

Dales Lake Ecological Reserve: Cornerstone of a new vernal pool project

By Eda C. Eggeman

What does a 42-inch, 845-mile-long natural gas pipeline slicing its way from northeastern to central California have in common with a triangular snippet of wetland habitat in Tehama County? Plenty!

The connection between the two begins with the 1992-1993 construction of the natural gas pipeline by Pacific Gas and Electric Company (PG&E). As partial mitigation for vernal pool destruction along the pipeline right-of-way, PG&E agreed to acquire and enhance vernal pool habitat.

PG&E bought the triangular Tehama

property from a local rancher and transferred ownership to the Department of Fish and Game (DFG) in 1993. The area, now known as Dales Lake Ecological Reserve (DLER), comprises 366 acres of prime Mt. Lassen viewing, tundra swan dawdling, coyote hip-hopping, tidy-tips trundling, volcanic rock tripping, wild pig rooting, vernal pool shimmering habitat.

The DLER, along with nearby vernal pools on Bureau of Land Management holdings, will be the site for a three-year project which plans to reintroduce controlled grazing to vernal pools in order to determine the impacts. Funded by the U. S. Fish and Wildlife Service, the project's goals are twofold: produce

recommendations for grazing regimes that minimize impacts to vernal pool communities, and restore native grasses and forbs as the dominant vegetation.

Okay, just what is a vernal pool anyway? Whether you prefer "ephemeral wetland," "vernal marsh," "hog wallow," "seasonal pool," or "temporary water," vernal pools have three basic distinguishing characteristics. First, they are rain-fed. Second, they have an impervious substrate under the soil, typically clay or a cemented duripan layer, which allows them to collect water and hold it for a period of time in what is known as the inundation phase. Lastly, vernal pools dry up in the summer. It's just



DFG photo © Dana Lis

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that simple.

All things considered, it is clear why vernal pools have their own unique set of plants and animals. The word “ephemeral,” from the Greek word *ephemeros* which means “lasting a day,” aptly describes the flora and fauna which must hurriedly rehydrate and reproduce during the inundation phase and then survive the long, hot summer drought in dormancy.

Vernal pools throughout California are threatened by factors such as urbanization, agricultural conversion, inappropriate grazing and non-native plants. At stake in such pools are up to six species of tiny creatures known as fairy shrimp and numerous plants such as slender Orcutt grass, valley sagittaria and Boggs Lake hedge hyssop. All are rare because of their limited and vulnerable habitat. Migrating waterfowl pause at vernal pools to feast on protein-rich fairy shrimp and other invertebrates which aid egg-laying and spring migration.

The fact that vernal pool habitat is declining means opportunities to study intact vernal communities are becoming scarce. The Dales Lake study, the brainchild of DFG botanist and plant ecologist Dr. Richard Lis, presents one of these rare opportunities.

As project biologist hired by Lis, I spend the winter with wet feet, as it is been my job to collect all the data and compile it into publishable form. My motto has become, “If it’s raining it must be a field day!” That is when I would head out for another day of sampling.

Vernal pool studies, as it turns out, are a good fit for the high tech world. *Optic StowAways*, immersible and programmable devices about the size of a hot dog, log the temperature of a vernal pool every 15 minutes. Every two weeks data from the *Optic StowAways* are downloaded to a portable *Optic Shuttle* and then, back at the office, to software that neatly arranges the data in graph form. Other hand-held instruments help collect physical variables such as dissolved oxygen content, conductivity, pH and salinity.

With first-year water quality data in hand, the project calls for incorporating fairy shrimp surveys into the second-year procedure. Armed with a survey permit from the U. S. Fish and Wildlife Service, it has been my job to sample fairy shrimp populations which may include the vernal pool tadpole shrimp, *Lepidurus packardii*, and the vernal pool branchinecta, *Branchinecta lynchi*, both



Swans on Hog Lake.

DFG file photos provided courtesy of Edna Eggeman



Cattle graze on South side of Inks Creek Road.



Air temperature logger placement.

of which are protected by the Federal Endangered Species Act.

Data from water quality, fairy shrimp collections and botanical surveys will provide a composite view of the vernal pool ecosystem. These revelations will, in turn, help determine if, when, how many and how long cattle could be allowed to graze at Dales Lake and perhaps other delicate vernal pool sites.

The study’s limited cattle grazing at DLER is expected to begin in the spring. Dr. Lis and researchers throughout the state are keenly aware that merely fencing, thus protecting vernal pools may not ensure the long-term survival of these ecosystems. Grazing may be a useful tool to control competition from

introduced annual grasses and weeds that now dominate so much of California.

Dales Lake has not been grazed for five years. The swans, hogs and biologists have had the place all to themselves. Soon we’ll know how well 1000-lb. steers and translucent fairy shrimp the size of a rice grain get along.

Eda Eggeman has a Bachelor of Science in Entomology from Colorado State University. As a scientific aid with the DFG’s Region 1, she assisted water quality and timber harvest review biologists before being hired as a biologist to study vernal pools.