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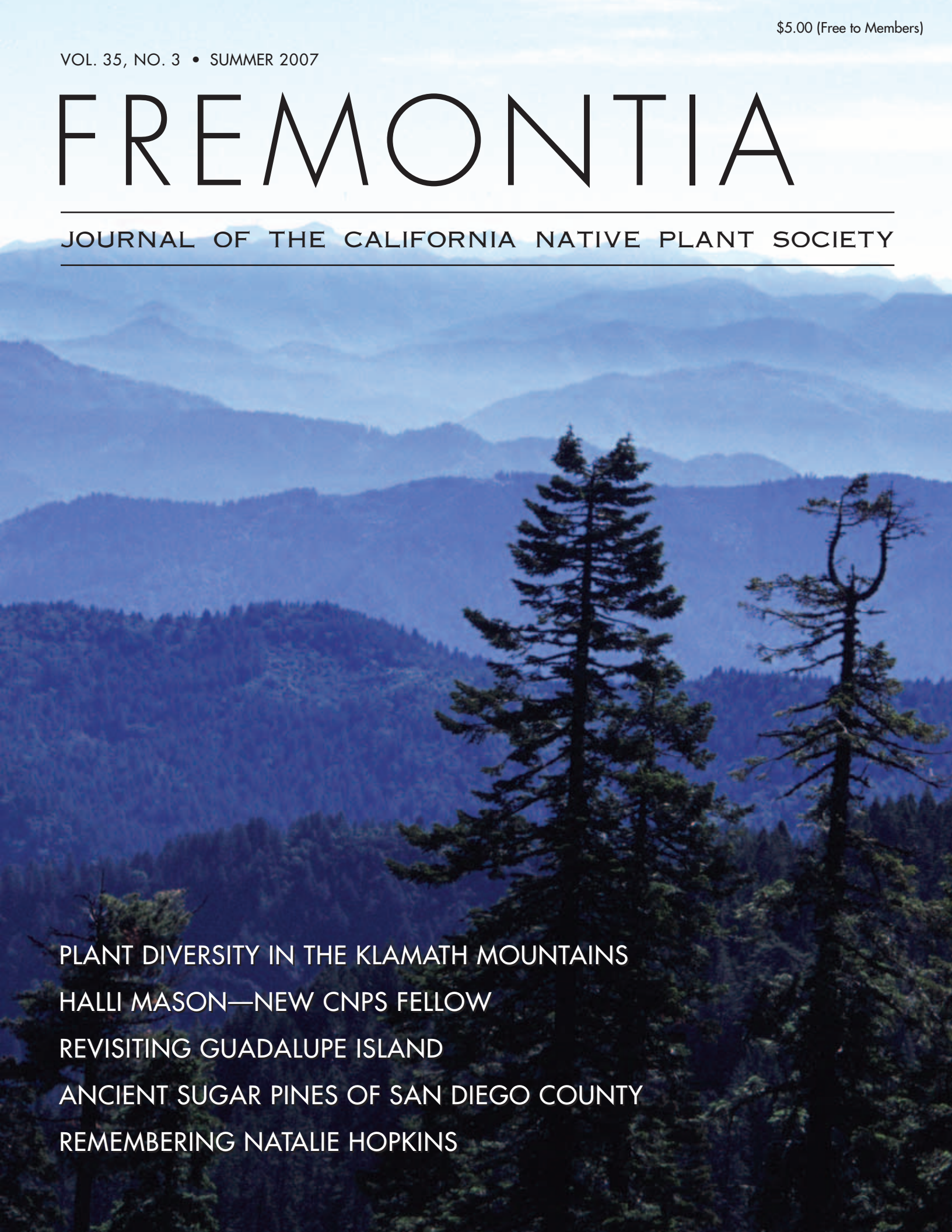

PLANT DIVERSITY IN THE KLAMATH MOUNTAINS

HALLI MASON—NEW CNPS FELLOW

REVISITING GUADALUPE ISLAND

ANCIENT SUGAR PINES OF SAN DIEGO COUNTY

REMEMBERING NATALIE HOPKINS

FREMONTIA

VOL. 35, NO. 3, SUMMER 2007

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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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CONTENTS

THE COVER: The Klamath Mountains seen from South Fork Mountain. The Trinity Alps are on the horizon. Photograph by J. Sawyer.

EDITORIAL: A CALL FOR NAMES

The Need for a Standardized List of Common Names for California's Native Plants

Many years ago, when I was in college, I was told that one of the reasons for botanical nomenclature was the stability of these Latin names. That hardly seems the point these days with the radical changes to the system wrought by molecular systematists. Don't get me wrong—I am endlessly fascinated to know the latest interpretation of our flora. Learning what new lines of evidence have to tell us about the origins and relationships amongst California's flora is a never-ending process. Unfortunately, the results of new information can lead to a plethora of name changes. Many of these will be incorporated into the upcoming new (2008) edition of *The Jepson Manual*.

A surprising number of these name changes are at the genus level. Some of our former *Rhamnus* are now recognized as species of *Frangula*. California will no longer have any native *Coreopsis* species as these have all been transferred to the genus *Leptosyne*. Our palo verdes are no longer in the genus *Cercidium* as they have been incorporated into the genus *Parkinsonia*. It appears likely that we will no longer have any native species left in the genus *Leptodactylon* as California's are almost certainly moving into the genus *Linanthus*—and a number of *Linanthus* species are moving into the genus *Leptosiphon*. Some of our native *Aster* species, including the well known *A. chilensis*, have been moved to the genus *Symphyotrichum*, another *Aster* species goes to *Almutaster*, and still others are now recognized as species of *Eurybia*, *Oreostemma*, *Eucephalus*, and *Ionactis*.

There are also cases where formerly familiar genera that had been done away with in the current edition of *The Jepson Manual* but will be making a comeback in the next edition. Examples include *Benitoa* and *Munzothamnus*.

It's enough to make even the most dedicated field botanist's head spin!

Faced with the ever-evolving nature of scientific nomenclature, birders decided that it would be beneficial to create a standardized list of common names that generally will not change with the latest updates of scientific researchers. Yes, these common names are tied to scientific names. Yes, the system seems to be working. With the changes in the scientific names of plants coming at us at such an astonishing rate, I think it is time that CNPS lead the way for the plant-interested public. Create a list of the accepted common name for every plant native to the state of California. It will be an interesting task, as some of our plants have no readily accepted common name while others have dozens. It will be an exercise for both public relations—common names make a plant more accessible and provide a point of reference to the vast majority of people that need to know more about our natural world—and to correct some of the oft-repeated yet silly "common names" that are anything but common. Examples of uncommon common names include: changeable phacelia (*Phacelia mutabilis*), and crisp monardella (*Monardella crispa*). There will be challenges: evergreen currant or Catalina perfume for the delightful *Ribes viburnifolium*? And what of *Tolmeia menziesii*—the plant with over 25 recorded common names? If CNPS were to take on this task, we would provide a service and a steadying force in the face of rapid change—one that all Californians who seek to know our native plants could appreciate. CNPS has already accomplished significant work on this topic with the publication of common names for all of the plants listed in our *Inventory of Rare and Endangered Plants*. Let's finish this job for the rest of our flora.

Bart O'Brien, *Fremontia* Editor

USEFUL WEBSITES AND CONTACT INFORMATION

California Native Plant Society (CNPS):

www.cnps.org, with links to conservation issues, chapters, publications, policies, etc.

For updates on conservation issues:

Audubon Society
www.audubon.org

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www.sw-center.org

Native Plant Conservation Campaign *www.plantsocieties.org*

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The Duck Lakes area in the Salmon Mountains, home of the first known stand of subalpine fir (*Abies lasiocarpa*) in California. Little Duck Lake is in the foreground. All photographs by the author unless otherwise specified.

WHY ARE THE KLAMATH MOUNTAINS AND ADJACENT NORTH COAST FLORISTICALLY DIVERSE?

by John O. Sawyer

The following is adapted from the ideas of the chapter "Beyond the Ancient Meeting Ground" in Northwest California, a Natural History *published in 2006 by University California Press.*

NORTHWEST CALIFORNIA, THE GREAT MEETING GROUND

The flora of the Klamath Mountains and adjacent North Coast is diverse in many ways. It is the home of 3,540 both native and naturalized vascular plant taxa (species, subspecies, and varieties), more than grow in New England and adjacent Canada combined. Only one other region of roughly equivalent size in the nation, the southern Appalachian Mountains, has a comparably diverse flora. Robert Whittaker, an influential plant ecologist of ecological theory, explained this diversity almost 50 years ago by noting that our mountains are a great meeting ground. The region's central location along the Pacific Coast, its continuity with other mountain systems, its diverse climate, geology, and topography, and its long geological history led to the development of a complex and diverse flora. The title of David Rains Wallace's *The Klamath Knot* encapsulates the argument well. Threats to the region's rich flora are less than other parts of the state, but still forest fragmentation, invasive plants, and habitat loss are important conservation issues in the Klamath Mountains and adjacent North Coast.

THE CONTINUITY OF MOUNTAIN RANGES

You can easily see the region's central location along the Pacific Coast on national maps, but its continuity with other mountain systems is less evident. Most people think of the Rocky Mountains, the Cascades, the Sierra Nevada, and the Klamath Mountains as separate ranges, but they actually comprise an uninterrupted mountain system that geolo-

gists call the *western cordillera*. The Cascades are volcanic and the Trinity Mountains are not, but their ranges are continuous at mid-elevations, and they share many plant species. Within the Klamath Ranges, the Trinity Mountains are continuous with the Scott, Salmon, and Marble mountains. The Klamath River separates the Marbles and the Siskiyou mountains, which are continuous with the Cascades in Oregon. The Yolla Bolly Mountains connect South Fork Mountain with the northern Coast Ranges.

One way to appreciate the significance of this meeting place is to recall where you first learned your plants. Was it in the Santa Cruz area where you met redwood (*Sequoia sempervirens*); in the heights of Yosemite National Park when you first encountered whitebark pine (*Pinus albicaulis*) and its partner, the Clark's nutcracker (*Nucifraga columbiana*); in southern California the birch leaf mountain mahogany (*Cercocarpus betuloides*); in Nevada the desert mountain mahogany (*Cercocarpus ledifolius*); in the flower fields at Mount Rainier the red heather (*Phyllodoce empetriformis*); in Alaska the crowberry (*Empetrum nigrum*)? All these plants grow in the Klamath Mountains and adjacent North Coast. Plant migration into and out of the region has been greatly aided by these land connections.

Jeffrey pine (*Pinus jeffreyi*) growing on serpentine substrates in the Scott Mountains. This pine is commonly found in California.

A WIDE RANGE OF HABITATS

Beyond the physical continuity, the multitude of habitats in northwest California offers suitable environmental conditions for a myriad of species. Granitic, metamorphic, sedimentary, and serpentine substrates, including limestone, exist at all elevations. The cool, foggy climate of the coast contrasts with the sun-baked interior. Annual precipitation exceeds 120 inches in the west side Smith River watershed in the Siskiyou Mountains but is a modest 18 inches in the Stony Creek watershed in the northern Coast Ranges. Scott Valley's winter temperatures are often well below freezing, and snow is long lasting. On the coast, winters are mild, and snow is a fleeting event occurring only about once a decade.

The maze of mountain ranges and complicated river systems make for many local climates in the rugged terrain, even within a single watershed. The variable and patchy structure of the vegetation itself adds to this microclimatic variability. Patches of open woodlands with filtered light, well-lighted chaparral, and dark coniferous forests mingle on a single mountain slope along the Sacramento River watershed east of the Trinity Mountains. In the current jargon of ecology, "environmental heterogeneity is high at all scales."

AN ANCIENT LAND

The region's flora is a rich collection of long, enduring lineages mixed with more recently evolved ones. Its lands have been available to flowering plants since the Cenozoic (65 million years ago). During this time, volcanism created the Cascades to the east and the hills in the Clear Lake area to the south, but the

The serpentine substrates of Swift Creek in the foreground contrast with granitic substrates of Stewart Fork in the background in the Trinity Alps.

region has no volcanic deposits. Glaciers were not regionally extensive, and in many mountain ranges, the glaciers were spotty. With this geological history, we should expect to hold onto ancestors and yet allow these residents and new immigrants to evolve to meet new environmental situations.

Indeed, our flora may be rich because it responds quickly to environmental change. Helen Constantine-Shull, who received her Masters degree from Humboldt State University (HSU) in 2000, surveyed the flora of the San Joaquin Roadless Area, just north of the town of Mammoth. She found that, unlike most of the Sierra Nevada, volcanic rock and ash buried this area in recent geological time. Some eruptions occurred only 650 years ago. Yet, in this very short period, a new flora has developed that is similar to that of the central Sierra Nevada as a whole. Gordon Leppig, who received his Masters degree from HSU in 2002, came to the same conclusion when he studied fens in northern California.

PLANT GENERALISTS

A surprisingly high proportion of species in California's larger genera grow in the Klamath Mountains and adjacent North Coast. We find half of California's pines (*Pinus* spp.), two-thirds of the oaks (*Quercus* spp.), and two-thirds of the gooseberries (*Ribes* spp.) here. Genera of herbaceous plants show the same pattern. Three-fourths of the state's sedges (*Carex* spp.) occur in northwest California, as do 21 of the 24 wild peas in the genus *Lathyrus*.

Many of the region's species grow throughout California and the rest of the West. Ponderosa pine (*Pinus ponderosa*) ranges from South Dakota to Mexico and throughout western mountain ranges. Virgin's-bower (*Clematis ligusticifolia*) has a similar range. Canyon live oak (*Quercus chrysolepis*), green leaf manzanita (*Arctostaphylos patula*), and tobacco brush (*Ceanothus velutinus*) also reside in the Rocky Mountains. Many species whose distribution is centered in the Pacific Northwest have ranges that extend south into northwest California. Mountain alder (*Alnus incana* ssp. *tenuifolia*), Pacific yew (*Taxus brevifolia*), wild ginger (*Asarum caudatum*), and yellow pond lily (*Nuphar polysepala*) grow from Alaska to the Sierra Nevada. We see a southern pattern with the California poppy (*Eschscholzia californica*) and sugar pine (*Pinus lambertiana*), which range from southern California to central Oregon. Other species have extensive ranges. For example, madrone (*Arbutus menziesii*) ranges from British Columbia, where its common name is arbutus, to San Diego County, where it is madroño. Much of northwest California's floristic richness comes from these generalists.

PLANTS WITH ANCIENT LINEAGES

Large areas of the Klamath Mountains and adjacent North Coast were well above sea level during the last 65 million years and were therefore available to terrestrial plant growth. With this kind of geological history, we might expect to find *relicts*—plants surviving after extinction of related groups, or once widespread populations now persisting in isolated localities—in our flora. Coast redwood (*Sequoia sempervirens*) is our most famous example. Its ancestry is a venerable one. We can trace the fossils of *Sequoia* back to the Jurassic 200 million years ago, and ones with the overall appearance of the species to the Paleocene 60 million years ago. As many as half of the modern genera of woody plants that grow in the Klamath Ranges and adjacent North Coast existed in the Middle Eocene 45 million years ago (Table 1).

Comparing modern and fossil floras is not the only way to evaluate the idea that northwest California's

Green leaf manzanita (*Arctostaphylos patula*), a common shrub in the mountains of northwest California and elsewhere in the West.

flora is rife with these ancient lineages. Plant geographers also study distributional patterns of modern taxa to understand the history of plant groups. They consider plants that share many characteristics, even when found in very different parts of the world to be closely related. Settlers of New England came upon beech (*Fagus*), oak (*Quercus*), and pine (*Pinus*) trees that were nearly identical to those in Britain and Europe. Gold miners were using oak and pine from northwest California's forests in their mines. When they saw the fruits of the local chinquapin (*Chrysolepis chrysophylla*), they recalled the chestnuts (*Castanea*) of Europe.

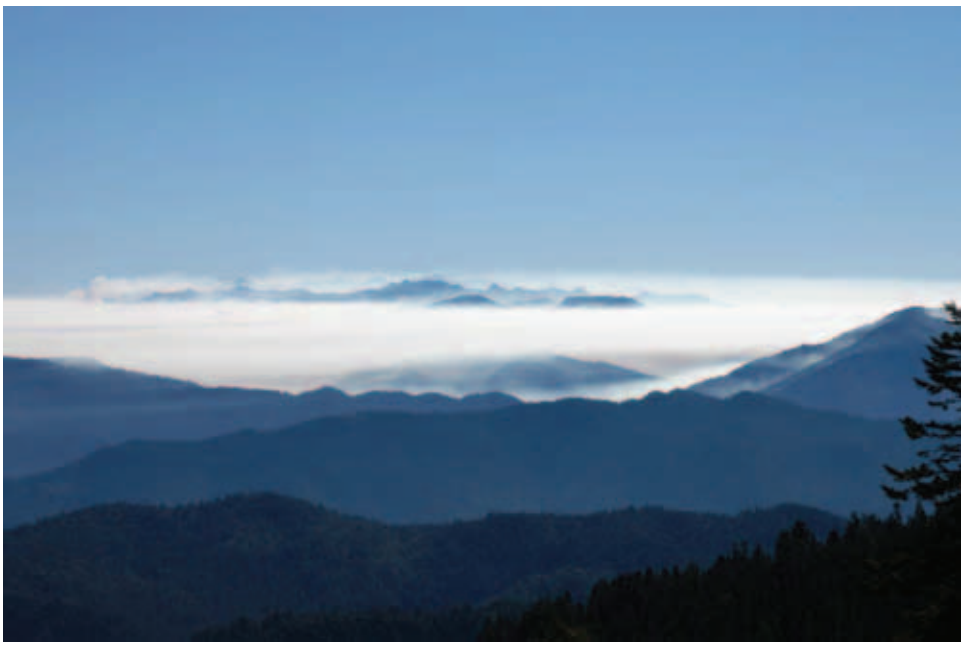
By the middle of the 1800s, botanists had cataloged many regions of the world. It was at this time that Asa Gray, the foremost authority on the North American flora, received a copy of Carl Thunberg's *Flora Japonica*. To Gray's surprise, he discovered that maples (*Acer*), columbines (*Aquilegia*), bleeding hearts (*Dicentra*), mock oranges (*Philadelphus*), plum yews (*Torreya*), wisterias (*Wisteria*), and many other gen-

False bugbane (*Trautvetteria carolinensis*) growing on the western slopes of North Trinity Mountain in the Trinity Alps. Photograph by M. Mesler.

era in the Japanese flora were similar to those he knew from eastern North America. In his 1858 paper, "Observations Upon the Relations of the Japanese Flora to That of North America," Gray offered an explanation: These genera were relicts, he believed, surviving in eastern North America and in eastern Asia, two areas of similar climate and geological history, but continents apart.

Californian relicts with close relatives in eastern North America and elsewhere are easy to identify using current distribution information. Fossils of sycamore (*Platanus*) are widespread in California. Today the genus ranges from California and Arizona to eastern North America, Europe, Iran, and China. *Pseudotsuga* includes the familiar Douglas fir that grows in northern California, the Pacific Northwest, and the Rocky Mountains. Other *Pseudotsuga* species and close relatives grow in southern California, Mexico, Japan, and China. Our California spicebush (*Calycanthus occidentalis*) is closely related to Chinese sweetshrub (*Sinocalycanthus chinensis*) from China, eastern white pine (*Pinus strobus*) of New England has cones that are nearly identical to those of western white pine (*Pinus monticola*) of California. Hazel (*Corylus cornuta*) has two subspecies—the western ssp. *californica* with broadly elliptical leaves and the eastern ssp. *cornuta* with narrowly elliptical leaves. False bugbane (*Trautvetteria carolinensis*), grows with little morphological difference in three, isolated parts of the United States: the Pacific Northwest, the southern Rocky Mountains, and in the South.

The Klamath Mountains seen from South Fork Mountain. Smoke from the Pigeon Point fire covers the lands of Trinity River Canyon. The Trinity Alps are on the horizon. Photograph by M. Mesler.



RECENT IMMIGRATION OF SPECIES

Today plant geographers have new methods to ascertain relationships among disparate populations. In 1969, in the Klamath Mountains, Dale Thornburgh, Professor of Forestry at HSU, and I discovered a population of subalpine fir (*Abies lasiocarpa*) in the Klamath Mountains of California. It is a common tree in the Rocky Mountains. Was this a relict population far out of range, or was it the result of a recent immigration? Ed Cope, who received his Masters degree from HSU in 1983, worked with us to compare the chemical makeup (monoterpenes) of fir needles among California, Oregon, and Colorado populations. The results showed that the needles from the southern Cascades of Oregon and

TABLE 1. The fossil record from northern California fossil locations: Paleogene list for California,[4] Oligocene or Early Miocene list from the Weaverville flora,[1] Middle Miocene list from Upper Cedarville locality in the Warner Mountains,[2] and Pliocene list from a locality near Santa Rosa.[3]

TERTIARY RECORD

PALEOGENE
Cycads
Ficus-like fig
Palms
Persea-like avocado
Tree ferns

OLIGOCENE OR EARLY MIOCENE
Bald cypress (*Taxodium*)
Cattail (*Typha*)
Elm (*Ulmus*)
Spice bush (*Lindera*)
Sycamore (*Platanus*)
Tupelo (*Nyssa*)
Walnut (*Juglans*)
Willow (*Salix*)

MIDDLE MIOCENE
Bay tree (*Umbellularia*)
Chestnut (*Castanea*)
Ginkgo (*Ginkgo*)
Hickory (*Carya*)
Maple (*Acer*)
Nutmeg (*Torreya*)
Ponderosa-like pine (*Pinus* cf. *ponderosa*)
Red-like fir (*Abies* cf. *magnifica*)
Redbud (*Cercis*)
Redwood (*Sequoia sempervirens*)
White cedar (*Chamaecyparis*)

PLIOCENE
Avocado (*Persea*)
Elm (*Ulmus*)
Fir (*Abies*)
Hemlock (*Tsuga*)
Holly (*Ilex*)
Redwood (*Sequoia sempervirens*)
Spruce (*Picea*)

1. MacGinitie, H.D. 1937. The flora of the Weaverville beds of Trinity County, California, with descriptions of the plant-bearing beds. Carnegie Institution of Washington Publications 465(3):131.
2. Millar, C.I. 1996. Tertiary vegetation history. *In* Sierra Nevada ecosystem project: final report to Congress, volume II, assessments and scientific basis of management options. Center of Water and Wildland Resources. University of California, Davis.
3. Noss, R.F., ed. 2000. The redwood forest: history, ecology, and conservation of the coast redwoods. Island Press. Covelo, California. Chapter 2.
4. Wilken, D.H. 1993. California's changing climates and flora. Pages 59–88. *In* J.C. Hickman, ed. The Jepson manual. University of California Press.

the Klamath Mountains were similar but that they differed greatly from the Colorado needles. Such evidence indicates that this subalpine fir population is the result of a recent immigration.

ENDEMICS NEW AND OLD

Botanists use the term *endemic* for plants with restricted ranges. The two-flowered pea (*Lathyrus biflora*) exists only at the Lassics, a set of high peaks in the North Coast Ranges, and the Castle Crags harebell (*Campanula shetleri*) exists only on north-facing granodiorite cliffs in the Trinity Mountains. These are good examples of narrowly restricted endemics. Botanists use the term for different taxonomic levels and larger areas as well. The diverse and widespread genus *Penstemon* is endemic to North America; giant sequoia (*Sequoiadendron giganteum*) and valley oak (*Quercus lobata*) are endemic to California; Brewer spruce (*Picea breweriana*) is endemic to the Klamath Mountains.

California's flora is particularly high in the number of endemic taxa. The California Floristic Province (see map in *The Jepson Manual*) includes southwestern Oregon and parts of cismontane California (west of the Cascade–Sierra Nevada–Peninsular Range crest) and northwestern Baja California. James P. Smith, Professor of Botany at HSU, reports that the California Floristic Province has 3,092 endemic taxa excluding Baja California. Additionally, an area including just northwest California and southwest Oregon has 225. These numbers are very high in comparison to other areas of comparable size in temperate North America.

ANCIENT ENDEMICS

The late Ledyard Stebbins, Professor of Genetics at the University of California and one of the founders of CNPS, and the late Jack Major,

Brewer spruce (*Picea breweriana*) growing at Bear Basin Butte in the Siskiyou Mountains.

TABLE 2. A selection of neoendemics of the Klamath Mountains and adjacent North Coast (Smith and Sawyer, 2007). Some species are widespread in California, but their subspecies or varieties are endemic; some endemic species have several subspecies or varieties; some species are restricted to specific mountain ranges or special habitats.

I. Endemic forms of widespread species	
A. **Widespread in the region**	Berry's penstemon (*Penstemon newberryi* var. *berryi*)
	Great red Indian paintbrush (*Castilleja miniata* ssp. *elata*)
	Oregon bleeding heart (*Dicentra formosa* ssp. *oregana*)
B. **Scattered throughout the region**	Mendocino tarweed (*Hemizonia congesta* ssp. *calyculata*)
	Tracy's pea (*Lathyrus lanszwertii* var. *tracyi*)
	Tracy's tarweed (*Hemizonia congesta* ssp. *tracyi*)
C. **Restricted in the region or habitat**	
1. **Siskiyou Mountains**	Vollmer's lily (*Lilium pardalinum* ssp. *vollmeri*)
	Wiggin's lily (*Lilium pardalinum* ssp. *wigginsii*)
2. **Salmon Mountains**	Salmon Mountain wake robin (*Trillium ovatum* ssp. *oettingeri*)
3. **Scott Mountains**	Scott Mountain bedstraw (*Galium serpenticum* ssp. *scotticum*)
4. **Red Mountain in Mendocino County**	Red Mountain catchfly (*Silene campanulata* ssp. *campanulata*)
5. **Humboldt Bay Dunes**	Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekense*)
6. **Serpentine substrates of the northwestern Klamath Mountains**	Koehler's rock cress (*Arabis koehleri* var. *koehleri*)
	Stipitate rock cress (*Arabis koehleri* var. *stipitata*)
	Yellow-tubered toothwort (*Cardamine nuttallii* var. *gemmata*)
7. **Serpentine substrates of the southern Klamath Mountains**	Mount Tedoc brush-gilia (*Linanthus nuttallii* ssp. *howellii*)
8. **Coastal bluffs**	Whitney's farewell to spring (*Clarkia amoena* ssp. *whitneyi*)
9. **Serpentine substrates at Kneeland Prairie**	Kneeland pennycress (*Noccaea fendleri* ssp. *californica*)
II. Local forms of endemic species	
A. **Scattered throughout the region**	Pale-yellow stonecrop (*Sedum laxum* ssp. *flavidum*)
	Pale-yellow stonecrop (*Sedum laxum* ssp. *heckneri*)
	Pale-yellow stonecrop (*Sedum laxum* ssp. *laxum*)
B. **Restricted within region**	
1. **Scott Mountains**	Scott Mountain fawn lily (*Erythronium citrinum* var. *roderickii*)
2. **Trinity Mountains**	Trinity Mountains triteleia (*Triteleia crocea* var. *modesta*)
3. **Serpentine substrates in northwest Klamath Mountains**	Serpentine pink (*Silene serpentinicola*)
4. **Klamath and Trinity River canyons**	Howell's lewisia (*Lewisia cotyledon* var. *howellii*)
III. Species endemic to mountain ranges	
A. **Klamath Mountains**[1]	
1. **Marble, Scott, and Trinity mountains**	Copeland's speedwell (*Veronica copelandii*)
2. **Trinity Alps, Scott, Siskiyou, Trinity mountains**	Mount Eddy draba (*Draba carnosula*)
	Siskiyou fireweed (*Epilobium siskiyouense*)
	Siskiyou phacelia (*Placelia leonis*)
3. **Trinity Alps, Scott, and Trinity mountains**	Mount Eddy lupine (*Lupinus croceus*)
	Trinity phacelia (*Phacelia dalesiana*)
4. **Scott and Trinity mountains**	Klamath manzanita (*Arctostaphylos klamathensis*)
	Showy raillardella (*Raillardella pringlei*)
	Siskiyou buckwheat (*Eriogonum siskiyouense*)
5. **Trinity Alps**	Canyon Creek stonecrop (*Sedum paradisum*)
	Tracy's penstemon (*Penstemon tracyi*)
6. **Scott Mountains**	Nelson's sandwort (*Minuartia stolonifera*)
	Scott Valley phacelia (*Phacelia greenei*)
	Silky ivesia (*Ivesia pickeringii*)
7. **Trinity Mountains**	Serpentine haplopappus (*Ericameria ophitidis*)
	Thread-leaved penstemon (*Penstemon filiformis*)
	Trinity buckwheat (*Eriogonum alpinum*)

8. **Castle Crags**[2]	Castle Crags ivesia (*Ivesia longibracteata*)
	Castle Crags harebell (*Campanula shetleri*)
9. **Greenhorn Mountains**	Siskiyou mariposa lily (*Calochortus persistens*)
	Yreka phlox (*Phlox hirsuta*)
10.**Siskiyou Mountains**	Klamath Mountains buckwheat (*Eriogonum hirtellum*)
	Applegate's stonecrop (*Sedum oblanceolatum*)
B. North Coast Ranges	
1. **South Fork Mountain and North Yolly Bolly Mountains**	Elmer's lupine (*Lupinus elmeri*)
	Yolly Bolly Mountains trefoil (*Lotus yollabolliensis*)
2. **Lassics**[1]	Lassics lupine (*Lupinus constancei*)
	Lassics sandwort (*Minuartia decumbens*)
	Two-flowered pea (*Lathyrus biflorus*)
3. **Red Mountain in Mendocino County**[1]	Kellogg's buckwheat (*Eriogonum kelloggii*)
	Red Mountain stonecrop (*Sedum eastwoodiae*)
	McDonald's rock cress (*Arabis macdonaldiana*[3])
IV. Habitat endemics	
A. Serpentine substrates	
1. **Serpentines of the northwestern Klamath Mountains**	Del Norte willow (*Salix delnortensis*)
	Brook wake robin (*Pseudotrillium rivale*)
	Siskiyou inside-out flower (*Vancouveria chrysantha*)
2. **Serpentines of the southern Klamath Mountains**	Dubakella buckwheat (*Eriogonum libertini*)
	Stebbins' tarweed (*Harmonia stebbinsii*)
	Niles' tarweed (*Harmonia doris-nilesiae*)
B. Other substrates	
1. **Klamath River canyon**	Siskiyou mountain mint (*Monardella siskiyouensis*)
	Marble Mountains (*Silene marmorensis*)
2. **Sacramento River limestones**	Shasta ageratina (*Ageratina shastense*)
	Shasta snow-wreath (*Neviusia cliftonii*)
3. **Coastal bluffs**	Mendocino Coast paintbrush (*Castilleja mendocinensis*)
4. **Alkali seeps**	Howell's alkali grass (*Puccinellia howellii*)
5. **High elevation habitats**	
a. **Gravelly slopes**	Heller's lupine (*Lupinus lapidicola*)
	Stebbins' lewisia (*Lewisia stebbinsii*)
b. **Forest openings**	Tracy's lupine (*Lupinus tracyi*)
6. **Creek beds and disturbed areas**	Dimorphic snapdragon (*Antirrhinum subcordatum*)
7. **Recently disturbed forest sites**	Humboldt milk-vetch (*Astragalus agnicidus*)
	Tracy's sanicle (*Sanicula tracyi*)

1. Many mountain endemics, also serpentine substrate endemics
2. Also, granite substrate endemics
3. Also, grows in northwestern Klamath Mountains

Professor of Botany at the University of California, in their 1965 article, *Endemism in the California Flora*, recognized two classifications of plants: *paleoendemics,* plants that come from ancient stock, and *neoendemics,* plants that are recently evolved. Relicts represent a special subset of an area's paleoendemics, in that their occurrences are now highly limited. For example, Brewer spruce probably originated somewhere other than in northwest California, since fossils exist in the Miocene deposits in Oregon and Nevada 15 million years ago. Today it only grows naturally in the Klamath Mountains. Engelmann spruce (*Picea engelmannii*) and Sitka spruce (*Picea sitchensis*) are distant relatives of Brewer spruce. Both grow near Brewer spruce in the Klamath Mountains. Brewer spruce's closest relatives are two highly restricted species in the Mexican highlands. Sadler oak (*Quercus sadleriana*), only grows in the Klamath Mountains, and looks to distant Japan for its closest relatives. The closest relative of the limestone-loving snow-wreath (*Neviusia cliftonii*), found around Lake Shasta, lives in the southeastern United States. These plants fit the very special category of being both relicts and paleoendemics.

Paleoendemics are variously distributed in the rest of the California Floristic Province: redwood (*Sequoia sempervirens*), California bay (*Umbellularia californica*), California nutmeg (*Torreya californica*), California sycamore (*Platanus racemosa*),

Cobra lily (*Darlingtonia californica*) growing in the Scott Mountains.

Oregon ash (*Fraxinus latifolia*), storax (*Styrax redivivus*), and western burning bush (*Euonymus occidentalis*) are all paleoendemics of the province. Populations of Sierra bladdernut (*Staphylea bolanderi*), spicebush (*Calycanthus occidentalis*), and cobra lily (*Darlingtonia californica*), a plant most botanists associate solely with the Klamath Mountains, also grows in the Sierra Nevada. Western leatherwood (*Dirca occidentalis*) grows in the hills around San Francisco Bay; Sierra sweet-bay (*Myrica hartwegii*) occurs only in the central Sierra Nevada. Northwest California is not distinct in the California Floristic Province in having paleoendemics.

NEW ENDEMICS

While relicts and paleoendemics have a special place in the hearts of botanists, most of the endemic taxa from the California Floristic Province are, in fact, of recent origin at the species level. Botanists argue that relatives of newly evolved taxa often live nearby. As the range of a species expands, different populations come under distinctive selection pressures due to slight differences in their environments. Plants in these distinct populations may eventually establish detectable differences. Botanists then categorize these distinct entities by recognizing them as subspecies or varieties within the species. If the populations are sufficiently distinct, botanists may recognize them as new species. If the process has occurred recently, the taxa will have small ranges. The Klamath Mountains and adjacent North Coast have many closely related taxa because of this ongoing speciation process.

Serpentine pink (*Silene serpentinicola*), a recently described endemic from the Smith River watershed.

Geographic isolation and/or habitat isolation can be responsible for speciation. The following are examples of this phenomenon: Berry's penstemon (*Penstemon newberryi* var. *berryi*) and Oregon bleeding heart (*Dicentra formosa* ssp. *oregana*) are local versions of species that are widespread in the western mountains of California. Henderson's horkelia (*Horkelia hendersonii*), a member of a moderately large genus, grows only on granite talus slopes high in the Siskiyou Mountains. Geographic isolation is a likely explanation. Yellow-tubered toothwort (*Cardamine nuttallii* var. *gemmata*) grows only on serpentine substrates in the upper Smith River watershed. Other toothwort species grow on many substrates throughout the region's mountains. Shasta eupatorium (*Ageratina shastense*), a member of a widespread genus, exists on limestone in the Sacramento River watershed. Habitat isolation is the probable reason. Kneeland pennycress (*Noccaea fendleri* ssp. *californica*) thrives on only two local slices of serpentine in the North Coast, far from other serpentine outcrops and other *Noccaea* species. Geographic and habitat isolation are probable factors.

Another interesting example is the Del Norte race of lodgepole pine (*Pinus contorta*) that grows on serpentine substrates in the Siskiyou Mountains. Specimens do not key to any one of lodgepole pine's four subspecies. Mignonne Bivin and Jim Oliphant, who received their Masters degrees from HSU in 1986 and 1992, found the trees to be intermediate in both morphological and allozyme characteristics. Surprisingly, Del Norte specimens have more traits in common with the Rocky Mountain subspecies than they do with either the Sierra

Nevada subspecies or with the coastal subspecies. They hypothesized that Quaternary events over the last million years, the many glacial epochs—the last one, the Little Ice Age, ending just 150 years ago—alternating with periods of warmth, allowed long-isolated populations to mingle in the western Klamath Mountains. A future lodgepole pine taxon may be the result. These recently evolved taxa are most numerous on the region's serpentine outcrops. The chemical composition makes serpentine a very difficult substrate for plant growth. The nutrients needed for growth (nitrogen, phosphorus, and potassium) are in low supply and heavy metals (magnesium, iron, chromium, and nickel) are at high, or even toxic levels. Soils tend to be thin and dry quickly. Over time, some plant populations have evolved to take advantage of this habitat. The 70 endemics growing only on serpentine substrates in the Siskiyou Mountains outnumber endemics on any other serpentine outcrop in North America. The majority come from only a handful of families that have solved the evolutionary problems posed by these inhospitable substrates: mustard family (*Brassicaceae*), the genera *Arabis* and *Streptanthus*; buckwheat family (*Polygonaceae*), the genus *Eriogonum*; parsley family (*Apiaceae*), mostly in the genera *Lomatium* and *Perideridia*; and waterleaf family (*Hydrophyllaceae*), the genus *Phacelia*.

However, not all newly evolved plants in northwest California inhabit serpentine substrates. We find them on different substrates and in different habitats including alkali seeps, canyon walls, coastal bluffs, and seasonal dry creek beds (Table 2). Some are widespread in the region, and others occur in scattered localities. Both endemic species and subspecies are restricted to mountain ranges. Each serpentine outcrop has its own rarities. Some of these plants occupy granitic and sedimentary substrates; still others favor temporary environmental conditions following fires and logging. Most of the endemics in northwestern California are at the species, subspecies, or variety levels with their close relatives growing nearby. This ancient, environmentally diverse land is an area of active adaptive radiation at this time.

CONSERVATION IMPERATIVE

Northwest California's flora is a great treasure trove worthy of the focused attention and efforts of the members of the California Native Plant Society; we have a good chance of preserving it. The Klamath Mountains and much of the North Coast now comprise one of the largest intact forest habitats in the nation. Working with the California Wilderness Coalition, Save-the-Redwoods League, and other conservation organizations to keep the Klamath Mountains and adjacent North Coast wildlands roadless will go a long way in preserving the floristic diversity of these grand forests.

Other local conservation issues include saving the heritage of the area's coastal dunes, oak woodlands, prairies, salt marshes, and other more localized habitats through restoration, active monitoring, and continued care.

This beautiful wildland and its rich flora are unique and irreplaceable. I am confident that after even one visit you will be hooked, and that you will come back many times. Ancient and newly-evolved plants await your visit.

I wish to thank and acknowledge my colleagues and graduate students for their helping me to better understand the natural history northwest California.

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NEW CNPS FELLOW: HALLI MASON

by Jo Kitz and Steven L. Hartman

Writing, hiking, guiding, teaching, fundraising, organizing, plant-selling, weed-whacking, phoning, emailing, educating, and advocating, since 1987 Halli Mason's contributions have advanced the protection of natural areas, appreciation of native plants by the public, and the efficiency and financial fitness of the California Native Plant Society both locally and at the state level.

A member of Los Angeles/Santa Monica Mountains (LA/SMM) Chapter of CNPS, Mason's activism runs the gamut from the grassroots level—in her case weed roots level—to fund-raising and state offices.

Halli's childhood, in an idyllic town in northern Germany's Harz Mountains, provided a rich natural environment that stimulated her interest in flora. Her mother was a powerful influence. As Halli recalls, "When my mother was rested enough to deal with me, our pastime consisted of exploring beyond the boundaries of the little town, with my mother naming every green growing thing she saw. How did she know, I often wondered. But she was my authority. I accepted what she said. And she would test me on our next exploration to see what I had retained."

Halli and her friends, in turn, made a game of devising their own names for grasses and wildflowers, then checking their memories in this name game. After settling in Los Angeles, it didn't take long for Halli to develop an interest in California's native plants.

First tackling chapter plant sale responsibilities in 1987, Mason moved to the role of Corresponding Secretary to what was then the Executive Council in 1989. She has continued in that role for the chapter, answering countless email questions and requests from residents of this vast urban area. Mason has served as Chair of the chapter's Nominating Committee since 1991 and has been a tireless ongoing member of several state-wide committees: State Chapter Support, Fundraising, Membership, and the Fellows Committee, plus overseeing the timely preparation of the LA/SMM Chapter's Annual Report for the CNPS State Board.

Mason is highly effective at raising funds for native plant programs. Her primary commitment for more than ten years has been spearheading CNPS participation in Earth Share of California (ESC). (Earth Share, representing mostly environmental not-for-profit groups, such as CNPS, conducts workplace-giving campaigns.) As Earth Share liaison for CNPS for the past decade, she attended meetings and volunteered countless hours making Earth Share presentations to potential donors. ESC member groups are required to give presentations to employees at their job sites to explain ESC and to promote the mission and goals of CNPS. Mason shouldered this responsibility, delivering Los Angeles-area presentations herself. Further, she arranged for other CNPS members in the San Diego and Sacramento areas to handle presentations there, a feat of phone and time juggling. At the height of the ESC campaigns, under her leadership, there were two to three CNPS presentations per week. This daunting effort paid off, with over ten thousand dollars per year coming to CNPS through the generosity of individual employees at participating companies. Beyond presentations at ESC-affiliated companies, Mason worked to secure several new participating companies, ensuring that CNPS received a percentage of that company's undesignated donations.

Halli Mason in Caballero Canyon in the Santa Monica Mountains. Halli became a CNPS Fellow in 2005. Photograph by M. Mason.

Mason was the key CNPS player in the recent Aveda promotion of CNPS, again donating countless hours to the cause. Aveda, an international personal care products corporation, uses native plants grown specifically for use in their beauty products. Aveda invited CNPS to partner with them for their Earth Month campaign in Southern California. The first year's success led to an invitation for a second year. Mason co-conducted the campaign for the first year; the second year Mason was on her own, devoting an incredible amount of computer, phone, and personal appearance time to schedule many presentations by numerous CNPS volunteers to talk to Aveda's professional salon staff and also to give visual and verbal presentations at their Aveda regional meetings.

Many visual props and promotional materials were developed expressly for the Aveda campaign. Under Mason's direction, CNPS publications showing off California's beauty were shipped to Aveda sa-

lons and spas for their personnel to share with their clientele. These included "Wildflowers of California," "The Best Spring Ever," and "Flowering Plants of the Santa Monica Mountains." Her efforts generated over $100,000 for CNPS during this two-year collaboration.

A major interest of Mason's is public outreach. She passionately believes that a strong visual component of any education or outreach program is paramount to winning public support. Mason comments, "When doing presentations, be it in an elementary school classroom, the boardroom of a corporation, a luncheon gathering for a regional meeting, or talking to employees with many different backgrounds, graphic props are essential. Audiences respond to beautiful pictures. Showing the diversity of California's topography from the desert to the sea, showing the many different landscapes California has to offer, showing off the uniqueness of the Golden State, it is absolutely essential to have those 'props.' You are essentially acquainting groups of people with the concept of California native plants and the importance of their preservation and protection in their habitat."

She creates visual montages that both display the work of CNPS and teach the public about the beauty and function of native plants in the wild and in the garden. Mason has pitched in for native plants wherever CNPS has been invited to make a presentation, be it convention center, zoo, environmental education fair, college, or Earth Day event.

A teacher in the field, Mason was there when, for four weeks, a crew from the Camarillo-based California Conservation Corps (CCC) battled milk thistle (*Silybum marianum*) in Point Mugu State Park. In exchange for CCC's *pro bono* work, CNPS agreed to provide an element of environmental education for the crew. Halli is an excellent teacher, and presented lessons on the parts of a plant, their functions, and their importance in the chain of life. The CCC crews were fascinated—as much by the presenter as the subject matter.

Mason takes an active role in reclaiming natural sites from invasive species. For more than fifteen years, she has been involved in weed-whacking in the Santa Monica Mountains. The first weed wars were started in the area at the request of Superintendent Bud Getty, to remove milk thistle in Big Sycamore Canyon of Point Mugu. Mason, armed with a weed whip, chopped the six-foot stalks to the ground. This was the training ground for the later assault on the milk thistle of Solstice Canyon, where pet goats had destroyed most of the native vegetation.

Mason went on to destroying weeds in Caballero Canyon. She makes weekly treks into the canyon to monitor and, of course, weed. She has recruited dedicated friends who help with trail maintenance. Working at the advocacy level, Mason secured a grant in 2004 from the California Wildlands Grassroots Fund of the Tides Foundation for removal of invasive weeds in Caballero Canyon.

An avid hiker, Mason has led the Thursday morning "Chaparral Chatter Hike" through the Cold Creek Preserve Loop in Calabasas. She has guided these hikes, now offered in Caballero Canyon, almost every month for the past ten years.

Mason leads the Easter weekend walks at Malibu Bluffs Park, showing visitors fifty-plus species of wildflowers in the park. She is one of several leaders from the LA/SMM Chapter who lead monthly walks in the park for the public, which the chapter initiated in June 2003 as a way to increase public awareness of this incredible site.

Since 1987, Mason has chaired or co-chaired the annual two-day plant sale, volunteering for that important role shortly after joining the chapter. She organizes volunteers, arranges for participation by

Halli Mason in Caballero Canyon in the Santa Monica Mountains, site of one of the Los Angeles/Santa Monica Mountains Chapter's ongoing weed eradication projects. Photograph by F. Cookler.

environmental groups to provide educational booths, invites vendors, deals with publicity, coordinates the selection and delivery of plants, and of course helps with set-up, operates the cash register, and helps with cleanup. Mason always assembles a strong crew for the big plant sale event, supervises a fast set up, and a smoothly-run, successful event.

Mason has contributed ten articles to the *Toyon*, the chapter's monthly newsletter. These articles cover subjects from "Making Your Yard Less Toxic" to "Prescribed Fire in Southern California," several pieces on wildflowers, and wrap-ups of the chapter's annual plant sale.

For over twenty years, Halli Mason has brought expertise and enthusiasm to every aspect of her work for the benefit of her chapter and of native plants of California. As her chapter colleague, Steven L. Hartman, stated, "Words aren't enough to describe Halli's importance to CNPS!"

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THE RESTORATION OF GUADALUPE ISLAND, REVISITED

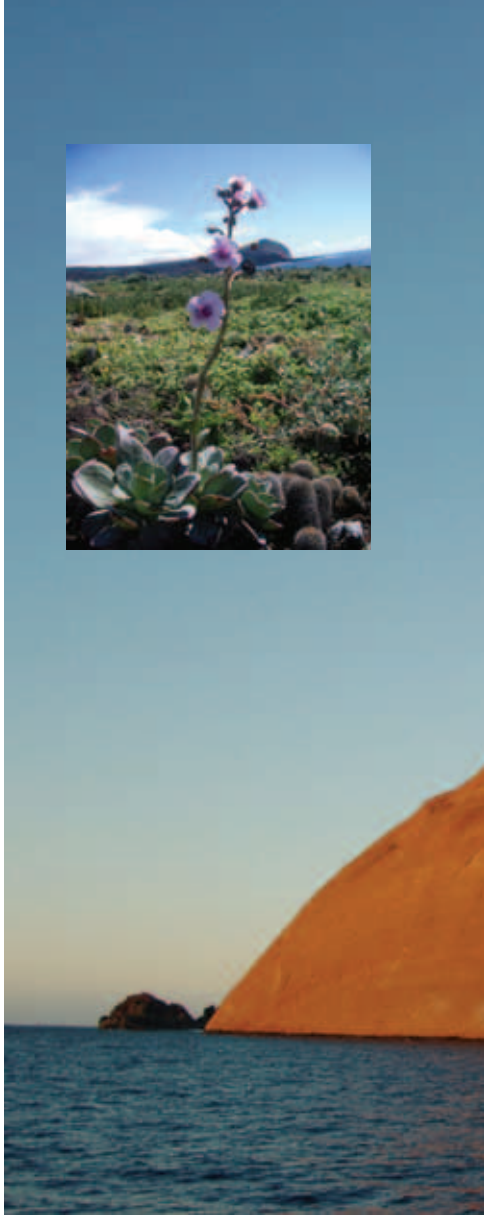
by Luciana Luna Mendoza, Alfonso Aguirre, Bradford Keitt, Steve Junak, and Bill Henry

Guadalupe is a large (26,000 ha) oceanic island off the Pacific Coast of Baja California, Mexico. It is home to over 200 native plant species of which 34 are endemics, found nowhere else on Earth. Guadalupe's floral affinities are greater to Southern California and the Channel Islands than to other Mexican islands, making the island an important remnant of the highly threatened Southern California coastal flora. However, goats were introduced to the island over 100 years ago by sealers, likely to provide an alternative food source for their long sea voyages and while hunting seals on the island. The devastation of the Guadalupe ecosystem by the goats is a familiar event played out on thousands of islands worldwide, where damaging non-native mammals wreak havoc on islands with native species that have lost their defenses to predation and herbivory. Fortunately, damaging invasive mammals can be removed from islands, and islands can recover. Mexico is a world leader in island restoration and the Grupo de Ecología y Conservación de Islas (GECI) together with its partners[1] has removed damaging invasive mammals from 28 islands in northwestern Mexico. Guadalupe Island is the largest and most important project undertaken in Mexico to date.

In order to develop support for the removal of goats from Guadalupe and learn what to expect from the plants in their absence, 12 fenced exclosures were built across the island to keep goats out of sensitive areas. The dramatic events inside those exclosures are more fully discussed in an earlier article in *Fremontia*, by Keitt et al. (2005). In 2004 the eradication of the goats was begun and it is believed the last of the goats were removed in early 2007. GECI will continue to monitor the island for several years to make certain that no goats remain.

With the goats gone, the island continues its dramatic recovery, but, no longer restrained within the fenced exclosures, recovery is occurring across the island. Once again young pines, cypresses, oaks, and palms are sprouting, promising to restore the forests to the grandeur described by the first botanical visitors to the island. Beneath these trees and out in the barren exposed rock, numerous species are thriving, stopping the inexorable erosion of years past, creating soil where there was once only rock and initiating the cycle of recovery that will enable the plants and the native birds and insects that rely on them to persist. In these photos, and their captions, we attempt to share some of the spectacular recovery of Guadalupe Island. To learn more about Guadalupe Island we recommend the following reading: Moran 1996, Moran 1998, Keitt et al. 2005, Jehl and Everett 1985. To learn more about the Grupo de Ecología y Conservación de Islas and Island Conservation please refer to the sidebar for contact information and website address.

[1] Island Conservation, Santa Barbara Botanic Garden, The Nature Conservancy, Conservation International, Secretaria Marina, Centro de Investigación Científica y de Educación Superior de Ensenada, Universidad Autónoma de Baja California, Seacology.



ABOVE: Toro Islet, also known as Adentro or Inner Islet. This massive rock lies just off the south end of the main island and its sheer cliffs make it accessible only by helicopter. • INSET, UPPER LEFT: *Cistanthe guadalupensis* on Afuera Islet; named the "pride of Gudalupe" by Reid Moran, this species was thought restricted to the offshore islets, though we recently encountered a specimen on the south end of the main island adjacent to the offshore islets. INSET, UPPER RIGHT: North ridge Guadalupe Island. A Conservacion de Islas biologist hikes up the steep north ridge underneath the island oaks (*Quercus tomentella*) and pines that thrive in these frequently wind blown and cloud draped cliffs. Only about 250 pine trees and 50 oaks remained on the island. All three top photographs by B. Henry. • BOTTOM ROW, LEFT TO RIGHT: *Mimulus latifolius.* Rarely reported by Moran and other botanists, we encountered a small population of this beautiful plant in flower inside the cypress forest in 2004. • Reid Moran encountered *Senecio palmeri* only a few times during his 40 years of visiting Guadalupe, yet the earliest botanical visitors described this "white sage" as incredibly abundant. We found a small population thriving on an inaccessible cliff. • *Senecio palmeri* in the cypress forest. Now that the goats are gone, thousands of these plants have sprouted across the north end of the island. • Island snapdragon (*Galvezia speciosa*), previously confined to cliff faces on the main island and the offshore islets, is now spreading to flat areas on the main island. Its stems can be brittle and were easily broken by goats. All photographs by GECI staff unless otherwise noted.

THIS PAGE, TOP: The endemic Guadalupe Island fan palm (*Brahea edulis*) is a popular landscaping tree in Southern California. Adult trees are still fairly common on the island although seedlings like the one pictured in the foreground were extremely rare until the goats were removed. • RIGHT: Fenced exclosures were built to see how plants would respond in the absence of goats. The answer: rapidly. In the six years since the fences were built we have counted more than 9,000 pine seedlings, such as those pictured here. Now that goats have been removed, pine seedlings are beginning to appear outside the fences. • OPPOSITE PAGE, TOP: Cypress seedling. It was odd to walk in the cypress forest on Guadalupe Island and see only large trees and the skeletons of dead trees that have fallen, it was a forest in decline with no regeneration. However, in the last three years we have seen an estimated 50,000 cypress seedlings with some reaching 20 feet in height. • BOTTOM: *Senecio palmeri*. • RIGHT: The endemic *Deinandra frutescens* (a perennial tarweed), once confined to steep cliffs, is starting to colonize flats on the island, often in association with the rare San Clemente Island hazardia (*Hazardia cana*) and *Phacelia phyllomanica* (a perennial phacelia that is endemic to Guadalupe Island).

YOU CAN HELP

Grupo de Ecología y Conservación de Islas (GECI, Mexico) and Island Conservation (IC, USA) are non-governmental organizations working together to restore Guadalupe Island by removing feral goats. Together GECI and IC, in partnership with the Mexican Government, Mexican Navy, and local fishing cooperatives, have removed damaging invasive mammals from 28 islands in northwestern Mexico, helping to protect 30 taxa of seabirds, 48 endemic taxa of terrestrial mammals, and 29 taxa of endemic plants from the threat of extinction. You can learn more about GECI and IC at *www.islandconservation.org*. IC is a US 501(c)3 not-for-profit and you can make tax deductible contributions to the Guadalupe Island project or other worthy projects by contacting Brad Keitt or visiting the website listed above. In Mexico you can contact Alfonso Aguirre at *alfonso.aguirre@conservaciondeislas.org*.

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Burned forest on Middle Peak, Cuyamaca Mountains. All photographs by the author unless otherwise specified.

LOSS OF 500-YEAR-OLD SUGAR PINES DURING OCTOBER 2003 FIRE STORMS

by Thomas Oberbauer

Sugar pine, *Pinus lambertiana,* is known for extreme size: It is the largest growing member of the pine genus, and supports one of the largest cones of any pine. The cones up to a foot-and-a-half (45 cm) long, dangling from the branch tips are familiar to anyone who has visited Yosemite or Sequoia National Parks. I recall a park ranger stating that unopened cones heavy with sap have been known to shatter car windshields. This five-needle member of the white pine group has relatives in Asia and a long fossil history (Critchfield, 1986). But when I first studied this tree in college, at San Diego State University, I had never seen one in San Diego County.

That changed quickly, as my project was to draw a detailed map of the species' distribution, use an increment borer to measure age, create growth charts, and measure the height of the trees by triangulation. In San Diego County, Griffin and Critchfield (1976) generally mapped a population on the Cuyamaca Mountains in central San Diego County, including Cuyamaca Peak, Middle Peak, and some near Japacha Peak, as well as Hot Springs Mountain above Warner Springs in the northeastern portion of the county. Their maps were the basis for my

explorations. The Cuyamaca and Hot Springs Mountains contain the highest peaks in San Diego County and are over 6,500 feet (1,964 m) in elevation.

A fire road traverses Middle Peak, and after a climb of several hundred feet in elevation, I encountered the first sugar pines of a few dozen years in age. Further up, enormous pines grew that were greater than six feet (182 cm) in diameter and 150 feet (45 meters) tall. In an effort to determine the lower limit of sugar pines, I walked down the north slope of Middle Peak encountering more enormous sugar pines. What is more important, I found a stump of a tree that was five and a half feet in diameter, approaching the size of the six-foot trees. I carefully counted 475 growth rings. These huge trees grew on the southern fringes of the species' range, within sight of the desert in an area that receives between 30 and 40 inches (760 and 1,000 mm) of rainfall. The six-foot trees had been growing at the time that Juan Cabrillo landed in San Diego Bay in 1542. Of course, compared to the giant sequoias in the Sierra Nevada, they were not of such great significance, but these grew in San Diego County mountains far from their traditional forest strongholds. It was truly remarkable that such old trees flourished in the southern reaches of their range.

RECORD HOLDERS

Even larger sugar pines were described in old newpaper accounts for Cuyamaca Peak in the first half of the 1900s. There, some were estimated at 180 feet (54 m) tall prior to the Conejos fire in 1950 when flames were visible from San Diego, 40 miles (66 km) away. The Boulder Creek fire in September of 1970 burned part of that area again, further reducing the population of sugar pines.

The record age for sugar pines, without much supporting documentation, has been described in the gymnosperm database as 760 or 800 years by John Muir in his *Mountains of California* and by Carder (1995). The largest tree currently growing is ten feet (352 cm) in diameter near the general store in Dorrington, California, and the tallest, at nearly 250 feet (81 m), is near Hogden Meadow in Yosemite National Park.

BAJA PINES

Sugar pines in the southern limit of the range, in the Sierra de San Pedro Martir of northwestern Baja California, are quite a bit smaller, generally less than 100 feet (30 m) in height and half the diameter of the big trees in San Diego County, and the cones are roughly half the length of those from the more northern trees. There they grow in a climate with an estimated 28-30 inches (710-760mm) of rainfall at most, high on the rocky ridges up to nearly 10,000 feet (3,000 m). It has been suggested by the gymnosperm database that some of them could be of great age because the rocky peaks protect them from fire.

DENSITY PROBLEM

Over the years, I have lead groups of the California Native Plant Society San Diego Chapter, and other interested parties, on hikes up to see the big trees on Middle Peak as the forest grew more dense. Shade-

Lake Arrowhead sugar pine section. In the photographs, please note that the author is six-feet-eight-inches tall.

Surviving 500-year-old sugar pine on Cuyamaca Peak.

tolerant incense-cedar (*Calocedrus decurrens*) and white fir (*Abies concolor*) were encroaching in the under-story openings. In some locations, young sugar pines were able to grow in the mix. Because of this increasing density there also were proposals by Cuyamaca Rancho State Park (Cuyamaca Rancho State Park, 1983) to conduct controlled burns in the State Park. Though attempts were made that encountered local resistance, lawsuits, and funding issues, some of the first of these were initiated during the summer of 2003 on the East Mesa portion of the park by the State Park in cooperation with California Department of Forestry staff. The concern about overly dense forests is that they are unnaturally vulnerable to fires. During fire events, small dense trees become burning fuel that carries flames into the upper portions of mature trees resulting in mature tree-killing crown fires rather than low-burning ground fires.

RAIN PROBLEM

For six years, from 1998 to fall 2004, rainfall was far below normal in the mountainous regions of Southern California, especially the San Bernardino, San Jacinto and San Diego County mountains. Cuyamaca Lake receives on average—over a record of more than 110 years—36 inches (910 mm) of precipitation at its 4,600 foot (1,390 m) elevation. During this period there was a cumulative deficit of 90 to 100 inches (2,200 to 2,540 mm) of precipitation that created a critical level of stress for the trees. (The 2001-2002 season was the driest, with only 10.8 inches (274 mm) including a 1.5 inch (38 mm) thunder-storm.) Two factors, this drought stress and overly dense forest growth, caused a major loss of trees with many of the young and a few of the moderately aged trees dying.

FIRE PROBLEM

In the summer of 2002, a fire, started by a National Guard helicopter clipping a power line, burned 60,000 acres (24,000 hectares) in a strip up and down the east side of the San Diego County mountains, including forests on Volcan Mountain. One of the major concerns was that the fire might burn the Cuyamaca Mountains, with their standing dead trees, but the fire was stopped before that happened. With the rainfall level of the 2002-2003 season closer to average, though still below, there was hope by fire agencies and local conservationists that the worst had passed even though a large number of dead trees remained in the forests.

FIRE OCTOBER 2003

The third week of October 2003 began with predictions that a hot Santa Ana wind condition would begin by the weekend. There were terms such as “the hottest days of the year” and “red flag alert” bantered about in the media. Comments were made at the end of the day on Friday that we would all see one another on Monday if the county does not burn down over the weekend.

October 25, Saturday

Saturday dawned foggy and moist along the coast, and when it was still foggy on Saturday night, I checked the weather report on the local page of the National Weather Service. I hoped that the weather service might be over-predicting a Santa Ana wind as they often over-predict rain in winter. One line in the weather report, however, caught my attention. It stated, "A small fire has been observed near Cuyamaca."

October 26, Sunday

The next morning, Sunday, October 26, 2003, there was a heavy haze in the sky. Ash was falling. At first, it seemed this could be ash from several blazes already burning in the San Bernardino National Forest. However, a quick check on the news indicated a fire was racing through central San Diego County carried by 50-60 mph winds and humidity below nine percent. At my home in Point Loma, wind was gentle from the east, but it was very dry, very warm, and especially, very smoky.

TECATE CYPRESS

Another fire that had just broken out on Otay Mountain on Sunday morning was also visible. Otay Mountain is home to the world's largest stand of Tecate cypress (*Cupressus forbesii*). Tecate cypress needs fire to heat its cones and open them to release seeds, but the trees need to be 30 to 50 years old before they are large enough to produce enough cones for reproduction. Much of Otay Mountain burned twice already since 1977 with the last time only seven years ago. These trees were too young to benefit from fire. Rather, another fire could cause the elimination of the cypress on portions of the mountain. The entire mountain burned in a matter of a few hours. It consumed roughly two-thirds of the Tecate cypress on the mountain.

October 26, later in the evening

The larger fire burned more than 10,000 acres an hour at its peak, spreading toward my mother's home in eastern San Diego County. It burned community after community on its way: Wildcat Canyon, Harbison Canyon, Crest, as well as a number of suburbs of San Diego, Poway, and El Cajon. After my mother was warned by the sheriff to evacuate the home of my childhood, I made an apocalyptic-like late evening drive toward the creeping line of flames to evacuate my mother to stay with my family in Point Loma.

SUGAR PINES BURN

October 28, Tuesday

The fire continued and a day later, a quick shot from one of the news helicopters showed a line of smoke creeping up a familiar mountain range from the west: the Cuyamacas. That day, Tuesday the 28th, the wind shifted back westward from the coast, which pushed the fire faster to Middle Peak. The evening newscast showed footage of Middle Peak consumed in a raging, towering firestorm. The distinct twisted-branch outlines of the sugar pines were visible protruding above the forest canopy in front of a creeping wall of swirling flames reaching hundreds of feet in the air. It was a vision of Dante's inferno combined

clockwise from top right: **Ancient sugar pine in 1985 on Middle Peak, Cuyamaca Mountains (inset). • The same sugar pine in 2004, after the catastrophic fires of 2003. • Burned 1,000-year-old sugar pine. • Base of an ancient sugar pine near Lake Arrowhead.**

Post-fire base of 1,000-year-old sugar pine, November 2003.

with the surface of the sun. The ramifications of the devastation from this forest fire were very clear.

October 29, Wednesday

By the next day, the fire had already moved toward Pine Hills and Pine Valley to the north and east of the Cuyamaca Mountains. County field crews reported that no greenery of any kind remained in the area around Cuyamaca Lake and very few structures remained in Cuyamaca village as well. That meant the 500-year-old trees were gone, along with hundreds of homes.

The Cedar fire, named for the Cedar Creek location where it started, had turned into the largest California fire in over a century (280,000 acres) and took the lives of 14 people including a Northern California fire fighter.

EXPLODED TREE

Six weeks later, I had the opportunity to travel with State Park personnel to view Middle Peak, Cuyamaca Peak, West Mesa, and East Mesa within Cuyamaca Rancho State Park. We slowly drove the old fire road up Middle Peak, which had supported, at a minimum, several dozen trees of great age. We stopped at some of the old familiar trees and confirmed that they were indeed killed by the fire. We then walked to a small cluster of old growth trees. Near the center was a tree of awesome size that had also been killed by the fire. It appeared to have exploded. All that remained was a fire-hollowed 25 foot high base that brought to mind one of the sequoias that one could drive a car through. The 100-foot top por-

1,000-year-old tree before the fires. Photograph by G. Reece.

tion of this tree had been blown off and lay in pieces up the slope. Brett Goforth, a student at University of California, Riverside, had studied and photographed the tree before the fire and measured it at 107 inches in diameter. Based on my old growth charts for sugar pines, in which the number of rings per inch of diameter increases as the trees age, this tree would have been approaching 1,000 years old. It may have been the oldest sugar pine in existence and was only 14 inches smaller than the largest surviving sugar pine on record.

Correlation of diameter at breast height (DBH) measured in inches and age measured in years for sugar pines in San Diego County.

REMAINING TREES

Later we traveled up the fire lookout road to the top of Cuyamaca Peak. For some reason, possibly a small wind change due to topographic position, some of the forest on the east side of Cuyamaca peak was not killed by the fire. There, at least one old growth sugar pine remained. At 74 inches in diameter, it must be well over 500 years old. Its lower trunk was slightly scorched and a small sugar pine sapling near its base was killed by the fire, but now it and its immediate surrounding represent the remaining old growth forest in the Cuyamaca Mountains. That same day, we also observed where the recently conducted controlled burns contributed to stopping the spread of the fire.

Unfortunately, these trees are not the only old growth trees in San Diego County to succumb to the drought and excessively high tree density. On Palomar Mountain, white fir, four-and-a-half feet in diameter, have been killed outright by the drought, though one old incense-cedar, 7.1 feet in diameter, still survives as a grizzled old monarch. It is noteworthy that this tree is certainly older than the 542 years listed as the oldest recorded incense-cedar in the Forest Service's *Silvics Manual*. In the San Bernardino Mountains, near Lake Arrowhead, the drought-caused loss of conifers has been extreme. More than 60% to 70% of the trees have been killed, including one very large sugar pine. This sugar pine was more than six feet in diameter with a wider base. In August 2004, sections of its trunk remained. I counted 562 annual growth rings.

SITUATION IN 2007

I have revisited the peaks more than once since the fire, recently hiking up the familiar road on Middle Peak and up to the top of Cuyamaca Peak. Around the edges of Middle Peak, new growth is visible. Here and there California black oak (*Quercus kelloggii*), and canyon live oak (*Quercus chrysolepis*), have resprouted from their bases. However, in the center of the former forest, conifer seedlings including sugar pines appear to be totally absent and are replaced by thickets of chaparral consisting of Palmer's ceanothus (*Ceanothus palmeri*). The bark has begun peeling away from the dead trees, hanging loose, with white wood exposed like bleached bones. The sweet scent of sugar pine wood carries through the air. The old sugar pines still stand in death but intact for now and the hollow shell of the nine-foot tree serves as a reminder of this former glory.

On a positive note, a very small grove of sugar pines was recently found by Brett Goforth on Palomar Mountain.

On Cuyamaca Peak, the one large remaining tree and several other sugar pines greater than four feet in diameter seem to be surviving now even with the continued drought. Following the wet season of 2005, cones have formed on the ends of branches for the first time in a number of years. The California State Park staff has indicated that there will likely be a need to reestablish some nodes of conifers in their former growth areas. The State Park personnel have also worked on creating a more aggressive controlled burn program as well as a program for thinning some of the trees in Palomar Mountain State Park. In an era of drought and potential climate change, aggressive action will be necessary to provide for the survival of old growth conifers in Southern California.

In October 2007, once again major fires raged in San Diego County mountains. Fortunately, few of the forested areas were heavily affected. However, a previously unknown six-foot-plus DBH incense cedar (*Calocedrus decurrens*) on Palomar Mountain was extensively damaged by the fire and had to be cut down for safety purposes.

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IN MEMORIAM: NATALIE HOPKINS

Natalie Hopkins passed away on April 15 after a brief illness. She was 87. I met her in the early 1970s when she was the second president of the Santa Clara Valley Chapter and I was a new member. She was the person who got me active in CNPS, when she asked me to be Vice-President with the understanding that VP was a training position for President. She actually came to my workplace (at that time, Yerba Buena Nursery) to broach the subject. I was so flattered that this handsome woman whom I admired had gone out of her way to ask me, that it never occurred to me to decline. Such is the value of personal contact when recruiting new people to take on CNPS roles!

Natalie was born in Wellesley, Massachusetts, one of four sisters. Her mother was a homemaker and her father was engaged in education and social work. She graduated from Oberlin College in 1940 with a BA degree in English Literature. Later that year she married Mark Hopkins, and after several wartime relocations they raised their son and daughter in San Jose, near her husband's family home. Natalie was active as a social work volunteer and served on the boards of a nonprofit orphanage and other youth service organizations. Family vacations included several weeks each summer in the northern Sierra Nevada, where Natalie developed a deep love of the natural world and its plant life in particular.

Natalie Hopkins in the Galápagos Islands last year with her son Tom and a Galápagos tortoise. Photograph by D.C. Powell.

After her children were grown, she entered the Bachelors program in botany at San Jose State University and then the Masters program in biology. She had an inquiring mind and was an early fan of Lynn Margulis' ideas on microbial biology, including symbiogenesis—the merging of organisms into new collectives as a major source of evolutionary change on earth. Her thesis on the endomycorrhizae of *Plantago erecta*, a native plantain of serpentine grasslands and the principal host of the threatened Bay Checkerspot Butterfly (*Euphydryas editha* ssp. *bayensis*), was published in the *Canadian Journal of Botany*.

During the time of her Masters studies, the internet was in its early stages. Natalie foresaw the importance of online access to botanical resources, so when she completed her graduate work she stayed on to digitally catalogue the 15,000 sheets of specimens in the Carl Sharsmith Herbarium. Dr. Sharsmith had been her mentor and after his death she was named curator of the herbarium at San Jose State. She was also a major volunteer in the project to publish the first edition of *The Jepson Manual* and was its newsletter editor in 1987 and 1988. On her retirement she moved to Pacific Grove, where she was active at Point Lobos as a docent (even after a total knee replacement) and worked to curate the herbarium there.

She was plucky and forward-thinking beneath a native New England reserve. She saw what she needed to do, researched it, went about it quietly, and never spoke about herself. She was a violinist who loved orchestral and chamber music. Her long-time friend and fellow botanist Sally Casey taught music for years, but Natalie never mentioned to her music-teacher friend that she herself was a musician. That's the kind of person Natalie was. She was a woman who had a gracious ability to implement talent and conviction within an understated exterior.

An endowed scholarship is being established in her honor for rare plant research by women. Further information is available from her daughter-in-law, Julie Anne Hopkins, 585 High Street, Santa Cruz, CA 95060, or from the author.

Suzanne Schettler, P.O. Box 277, Ben Lomond, CA 95005. greening@cruzio.com

BOOK REVIEWS

Northwest California: A Natural History. John O. Sawyer. University of California Press. 2006. 264 Pages, 73 illustrations. $75.00 hardcover.

That the ecology of the northwest corner of the state of California is inordinately complex is widely known to CNPS members.

You have to be a long-time resident in order to even begin to piece this complexity together. Author John Sawyer fits the bill. His insights are further sharpened by being the "go-to-guy" among the Humboldt State University natural sciences faculty. Now

those insights are captured in book form by the University of California Press. I doubt if there is anyone else who could have written this book with such vision.

Noting that natural history books are always overflowing with facts, Sawyer points out that ". . . the real natural history of northwest California is in the field, bring this book along on a visit, and get to know the region firsthand."

In your own outdoor ramblings, how many times have you asked yourself, "Why does this area look the way it does?" And, how many years of revisits has it taken you to satisfactorily answer that question? In Sawyer's case it has been forty years or more, and you are the beneficiary. The book runs the gamut from natural history to human history and interactions between the two.

It starts with a landscape point-of-view, laying the groundwork for the ecological point-of-view. He describes the regions and the sub-regions from a geologic and topographic perspective, setting the scene for the climatic and soil parent-material perspective, which, of course, sets the scene for the vegetation, which in turn sets the scene for the animal communities.

His chapter called "Agents of Change" provides historical insights into natural as well as human impacts at various locations. These insights help you answer the above question of why an area looks the way it does by recounting the sequence of historical events.

Starting on page 116 is an articulate discussion of the process of *stand dynamics*. If you have already participated in basic ecology classes, you will find this an interesting and easy-to-follow alternative discussion on the concept of *plant succession*. You will find his perspective interesting and probably, from time to time, nod your head up and down in agreement.

The combination of photographs and the chapter "Looking for Patterns in Vegetation" do a good job of describing the ecological variety of the region. Starting at the broadest level, we learn of the forests with closed canopies growing on well-developed soils and having high colonizing abilities and wide ecological tolerances. By contrast there are localized areas with specialized environmental conditions that are so much a part of the region's diversity.

Drawing on parallel descriptions of the Sierra Nevada, Sawyer takes us through elevation belts from low elevation to subalpine and through western to eastern portions of the Klamath and Siskiyou mountains including places like the Trinity Alps, Marble Mountains, and the watersheds of the major rivers such as the Smith, Klamath, and Trinity rivers.

Although in varying degrees of condition, he says that, "A great biological treasure trove still exists in northwest California, even after nearly two centuries of mining, logging, grazing, changes in fire regimes, and dam building. Many aspects are not greatly different from those at the time of [early explorer] Jedehiah Smith. Nearly all of the plant and animal species remain, as do the original patterns. Those that have been degraded can be restored. We can save not only fragments of natural tapestries but make them complete again."

For those who want further detail on specific points, there is an extensive list of selected further reading.

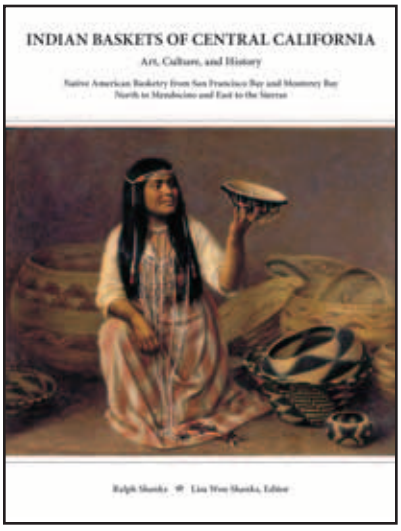
Norden H. (Dan) Cheatham
East Bay Chapter

Indian Baskets of Central California: Art, Culture, and History. Native American Basketry from San Francisco and Monterey Bay North to Mendocino and East to the Sierras. Ralph Shanks and Lisa Woo Shanks. Novato, Costano Books in association with Miwok Archaeological Preserve of Marin (MAPOM publication no. 8), distributed by University of Washington Press. 2006. 176 pages. Lavishly illustrated. $45.00 hardcover.

Basketry is more than an art form or survival technique. It is a way of life that the Indians of California lived to the fullest in ancient times and continue to live today. Baskets traditionally were an integral part of daily life, from cradle to grave. They were and are made with exacting attention to detail, exceptional mastery of technique, and exquisite design. Though perishable, California baskets express on multiple levels an imperishable reverence for the natural world and they manifest deep knowledge of natural processes. Merely assembling the materials, California native plants reflecting the regions where the baskets were made, required a long history of tending the land, and continuous collecting, curating, and preparing, for which understanding of natural history and attention to seasons, rainfall, animal-plant interactions, and plant productivity were fundamental and indispensable prerequisites.

California basketry, certainly the pinnacle of achievements in native Californian material culture, is arguably the world's most magnificent. This book does full justice to this tradition. Based on more than 30 years of basketry research, Ralph and Lisa are eminently qualified to provide the comprehensive treatment lovers of California basketry have been longing for. Beginning with the collection at the University of California, Berkeley, they traveled the world to record baskets that had been dispersed around the globe since the early days of European conquest. Ohlone baskets are a case in point. Very few survived the early and rapid destruction of indigenous culture in the San Francisco Bay Area, and those that did survive ended up all over the map: the Smithsonian Institution in Washington, D.C., the Peabody Museum at Harvard, the American Museum of Natural History in New York, the British Museum, la Musée de l'Homme in Paris, and several collections around California. Ralph and Lisa pursued them.

Most residents of the Bay Area



today have never seen a basket made by people who lived by the bay before European contact. The photos and descriptions provided by the authors reveal Ohlone baskets, sometimes intensely decorated with *Olivella* shell beads and woodpecker feathers, to be distinctive and stunningly beautiful. Especially striking are "walaheen" winnowers in which visual designs (diamonds, contrasting bands) are made not with the usual overlay, but by changes in twining techniques, all in a single color. According to the authors, "Three different design techniques can sometimes be found in an area as small as two square inches…This density of pattern and technical variation…is unparalleled in all of North America…" and "In terms of design complexity, creative technical features and design techniques, the U-shaped…walaheen winnower is perhaps the most amazing basket in California…" and "one of the most subtle artistic creations ever made." It is encouraging to learn that contemporary Ohlone weavers have revived the art of walaheens.

Ralph Shanks writes in a compact, precise, economical style in which not a word is wasted and energy is stored up for moving historical accounts and fascinating descriptions. Photographer Lisa Woo Shanks captures with great skill the fine detail and sumptuous beauty of the full range of basketry traditions and types.

Indian Baskets of Central California covers an area from Monterey to Mendocino and from the coast to the western Sierra. Within that region we encounter the famous feathered baskets of the Pomo (but also rugged utilitarian forms like the plunge trap, used for catching one fish at a time in shallow water), Maidu feast baskets with matchless redbud (*Cercis occidentalis*) designs, coiled masterpieces of the Patwin, baskets that not only inspire but take one's breath away. Page after page presents baskets of surpassing beauty—beauty of form, entrancing weave, or splendid decoration. A Maidu conical twined burden basket is decorated with broad concentric bands of yellow beargrass (*Xerophyllum tenax*) overlay on brown conifer root. A Hill Patwin coiled bowl basket is lavishly adorned with feath-

Clockwise from the upper left: This Mountain Maidu burden basket from the Sierra features designs of bracken fern root on a background of beargrass. (California Academy of Sciences) • The Coast Miwok people of Marin and Sonoma decorated their baskets with olivella shell disc beads and abalone pendants. The baskets themselves were made of sedge root wefts on a willow foundation. (Peter the Great Museum, Russia) • This conical Pomo seed-gathering basket is a beautiful symbol of the central importance native plant resources played in Native American life. From Mendocino or Lake County, it is made of redbud, sedge root, and willow. (Private collection) • A huge Maidu feast basket such as this one required four men to lift it when filled with acorn mush. Plant materials favored in making such baskets included redbud, maple, and other shoot material. (Pacific Grove Museum of Natural History) Photographs by L.W. Shanks.

ers—red of woodpecker, dark green of mallard, blue of bluebird—and clamshell disc beads and abalone pendants. Readers are likely to linger over each page, taking time to savor a basket or to read the text a second time, not because it is difficult but because it is so interesting.

In the late 1800s and early 1900s, a cottage industry made baskets available to Europeans, but refined and elegantly decorated basketry is an ancient tradition. Such baskets have much to say of the care with which First Peoples tended the environment, and the respect they had for the earth, living things, and each other. This subject may easily lead one to flights of fantasy, but the baskets afford firm grounding. All their materials, excepting a few trade beads that came in late, are of California native plants (and some from animals). The plants were carefully tended through diverse management practices, including coppicing and fire, in a landscape inhabited by rocks, winds, streams, springs, birds, rabbits, deer, an infinite community of beings First Peoples considered to be intelligent persons in their own rights, deserving, often commanding, intelligent respect.

Indian Baskets offers more than pic-

tures and elegant descriptions. Its treatment of basketry styles, weaves, materials, techniques, variations, and history surpasses any other available work and does so in thoroughly accessible fashion. And it is full of "Ahas!"… an outstanding example is the simple cross sections it provides of coiled basketry foundations, that make it clear exactly how people were able to make strong structural elements (by bundling them) from seemingly flimsy items like the culms of basket grass (*Muhlenbergia rigens*).

The book is also enriched with history and lore that only someone steeped in a venerable academic tradition would know, for example a story involving Alfred Kroeber:

At the beginning of the last class he taught at the University of California, Berkeley, Professor Kroeber brought a large Pomo basket into class and filled it with water. He then covered it with glass and there it sat in front of the class week after week. On the final day of his last class, Dr. Kroeber lifted up the glass and the water was still there. It was a graphic illustration of the magnificent weaving abilities of California Indian women. It was the final point the "Dean of American Anthropologists" wanted to make to his students.

Indian Baskets of Central California is indeed the basketry book we have all been waiting for—so long! In its own way resembling a basket, the book seems to absorb refinement and attention to detail from the originals. Put simply, it is a beautiful book that celebrates a beautiful tradition well.

Stephen W. Edwards,
East Bay Chapter

BOOKS BRIEFLY

Calochortus: Mariposa Lilies & Their Relatives. Mary E. Gerritsen & Ron Parsons. Timber Press, Portland, Oregon. 2007. 232 pages. $29.95 hardcover.

This beautifully produced book will be treasured by botanists and horticulturists as it summarizes the current state of knowledge of this wondrous genus of geophytes (true bulbs in this case). The photographs are marvelous, but I found myself wishing there were even more of them. Unlike most botanical-horticultural books, this volume includes a short six-page chapter addressing the phylogeny of the group as it is currently informed by the latest molecular level scientific investigations. Other chapters cover history, horticulture, description of all of the species (listed alphabetically within each subsection) and their geographic distribution, sources of seeds and bulbs, glossary, and index. If you are a fan of *Calochortus* you will not be disappointed by this book, and if you are not yet a fan you soon will be.

(*CONTRIBUTORS: continued from back cover*)

John O. Sawyer is a longtime member and Fellow (in 1995) of CNPS. A co-founder of the North Coast Chapter, past president, and Conservation Committee chair of the Society, John continues to be active with his work on the Vegetation Committee.

Suzanne Schettler is a former State President of CNPS and is currently a member of the Santa Cruz Chapter. She is engaged in restoration projects as principal of Greening Associates.

CONTRIBUTING PHOTOGRAPHERS

Faith Cookler is a hiking friend of Halli Mason's. She took this photo in Caballero Canyon in the Santa Monica Mountains, a major CNPS weed eradication project.

Mel Mason is Halli Mason's husband and regular hiking companion.

Michael Mesler is a botany professor in the biological sciences department at Humboldt State University. His current research focus is pollination biology with an emphasis on the interactions between native plants and bees.

David C. Powell is a marine biologist and retired Director of Live Exhibit Development at the Monterey Bay Aquarium. He is the author of *A Fascination for Fish: Adventures of an Underwater Pioneer*.

Gary Reece is a fire specialist with the California State Parks system. He is responsible for saving much of Palomar Mountain State Park from burning in October 2007.

Lisa Woo Shanks is an area resource conservationist for the USDA Natural Resource Conservation Service. Her images appear in many books and articles.

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.

FROM THE EDITOR

The Klamath Mountains are one of the most beautiful and botanically rewarding areas of California to explore. In this issue, our guide is none other than John Sawyer whose incomparable knowledge of this region is legendary. John explains why this spectacular region is such a center of biodiversity. His wonderful new book, *Northwest California: A Natural History*, is reviewed by Dan Cheatham.

CNPS would not exist without dedicated volunteers. In this issue we celebrate another such stalwart, Halli Mason, who became a CNPS Fellow in 2005. Halli continues to be an integral part of CNPS's infrastructure for both the Los Angeles/Santa Monica Mountains Chapter and statewide.

For this issue's photo essay, we revisit Guadalupe Island for a beautiful and optimistic update on the recovery of the flora now that the ravaging goats have been eliminated.

Tom Oberbauer takes us on a journey to the southern end of the state, to San Diego—the home of the most diverse county flora in the country. He tells the story of the ancient sugar pines found in the local mountains, and provides a personal account of their fate in the fires of 2003. The ever-changing nature of California's landscapes appears to have caught up and indeed overtaken many of these monarchs of San Diego's highest mountain ranges.

We also acknowledge and mourn the passing of botanist Natalie Hopkins, a long-time CNPS member and former Santa Clara Valley Chapter president.

Stephen Edwards closes out this issue with an insightful review of the outstanding new book, *Indian Baskets of Central California: Art, Culture, and History. Native American Basketry from San Francisco and Monterey Bay North to Mendocino and East to the Sierras*, by Ralph Shanks and Lisa Woo Shanks. The diversity of materials used to create these works of art is astounding.

Bart O'Brien

CONTRIBUTORS

Alfonso Aguirre is director of the Grupo de Ecología y Conservación de Islas (Mexico). He is also leading the effort to protect Bahia San Quintin by promoting the first municipal coastal protected area in Mexico's history.

Norden H. (Dan) Cheatham is well known for the Cheatham & Haller vegetation classification system from the 1970s that was originally developed for the UC Natural Reserves System.

Stephen W. Edwards is Director of the Regional Parks Botanic Garden in Tilden Regional Park in the Berkeley Hills. He is a widely recognized author in field botany, paleobotany, anthropology, geology, and horticulture.

Steven L. Hartman is an active member of the Los Angeles / Santa Monica Mountains Chapter of CNPS, and serves as treasurer for the CNPS state board. He is also on the board of the Theodore Payne Foundation.

Bill Henry is a Ph.D. student at UC Santa Cruz. He has used his broad background in ecology and restoration to assist in studies of the flora and fauna of Guadalupe Island.

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Bradford Keitt is a program director for the not-for-profit organization Island Conservation and Ecology Group.

Jo Kitz became a CNPS Fellow in 1995. Due to her many conservation accomplishments, she was named 2004 Woman of the Year by Assemblywoman Fran Pavley.

Luciana Luna Mendoza is the Guadalupe Island Project Director with Grupo de Ecología y Conservación de Islas (Mexico). She leads restoration activities on the island.

Thomas Oberbauer is the Chief Land Use Planner for the San Diego County Department of Planning and Land Use. Tom is a long-time member of CNPS and has a deep interest in the flora of San Diego County, California's Channel Islands, and Baja California, Mexico.

(*continued on inside back cover*)

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