“The Ecological Reserves are some of the most valuable resources we have here at Chico State! We use the Reserves as “home base” for my field ecology course, and bringing my students there over the course of the semester has helped them build a sense of stewardship and connection with the land that is impossible to cultivate in the classroom.” – Dr. Mandy Banet, Biology
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Ecological Reserves staff and volunteers spring 2017  
photo by: Jon Aull

Cover photo by: Kohner Vugrenes
Reflection and Opportunity:

As 2017 draws to a close, I find myself reflecting on what an amazing opportunity I have working on the Reserves. While I am still very new in this role, I am enthusiastic about the potential of our Reserves, and inspired by all those who volunteer, donate (time and resources), learn, and work on these lands.

During a recent visit, Dr. Norm Christensen, founding Dean and Professor Emeritus at Duke University's Nicholas School of the Environment, recognized the BCCER as the "only biological research facility of this kind in the northern Sierra Nevada." The BCCER, he said, has a "priceless legacy of long-term research dealing with a wide range of topics including fire suppression and restoration, management of nonnative species, and animal-plant interactions."

Dr. Christensen's comments reflect what all of us that are involved with the Reserves already know. These Reserves are special. The restoration and ongoing maintenance of these lands play a critical role in connecting current and future generations to the natural environment.

2017 has been an interesting year. While management turnover and decreased resources have been a challenge, we have had the most visitors on the Reserves ever recorded. I attribute our success to the amazing staff, faculty, hardworking volunteers, and community support that we are so fortunate to have. I am looking forward to next year and all of the incredible opportunities and growth that it will bring. Please keep an eye out for exciting events, activities and volunteer opportunities coming your way in 2018.

See you at the Reserves!

Eli Goodsell, Reserves Manager
Reserves Background

The Ecological Reserves are owned and operated by The CSU, Chico Research Foundation (RF). The RF is a public non-profit corporation that is dedicated to the development and execution of activities that supplement the educational mission of CSU, Chico. The Big Chico Creek Ecological Reserve (BCCER) and the Butte Creek Ecological Preserve (BCEP) make up the CSU, Chico Ecological Reserves. Our mission is to work to preserve critical habitat and to provide a natural area for environmental research and education. The Reserves have adopted an adaptive management approach to facilitate programs such as research, conservation, community outreach, education, and habitat management.

**BIG CHICO CREEK ECOLOGICAL RESERVE**

The Big Chico Creek Ecological Reserve contains 3,950 acres of diverse canyon and ridge habitats, including 4.5 miles of Big Chico Creek. The BCCER was created with the purchase of the Simmons Ranch in 1999 and the Henning Ranch in 2001.

The Reserve ranges in elevation from 700 feet to 2,044 feet and contains a wide variety of habitats, including creek riffles and pools, riparian areas, oak woodlands, chaparral, pine forest, rock cliffs, and springs. These diverse habitats support hundreds of wildlife species, including a number of listed species and species requiring large tracts of undisturbed habitat.

**BUTTE CREEK ECOLOGICAL PRESERVE**

The Butte Creek Ecological Preserve (BCEP) is a 93-acre site along the middle section of Butte Creek. The site was formerly used for gold, sand, and gravel mining, and is recovering from those activities. The property contains more than a mile of creek frontage, which is critical habitat and spawning grounds for the largest population of the threatened Central Valley spring-run Chinook salmon, as well as habitat for many species of special status, including Western Pond Turtle and Foothill Yellow-legged Frogs. In December 1998 the RF purchased this site with grants from the US Fish and Wildlife Service, National Fish and Wildlife Federation, CALFED, and the Wildlife Conservation Board. The goal of the Preserve is to work in conjunction with other programs towards achieving a reasonable balance among the diverse demands on the resource base of the Butte Creek watershed.
Executive Summary

The past year saw significant changes and remarkable growth for the CSU, Chico Ecological Reserves. It was a year of examination and renewal. A new blueprint for the Ecological Reserves is now under development. The pages to follow highlight some of the accomplishments the Ecological Reserves staff and volunteers achieved in the 2016/17 fiscal year.

A SUCCESSFUL MATCHING CAMPAIGN, GRANT AWARDS, AND FUTURE CHALLENGES

2016/2017 saw real progress in our fundraising success.

- With the help of a match by Professor Emeritus Wes Dempsey, we were able to raise over $46,000 for our programs during our spring 2017 fundraising campaign.
- The Butte County Department of Fish and Game funded the purchase of new Bobcat Tracks to aid in our restoration efforts.
- A grant from the California Deer Association allowed us to purchase fire equipment to enhance the scope of our prescribed burns.
- A Student Learning Fee Grant funded a new wifi enabled weather station that will augment student and faculty research on the BCCER, Personal Protective Equipment and fire pumps to enable more students and staff to participate in prescribed burns, a student position in our Outdoor Classroom, and a quality GPS unit.
Reserves Usage

In spite of an extremely rainy winter/spring, (in which we experienced the Oroville Dam crisis, and the splitting of Butte Creek into 4 channels through the Preserve), in 2016/17 the Ecological Reserves hosted over 4,000 visitors, not including the untracked usage of the public.

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</table>

“The support of the Reserve staff has been absolutely instrumental in making my class successful; in addition to providing knowledge and logistical support, they create a sense of community that helps the students thrive. With their support, all of my students have been able to devise and conduct their own independent research projects, some of which have been developed into funded studies that continue after the class ends. At the end of the semester I am always amazed at the ownership my students have developed for the work they’ve done, and the students are always so proud (and nervous!) to present their work to the Reserve staff.”

- Dr. Mandy Banet, Biology
2016-17 University Classes:

The Reserves offer an unsurpassed opportunity for Chico State Students to experience extraordinary field experiences that leave a lasting impact and prepare them for work as professionals in their fields.

- 86 Field Trips for CSU, Chico classes
- 1,298 CSU, Chico participants (BCEP- 205; BCCER – 1093)
- Provided transportation on the BCCER for CSUC student field trips
- Assisted with individual graduate and undergrad projects

“I am fortunate to teach several classes which use the Reserves for hands-on learning. The Reserves offer a unique opportunity for applied and situational learning.” – Dr. Don Hankins, Geography

Field Biology student Anton Dresler had this to say about his experience at the BCCER:

“We visited the BCCER nearly every week of the semester, and it was the first real outdoor research experience for me and the majority of the class. I learned how to estimate deer populations, set up trail cameras, and was able to conduct an investigation into the growth patterns of poison oak, something I’d been itching to learn about, and found out that I am no longer allergic to it. Whether we were counting piles of deer scat, trekking around in the rain, or standing hip-deep in thickets of poison oak, it was a great and valuable experience. The semester culminated in student groups developing and executing their own research, and presenting it at the spring research symposium. Without the Big Chico Creek Ecological Reserve, many biology and ecology students graduating from Chico State would be doing so with no real field experience, which would make them vastly unprepared for a career in the natural sciences.”

Studying responses of chaparral plants to fire  photo by: Jon Aull

Field Biology students set up trail cameras for a study, photo by: Jon Aull
RESEARCH:
The Reserves continue to be a rich environment for student, faculty, and outside research. 2016/17 projects included:

- Ongoing meadow restoration research by Dr. Don Hankins
- Ongoing research by graduate student Amanda Erling: “High Definition Analysis of Tuscan Formation facies geometries in Upper Bidwell Park and the BCCER near Chico, CA”
- "Native vs. Non-native riparian inputs to California stream communities: A comparative leaf decomposition analysis" by Jimmy Monge, B.S., Environmental Science-Applied Ecology, and Dr. Kristen Kaczynski, GEOS
- Research on the efficacy of lures synthesized from pheromones of longhorn beetles by Austin Richards
- Student research on poison oak growth diversity, dung beetle preference for elephant vs. cow or deer dung, and population density of Foothill Yellow-legged Frogs and Bullfrogs in various habitats, and more.

OWL MONITORING
The BCCER continues to partner with the Altacal Audubon Society to support access for ongoing Northern Saw-whet owl (NSWO) banding. Dawn Garcia, a CSUC graduate and longtime supporter of the Ecological Reserves, completed her 12th banding season at the BCCER in January 2017 and published a paper with her findings in the Central Valley Bird Club Bulletin (on the BCCER website under research reports): [http://www.csuchico.edu/bccer/documents/NorthernSaw-whetOwl2017publication.pdf](http://www.csuchico.edu/bccer/documents/NorthernSaw-whetOwl2017publication.pdf). The new director of the banding project, Ken Sobon, instituted an owl box program to determine if the NSWOs would use them to nest on the Reserve. While we did not get any NSWOs, we had a mother Western Screech-owl raise two babies in one of the boxes.
OUTDOOR EDUCATION AND OUTREACH

Since its inception, the Ecological Reserves education and outreach programs have offered visitors and students hands-on experiences with nature.

2016-2017 K-12 Outdoor Classroom:

- 37 K-12 Field trips from Chico, Paradise, Oroville, charter schools, and home schools
- 1420 K-12 students (BCEP- 1022; BCCER –398)
- 46 in-class presentations
- 82 volunteer/days
- 19 transportation scholarships (712 students) were provided to Title 1 economically disadvantaged schools
- Two day environmental day camp with Mechoopda youth

Some testimonials from teachers who have visited the Reserves with their classes:

“The structure of the activity where the students become the expert on the plant and teach the next groups was awesome to watch each individual student step into the role of being a leader.”

“The walk along the creek fit so nicely with our NGSS science unit on weather conditions and climate.”

“All of the activities were excellent and age appropriate. The students loved looking in the water for creatures and were also very engaged in the ‘salmon migration madness game’ where there were fewer and fewer survivors.”

“The activities were all a perfect length of time, with great leaders who worked well with the students and kept them engaged. Students still talk about the things they learned and did on the trip.”

“Jon always does a quality job, is extremely knowledgeable, and draws the students in well, no matter what the subject, although his vast knowledge of wild animal poo helps, too…”

“I think these programs are the best offered.”
Special Events/Outreach:

We received some great media attention for our programs this year:

Our Edible and Useful Plant Hike was featured in articles in both the Chico Enterprise-Record and the Chico News and Review:
https://www.newsreview.com/chico/natures-remedies/content?oid=21875091

Our Mushroom Workshop was featured in “Putting the Fun in Fungi” in the Chico State Today blog:
http://today.csuchico.edu/putting-the-fun-in-fungi/

Our annual citizen science event, the Butterfly Count received coverage in “Close Encounters of the Insect Kind” in the Chico State Today blog: http://today.csuchico.edu/close-encounters-of-the-insect-kind/

A visiting Chico State Biology class’s adventure in snorkel surveys was featured in the Fishbio “Fish Report” (great pictures and video here): http://fishbio.com/field-notes/the-fish-report/snorkel-school-diving-big-chico-creek-chico-state

- “History Hike” with Dave Nopel and Marti Leicester, authors of The Humboldt Wagon Road
- “Owl Banding Night” public event with Northern Saw-whet Owl Banding Project, Ken Sobon director
- Autumn Watersheds Ed-Venture in cooperation with the Butte Environmental Council (BEC)
- Two Wildflower Hikes with Reserves Field Director Emeritus Paul Maslin
- Information booths at Butte Environmental Council’s Endangered Species Faire, Sense of Place Event for the First Year Experience Program, Mt. Lassen Chapter of the California Native Plant Society’s Wildflower show and sale
- Guided hike for Youth Conservation Corps
Management Activities

FIELD OPERATIONS

The Ecological Reserves were established with the purpose of conserving habitat. Consistent, recurring and ecologically responsible property management is fundamental to habitat conservation. The Ecological Reserves staff work diligently to foster conditions that sustain and preserve native plant and animal communities and maintain biodiversity in two of Butte County’s most critical watersheds. This year staff and volunteers accomplished the following:

- Improved and maintained over 30 miles of trails and 10 miles of road, thus improving access for restoration, education, research and public access.
- Maintained over 4 miles of trails for K-12 and CSUC outdoor classes and public use at BCEP
- Continued removal of troublesome invasive species including: Yellow Starthistle, Klamath weed, Milk thistle, and broom
- Thinned 430 acres of brush to encourage wildlife forage and reduce fuel
- Treated 105 acres with pile burns, where soil was enhanced and carbon was sequestered through the creation of charcoal
- Established (and are currently extending) an extensive shaded fuel break from Hwy 32 and 14 Mile House to the Old Chico Canyon Road along the creek
- Seeded over 100 pile burned plots with mixtures of on-site collected native grass and forb seeds
- Planted 20 plots with native Purple Needlegrass plugs
- Established a new ¼ acre study plot to test the effects of mowing and burning on medusa head
- Established 550 gallons of rainwater storage capacity in remote barrels for prescribed burns
- Began initial steps to forming a contract with CAL FIRE to treat 300 acres in the next 3 years
- Maintained infrastructure, vehicles, and equipment in support of operations developed Ecological Reserves specific safety program
- Participated in National Wildfire Coordination Group Firefighter 2 Training and certification for 12 staff and interns
- Administered 20 operational safety trainings
- Finalized evacuation route and established new helicopter landing zones
VOLUNTEERS - The Ecological Reserves could not fulfill their mission without the hard work of our dedicated volunteers. Volunteers help us in all aspects of Reserve operations, from field work, to assisting with the K-12 programs, to leading public hikes. The majority of volunteer hours are spent laboring in the field improving wildlife habitat, removing invasive species, reducing fuel loads, and general maintenance of these pristine pieces of land. Over 4,000 volunteer hours were logged this past year at the BCCER and BCEP. Outstanding contributors included: Dr. Paul Maslin, PhD (over 2,200 hours), Dr. Bruce Gallaway, MD (over 400 hours), Colin Stokes (over 400 hours), and Emily Allsup (over 100 hours). Estimated value of volunteer hours is over $90,000.

Ryan Edwards worked at the Reserves for two years as a student land steward, and now works as a GIS analyst for an environmental consulting firm. "I was able to hone skills related to my major in support of the operations, including: GIS and mapping, environmental planning, and conservation planning. I have found that my greatest lessons came from being on the land at the Big Chico Creek Ecological Reserve. I learned how important it was to have a place to go to experience being in a healthy living ecosystem as opposed to just reading about one in a book. This land-management skill-set is unattainable for a college student without a place like the Ecological Reserves."

PRESCRIBED FIRE

Fire is a powerful force that has been present on the California landscape for thousands of years and is an essential element in the healthy functioning of the Reserves’ ecosystems. Decades of fire suppression have altered natural fire regimes and have led to unnaturally high fuel accumulations. The re-introduction of prescribed fire to the landscape is one of the most important restoration strategies employed on the Reserves. The 2016/17 prescribed fire season was successful at the BCCER. In spite of a very rainy winter, we were able to accomplish numerous pile burns and broadcast burns which reduced fuel loads in strategic locations to reduce hazard fuels such as yellow starthistle, and to improve deer browse.
HUNT PROGRAM

The BCCR offers unique hunting opportunities for fall deer and spring turkey. The 2016/17 hunting seasons brought 100 hunters to the BCCR over 37 hunt days. 5 deer were taken in the fall of 2016. In 16/17 staff field efforts focused on improving deer browse and access to remote areas of the Reserve to better serve hunters.

The turkey season had its challenges with an extremely wet winter and spring which caused multiple road closures and longer hikes. Flocks of over 20 turkeys have been seen on the BCCR in the fall months of 2017, a promising sign for the 2018 spring turkey season.

Cody and Randy Baylor's 2016 BCCR turkeys, photo by: Randy Baylor

photo by: Jon Aull

Big Chico Creek canyon, view from Perspective Point - photo by Marianna Chambard
Financials

Current financials are being finalized and will be available by the end of January, 2018.

Support

Your support helps us fulfill our mission to preserve and improve critical habitat and to provide a natural area for environmental research and education. The Ecological Reserves inspire people to care for, enjoy, and explore our natural world. Donations support our outdoor education programs, student research, and restoration efforts.

A donation of $200 can pay for a bus for 2 classes from Chico, Paradise, or Oroville to participate in one of our free field trips. Without your support, many of these young students would never experience a healthy, living, natural ecosystem.

Donations can be made through our website:  
http://www.csuchico.edu/bccer/Support/index.shtml

The CSU, Chico Research Foundation
Ecological Reserves
Big Chico Creek Ecological Reserve and
Butte Creek Ecological Preserve

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