniques and foster stewardship of native desert habitat in urban areas.

Groundwater

The groundwater monitoring protocol

for [Southwest Network Collaboration](#) national park units has been approved and was published in the NPS Natural Resource Report series in April. We have been conducting groundwater-database QA/QC and working with our data manager to meet current operational needs. We are continuing to monitor and process data on schedule and coordinate with SOAR Geographer Jake DeGayner to include groundwater wells in his surveys for accurate elevations and locations.

Invasive Exotic Plants

We continue to collaborate with the Exotic Plant Management Teams, with the goal of incorporating monitoring with survey and treatment efforts.

Springs

SODN's first international intern, Jesper Devantier, has completed the SOP for monitoring vegetation at springs. Jesper has been working with the SODN vegetation crew for almost a year, and this report is the culmination of his internship. This step-by-step procedure outlines the method for quantifying species richness and structural diversity of vegetation in spring systems, to help us understand the status of this valuable resource and detect trends in richness over time. A number of graduate students spent their spring break working with staff from Saguaro NP, SODN, and the NPS Inter-mountain Region (IMR) to study the hydrogeology of several tinaja complexes in the Rincon Mountain District of Saguaro NP. They collected data, surveyed the literature, and gave an engaging and thorough presentation at the week's end. A report of their findings is expected in the fall. This year's [Park Break](#) program was supported by Saguaro NP, the IMR, and the George Wright Society.

Streams

In May, SODN published its first [streams monitoring report](#), focusing on three

water bodies at Montezuma Castle NM and Tuzigoot NM during 2009–2011. This spring, through our [SWNC partnership](#), the streams field crew surveyed channel morphology, sampled benthic macroinvertebrates, and collected water quality samples at Bent's Old Fort NHS. SODN staff conducted training that will enable park resource management staff to assist with sampling in the future. Water quality and macroinvertebrates were sampled at Pecos NHP, Gila Cliff Dwellings NM, Montezuma Castle NM (both units), and Tuzigoot NM. Multiparameter logging water quality instruments were deployed at these locations for 2–3 week intervals.

Uplands

Uplands data have been moved into new SQL server databases, improving our ability to store and retrieve data. A [report](#) and [brief](#) on uplands monitoring at Montezuma Castle NM were published in May.

Vegetation Mapping

Data from Montezuma Castle NM (both units) were analyzed and the vegetation community types have been drafted. The validation phase was completed in June. Additional ground-based polygon mapping was completed at Coronado NMem, completing that effort. The next steps will be to draft the vegetation types and plan for an accuracy assessment for the Coronado report this fall.

Washes

SODN has received funding for training and implementation of continuous slope area stream gages in network washes. SODN also partnered with federal and state agencies, non-governmental organizations, and ranchers in the Chiricahua Mountains to collaborate on watershed function restoration.



National Park Service
U.S. Department of the Interior

The Sonoran Desert Network is one of 32 National Park Service inventory and monitoring networks nationwide that are implementing vital signs monitoring in order to assess the condition of park ecosystems and develop a stronger scientific basis for stewardship and management of natural resources across the National Park System.

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The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

MOCA/TUZI BioBlitz Coming in October

On October 3, 2014, Sonoran Desert Network ecologists will be helping Montezuma Castle and Tuzigoot (MOCA/TUZI) national monuments with their first BioBlitz. While not as big as Saguaro National Park's in 2011, this event will be a joint effort between multiple park divisions, NPS support offices (such as SODN and the Southern Arizona Office), the Verde Natural Resource Conservation District, local high school students, Northern Arizona University, the U.S. Geological Survey, Arizona State Parks, Friends of the Verde River Greenway, and Friends of

the Well. The MOCA/TUZI BioBlitz will also bring together eight fifth-grade classes from Verde Valley schools to learn about local natural and cultural resources. Students will travel between a number of stations at Montezuma

BioBlitz: A 24-hour event in which teams of volunteer scientists, families, students, teachers, and other community members work together to find and identify as many species of plants, animals, microbes, fungi, and other organisms as possible.

(<http://www.nationalgeographic.com/explorers/projects/bioblitz/>)

Well unit, Tuzigoot NM, Dead Horse Ranch State Park, and other sites. Along the way, they will learn from scientists, such as biologist [Dr. Erika Nowak](#) and research zoologist Dr. Charles Drost, about herpetofauna, invasive plant species, and aquatic ecology, as well as the cultural significance of these resources to the historic occupation of the Sinagua people and current importance to local residents. For more information, please e-mail [Deborah Decovis](#) or call 928-649-6195 x229.

—*Anna Iwaki*
Biological Technician



Learning the Art—and Science—of Filmmaking

In May, SODN (and the Northern Colorado Plateau Network, my other professional kin) sent me to Salt Lake City for training in science filmmaking. The training, presented by National Geographic producer/videographer Jeff Morales and professor Colin Bates, who together are [ScienceFilm](#), focused on both creative and technical aspects of filmmaking, with an emphasis on natural history stories.

Over five days, our small class (mostly graduate students in science and math) explored the elements of effective storytelling; how to choose which story to tell; how and why to outline the creative and filming process from start to finish; which types of shots every film should include; how to select and use camera equipment and accessories (and save some cash by building some of the latter yourself); what makes for good lighting, sound, and videography; how to edit film and audio using production software; how to plan, conduct, and film an interview; and how to write for documentaries.

As much as was possible in a single workweek, the training took an immersion approach, in which time spent in the lecture hall was balanced with time spent in the field and editing lab. We were sent out to (1) experiment with using a variety of shots to

tell a story, (2) use a variety of microphone types to collect audio, and (3) conceive, conduct, and film an interview. Lab time then allowed us to sift, cull, and assemble the footage into short films using a variety of audio and video editing techniques.

Interspersed throughout the week were Skype sessions with industry professionals who have collaborated with Jeff over the years, including producer/writer/videographer David Hamlin, cinematographer/composer Mark Emery, and editor Sal Vecchio. Finally, molecular animator and class participant [Janet Iwasa](#) shared her experiences with developing a relatively new approach to communicating information about molecular processes—and trying to convince scientists that it's desirable and important to present their results in a fashion that's visually compelling and makes their work accessible to laypeople.

With the skills gained from this training, I hope to work with network and park staff to develop ideas for short films related to SODN activities and concepts that could be posted on our website and the network's [youtube channel](#), and available for use by parks at seasonal orientation and other purposes.

—*Alice Wondrak Biel*
Science Writer-Editor

Staff profile: Anna Iwaki

When Anna Iwaki says her greatest strength is “networking . . . [and] getting along with most anybody,” you believe her. It’s a trait that’s served her well in her NPS career to date, and makes her a good fit for her current duties as SODN’s biological technician for science communication. “Getting along with most anybody” requires a certain degree of flexibility and a willingness to do what’s necessary, and Anna’s background and outlook reflect that.

While a teenager growing up in the Bay Area, she spent a summer maintaining trails at Denali National Park as a Student Conservation Association intern, and decided that rangering was for her. After earning her degree in Environmental Sciences from Washington’s Evergreen State College, Anna held seasonal positions at Lava Beds NM and Lassen Volcanic NP before being hired to help Saguaro NP plan and host its 2011 BioBlitz. Anna was assigned to work on science and education components for the event—contacting scientists, setting up inventories conducted by the public, and coordinating scientists to work with school groups. All of which set her up nicely to become SODN’s primary point of contact for activities related to the Desert Research Learning Center, whose purpose is to facilitate science and education (though these days, she spends most of her time assisting NRSS staff with the Natural Resource Publications Series).

In addition to being virtually (and fiscally) split between SODN and NRSS, Anna is physically split between Tucson and Chiricahua NM, where her fiancée is employed. Fantasy and science fiction audiobooks help shorten the drive.

Anna is currently working on her Master’s degree in resource interpretation from Stephen F. Austin University, and hopes one day to be a program manager or superintendent at a small park—preferable because she likes the idea of “being able to know everyone you’re working with.” Her favorite part of her current job is being able to talk to many different people in different divisions and parks, and being involved with new and innovative efforts for I&M.

Though she expresses common concern about the weight of rules, regulations, and paperwork that NPS employees often bear these days, she is optimistic about things here in southern Arizona, where “so many people [are] willing to work together to share resources across different parks and divisions . . . [to] accomplish park service goals. It’s not about turf. It’s a big partnership and collaboration and everyone embraces it really well.”

—Alice Wondrak Biel, *Writer-Editor*

COURTESY ANNA IWAKI



NEW DOCUMENTS AVAILABLE AT OUR WEBSITE

Briefs

- Uplands Monitoring at Montezuma Castle NM, 2011
- The Southwest Network Collaboration

Protocol

- Groundwater Monitoring in SWNC National Park Units

Reports

- Streams Monitoring at Montezuma Castle and Tuzigoot NMs, 2009–2011
- Uplands Monitoring at Montezuma Castle NM, 2011

a multi-faceted outdoor environment conducive to facilitating education, research, stewardship, and environmental awareness that will help connect people to nature in new and relevant ways. To help realize that vision, Cory has created designs that organize the grounds into a number of features that highlight not only the desert environment, but also the kinds of sustainable practices that can help to maintain life here.

A heritage orchard, composed of seedlings that originated with trees planted by Father Kino at Tumacácori National Historical Park, will acknowledge past cultural influences. Inside the courtyard area, a tinaja water feature will serve as a destination point for visitors to learn about the importance of water in the desert environment and provide habitat for native amphibians. Pocket gardens will feature native foods, seasonal vegetables, xeriscaping practice, and habitat for native pollinators (the lesser long-nosed bat, for instance, is highly reliant on agave). A desert tortoise enclosure is also part of the plans, as are a number of water-catchment features (see WMG design at right).

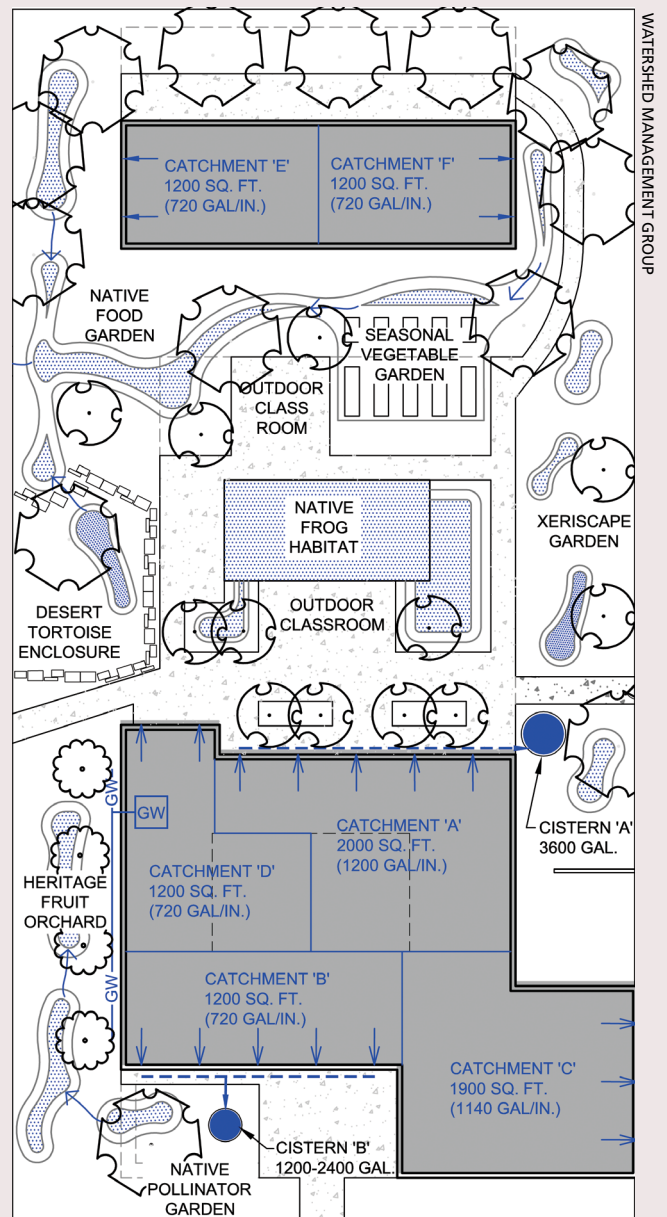
Flexible gathering spaces, including a small array of tent pads with access to a simple common area, will accommodate different group sizes for work and research activities, partnership events, and general visitation. A contemporary outdoor classroom will provide a comfortable, structured environment for outside instruction.

Cory says his biggest challenge was the design of “green roof” features, which add natural landscaping to the built elements of a roof in order to reduce the urban heat-island effect. On a green roof, lightweight plants with small roots, such as small cacti and succulents, small shrubs, and native grasses are planted inside a frame, creating both a cooler microclimate and an insulating effect that will help increase the energy efficiency of the building inside. Cory’s plans also include a “green wall,” which follows the same principles, except with a vertical soil frame.

Cory expects to have the initial plans finalized in the next month or so, but there’s plenty of work to come. He describes landscape-architecture planning as “a linear process that loops back on itself,” as initial plans are examined, goals are refined, costs are estimated and analyzed, and plans are modified accordingly. Keep watching the Helio-graph for future updates!

—Alice Wondrak Biel, Science Writer-Editor
—Anna Iwaki, Biological Technician

Cory Ziolkowski is a recent graduate of the University of Arizona, with a Master’s in Landscape Architecture. A native of Tucson, Cory was initially approached with the idea of using the DRLC planning as his Master’s project, but opted to take on the work as a freelance volunteer effort, instead. His Master’s project focused on ways in which municipal golf courses can be used as large city parks, to serve multiple needs of local residents, without losing their primary function as golfing spaces.



Plans designed by the Watershed Management Group, showing a rain harvesting installation and landscaping.



COURTESY CORY ZIOLKOWSKI

Where Are We?

Here's what we have planned for June–September 2014 (subject to change).

Park	June		July	August	September
CHIC ¹					Springs: Inventory, Sep 22–26
SODN			Washes: Training, USGS stream gaging methods, July 7–11		
TONT					Uplands: Sep 10–17, Sep 24–Oct 1 (tentative).
TUMA				Streams: Quarterly sampling, Aug 19	
MOCC	Streams: First revisit for riparian vegetation, June 4–11 and 18–25. Sonde retrieval, June 25.	Vegetation Mapping: June 4–11		Streams: Quarterly sampling, Aug 25–27	Streams: Sonde retrieval, Sep 9
MOWE		Vegetation Mapping: June 18–25			
TUZI					
GICL			Streams: Sonde deployment	Streams: Quarterly sampling, Aug 4–7	
BEOL ¹					
PECO ¹					

¹ Southern Plains Network parks: BEOL=Bent's Old Fort National Historic Site, CHIC=Chickasaw National Recreation Area, PECO=Pecos National Historical Park
Acronyms for SODN parks are shown in the box below.



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Sonoran Desert Network Park Units

Casa Grande Ruins NM (CAGR)
Chiricahua NM (CHIR)
Coronado NMem (CORO)
Fort Bowie NHS (FOBO)
Gila Cliff Dwellings NM (GICL)
Montezuma Castle NM (MOCA)
 Castle unit (MOCC)
 Well unit (MOWE)
Organ Pipe Cactus NM (ORPI)
Saguaro NP (SAGU)
 East (SAGE)
 West (SAGW)
Tonto NM (TONT)
Tumacácori NHP (TUMA)
Tuzigoot NM (TUZI)

NM = National Monument
NMem = National Memorial
NHS = National Historic Site
NHP = National Historical Park