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COLONET MESA: A BOTANICAL TREASURE

THE GENUS *CORYPHANTHA* IN CALIFORNIA

HARWOOD'S WOOLLY STAR

GROWING MATILJA POPPY FROM STEM CUTTINGS

CNPS FELLOW: KEN HIMES

FREMONTIA

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CNPS carries out its mission through science, conservation advocacy, education, and horticulture at the local, state, and federal levels. It monitors rare and endangered plants and habitats; acts to save endangered areas through publicity, persuasion, and on occasion, legal action; provides expert testimony to government bodies; supports the establishment of native plant preserves; sponsors workdays to remove invasive plants; and offers a range of educational activities including speaker programs, field trips, native plant sales, horticultural workshops, and demonstration gardens.

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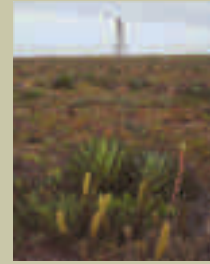
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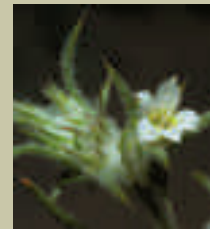
THE THREATENED BIOLOGICAL RICHES OF BAJA CALIFORNIA'S COLONET MESA *by Kevin B. Clark, Mark Dodero, Andreas Chavez, and Jonathan Snapp-Cook* . 3

Colonet Mesa is a little known peninsula halfway between Ensenada and San Quintin that supports some of the most robust populations of endangered species and habitats within the California Floristic Province. Over one hundred vernal pools are scattered within a matrix of Mártirian sage scrub, maritime chaparral, and coastal dune vegetation communities. While Colonet Mesa has long been a hidden gem for botanists, it is now threatened by a mega-port project that would transform the entire region.



THE CORYPHANTHAS OF CALIFORNIA *by Stephen Ingram* 11

California's three species of *Coryphantha*, the pincushion cacti, are beautiful but easy to overlook, and all are listed by CNPS. Based on three species profiles from the recent book, *Cacti, Agaves, and Yuccas of California and Nevada*, author-photographer Stephen Ingram shares some of the human and natural history associated with these small cacti.



MEET HARWOOD'S WOOLLY-STAR (*ERIASTRUM HARWOODII*)

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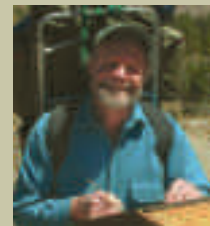
How do new species get recognized? The author tells the story of one such plant that didn't fit into the existing botanical hierarchy. *Eriastrum harwoodii* is currently recognized as a rare endemic species of California.



PROPAGATION OF MATILIJA POPPY (*ROMNEYA COULTERI*)

by Kathleen Navarez 18

It has long been part of horticultural dogma that our beautiful Matilija poppy cannot be propagated from vegetative stem cuttings. This resourceful author describes her new successful method to reliably propagate this plant from an unusual type of stem cutting known as a mallet cutting. Follow these step-by-step instructions and clonally grow more of your favorite selection.



NEW CNPS FELLOW—KEN HIMES *by the Santa Clara Valley Chapter*

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From his first participation at a "member's night" slide show meeting in 1983, Ken Himes has been a most welcome fixture of the Santa Clara Valley Chapter of CNPS. Over the years he has shared his extensive knowledge and enthusiasm for California native plants far and wide.

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THE COVER: A rosy day dawns over Punta Colonet in Baja California, Mexico. This view, taken from the south, is from what would be the center of the proposed new mega-port facility that would severely impact this unique coastal outpost of California flora. Photograph by Alan Harper.



California Bureau of Land Management

Making a Difference with the Help of Partners and Volunteers



School children clearing invasive European beach grass as part of Ocean Day at the South Spit of Humboldt Bay. The restored dunes provide habitat for endangered plants such as Humboldt Bay wallflower.



Volunteers clearing water hyacinth from Lost Slough at the Cosumnes River Preserve.



Plant materials grown at the Deepest Valley Cooperative Native Plant Propagation Center are used to restore alkali meadows in the Owens Valley and vicinity. The Center is a cooperative effort between BLM, CNPS, UC White Mountain Research Station, Los Angeles Dept. of Water & Power, Inyo NF, and Inyo County.



Santa Catalina High School students planting coast live oaks at Fort Ord.



For information on volunteering for BLM in California, please visit our website at: www.ca.blm.gov. On the left side of the page click on "Resources," then on "Volunteers."



Flowers at dawn, Punta Colonet. The abundant cream-colored flowers of tidy-tips (*Layia platyglossa*) carpet the land, with the sun still below the horizon behind the Sierra de San Pedro Mártir. Photograph by Alan Harper.

THE THREATENED BIOLOGICAL RICHES OF BAJA CALIFORNIA'S COLONET MESA

by Kevin B. Clark, Mark Doderer, Andreas Chavez, and Jonathan Snapp-Cook



On the Pacific coast of Baja California, about 65 miles south of the port city of Ensenada, lies

the small village of Colonet. While the town itself is nondescript, just beyond it lies a point named Punta Colonet that contains a little known

mesa harboring one of the most biodiverse sites on the west coast of North America. For years, the uninhabited Colonet mesa has been ex-



The vernal pool tarplant (*Centromadia perennis*) is found in its largest populations on Colonet Mesa. Photograph by Mark Dodero.

plored by small numbers of botanists and naturalists, but has otherwise escaped much notice from the scientific community.

Recently, however, in response to the overcrowded ports in the United States, and at the urging of U.S. import companies, the Mexican government and the Baja California state government, along with private industry have proposed a massive port complex in a bid to satiate American consumers' demand for imported goods. The port, which planners hope will one day

rival the ports at Los Angeles and Long Beach, would include a breakwater, 10 to 20 berths, roads, housing, public buildings, and infrastructure such as power generating plants.

The government also proposes a 180-mile rail line to the border, and an airport specializing in cargo service. To support the project, a new port city will be home to 250,000 residents by 2025. The exact footprint of the proposal has not been released, but the entire mesa would be directly or indirectly affected by such a massive project. While the news has been filled with discussions of the economic benefits of the proposed port, little has been mentioned of the threats the project poses to the rare species located in the area.

As a relatively undisturbed mesa located right along the coast, Colonet mesa offers an example of what much of southern California looked like 200 years

ago. The mesa is comprised of a plateau about 6 miles wide and 10 miles long that has been uplifted about 300 feet over the adjacent sea. Washes and gullies have eroded portions of the mesa into short, steep canyons, while the southern end of the plateau ends in an abrupt vertical drop into the sea.

The vernal pools on Colonet mesa are unparalleled in northern Baja or Alta California. Larger than the great pools on the Santa Rosa Plateau in Riverside County, and as varied and rich in species composi-

tion as all the remaining pools in southern California combined, these pools are truly a wonder to behold. The number of pools likely totals over 100, and two of the vernal pools are over half a mile in diameter, while another approaches eight-tenths of a mile. Many of the pools have yet to be explored, but those that have been have revealed an amazing diversity of endemic and rare taxa, including several on the U.S. list of endangered species.

The mesa supports the largest known population of endangered San Diego button-celery (*Eryngium aristulatum* var. *parishii* [Apiaceae]). The pools also support the largest known population of the endangered Orcutt's grass (*Orcuttia californica* [Poaceae]). The threatened spreading navarretia (*Navarretia fossalis* [Polemoniaceae]) is also found in healthy populations, as is the endangered San Diego ambrosia (*Ambrosia pumila* [Asteraceae]). Other rare taxa on the mesa include the little mouse tail (*Myosurus minimus* var. *apus* [Ranunculaceae]), California adder's tongue (*Ophioglossum californicum* [Ophioglossaceae]), and a local endemic called the ver-



ABOVE: Map showing the location of Punta Colonet, Baja California. • RIGHT: A 300-foot cliff over the Pacific Ocean dominates the south end of Colonet Mesa. Photograph by Mark Dodero.





nal pool tarplant (*Centromadia perennis* [Asteraceae]). The endangered San Diego fairy shrimp (*Branchinecta sandiegoensis*) also inhabits the pools, as well as hosts of other copepods, ostracods, and tadpole shrimp that remain to be explored.

Reptiles and amphibians found on the mesa include the western

spadefoot toad (*Spea hammondi*), coast horned lizard (*Phrynosoma coronatum*), and the endemic Baja California whiptail (*Cnemidophorus labialis*). Birds breeding on the mesa include the threatened California gnatcatcher (*Polioptila californica*), cactus wren (*Campylorhynchus brunneicapillus*), burrowing owl (*Athene*

TOP: Riparian channels on the mesa support many of the same rare and unusual species as are seen in vernal pools. Photograph by Alan Harper. • LEFT: California adder's tongue (*Ophioglossum californicum*). Photograph by Mark Doderio.



cunicularia), and sage sparrow (*Amphispiza belli*). From the cliff face one can watch a resident pair of peregrine falcons (*Falco peregrinus*) cruise back and forth just below. In addition, numerous waterfowl and shorebirds are attracted in the spring to the large vernal pools. Arthropods have been little explored on the mesa, but species becoming rare in southern California are still common here, including the Sonoran blue butterfly (*Philotes sonorensis*).

Surrounding the pools on the mesa are species-rich upland vegetation communities including Mártirian coastal succulent scrub, maritime chaparral, and stabilized coastal dunes. Also adding to this diversity of upland habitats on the mesa are geologic formations such as gabbro clay lenses, Pleistocene beach ridge formations (similar to those found at Del Mar and Torrey Pines in Alta California), and volcanic rock intrusions. These diverse habitats support their own rare taxa such as the threatened San Diego thorn-mint (*Acanthomintha ilicifolia* [Lamiaceae]) that has three large populations on the mesa, and the rare Nuttall's lotus (*Lotus nuttallianus* [Fabaceae]) in the dunes.

Several species such as dwarf brodiaea (*Brodiaea terrestris* ssp. *kernensis* [Themidaceae]), ashy spike-moss (*Selaginella cinerascens* [Selaginellaceae]), and prostrate spineflower (*Chorizanthe procumbens* [Polygonaceae]) reach the southern



San Diego thorn-mint (*Acanthomintha ilicifolia*) grows on clay soils. Photograph by Alan Harper.

extent of their distribution on the mesa. An endemic buckwheat (*Eriogonum fastigiatum* [Polygonaceae]) is also found here, as well as the Baja gooseberry (*Ribes tortuosum* [Grossulariaceae]). The list of rare taxa

In a wet year, this, the largest vernal pool on Colonet Mesa, is over a kilometer across. The emergent vegetation in this pool is predominantly the vernal pool tarplant (*Centromadia perennis*), which is endemic to the region. Photograph by Alan Harper.







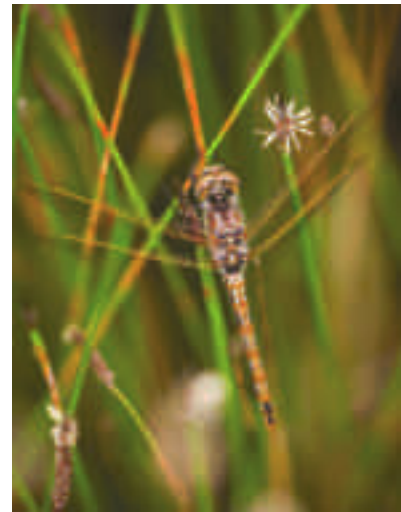
continues to grow. At least two undescribed species of *Dudleya* (Crasulaceae) have also been found on the mesa, and with further exploration, other undescribed taxa are likely to be found among the diverse habitats.

One of the most spectacular features of Colonet Mesa is not actually on the mesa at all. Stare off into the ocean below the 300-foot cliff, and within a few minutes during the right season you are likely to see a spout of water not far offshore. Gray whales (*Eschrichtius robustus*) make a very close approach to the coast in this location, and during their migrations you are likely to see several per hour while gazing at the sea. They are so close you feel as if you are in a small aircraft right above them as they cruise by. Historically, gray whales kept close to shore along Alta California as well, but over the past several decades

LEFT: The lighthouse at Punta Colonet is surrounded by high quality coastal succulent scrub vegetation. This formerly widespread characteristic plant community of the region is now threatened. Shaw's agave (*Agave shawii*), huge live-forever (*Dudleya ingens*), and golden-spined cereus (*Bergerocactus emoryi*) appear in the foreground of this image. Photograph by Alan Harper.

the bulk of the migration has shifted offshore, possibly in response to increased ship traffic. Of course, establishing a freeway of daily cargo ship traffic at a future Colonet port that directly crosses the gray whale's migratory route will only invite disaster, as whale strikes would be inevitable. What will this new impact have on the gray whale population that hugs the shoreline here, many with young calves in tow? And what effect will it have on the vibrant ecotourism industries in the communities surrounding Scammon's (Ojo de Liebre) and San Ignacio Lagoons, which rely on healthy gray whale populations tolerant of viewers in small boats?

The proposed port project at Colonet represents a threat to all the unique biological features of the region. Any planning for the area should be done in active consultation with conservation groups to help minimize the loss of Baja California's biological diversity in the Colonet area. As planners dream of a multi-billion dollar mega-port, conservationists can insist on a mega-national park that preserves the unique coastal resources of the mesa. The recently completed conservation agreement to conserve San



CLOCKWISE FROM TOP LEFT: The endemic Baja California whiptail lizard (*Aspidoscelis labialis*). Photograph by Mark Doderer. • A dragonfly rests on a spikerush (*Eleocharis* sp.). Photograph by Alan Harper. • The Sonoran blue butterfly (*Philotes sonorensis*) has several *Dudleya* species to use as host plants on the mesa. Photograph by Alan Harper.

Ignacio Lagoon and the same gray whales that pass Colonet can serve as inspiration. Ecotourism generated by preserving sensitive natural resources will add economic diversity to the region and maintain a better quality of life for the future citizens of the area by leaving much needed open space. While economic development is important for the local residents and the country, without proper planning a unique and one of the most and biologically rich locations in all of Baja California will be lost.



With the Punta Colonet lighthouse in the distance, the low-growing mosaic of coastal scrub vegetation is viewed from an old stabilized sand dune. Such minimally disturbed large swaths of flat coastland are now rarely seen. Coastal sagebrush (*Artemisia californica*), and golden-spined cereus (*Bergerocactus emoryi*) are clearly seen in the foreground. Photograph by Alan Harper.

ACKNOWLEDGMENTS

A number of biologists have made contributions to our knowledge of the resources at Colonet Mesa over the years. A few in particular who we would like to thank include Scott McMillan, Brenda McMillan, Kim Marsden, Bruce Hanson, Alan Harper of Terra

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THE CORYPHANTHAS OF CALIFORNIA

by Stephen Ingram

California boasts an impressive diversity of Cactaceae, with 42 species, varieties, and named natural hybrids. Chollas (*Cylindropuntia*), prickly-pears (*Opuntia*), and the colorful hedgehog cacti (*Echinocereus*) command most of this family's notoriety due to their relative abundance and high visibility. But the diminutive pincushion or beehive cacti in the genus *Coryphantha*, which are often overlooked when not in flower, deserve a closer examination.

Many California botanists and cactus enthusiasts know our native pincushion cacti as varieties of *Escobaria vivipara*, as treated in *The Jepson Manual* (Hickman 1993) and *The Jepson Desert Manual* (Baldwin et al. 2002). The International Cactaceae Systematics Group recognizes *Escobaria* as a valid genus, and Edward Anderson in *The Cactus Family* (2001) treats our taxa as distinct species of *Escobaria*. However, the *Flora of North America* (Zimmerman and Parfitt 2003) does not recognize *Escobaria* as a separate genus, and treats the three varieties of *E. vivipara* as species of *Coryphantha*. Since the soon to be published second edition of *The Jepson Manual* will follow this newer treatment (B. Parfitt, personal communication), now is a good time to get to know these small, benign, and beautiful cacti.

Coryphantha is actually an earlier name for *Escobaria* that was used by most California botanists (e.g., Dawson 1966, Benson 1969, Munz 1974) prior to publication of *The Jepson Manual*. In fact, even earlier, these species had been treated (as a subgenus) in the genus *Mammillaria* by renowned botanist and physician, George Engelmann, who described numerous species of cacti. *Mammillaria*, our other genus of small, globu-

lar cacti, can be distinguished most readily from *Coryphantha* by the presence of hooked spines and a ring of flowers below the stem tip. The (sub)genus *Escobaria* differs from the main group of *Coryphantha* in having pitted seeds and flowers with fringed outer tepals. The genus name *Coryphantha* comes from the Greek words, *koryphe*, for head, and *anthos*, for flower, alluding to the stem-tip position of its flowers. *Coryphantha* ranges from Cuba through Mexico and north into 15 western U.S. states and southern Canada. Of the 55 to

75 species of *Coryphantha* known, only three species are found in California. One of these species is endemic to California, and another spans more than 20° in latitude, occurring from Mexico to Canada. All three are of conservation concern to CNPS. Unlike most of our native cacti, coryphanthas lack hooked or barbed spines, and can be cautiously touched.

Coryphantha alversonii, also known as cushion foxtail cactus, is an especially attractive, perky little cactus with handsome pinkish flow-

Three species of cacti in the genus *Coryphantha* are found in California. This one, inhabiting classic Joshua tree woodland habitats, is *Coryphantha vivipara*. All photographs by the author.





Three views of cushion foxtail cactus (*Coryphantha alversonii*): a mature plant, young colorful spines, and beautiful pink blossoms.



ers, which stand erect from the tops of the narrow barrel-shaped stems. Its pink flowers have spreading tepals with dark pink midveins and paler margins, and white, widely spreading stigma lobes. The 7 to 18 central spines are dark-tipped, straight, relatively stout, and not barbed. Cushion foxtail cactus often produces multiple stems that are generally taller, 5 to 27 cm. (2 to 10.6 in.), and more robust than California's other two *Coryphantha* species.

Cushion foxtail cactus was first described in 1894 by American botanist and educator, John M. Coulter (1851-1928), who named this species in honor of its collector, Allen H. Alverson (1845-1916) of San Bernardino, California. Alverson was a jeweler and mineralogist who also

traded in cacti and succulents. He collected cushion foxtail cactus in 1892 (when collecting cacti without a permit was legal) near

Twentynine Palms, close to present-day Joshua Tree National Park. Coulter's comments about cushion foxtail cactus noted that: "The covering of stout bushy interlocking spines is like that of var. *deserti* [now *Coryphantha chlorantha*, desert pincushion], but the black and reddish coloration gives a decidedly different appearance. On account of this appearance of a reddish-black brush, the plant has been popularly called 'foxtail cactus'" (from Baxter 1935).

Coryphantha alversonii is endemic to California, and occupies the transition zone between the southeastern Mojave and northern Colorado deserts. The only debatable occurrence outside California, a collection cited by cactologist Lyman Benson (1969, 1982) from Mohave County, Arizona, is apparently due to a misidentified fragment of a different species of *Coryphantha*. Cushion foxtail cactus can be found at elevations between 610 and 1,525 meters (2,000 and 5,000 feet), from the Little San Bernardino Mountains east to the Big Maria Mountains, Riverside County. It is locally abundant throughout much of the middle and lower elevations

of Joshua Tree National Park and is found on alluvial fans, desert pavement, and other gravelly, rocky areas. Although cushion foxtail cactus can be locally common, it is not widespread, and has a distribution that is disjunct from all other *Coryphantha* species. *Coryphantha alversonii* is on CNPS List 4.3, meaning it has a limited distribution, but a low degree of threats.

Coryphantha chlorantha, probably better known as *Escobaria vivipara* var. *deserti* from *The Jepson Manual*, goes by the common name of desert pincushion. This species was first collected east of St. George in southern Utah and named *Mamillaria chlorantha* by George Engelmann. Its species name comes from the green flowers (from the Greek words, *chloros* for green and *anthos* for flower) on the dried specimen from which the original description was based. However, most populations have dull orange to yellowish-green flowers. In addition to the different perianth color, *Coryphantha chlorantha* can be distinguished from our other two *Coryphantha* species by its narrower perianth and more erect stigma lobes. The white to gray, dark-tipped spines are interlaced and mostly obscure the 7 to 15 cm. (2.8 to 6 in.) tall stems.

Desert pincushion cactus has been treated as a variety of the variable beehive cactus (*Coryphantha vivipara*, listed below) because it shows vegetative similarities to that more widespread species. In the absence of flowers, this species can be difficult to distinguish from beehive cactus. Both species resemble a spiny ball, although the green tubercles (protuberances tipped with spines) of desert pincushion are barely visible through the dense covering of spines. Desert pincushion can also be distinguished from beehive cactus by its more numerous (usually 20 to 30) ashy-gray, overlapping radial spines. In addition, desert pincushion is often perched in cracks

of limestone dolomite, while beehive cactus usually protrudes from decomposed granite.

Based on the ashy appearance of desert pincushion cactus (due to its pale, interlaced spines) and its occurrence on dark dolomite rocks, one might expect this species to have a high heat tolerance. Indeed, experimental research shows that desert pincushion cactus can withstand a temperature of 64°C (147°F) (Smith et al. 1984). This heat tolerance is similar to that of California fishhook cactus (*Mammillaria dioica*) and higher than several chollas and prickly-pears examined in the same experiment. Its dense covering of pale radial spines helps desert pincushion cactus reflect excessive heat.

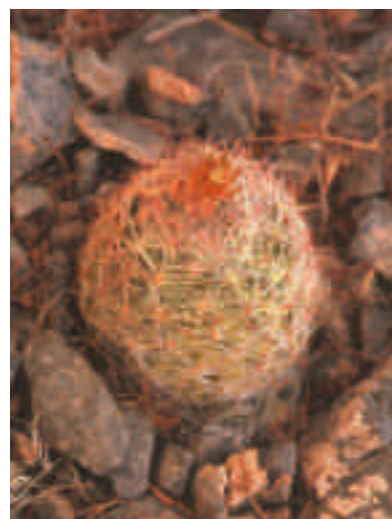
Coryphantha chlorantha is virtually restricted to limestone-derived soils and rocks and can often be found growing on dolomite outcrops with Clark Mountain agave (*Agave utahensis* var. *nevadensis*). This species occurs from 500 to at least 1,700 meters (1,640 to 5,600 ft.) in elevation and grows in pinyon-juniper woodland, Joshua tree woodland, and other plant communities of eastern Mojave Desert mountains. It ranges as far northwest as Death Valley National Park's Funeral Mountains and south through the Kingston, Clark, and Ivanpah Mountains of California's eastern Mojave. Desert pincushion can also be found in southern Nevada, southwestern Utah, and northwestern Arizona. It has recently been added to CNPS List 2.2, because it is considered to be rare or endangered in California but more common elsewhere, and is fairly threatened in California.

Coryphantha vivipara, or beehive cactus, has been known as *Escobaria vivipara* var. *rosea* in *The Jepson Manual*. It was first collected by the English naturalist and explorer Thomas Nuttall "near the Mandan towns on the Missouri" (North Dakota) in 1811. The range of beehive cactus

stretches from Sonora, Mexico to Saskatchewan, Canada—more than 20° in latitude—making it California's most cosmopolitan cactus. It is also the most widespread and variable species of *Coryphantha*, with numerous common and varietal names assigned to it by botanists and horticulturists. George Engelmann wrote of beehive cactus: "The extreme forms are certainly very unlike one another, but the transitions are so gradual that I can not draw strict limits between them" (from Britton and Rose 1919-1923). Lyman Benson recognized seven varieties in *The Cacti of the United States and Canada* (1982), two of which are now treated as separate species and the others treated as synonyms of *Coryphantha vivipara*. But Benson did acknowledge that further study was needed to delineate these variable cacti.

Beehive cactus has solitary or clustered stems 7 to 18 cm. (2.8 to 7 in.) tall, and prominent tubercles. Beehive and desert pincushion cacti are very similar vegetatively, but beehive cactus has fewer radial spines (12 to 18) than desert pincushion cactus (16 to 33). It has reddish-pink tepals without contrasting midveins, and white, spreading stigma lobes, in contrast to the less spreading, dull orange to yellow tepals, and erect stigma lobes of desert pincushion. It is more commonly found on granitic alluvium in California, while desert pincushion cactus is nearly always found on limestone. Beehive cactus occurs at higher elevations 1,500 to 2,500 meters (4,900 to 8,200 ft.) and farther north than cushion foxtail cactus.

As expected for a cactus that grows from the eastern Mojave Desert to the badlands of North Dakota, beehive cactus has to withstand both extremely hot and subzero temperatures. Throughout its range, beehive cactus can tolerate summertime ground-surface temperatures over 64°C (140°F) and survive a freezing temperature of -22°C (-8°F)



Desert pincushion cactus (*Coryphantha chlorantha*) has pale greenish-yellow flowers. In California, this species is restricted to the eastern Mojave Desert.

if it has time to acclimate to cold weather (Nobel 1994).

Although *Coryphantha vivipara* is an extremely widespread species, within California it is more restricted than our other two coryphanthas, occurring only in eastern San Ber-



Beehive cactus (*Coryphantha vivipara*) in full bloom.

nardino County. It is listed by CNPS as 2.2, meaning it is rare or endangered in California but more com-

The cryptic coloring and low habit of a young beehive cactus (*Coryphantha vivipara*) enables it to disappear into the decomposed granite soil where it grows.



mon elsewhere, and is fairly threatened in California. Beehive cactus can be found in the Mojave National Preserve inhabiting sagebrush scrub, Joshua tree woodland, and pinyon-juniper woodland, either in the open or under the cover of protective shrubs. The well-camouflaged beehive cactus often appears like a knobby, spine-covered ball half submerged in the coarse, granitic sand. During the late spring, how-

ever, its gorgeous pink flowers stand out in contrast to its pale brown substrate, signaling to any bees in the vicinity.

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MEET HARWOOD'S WOOLLY-STAR (*ERIASTRUM HARWOODII*)

by Sarah J. De Groot

Although it is endemic to California, *Eriastrum harwoodii* is a plant you may not have met before. It is a small desert annual, not often collected, and it is not recognized in *The Jepson Manual* (Hickman 1993). Let me explain.

Eriastrum harwoodii (in the phlox family, Polemoniaceae) was first described as *Gilia filifolia* Nutt. var. *harwoodii* by Thomas Craig, an undergraduate student of Philip Munz at Pomona College in Claremont, California. The specific epithet honors R.D. Harwood, a collector around California in the early 1900s. The very first publication of this name was in Craig's senior thesis (1934a), although this thesis is not widely known, and the usual reference cited is the subsequent publication in the *Bulletin of the Torrey Botanical Club* (with a few changes; Craig 1934b). The type locality is "sandy desert, 1200 ft., Blythe Junction [Rice], Riverside County." The type specimen, Munz and Harwood 3589, is housed at the combined herbaria of Rancho Santa Ana Botanic Garden and Pomona College (RSA-POM herbarium as POM 7622).

The name then went through a number of changes in position, as has happened often for most species of *Eriastrum*. Jepson (1943) placed it under *Hugelia diffusa*; Mason (1945) moved it to *Eriastrum diffusum*; and Harrison (1959, 1972) located it in *Eriastrum sparsiflorum*. So the subspecies *harwoodii* had been treated under three different species: *filifolium*, *diffusum*, and *sparsiflorum*. Recently, David Gowen (2008) elevated this taxon to the species level, which makes sense in that *harwoodii* never really fit any of

the three species under which it was placed.

HABITAT AND RANGE

Eriastrum harwoodii inhabits sand hills in the deserts of San Bernardino, Riverside, and San Diego counties. It is not found on very active dunes, but at every site where I have found it, there is still some sand blowing around, so the habitat would be characterized as semi-stabilized sand dunes. Usually other dune plants are also present, for example, desert lily (*Hesperocallis undulata*), birdcage evening primrose (*Oenothera deltoides*), big galleta grass (*Pleuraphis rigida*), and pink sand verbena (*Abronia villosa*). Within these dune sites, *E. harwoodii* plants tend to be scattered, and sometimes widely so, but if one walks around long and far enough, quite a few plants can be found.

These dune sites are not particularly common throughout the deserts. At present *E. harwoodii* is known from about a dozen sites, and this led to its being placed on the California Native Plant Society's List 1B.2 (fairly endangered in California and elsewhere; see <http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>). However, it may appear rare simply because it has not been collected very often, which was probably because it was not well known.

HOW TO RECOGNIZE IT

Basically, it is the tallest, woolliest, white- or cream-flowered *Eriastrum* you will find on sand dunes or in areas of loose, semi-stabilized sand. It flowers in early April or maybe late March, depending on how

much winter precipitation the area has received and how fast the weather warms up in the spring.

One species that might be confused with *E. harwoodii* is *E. diffusum*, since in California *E. diffusum* often has small white- or cream-colored flowers as well. In my experience, *E. diffusum* does not have as much wool on the bracts, leaves, and stems as *E. harwoodii*. Also, stems of *E. diffusum* are often brown, and leaves usually have several lobes. In contrast, stems are usually tan in *E. harwoodii*, and leaves are entire or have two lobes near the base.

Another species that may be found in sandy areas is *E. eremicum*. This species is easily distinguished

Eriastrum harwoodii plant at Rice, Riverside County. All photographs by the author.





TOP: Close-up view of *Eriastrum harwoodii* flower. • BOTTOM: *Eriastrum diffusum* can be easily confused with *Eriastrum harwoodii*.

by its large, blue, bilaterally symmetric flowers and leaves with many lobes (two to seven).

INTERESTING FEATURES

I have observed a few traits in *E. harwoodii* that I have not seen in other species of *Eriastrum*. One in-

teresting feature of *E. harwoodii* is its long roots. Long roots are quite common among sand dune plants, which need to send roots deep in order to stay in one place as sand blows around them. These roots are longer than roots in other species of *Eriastrum*, and probably represent an adaptation to the sand dune environment.

Also, I have noticed many plants lean toward the east, which is away from the prevailing wind. This may be a consequence of only the wind, or it may also be a result of sand piling against the stem predominantly on one side of the plant.

Lastly, you do not need to be either a morning person or a night owl to observe the flowers of *Eriastrum harwoodii*. The flowers usually do not open up before 9 a.m., and often close around 5 p.m.

Now you have heard about *E. harwoodii*, maybe you will get to meet a live plant out in the desert this spring.

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Typical habitat of *Eriastrum harwoodii* at Rice, Riverside County.

PROPAGATION OF MATILIJA POPPY (ROMNEYA COULTERI)

by Kathleen Navarez

In October 2004, I was cutting back Matilija poppy (*Romneya coulteri*) in my garden in Ben Lomond, California. The material was healthy, with vigorous lateral branches, and I thought there was not any reason why these stems should not root. I know literature says otherwise, but my propagator's instincts took over. I gathered up the pruned branches and brought them to Cabrillo College's Environmental Horticulture Center, where I work as a horticulture instructor.



To lessen the chances of the cuttings rotting, I cut the pencil-size laterals at an angle above and below the axil, leaving the main part of the stem attached. This is commonly referred as a mallet cutting.

The tip of each stem cutting was removed, so that the length of each cutting was 6 to 8 inches, and each cutting had 4 to 5 leaves attached. I gently scraped the base of each cutting's primary leaf axil (the basal axil at the mallet) thereby wounding the adventitious buds at that location. I further prepared the cuttings by dipping them in diluted Clorox (1 tsp:8 cups water), and then rinsed them with fresh water.

I applied Dip'N Grow liquid rooting concentrate at a rate of 1:5. I stuck the cuttings, in groups of three, in 4-inch pots prepared with a cutting mix of 3 parts perlite to 1 part sifted peat moss. I added RootShield to the cutting mix at the rate of 3 tbs. per cubic foot of mix. I prepared two trays of 25 4-inch pots and placed them in the greenhouse on a mist bench set at 15 seconds of spray every 20 minutes and with bottom heat set at 70 degrees Fahrenheit.

After one month, most of the leaves had dropped off the cuttings, but you could easily see the new bud growth. After 2 months, nearly 90% of the cuttings had rooted. I potted them into individual 2-inch liners using Sunshine Mix #4 and RootShield (at the rate of 3 tbs. per cubic foot of mix), then placed them back in the greenhouse on the same mist bench with bottom heat for 1 to 2 weeks. After that period of time,

ABOVE LEFT: A pruned stem of Matilija poppy is the source of several cuttings. • LEFT: A single mallet cutting is shown in relationship to the original pruned stem. All photographs by the author.



A rooted mallet cutting of Matilija poppy, ready to be potted up into a 2-inch liner pot.

the liners are then moved from the mist bench to a greenhouse bench with 70 degrees bottom heat. Two months later, the rooted plants were ready to pot up directly into three-gallon pulp pots, which I then set outside in a shade structure. In other years, we have potted the young plants into plastic gallon-sized containers.

In May of 2005, we sold our first crop at our spring plant sale. Most of the plants were in bud, and some were even blooming! I have since grown three crops successfully and teach this technique in our propagation class.

Kathleen Navarez, Cabrillo College, Horticulture Department, 6500 Soquel Drive, Aptos, California 95003. kanavare@cabrillo.edu



CLOCKWISE FROM LEFT: Treating the cuttings with the rooting compound Dip 'N Grow. • Young rooted cuttings are beginning to grow. • Successfully grown plants in 1-gallon pots, ready to be sold and planted in the garden.





Ken Himes in the Sierra Nevada on a CNPS backpacking field trip in 2004. All photographs by Kathy Korbholz.

NEW CNPS FELLOW—KEN HIMES

by the Santa Clara Valley Chapter Board of CNPS

A walking encyclopedia and an engaging teacher on the trail, Ken Himes has enchanted and educated countless Californians on the ways of native flora, and encouraged others to support this flora and its threatened habitat.

A member of Santa Clara Valley Chapter, Ken Himes was named as a Fellow of the California Native Plant Society in December 2006. Chapter members have fond memories of Ken through the years on a trail or in a meadow, describing the native flora and ecology in vivid detail, and in his distinctive voice.

How do people fall in love with native plants? In many cases, a series of lucky events, chance meetings, and a willingness to be open to different ways of seeing things. And so it was in Ken's case. While Ken was born and raised in San Francisco, he spent the weekends and summer vacations of his childhood with his family at a cabin in the redwoods in rural San Mateo County. He recalls an uncle pointing out western azalea and other native plants near Pescadero Creek. Years later, Ken earned an Associate's degree from the City College of San Francisco in Horticulture, and gradu-

ally learned more about gardening and plants—but not necessarily California natives.

EARLY INFLUENCES

Transferring to Cal Poly San Luis Obispo in 1967 provided the turning point in Ken's appreciation of native plants. The San Luis Obispo CNPS Chapter sponsored a talk by Ledyard Stebbins on biological islands, which had an inspirational effect on Ken's view of native plants and habitats. Following this talk, Ken had the opportunity to tour Robert Hoover's personal garden in

San Luis Obispo, and see native plants such as *Dudleya abramsii* ssp. *bettinae* in cultivation. Up to this time, Ken had experienced little use of natives in horticulture, and was more familiar with the showy cultivars favored in San Francisco. But as time went on, more serendipitous events spurred Ken's connections with the California flora.

In 1970, Ken left for Europe, where he worked and toured until 1973. A visit to Kew Gardens in London furthered his appreciation for California's heritage, with memorable specimens of *Aesculus californica* and *Sequoiadendron giganteum* on display. Returning to California in 1973, Ken soon after began work at the City of Belmont's Parks and Recreation Department, where he continued to work until his retirement in June, 2003. As fate would have it, Ken's first supervisor, Jim Raymond, in Belmont was a native plant enthusiast who furthered Ken's interest in local botany and ecology. Ken's work included purchasing natives for the local parks, and planning a nature trail through the oak woodland community at Twin Pines Park in Belmont.

CNPS

While purchasing plants for Twin Pines Park at the East Bay Chapter's fall 1974 plant sale, Ken joined CNPS. He gradually became involved in plant sales and other activities. His interest grew steadily, and finally came into full bloom in April of 1980 when Ken set out on a self-styled sabbatical. Loading up his 1963 Dodge pickup with camping gear, his dog Lupine, and all the native plant books he could pack, Ken hit the road on what would turn out to be a three-and-a-half month long odyssey exploring the wild places and native plants of California, crisscrossing the state from as far south as Santa Barbara all the way to southern Oregon. To this day Ken is still able to draw on the

experience from that adventure, often remembering the precise locations of some of California's most special plants and places, despite not having been back in the intervening 30 years!

Returning to the Peninsula, Ken started to participate in local CNPS field trips, but what really intrigued him was collecting specimens for the Santa Clara Valley Chapter Wildflower Show. By 1985, this interest became official as he was appointed by then chapter President Bart O'Brien to his first chapter board position, Chair of the Wildflower Show. Ken went on to hold nearly all Santa Clara Valley Chapter officer positions, including Treasurer, Vice President, and President (1987-1989); and to chair nearly all chapter committees, including Field Trips, Photo Group, Invasive Removal, Books Sales, and Programs.

EDGEWOOD AND BEYOND

In addition to these many contributions to the chapter, Ken's primary efforts in the last 20 years have been focused on Edgewood County Park and Preserve in San Mateo County. In the early 1980s, the Santa Clara Valley Chapter began efforts to protect the various special habitats, including significant serpentine grasslands, at what would eventually become the park. Ken, who lives just a few miles from the site, was a staunch supporter of, and advocate for, the park since the very beginning.

In 1988, Ken helped start the Edgewood Park docent program, and has worked with that program continuously: sharing his vast knowledge of the park with the public during docent walks, and handing down that knowledge to other docents

Ken signing in on the trail at Saddlebag Lake, near Yosemite in September of 2004.



through the Docent Training Program. In 1996, Ken joined the invasives removal program at the park, eventually assuming leadership of the effort a few years later. Under Ken's stewardship the program has expanded greatly over the years, with dramatic increases in acreage and the number of species being treated, the number of volunteers involved, and overall volunteer hours contributed per year. These efforts include regular weeding parties up to three times per week throughout the year, since a weeding permit was first obtained in 1989.

As part of this effort, Ken oversaw the creation of the yellow starthistle mowing effort at Edgewood, and turned it into a rigorous scientific program using test plots and other methods. Annual grasses and teasel were also targeted, and new invasives were not allowed to get a foothold. Through careful recordkeeping, monitoring, and collaboration with San Mateo County Parks, Ken and his team have contributed a significant dataset to invasive plant research and weed control. Ken and his colleague, chapter member Paul Heiple, presented the results of their work to the Califor-



Ken Himes at Pinnacles National Monument in 2008.

nia Invasive Plant Council (Cal-IPC) in 2004, and have made presentations about the program to numerous other groups as well. Beyond the science, Ken has also greatly increased awareness of, and participation in, conservation efforts, including helping to establish volunteer programs with local high schools that have resulted in the contribution of thousands of additional volunteer hours at the park.

Ken has led hundreds of day and camping trips, both locally and throughout the state, for Santa Clara Valley, Yerba Buena, and other chapters. Along with Bart O'Brien, Ken revitalized the chapter's field trip program in the 1980s, and continues to volunteer as a leader. Some of Ken's favorite destinations include San Bruno Mountain, Montara Mountain, Pulgas Ridge, Edgewood, Jasper Ridge, Butterfly Valley, Snow Mountain, Bear Valley, Mount Pinos, Smith River, and the White Mountains. With his prodigious memory and an encyclopedic knowledge of the state's flora, Ken can identify thousands of plants, patiently explaining to his listeners their individual characters and differences.

Many view Ken's heartfelt dedication to education, outreach, and mentoring as his most important contribution toward conservation. Education is a cornerstone of his approach to life, and he integrates both learning and teaching into just about everything he does. He is a true naturalist and ecologist, and is a model for nature lovers at all levels. It isn't uncommon for Ken to pause

along a trail or meadow to discuss the flora and end up surrounded by others who have happened along, friends and strangers alike, all enthralled by his engaging manner and extensive knowledge. Whether describing the smallest details of a plant or the broad ecological relationships of regional geography and climate, Ken is able to bring the listener into the topic, making complex concepts accessible and helping listeners feel they are active, contributing participants in the discussion.

SUMMATION

Ken's work with CNPS has made his knowledge available to the greater community. His early attendance at the lecture by Ledyard Stebbins on biological islands found resonance later in his ongoing field trips and conservation endeavors at Edgewood Preserve and San Bruno Mountain, two of the Peninsula's most well-known "islands" that are now surrounded by urbanization and threatened by development.

Best of all, Ken does not simply share his knowledge and experience with others as occasion allows, but actively, eagerly, and generously seeks out ways to do so. Whether it be through his work with high school students at Edgewood, or the many trips he has led, or his presentations and lectures (drawn from his own extensive photographic library of thousands of slides) to various CNPS chapters and other groups, or his mentoring of other chapter members to help them learn and grow into chapter leaders, Ken is passionate about passing on his knowledge and experience to future generations. His enthusiasm and ability for helping others to know, appreciate, and protect the native flora of our state make him a treasure not just for our own chapter, but for CNPS as a whole.

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BOOK REVIEWS

Terrestrial Vegetation of California, 3rd Edition, Barbour, Michael G., Todd Keeler-Wolf, and Allan A. Schoenherr, editors. University of California Press, 2007. 712 pages. \$80.00 hardcover.

This is not the sort of book that you sit down and “read” but it is nevertheless a landmark publication covering California vegetation. Although heavy on academics there are also land management and conservation implications.

The list of contributors reads like a Who’s-Who among the leaders in the field of California vegetation studies. They may not be the inventors of vegetation classification but they surely are the collectors and analysts of those data that put California at the forefront of this field. I must also add that these contributors are, or will be, the teachers of those who will follow in their footsteps. In this regard, I especially tip my hat to lead-editor Michael Barbour who is now passing along insights gathered by his former students, as well as others, who assembled the abundance of new information contained in this, the third edition of the book he helped pioneer back in 1977—with typed manuscripts, no less. I wonder how many of today’s readers remember typewriters?

In the very first paragraph of the preface to the first edition, it says “... enthusiasm for the project was infectious, and it carried the two year manuscript preparation period through to completion with little discord and many pleasant memories of a sense of community among California ecologists.” I dare say, the new edition carries forward that tradition—on laptop computers, no doubt.

Here is a collection of irrefutable evidence that has, and will continue to have, influence on management and court decisions relating to California’s land use management practices. This is well and good and is an important contribution. But, Chapter One especially catches my attention because it captures the history of the coming together of widely-scattered private and public land management agencies to-

ward the concept of “reading off the same page.” Hidden away between the lines of this chapter are only hints of the lead role that the California Native Plant Society played in arriving at the wonderful cooperative efforts existing today.

In the 1980s and 1990s, high-energy CNPS members applied their talents, and their concerns, from disappointment to disappointment, to minor success, to eventual success in creating an atmosphere allowing agency workers to include native plant needs within their official duties. This was accomplished in spite of disinterested, “stick-in-the-mud” administrators who did not want their employees being distracted. This, positive and unrelenting energy came from folks like Ledyard Stebbins, Jean Jenny, Alice Howard, Bill Critchfield, Larry Heckard, among a long list of others. Many of these people achieved recognition within CNPS and set the scene for where the Society is today. Some of the readers will also remember contributions of the “Natural Areas Breakfast, Chowder, and Marching Society” that would from time to time gather at Spenger’s Fresh Fish Grotto restaurant in Berkeley to cement the bonds of mutual interest across administrative boundaries.

CNPS never gave up on its information-gathering and lobbying efforts, herding together reluctant members of the “establishment” like stray cattle, resulting in today’s continuing progress, growing pool of knowledge, and insightful decision making. The California Natural Diversity Data Base and the Interagency Biodiversity Council, along with CNPS’s undisputed expertise in rare plants are examples of this.

While I am at it, I want to especially praise co-editor Todd Keeler-Wolf for being the right person at the right place at the right time. His whole academic and administrative career seemed to point him in this direction. He is the major constant administrative factor on the job through pluses and minuses of changing administrations and budgeting circumstances. Thus he is on hand to provide special insights to this book.

But I must look beyond Chapter One and recognize the collective knowledge represented in this book. Here are data and background supporting the field guides we carry in our backpacks. Here is authoritative knowledge to help resolve many of the fine points of administrative and legal disputes hinging on field biology. Here are data to guide tomorrow’s students.



Here is a book that many will find belongs on their bookshelf.

Norden H. (Dan) Cheatham

The Ladyslipper and I, Autobiography of G. Ledyard Stebbins, by G. Ledyard Stebbins. (Monographs in Systematic Botany from the Missouri Botanical Garden, Volume 109.) Missouri Botanical Garden Press. 2007. Victoria C. Hollowell, Vassiliki Betty Smocovitis, and Eileen P. Duggan, eds. \$35.00 hardcover. 173 pages, 25 photographs.

Dr. G. Ledyard Stebbins, Jr. (1906-



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2000) led a life full of passion for botany, teaching, mountain climbing, classical music, and politics. He made vast scientific contributions and is considered the founder of evolutionary botany. Many contemporary botanists learned plant evolution from *Variation and Evolution in Plants*, *Flowering Plants: Evolution Above the Species Level*, and *Chromosomal Evolution in Higher Plants*—those who learned plant evolution in Dr. Stebbins classroom usually caught his contagious passion for botany.

Ledyard made considerable contributions to the conservation of plants in California through his association with and leadership within the California Native Plant Society (CNPS). In 1968, he started a card file of plants with limited distribution which eventually evolved into the Rare Plant Program that maintains and publishes the CNPS *Inventory of Rare and Endangered Vascular Plants of California*, the definitive source of rarity information for California plants (<http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>). He served as president of CNPS from 1966 to 1972 and was made a Fellow of the organization in 1976.

The Ladyslipper and I is an enchanting autobiography by this legendary figure and serves as a who's who of the early contributors to our current state of knowledge about plant evolution. This autobiography provides an inti-

mate portrait of the many life passions that Ledyard embraced and is written in a delightful story-telling fashion typical of his oratory and teaching style. One disappointment is the brevity in which a few personal tragedies were addressed, but despite being the hub of academic and social circles, Ledyard was a private person.

The first several chapters tell of an early interest in nature fostered by privileged and indulging parents and Ledyard's own curiosity and intellect. One of the most insightful of Ledyard's childhood stories is his recollection of boat trips with his parents at the age of five to admire bog plants that the whole family venerated. Subsequent years and chosen vignettes cover the awkwardness associated with growing up male and not athletically inclined, but highlight a counterpoint growth in his connection with nature with numerous explorations in Seal Harbor, Pasadena, Colorado Springs, and Santa Barbara. Ledyard's account of a 1924 cross country auto trip with a boarding school companion in a modified Model T exemplifies his lifelong passion for travel and adventure.

The chapters dealing with Ledyard's life as an undergraduate and graduate student at Harvard show a young man learning about himself and his true interests in life despite them being disappointing to his family. These recollections also reveal the sometimes hos-

tile disagreements that can occur between academics with different perspectives and theories. These chapters are interspersed with scientific studies, nature explorations, travel adventures, and punctuated with personal and intellectual milestones. High points included publication of his first paper, attending an international botany congress, and eventually gaining his Ph.D. from Harvard.

Chapter 12 begins the long and colorful story of Ledyard's research career. He describes his research setbacks with the same honesty as his many breakthroughs and epiphanies. You can hear his delight in the recollections of relationships with col-

leagues—local and international—that resulted in ongoing collaboration and lifelong friendships. Following receiving tenure in 1948, he shifted his research focus to California native plants and California grasslands, and in 1950 he transferred from Berkeley to Davis to head a new Department of Genetics.

Several chapters are a synthesis of what he learned over the years and hypothesis for future studies.

Throughout his career, Ledyard traveled the world in search of specimens for his genetic research on grasses. Following his retirement in 1973, he spent some time teaching and traveling as well. His autobiography is thoroughly

sprinkled with accounts of travels both near and far, unusual botanical discoveries, and mountain climbing adventures with his oldest son, grandsons, and many friends. He climbed Mount Dana in 1986 at the age of 80.

This autobiography is a wonderful, personal account of a passionate, adventurous gentleman and a true scholar. A must read for anyone who knew Ledyard, studies botany, or is interested in the early stages of evolutionary botany.

Carol W. Witham

This book review was first published in Harvard Papers in Botany 13(2):301-302. 2008.

UPDATE

THEN AND NOW— FORMER *FREMONTIA* COVER PHOTO

When chaparral is viewed primarily as fuel and not understood as a valued ecosystem, it is threatened by poor land management practices. On the cover of the Fall 2007 issue of *Fremontia*, a remarkable stand of manzanita chaparral was featured (located

in the Trabuco District of the Cleveland National Forest). The area was clearcut by the US Forest Service shortly thereafter in an attempt to reduce “fuel” around a tree plantation. The plantation was established in 1956 with a mix of Coulter pines (*Pinus coulteri*) and a “frankenpine” hybrid (*Pinus* × *attenuradiata*, a cross of Monterey pine [*Pinus radiata*] and knobcone pine [*Pinus attenuata*]). Coulter pines are native to the area and have

adapted to living within the chaparral plant community by having serotinous cones that open when exposed to fire. Being surrounded by chaparral is their natural condition.

In the recent USFS land management plans for Southern California, forest types were carefully distinguished and management strategies were offered for seven different forest types. Yet when it came to chaparral, different types were not distinguished,



LETTERS TO THE EDITOR

CHAPARRAL "MISCONCEPTIONS"

I would like to take issue with some of the statements that Richard W. Halsey made in the lead article in *Fremontia* 35(4):2-7, on California chaparral, especially on page 4 under the heading of "Misconceptions." He states that two of the "wrong" assumptions that many folks make concerning chaparral are that "chaparral needs to burn to remain healthy," and that "chaparral is adapted to fire." While he makes a very valid point concerning too frequent fires resulting in the conversion of chaparral into weedy grasslands, the converse is also true from my observations. If chaparral does not burn frequently enough, it is converted into woodland. Chaparrals were created by fire patterns that need to be maintained to preserve their very nature, and the ideal frequency would depend on which taxon one is interested in maintaining.

Maybe it is extremely different in Southern California, and most of my nearly 30 years of observation have been in Central or Northern Califor-

nia, but I could easily show him, or anyone, dozens of places where chaparral has been eliminated by aggressive tree seedlings (all native) that relatively quickly turn a diverse chaparral community into a dark forest of Douglas-fir (*Pseudotsuga menziesii*), California bay laurel (*Umbellularia californica*), coast live oak (*Quercus agrifolia*), tanoak (*Lithocarpus densiflorus*), and madrone (*Arbutus menziesii*). Many people have hiked on Mt. Tamalpais in Marin County and walked into dark Douglas-fir/mixed evergreen woodlands, only to see large stretches of dead skeletons of manzanita, ceanothus, toyon, chaparral pea, etc., that persist in the now unsuitable habitat for these chaparral species. This is common throughout the Bay Area in many sites, public and private. The lack of fire—at least until the next fire comes through—has completely eliminated nearly all chaparral species in some places. Given this widespread phenomenon, how can he maintain that this is healthier than being renewed by fire?

More important to conservation, many of these chaparrals contain (or contained) rare species of *Arctostaphy-*

los or *Ceanothus*, as well as chaparral-associated forbs like *Cordylanthus*, *Horkelia*, *Antirrhinum*, *Streptanthus*, *Calochortus*, etc. For example, the rare *Ceanothus masonii*, known only from a relatively small section of chaparral on the Bolinas Ridge north of Mt. Tamalpais, is rapidly being lost to the intrusion of Douglas-fir and other mixed evergreen tree species. In the same areas, *Arctostaphylos virgata* is also largely gone or in serious decline. Similarly, not far away, *Arctostaphylos hookeri* ssp. *montana*, a serpentine endemic, is also losing ground rapidly as the invading forests kill off the sun-requiring manzanita. Associated with this manzanita are other rare plants, like serpentine reed grass (*Calamagrostis ophitidis*), Oakland star tulip (*Calochortus umbellatus*), *Streptanthus glandulosus* ssp. *pulchellus*, and *S. batrachopus*. The list could go on and on. There are *Arctostaphylos bakeri* dying due to chaparral being converted to Douglas-fir forests near Occidental, *A. stanfordiana* ssp. *decumbens* being shaded out in Santa Rosa and Dry Creek sites, *A. densiflora* struggling in its Vine Hill preserve due to increasing shade from oak and Douglas-fir along the county road right-of-way near Sebastopol, and *Ceanothus divergens* and *C. confusus* losing out in many sites in Sonoma and Napa counties. All these chaparrals and rare plants are suffering due to lack of fire which permits tree species to rapidly colonize the chaparral communities, prevents renewal, and increases pathogen loads for many sensitive species.

So while these and other species could theoretically suffer from too many fires, their health, in fact their very lives, are suffering today from not enough fire. That is because these plants are adapted to fire, and the lack of it has catastrophic consequences in terms of their preservation. It seems to me that every plant and plant association that we know of has an average (or ideal) fire frequency, based primarily on the prehistoric patterns of fire in

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these areas. When these fire patterns do not occur, or occur too frequently, something loses out and the vegetation shifts to plants that favor the new pattern. It also seems that if we want to preserve rare species in the wild, then those rarest elements need to be given priority, and the vegetation needs to be managed to favor those species or else we could lose them. And although a fire may remove an encroaching forest and stimulate the regeneration of “lost” plant taxa from the seed bank, this is not a sure thing, and it seems very conceivable that some plant taxa could be lost forever given enough time of inappropriate habitat conversion.

I have nothing against trees, but I truly love chaparral, as unfriendly as it can be to the human body. But all the trees that move into and alter chaparral in our area are common species without even a hint of rarity. We need to prioritize our conservation efforts, and since there are whole suites of rare species from chaparrals, we need to keep the forest areas out of our chaparrals. This can be done manually with some success, but fire was the natural process that originally accomplished this effect.

I think one of the crucial differences of Northern compared with Southern California chaparrals is that most of our northern chaparrals—and this is increasingly evident toward the coast—are adjacent to and/or surrounded by woodland communities of various components. These woodlands dominate, whereas the chaparral areas are “carved out of” this more predominant arboreal community. Thus the woodlands can very easily and relatively quickly move into the chaparrals. The converse is not viable; i.e., the sun-loving chaparral elements can not effectively move into the woodlands. And as mentioned previously, many trees, especially Douglas-fir, coast live oak, and California bay laurel are prolific seeders with a high degree of seedling survival, barring any limiting controls, a role previously played by fire. Now it seems that Douglas-fir woodland is destined to take over all coastal regions of Northern California—not only chaparral, but also grassland, coastal scrub, oak savannah, etc. Even as one moves into the interior, where Douglas-fir and coast live oak

do not occur, other elements, including madrone, blue oak, canyon live oak, interior live oak, and the previously mentioned bay laurel are effective at moving into chaparrals. Even chaparral-associated conifers, such as knobcone pine (*Pinus attenuata*) and Sargent or McNab cypresses (*Cupressus sargentii* and *C. macnabiana*) will eventually shade out most chaparral-loving plants when their canopies close in and eliminate sunlight.

In conclusion, although I realize that Richard Halsey probably knows more about chaparral than I ever will, I do not see how he can support those statements referred to earlier as misconceptions, since to me they are obvious truths, repeated again and again in almost every chaparral I have observed. I too love “old growth chaparral” and have reveled in its beauty, but here it does not stay as chaparral: it is inexorably displaced. Much like low islands in a rising sea, they are all too easily inundated and obliterated.

Roger Raiche

AUTHOR HALSEY REPLIES

I would like to thank Roger Raiche for responding to my article on the chaparral in the Fall 2007 issue of *Fremontia*. He provides a rare example of someone who does not blindly elevate the value of forests above all else. Too frequently, shrubs are seen as merely an “understory” that gets in the way of what people often think should exist, namely, wide open forests or grasslands unencumbered by such things as chaparral. Raiche’s perspective is refreshing, especially during a time when large areas of native shrublands are being destroyed in the name of “fire safety.”

Regarding Raiche’s criticism of my statements concerning misconceptions about the chaparral’s relationship to fire, it is important to make a distinction between natural and managed landscapes. The encroachment of trees into the chaparral plant communities that Raiche refers to is a natural process. Lightning-caused fires that would generally remove these trees are relatively infrequent in the San Francisco Bay Area. For example, over the past half-century, the frequency of lightning-caused fire in Alameda County

has been 1.8 fires per decade for every 250,000 acres (Keeley 2005a). However, if the desire is to maintain or expand a particular plant community, artificially adding fire to a managed landscape could certainly achieve such a goal. But it is important to remember that applying such a treatment can have unintended consequences. Prescribed fires have escaped into surrounding communities with devastating results and have led to the elimination of the very plant communities the fire was intended to encourage. Still, if local citizens want to restore a chaparral area currently overwhelmed by



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other vegetation, using fire on a limited basis is a reasonable approach.

When I wrote that chaparral does not *need* to burn, I was trying to counter the common misconceptions that chaparral is capable of handling *any* fire return interval and needs to burn "frequently" to maintain its ecological health. Yes, many chaparral plant species require fire to stimulate seed germination, but fire at the wrong time or the wrong frequency can seriously compromise the ecosystem. We know fire *will* eventually occur, regardless of our efforts to stop it. For the most part, we do not need to speed up the process. The danger of being impatient and artificially adding fire to a landscape is that the next set of flames may return sooner than the chaparral system can tolerate, leading to its extirpation. Continued climate change and increasing human populations will likely increase such risk.

Raiche's observations are most relevant for certain areas in northern California where forested systems can temporarily succeed chaparral systems. His suggestion that some elements of chaparral ecosystems "could be lost forever given enough time of inappropriate habitat conversion" if fire does not occur, is certainly an important concern that should be investigated. We do know, however, that there is a positive relationship between longer fire return intervals and robust chaparral

recovery (Keeley 2005b). In addition, the seeds of many chaparral plant species can remain viable in the soil for a century or more. Areas where living specimens of ceanothus have long since disappeared and only scattered skeletons of manzanita remain frequently explode with seedlings of these species in the post-fire environment. If not negatively influenced by trees in the manner Raiche describes, old-growth chaparral stands typically remain viable plant communities and important natural resource treasures. Unfortunately, such details are lost on many policy makers and members of the public, leading them to believe simplistic notions about the ecological role of fire and thinking chaparral is resilient no matter when or how frequently the flames come to visit.

A striking example of the ecologically destructive potential that fire possesses can be seen while driving through Riverside County along Interstate 15 or 215, or along State Highway 60 between Moreno Valley and Beaumont. Separating an occasional, struggling patch of sugar bush, sage, or chamise will be miles of invasive, non-native weeds. Much of the pre-European settlement landscape surrounding Thousand Oaks and Santa Maria was probably covered with California sage scrub rather than the non-native grasslands present today. This may well offer a vision of the future for

shrublands in many parts of the state if fire frequency continues to increase.

While there are definite differences between chaparral in southern and northern California, what appears to be consistent is the lack of appreciation for native shrublands and the tendency for some to blame native plant communities for wildfire damage. This was demonstrated after the Martin fire in Santa Cruz last year. CNPS, "environmentalists," and "brush" in the Bonny Doon Ecological Preserve were falsely blamed for the fire's wrath. This presents a challenge to all of us who love the natural environment and native plants in particular. We must help the public understand that the best way to create fire-safe communities is to adapt to the fire-prone environment in which we live rather than trying to force nature to adapt to us.

Richard W. Halsey

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(CONTRIBUTORS: continued from back cover)

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Roger Raiche is owner/partner of the design-build landscape firm of Planet Horticulture. For 23 years Roger was in charge of the Native Plant collection at the University of California Botanical Garden at Berkeley. There he revamped and expanded the collection, did extensive fieldwork, discovered new taxa—three of which were named in his honor—and selected about two dozen native cultivars.

The CNPS Santa Clara Valley Chapter Board of Directors prepared and wrote the article on Ken Himes as a group effort. The primary contributors to this effort included the following board members (listed alphabetically): Judy Fenerty (former chapter president and current past president), Drew Shell (former chapter vice president and current San Mateo County conservation chair), Georgia Stigall (former chapter president and current new member outreach chair), and Jean Struthers (former chapter president and current nursery manager).

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MATERIALS FOR PUBLICATION

Members and others are invited to submit material for publication in *Fremontia*. Instructions for contributors can be found on the CNPS website, www.cnps.org, or can be requested from *Fremontia* Editor, Bart O'Brien at bart.obrien@cgu.edu or c/o Rancho Santa Ana Botanic Garden, 1500 N. College Ave., Claremont, CA 91711.

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FROM THE EDITOR

The cover story of this issue takes us to the breathtaking beauty of Baja California's Punta Colonet, an area that is fast changing due to both local agricultural interests and the proposed mega-port project that would forever ecologically damage the region. If you have the opportunity to visit this coastal paradise, do so at your earliest convenience as there is less of it to see every year. I am especially pleased that we are able to feature such stunning images of this area by such talented photographers as Alan Harper and Mark Dodero.

We are treated to a view of Cali-

fornia's *Coryphantha*s by noted author and photographer Stephen Ingram. His new book, *Cacti, Agaves, and Yuccas*, published by Cachuma Press, is highly recommended for everyone interested in these fascinating Californian plants.

A fairly recently recognized new element of California's desert flora, *Eriastrum harwoodii*, is described and illustrated by Sarah DeGroot.

"Matilija poppy cannot be grown from stem cuttings." That longstanding conventional wisdom has been put to rest by intrepid plant propagator Kathleen Navarez. Follow her instruc-

tions and you will be growing more plants for your friends and plant sales.

Ken Himes is one of the most recently named CNPS Fellows. His lengthy term of service, in many capacities, to the Santa Clara Valley Chapter is celebrated in this article authored by many of his friends.

Rounding out this issue are two book reviews, a surprising visual update to the cover image of our recent special chaparral issue, and a pair of letters that convey vital information on the management of California's chaparral plant communities.

Bart O'Brien

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Andreas Chavez is a predoctoral student in the biology department at the University of Washington. He is a member of the San Diego Chapter of CNPS and has been involved in several floral and faunal surveys in northwestern Baja California.

Norden H. (Dan) Cheatham is probably best known for the Cheatham & Haller habitat classification system that was developed, with Professor Robert Haller, in the 1970s for use by the University of California Natural Reserves System and served as a forerunner of vegetation classification systems in use today.

Kevin B. Clark is a former board member of the San Diego Chapter of CNPS. He has conducted research on endangered species and the effects of habitat fragmentation on diversity. He recently completed six years with the US Fish and Wildlife Service and is now a consulting biologist.

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Mark Dodero is a restoration biologist at RECON Environmental, Inc. His restoration work focuses on rare and sensitive plants, animals, and habitats. He also coordinates with NGOs in Baja California, to further conservation efforts south of, and across, the border.

Richard W. Halsey is the director of the California Chaparral Institute, a research and educational organization focusing on the ecology of California's shrubland ecosystems, the dynamics of wildland fire, and the importance of nature education.

Alan Harper is a conservationist and photographer who works in both capacities in the California Floristic Province portion of Baja California, Mexico. Some of his photography can be viewed at www.alanharper.com.



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