

Adventure does not always mean going somewhere no one else has ever gone. It does not necessarily mean experiencing extreme thrills or chills, or doing what others would never dare to do. It can simply be pushing the limits of your own experience. In fact, kneeling in the Baldwin Lake Ecological Reserve admiring minute pincushion wildflowers could be called an adventure.

soil of the pebble plain. Clay soils swell when wet, then shrink and crack in the dry months. Over thousands of years, this

By Colleen Flannery

cycle of swelling and shrinking, combined with freezing, has pushed up the pebbles,

douglasii) speckle the purple hue of Parish's rock-cress (*Arabis parishii*). As the season progresses, new waves of flowers bloom. Special adaptations help the pebble plain plants survive months of freezing temperatures and intense summer sun. These special traits include having tiny leaves that are often gray or covered with fine hairs. These features reflect harsh summer sunlight better than larger, green

Enjoy a Baldwin Lake adventure



Baldwin Lake as it appears following the rains.

DFG photo by Mary Meyer

Let this wildflower adventure begin at the Department of Fish and Game (DFG) Baldwin Lake Ecological Reserve, on the north shore of Baldwin Lake in Big Bear Valley, San Bernardino County. Interspersed between the lush meadows and springs lies an open plain covered by small quartz rocks ("pebbles") with low growing, tufted plants rooted in the crevices. An Ice Age lake formed the clay

which accumulate on the surface. The combination of unique soils, harsh growing conditions and isolation from other similar areas has created a plant community found nowhere else in the world.

Spring brings beauty to the treeless pebble plains. The flowers of cushion-like plants create a panorama of color. In early spring, bright yellow Douglas' violets (*Viola*

leaves and help reduce water loss. Matt-growing plants have adapted to grow under snow that lingers for weeks, their deep roots allowing them to quickly take advantage of the short summer growing season. The ash-grey paintbrush (*Castilleja cinerea*), has grayish leaves and gets some of its nutrients by tapping into the roots of other nearby plants. Kennedy's buckwheat (*Eriogonum kennedyi* var



Pebble Plain overlooking Baldwin Lake.

DFG photo by Mary Meyer



Sagebrush and pinyon juniper habitat

austromontanum), another Baldwin Lake-area exclusive, grows deep roots that anchor it even when the clay freezes and expands beneath.

Plants as hardy as the buckwheat and the paintbrush seem able to weather anything. But these Baldwin Lake wildflowers, like many of California's most specialized species, appear on the state and federal endangered species lists or are on DFG's special plants list. DFG has managed this ecological reserve since 1991.

Even the Baldwin Lake Ecological Reserve (BLER) parking lot acts as a garden, where locals know fiery orange poppies, giant grape-soda lupines, and large, white-

flowered evening primroses bloom every spring. The parking lot gems prelude the wildflower show within BLER.

The reserve also provides a home for wildlife. Coyotes, jackrabbits, lizards and deer live in and around the reserve, drinking from Baldwin Lake when it has water. Overhead, the small saw-whet and screech owls, and the larger great horned owls fly silently in the night. The daytime sky belongs to Cooper's hawks, sharp-shinned hawks, red-tailed hawks and kestrels while fiery hummingbirds flit past and butterflies flutter by. Watch a rainbow of perching birds, from the red-breasted nuthatch to the Western bluebird,

whose colors blaze nearly as brightly as the wildflowers beneath them. Bald eagles winter here, taking advantage of the warmer Southern California weather. They fish at Baldwin and Big Bear lakes, and can be seen roosting on tall pines in the area.

The eagle is not the only visitor. The Big Bear Lake area, just west of Baldwin Lake, is a popular all-seasons recreation destination.

"The challenge in the Baldwin Lake area has been that these unique plants have been sitting there in Southern California's idea of an outdoor recreation area," said Mary Meyer, a DFG botanist who studied

Pebbles and matt-like plant (*Cuskiella douglasii*).

DFG photo by Mary Meyer



Ash grey paintbrush (*Castilleja*





DFG photo by Robert Waldron



Panoramic views from Baldwin Lake ER.

DFG photo by Robert Waldron

the slender-petaled mustard (*Thelypodium stenopetalum*), a state and federal-listed endangered species that flourishes in the moist meadow areas of BLER.

Meyer accepted the challenge of studying the plants when the DFG purchased BLER from The Nature Conservancy in 1989. Hard work and painstaking observation paid off as she watched the slender-petaled mustard's numbers rise from 29 to a more healthy 1,000. DFG botanists and biologists learn from natural communities that are more precious than gold.

During the southern California gold rush, which hit the Baldwin Lake area a

few years after the 1848 northern California discovery of gold, E.J. "Lucky" Baldwin mined the yellow metal in the Baldwin Lake area – until he found the ground too dry in more than one sense. A mysterious fire destroyed most of his mine and Lucky was fortunate enough to have the land insured. He bought a share in another mine and, using cyanide to leach gold from the ground, Lucky finally lucked out, striking it rich at \$4,000 a week. Lucky's and other miner's breaks have left their mark as scars from mining can still be seen on the land.

The fish in the lake graced by Baldwin's surname have a similar hard luck story.

The unarmored three-spined stickleback (*Gasterosteus aculeatus williamsoni*) is found in Baldwin Lake in wetter years, when the usually seasonal lake remains full year round. The stickleback dies out as the lake evaporates in dry summers. The fish can also be found in a few ponds and creeks near the lake. BLER only gets about 15 inches (38 cm.) of precipitation a year, most of that as winter snowfall.

"If the lake dries up, sticklebacks dry up too," Meyer said.

Like the rare plants onshore, the stickleback has developed some unique adaptations that improve the chances of species survival. Male sticklebacks, which

cinerea).

DFG photo by Mary Meyer

Parish's rock-cress (*Arabis parishii*).

DFG photo by Mary Meyer



Meyer calls “a fish that makes nests,” attract females by building nests which are shallow depressions in the lake’s sandy bottom. After fertilizing the eggs, the male chases the female away – her work is done, while his has only begun. “Mr. Mom” strictly shepherds his young ones both before and after they hatch, guarding the school as the young fish mature. He will even retrieve stragglers, catching them in his mouth and spitting them back into his offsprings’ school.

With such strong parenting skills, how can the species be in danger? Listed as “endangered” at the state and federal level, the stickleback exists in only a few isolated populations. D F G scientists hope to maintain a n d stabilize a healthy population in a f e w artificial ponds near the reserve. R a u l Rodriguez, D F G fisheries biologist, said the DFG plan diverts grey water (treated waste water) into the ponds. He is quick to note that the experiment hasn’t hurt the stickleback.

“We have determined that the fish is not being harmed by the grey water,” he said.

In a unique ecological reserve partnership, the Big Bear Lake municipal water treatment facility provides the water. Rodriguez hopes to provide more habitat for the sticklebacks soon, perhaps in a wet year when Baldwin Lake remains for the year.

“It’s a precarious situation,” Rodriguez said of the stickleback’s endangered status. “This is an experimental plan.”

Near the town of Big Bear Lake is the reservoir with the same name, formed by the damming of Big Bear Creek. The creation of the lake resulted in the inundation of Southern California mountain meadows, which were home to many rare plant species. One such species, the endangered slender petaled mustard, is host to t h e

into soft, white butterflies that look as if they have been “marbleized” with veins of gold paint.

Another mountain meadow flower, the California dandelion (*Taraxacum californicum*), thrives in wet meadows. The endangered Bear Valley blue-grass (*Poa atropurpurea*), grows in only a few Southern California mountain meadows. A scent reminiscent of lemonade wafts from lemon lilies (*Lilium parryi*). These rare and fragrant flowers appear in high-mountain springs and meadows southwest of Big Bear Lake.

As the name Big Bear implies, black bears exist in the vicinity of the Baldwin Lake/ Big Bear area, although they are not the same big grizzly bears t h a t used to roam t h e S a n Bernardino Mountains (those have been extirpated in C a l i - f o r n i a). Bobcat and gray fox slink s i l e n t l y through the shadowed twilight plains. Visitors are very lucky to see any of these rarely viewed animals, but they should be given ample distance.

So pack up and walk into an adventure of another sort at the Baldwin Lake Ecological Reserve.



Rabbitbrush at Baldwin Lake.
DFG photo by Robert Waldron

Andrew’s marble butterfly (*Euchloe hyantis andrewsi*), a species of federal special concern. When the butterfly’s eggs hatch, long, green caterpillars emerge to feed on the mustard’s blossoms and fruits. These larvae eventually metamorphose

Colleen Flannery is a scientific aide in DFG’s Lands and Facilities Branch.

Mary Meyer of DFG’s Region 5, Dee Sudduth and Raul Rodriguez from DFG’s Region 6, contributed to this article.