

# James San Jacinto Mountains Reserve

University of California Natural Reserve System



*Lolomi Lodge*



**Location:** 13 km (8 mi) north of Idyllwild, Riverside County, on State Highway 243; 80 km (50 mi) east of UC Riverside.

**Latitude:** 33°48'30" N  
**Longitude:** 116°46'40" W

**T. R. S:** T4S, R2E (SBB&M); portion of east half of sec 21

**USGS Maps:** Lake Fulmor 7.5' Banning 15' Palm Springs 15'

**Size:** 12 ha (29 ac) University-owned land at James Reserve headquarters adjacent to the 293-ha (723-ac) USFS Hall Canyon Research Natural Area.

**Elevation:** 1,623-1,692 m; 2,369 m at Black Mountain (5,325-5,550 ft; 7,772 at

**Black Mountain)**

**Mean Temps:** August max: 35 °C (96 °F)  
January min: -14 °C (6 °F)

**Topography:** Alluvial bench at lower end of a steep, west-facing canyon

**Habitats:** Mixed conifer forest, pine-oak woodlands, montane chaparral, moist ravine, montane riparian, adjacent engineered reservoir

**Species Diversity:** Vascular plants: 259  
Lichens and mosses: 35  
Amphibians: 6  
Reptiles: 18  
Birds: 125 (60% nesting)  
Mammals: 35

**Facilities:** Lodge accommodations for 25, including kitchen, bathrooms, beds, study areas; campground;

weather station; computer lab; museum; workshop; trail system with interpretative loop

**Database:** Library, maps, synoptic collections, tree-core samples, and photographic archive cross-referenced on microcomputer

**Personnel:** On-site Resident Director

**Additional Sites:** **Oasis de los Osos:** 65-ha (160-ac) palm canyon; University owned.  
**Cahuilla Mountain:** 300-ha (740-ac) mountaintop; USFS Research Natural Area.  
**Garner Valley:** 40-ha (100-ac) high wet meadow; USFS owned.

## DESCRIPTION

For a dramatic backdrop to the irrigated playgrounds of Palm Springs, the San Jacinto Mountains rise in a steep escarpment from sea level at the Colorado Desert to the summit of Mount San Jacinto at 3,294 meters (10,831 feet). Driving up the mountain, one passes from desert palms through chaparral, pinyon-juniper woodlands, and pine forests, to snow-covered peaks in a textbook display of life zones and habitat types.

About halfway up the western slopes, the James San Jacinto Mountains Reserve serves as basecamp for exploring this remarkable mountain range. The James Reserve continues in the spirit of its benefactors, Harry and Grace James, founders of The Trailfinders, an outdoor organization for boys, and The Trailfinders School for Boys. The rustic log cabin at the center of the Reserve reflects the kind of life Mr. and Mrs. James chose for themselves. For over 50 years, Harry, Grace, and the boys of The Trailfinders explored the San Jacinto Mountains and beyond. Today their cabin, Lolomi Lodge, greets a different kind of explorer.

Researchers and students from the James Reserve have access to public land throughout the San Jacinto Mountains. The land surrounding the Reserve in Hall Canyon is a candidate Research Natural Area (RNA) owned by the U.S. Forest Service. Trails link the Reserve with all parts of the canyon from its base at Lake Fulmor to its summit at Black Mountain (2,369 meters; 7,772 feet). The Reserve's database includes inventories from study sites throughout the 293-hectare (723-acre) RNA.



migrating ladybird beetles (*Coccinellidae*)

Opportunities for exploration extend even farther afield. Additional research sites within the range include a desert palm canyon, a high wet meadow, and a steep-ridged mountaintop. Sixty miles of hiking trails connect more study sites throughout high-elevation wilderness areas. Many of these sites and the species they support are unique in Southern California and have received relatively little previous study.

## HISTORY

Mortars carved in bedrock record early use of Reserve land by Cahuilla Indians. Charcoal deposits and scattered artifacts suggest the benchland that now includes the Reserve was once a seasonal campsite used for harvesting and milling acorns. Archaeological exploration of the area since the 1940s has recovered potshards, pestles, and arrowheads, but dating the deposits has been difficult because of rapid erosion of soils. However, Harry James recorded sometime in the sixties or seventies that "even in recent years a few Indians from the Soboba and Morongo reservations have come here, when the crop is good, to collect acorns."

The Cahuilla people ranged from the desert to throughout the San Jacinto Mountains. Their paths form the basis for a network of hiking trails that now link the Reserve with the rest of Hall Canyon and a series of high-country wilderness areas. Scientists probably used these paths during early surveys of the mountain range between 1878 and 1908. Following these trails today, one finds evidence of historic fires, logging, and early development in the area. An old wagon road, built sometime around 1876 to supply lumber to railroad communities in the San Geronio Pass, can still be seen where it crosses through the Reserve as Hall Decker Road.

Two-thirds of Hall Canyon was too rugged for logging operations. As a result, some very large ponderosa pine, black oak, white fir, and incense cedar still stand on or near the Reserve. The steep terrain may have discouraged agriculture as well. One small homestead was recorded on Reserve land around the turn of the century, but little remains from the operation besides a few apple trees. A leaf-mulching industry and plans for a subdivision early in the century were also short-lived.

Life in the area changed in 1941 when Harry and Grace James took over the 12-hectare (29-acre) property as a campsite for The Trailfinders. In 1950, they com-

pleted Lolomi Lodge and moved The Trailfinders' base from Pasadena to Hall Canyon. Harry, Grace, and The Trailfinders were the hub of much activity until 1966, when the Jameses sold their land to the University of California as a natural reserve. Since then, the James Reserve has become a center for teaching and research, employing the area's remarkable variety of habitats from desert to mountaintop much in the spirit of The Trailfinders. Support for and interest in the Reserve continue to come from alumni of The Trailfinders. In the late 1970s, their donations funded construction of Trailfinders Lodge.

In 1987, the James Reserve expanded to include a 65-hectare (160-acre) east slope canyon, Oasis de los Osos, located 19 kilometers (12 miles) northwest of Palm Springs. This new property, a gift from The Nature Conservancy, provides additional habitats for exploration from the headquarters of the James Reserve.

## FACILITIES AND USE

At its beginning, the James Reserve was used primarily for instruction. Classes from UC and other institutions camped alongside Indian Creek, exploring the natural history of Hall Canyon and beyond. Lolomi Lodge was used for meetings, lectures, and eventually as home for the Resident Director.

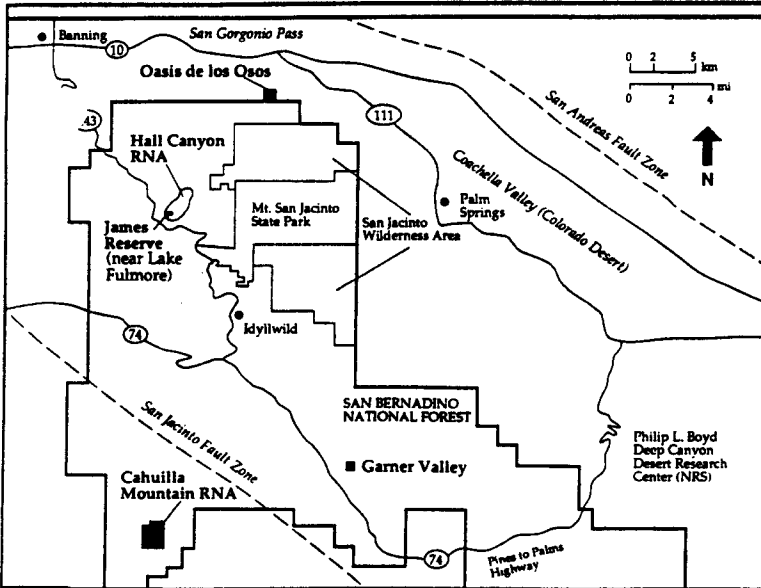
In 1980, Trailfinders Lodge was completed, providing sleeping space for up to 25 people, a kitchen, bathrooms, and classroom space. Five years later, the Lodge was remodeled to provide private rooms for long-term researchers.

Today most of the Reserve's electricity comes from a solar power system with a storage capacity of 43 kilowatt hours. Even the Reserve's automatic recording weather station is powered by its own solar-charged battery.

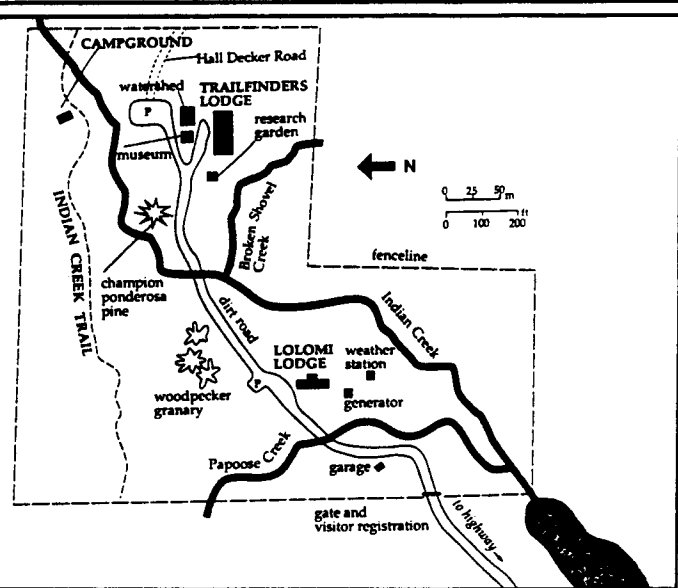
With additional accommodations and electricity for computers, the Reserve has seen a sudden rise in research use, as well as an increased number of professional meetings and conferences.

The campground with screened ramada is still available. As winterization of the road and other facilities is not complete, winter access depends on weather.

A turn-of-the-century cabin near Trailfinders Lodge serves as museum and laboratory, housing the Reserve's ever-growing collections of regional plants, invertebrates, and vertebrate skins. Laboratory equipment includes microscopes, dissecting scopes, and specimen preparation supplies.



**Regional Map**



**James Reserve Map**

A short nature trail winds through a cross-section of habitats and study sites within the Reserve. An interpretive guidebook is available to help acquaint new users to common species and communities in Hall Canyon. A longer trail system continues up through Hall Canyon RNA, with a series of photomonitoring benchmarks and established trails. This trail is part of the San Jacinto transect, a series of permanent study plots developed by the James Reserve that stretches across public land from the top of San Jacinto Peak to the western base of the range.

The database management system developed by the Resident Director is available to scholars through the Reserve's microcomputers and videodisc players. The system catalogues a small, on-site library, synoptic collections, maps, photos, and updated ecological inventories. Currently, five microcomputers (Macintosh II, Macintosh Plus, Apple IIe, IBM PC-XT, and IBM PC-AT), an Apple Laserwriter printer, and color-digitizing equipment combine into a flexible system for data acquisition, statistical analysis, map generation, report production, and image processing. The system continues to be updated. As of February 1988, several programs, including Hypercard, Filemaker Plus, Appleworks, and dBase III Plus, are available for manipulating the database.

**GEOLOGY AND SOILS**

The San Jacinto Mountains are the highest and northernmost of the California Peninsular Ranges. The earliest rocks in the San Jacintos record the presence of a shallow sea into which igneous rock,

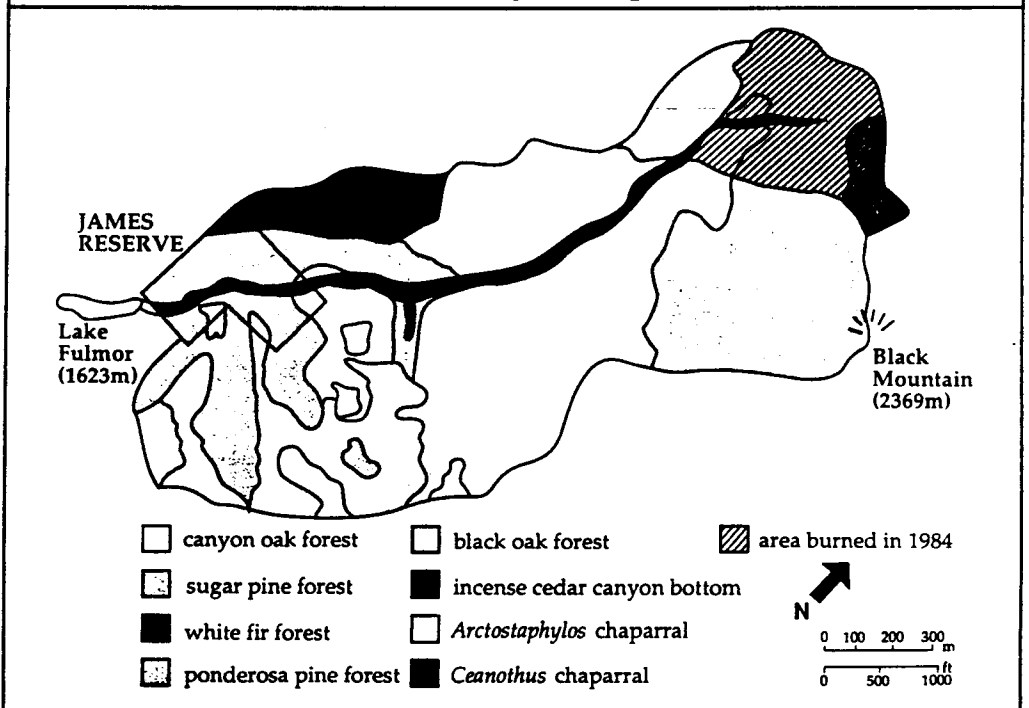
particularly granodiorite, intruded. The emplacement of the San Jacinto pluton transformed marine sediments into foliated gneiss, schist, and marble as the huge body of molten rock worked its way up from deep within the earth.

The pluton appears to have ground north along the San Andreas fault until it pushed into the San Gorgonio block, lifting the two mountain ranges and down-dropping San Gorgonio Pass between the two blocks. Erosional plateaus and stepped benches on the southern and western slopes of the range record different geological periods of uplift. Deep canyons cut into the granitic block form

alluvial fans on the steeply lifted east side. Mountain building continues in the San Jacintos with recent geologic activity along the San Jacinto fault to the west and the Bautista fault and Santa Rosa shear zone to the east.

Hall Canyon is located on the western slopes of the San Jacinto Mountains. Its northern boundary is a steep ridge rising sharply above the canyon. Jagged outcrops curve around to the summit of Black Mountain (2,370 meters; 7,772 feet). The southern boundary is a broader slope dissected by several ravines. Two of these side canyons converge at about 1,650 meters (5,400 feet)

**Hall Canyon Map**



to form the alluvial bench of the James San Jacinto Mountains Reserve.

Because the range is topographically young, the surface is unstable. Most of the soils are recently derived from the base rock, granodiorite. Steeper slopes hold shallow, erodible soils that support only those plants that can gain foothold in water channels and crevices. Slopes less than 60 percent may hold soils deep enough to support a continuous over-story of trees. The gently sloping benches on and near the Reserve hold soils up to 2.5 meters (8 feet) deep that support the area's highest quality ponderosa pine and black oak forests.

## HYDROLOGY

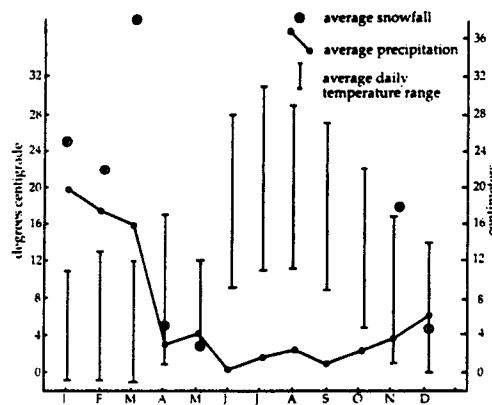
Seeps and springs appear throughout Hall Canyon where cracks from minor faults allow groundwater to percolate to the surface. Water collects to form Indian Creek, which cascades quickly down the steep upper canyon through a series of pools. When it reaches the bench on the Reserve, Indian Creek slows, joining Papoose Creek which drains the north side of the canyon. Together they empty into the dammed lower canyon, forming Lake Fulmor just south of the Reserve boundary.

## CLIMATE

Although the climate of California is Mediterranean, with mild winters and warm, dry summers, steep topography complicates the climate of the San Jacinto Mountains. With a rise in altitude, temperature drops and precipitation increases. Deep-cut ravines drain cold air back down the slopes, so that creek banks at mid-elevation may be several degrees colder than flat benches nearby.

Prevailing weather flows from the northwest. In spring, the coastal influence may result in a maritime fog that reaches up the lower montane slopes. In fall and winter, dry, northeasterly Santa Ana winds may gust for days. Generally, most precipitation falls between November and April, with occasional summer thundershowers. Winter snow is common at the Reserve.

A weather station began continuous recording at the Reserve in January 1986. Weather data collected since 1890 at the nearby Idyllwild Water District are also available. The table above is based on climatic data for 1977 through 1981 from the Idyllwild Fire Station, at an elevation of 1,650 meters (5,400 feet).



## FIRE HISTORY

Fire has played a part in the San Jacinto Mountains for thousands of years. Historically, wildfires were small and frequent, usually occurring from midsummer through fall, after many plants had gone to seed and wildlife young had gained some mobility and independence. Ground fires burned through mixed conifer forests every few years, killing low growth and maintaining open stands of tall trees. Chaparral fires were confined to old growth, leaving undamaged islands of oak and younger chaparral. Tree canopies did not burn because fires were generally small.

Suppression of wildfire in this century has increased the effect a single fire can have. Dead wood chokes the chaparral and shrubby forest undergrowth throughout the range, building up enough fuel to carry fire into the tree canopy. In 1974, a fire burned 7,042 hectares (17,387 acres), including a portion of northwestern Hall Canyon. Much of

the rest of Hall Canyon has not burned for many decades, allowing the build-up of shrubs and deadwood. Only remnants of open forest remain in the canyon, most of it on the James Reserve.

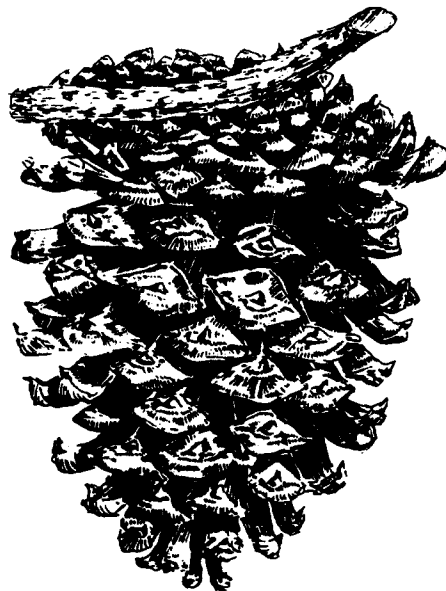
Today a consortium of agencies and citizens' groups, including Reserve researchers, are organizing a fire management plan to reduce the amount of fuel built up in the San Jacinto Mountains. The Coordinated Resource Management Planning program (CRMP) hopes to return the range to its natural, open condition that can be maintained with periodic, controlled burns.

## HABITATS

The San Jacinto Mountains encompass habitats from desert to subalpine, influenced by wide variations in elevation, temperature, moisture, and slope. Hall Canyon contains mid-elevation, west-slope habitats, including mixed conifer forest, conifer-oak woodland, montane chaparral, moist ravine, and lake. Varied physical factors, as well as fire history and human use, determine the mosaic of vegetation on the Reserve, in the canyon, and throughout the range.

At the lowest elevations of Hall Canyon, ponderosa pine (*Pinus ponderosa*) dominates. Several large specimens grow in the deep alluvial soils on the Reserve, including the oldest ponderosa pine in Southern California, estimated to be more than 470 years old. Canyon live oak (*Quercus chrysolepis*) grows in dense stands among the pines and may be responsible for the poor reproduction of ponderosa pine in recent years. Shrubs and herbs are typically sparse in this woodland association, but may include patches of bracken (*Pteridium aquilinum* var. *pubescens*), mountain lilac (*Ceanothus integerrimus*), or manzanita (*Arctostaphylos pringlei* var. *drupacea*).

The densest undergrowth is beneath stands of black oak (*Q. kelloggii*), the



ponderosa pine (*Pinus ponderosa*); 15 cm (6 in)



Coulter pine (*Pinus coulteri*); 30 cm (12 in)

major deciduous tree in Hall Canyon. Sunshine filters through its leafless canopy in spring, encouraging growth of shrubs that range from ceanothus to manzanita, such herbs as prince's pine (*Chimaphila menziesii*) and pennyroyal (*Monardella nana*), along with various brome-grasses (*Bromus* spp.). Coulter pine (*P. coulteri*) shares the canopy. Most black oaks in Hall Canyon grow in multistemmed resprouts from stumps burned a century ago; however, a few older, very large specimens still stand on the Reserve.

Canyon live oaks, many also multistemmed from historic fires, grow throughout the canyon. The hybrid oracle oak (*Q. kelloggii* X *Q. wislizenii*) is common in the understory, as are manzanita and coffeeberry (*Rhamnus californica*). Monkeyflower (*Mimulus longiflorus*) and lip fern (*Cheilanthes couillei*) grow from crevices on the rocky slopes.

Two types of montane chaparral are found on the dry slopes in Hall Canyon. Ceanothus (*C. leucodermis*) chaparral grows on recently burned northwestern slopes and appears in an early successional phase. Chaparral thickets give way to resprouting canyon and black oak and saplings of coulter, ponderosa, and sugar pines.

Manzanita chaparral contains dense stands of *Arctostaphylos glandulosa*, with occasional chamise (*Adenostoma fasciculatum*) that appear to be relatively long-lived. The remnant stands in Hall Canyon, restricted primarily to steep, south-facing ridges not accessible to conifers, appear healthy even though they have not burned for over 50 years. Much more extensive stands of manzanita chaparral grow in the Cahuilla Mountain candidate RNA (see page 7).

On the highest slopes of Black Mountain, white fir (*Abies concolor*) and sugar pine (*P. lambertiana*) dominate. Local areas of deep soil in the steep upper canyon support relatively high densities of trees thought to be responsible for carrying the 1974 fire uphill from the head of Indian Creek. These occasional pockets of soil provide foothold for buckwheat (*Eriogonum saxatile*) and beard tongue (*Penstemon centranthifolius*).

Scattered throughout the canyon, small seeps dot the slopes with deergrass (*Muhlenbergia rigens*), lupine (*Lupinus latifolius* var. *parishii*), and monkeyflower (*Mimulus* spp.). Indian Creek drains the canyon, flowing through increasingly riparian habitat as it gathers downhill. Incense cedar (*Calocedrus decurrens*) dominates the streamside canopy in the

steep upper ravine, with an understory of western azalea (*Rhododendron occidentale*), sierra current (*Ribes nevadense*), and burning bush (*Euonymus occidentalis* var. *parishii*). White alder (*Alnus rhombifolia*) and willow (*Salix* spp.) are common only on the broad stretches of Indian Creek near the Reserve. Moisture-loving herbs, including the rare lemon lily (*Lilium parryi*), as well as chain fern (*Woodwardia fimbriata*), lady fern (*Athyrium filix-femina* var. *californicum*), and various sedges (*Carex* spp.) flourish along the creek banks.

## FLORA

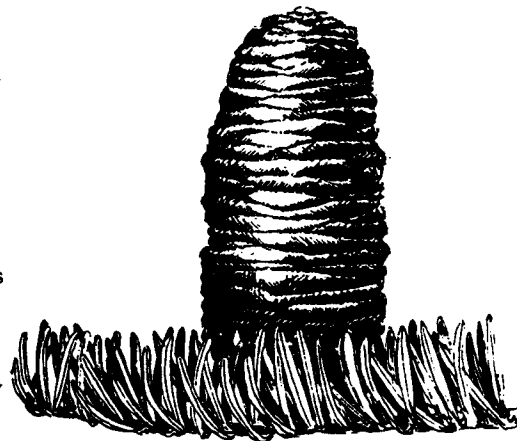
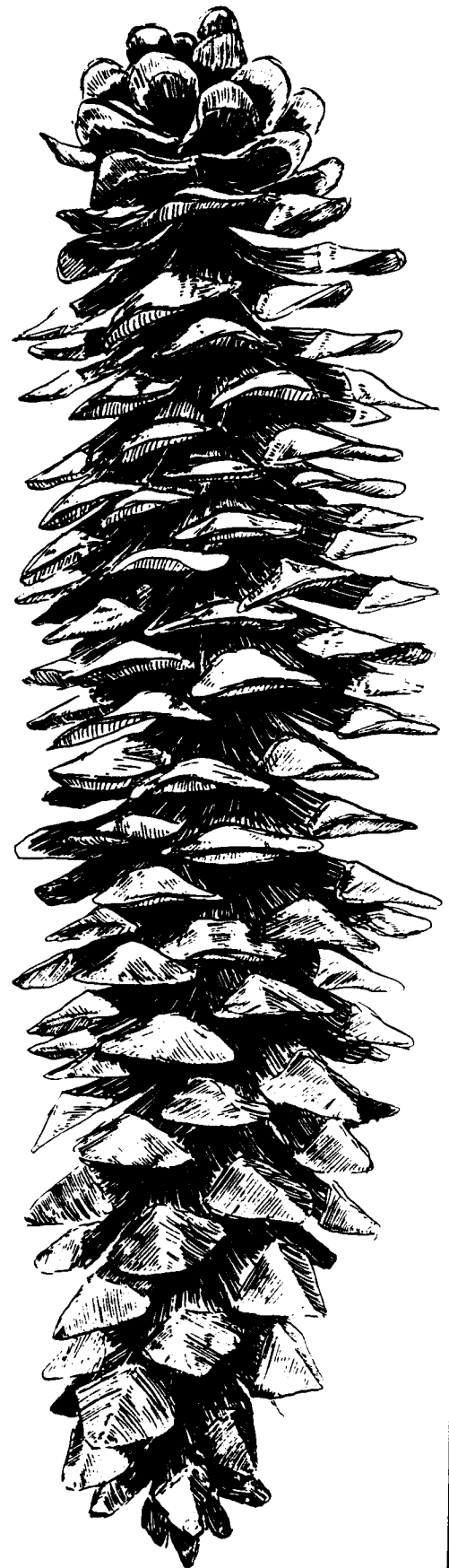
The flora of the San Jacinto Mountains includes a mixture of plants characteristic of many different regions, including the Sierra Nevada, Baja California, the coast, and the desert, as well as endemic plants found nowhere but here. Nearly 260 kinds of vascular plants and 35 species of mosses and lichens have so far been identified in Hall Canyon.

## FAUNA

Surveys of Hall Canyon vertebrates and invertebrates have been conducted seasonally since 1983. Species lists are growing from inventories taken throughout the area's unique combination of habitats.

**Invertebrates:** A rich invertebrate fauna is beginning to be catalogued as research accelerates at the Reserve. Invertebrates from throughout the canyon are represented in the Reserve's museum.

**Amphibians and Reptiles:** Only the moist ravines and creekbeds provide habitats damp enough for the six species of amphibians found in Hall Canyon.



white fir (*Abies concolor*); 10 cm (4 in)

sugar pine (*Pinus lambertiana*); 51 cm (20 in)

These include two subspecies and a hybrid of *Ensatina* (*Ensatina eschscholtzii*).

More widely distributed are 18 species of reptiles, including three species of spiny lizards (*Sceloporus* spp.) which occur sympatrically in some areas of the canyon. The rare granite night lizard (*Xantusia henshawi*), endemic to the Peninsular Ranges, hunts nocturnally among eroding granite boulders. Snakes are widespread throughout the canyon.

**Birds:** The variety of habitats attracts an equally rich diversity of birds to Hall Canyon. Over 120 species have been observed in the canyon and more than half are known to nest here. Five kinds of hummingbirds flash through the canyon in summer, including breeding Anna's (*Calypte anna*) and calliope (*Stellula calliope*). Ten woodpecker species, including Williamson's sapsuckers (*Sphyrapicus thyroideus*), hunt insects through the forests and woodlands. Western bluebirds (*Sialia mexicana*) benefit from an extensive nestbox program in Hall Canyon. At least two pairs of spotted owls (*Strix occidentalis*), considered endangered throughout much of their range, live year-round in the canyon.

**Mammals:** Current research is expanding the inventory of mammals, now listed at 35 species, known to occur in Hall Canyon. Already 13 species of bats have been identified, as well as four sympatric species of deer mice (*Peromyscus* spp.). Several kinds of squirrels occur throughout the woodlands, preyed upon by coyotes (*Canis latrans*), bobcats (*Felis rufus*), and mountain lions (*Felis concolor*). Mule deer (*Odocoileus hemionus*) range widely through the area.

## RESEARCH

Research at the James Reserve has increased dramatically since Trailfinder's Lodge was completed in 1980, providing space for visiting scientists to live and work. Since then, much research has focused on building a database for Hall Canyon and the San Jacinto Mountains, collecting seasonal inventories of plants and animals, as well as conducting ecological studies of individual species. The hybrid oracle oak, Merriam's kangaroo-rat, and ladybird beetles are a few of the subjects of ongoing research. The longest continuing study undertaken at the Reserve concentrates on the physiology and population dynamics of western bluebirds based on an intensive banding effort that began in 1976.

A corollary to the collection of an ecological database for Hall Canyon is research into methods for managing ecological data using microcomputers. The system being developed by M. P. Hamilton has far-reaching applications, particularly in image processing, remote sensing, and geographic information systems. The program allows a vast photographic archive to be filed on long-lasting videodiscs from which images can be retrieved in seconds. From this flexible archive, special features of vegetation can be analyzed to determine such factors as plant succession rates and standing crop biomass.

Different levels of precision within the program are being explored to create a tool that provides both the community and landscape details useful to researchers and a general overview to introduce ecological concepts to beginning students. Dubbed the "Macroscope," the interactive videodisc project simulates a guided tour through Hall Canyon with a full database available to aid the explorer, student, or researcher.



fan palm (*Washingtonia filifera*)

## ADDITIONAL RESEARCH SITES

The James Reserve often serves as a basecamp for research and study beyond Hall Canyon. Three other research sites are available in the San Jacinto Mountains. Oasis de los Osos is a recent addition to the James Reserve; Cahuilla Mountain RNA and the Garner Valley site are currently managed by the Resident Director.

**Oasis de los Osos:** The north face escarpment of Mount San Jacinto is one of the steepest in the continental United States, with a drop of over 3,000 meters (10,000 feet) in just over 8 kilometers (5 miles). From this face flows Lambs Creek, which tumbles precipitously through a chasm created by geologic faulting and deepened by erosion. Steep vertical walls isolate the stream bed from the slopes above. A broad alluvial plain fans out from the canyon into the Colorado Desert, one of the hottest, driest environments in the American Southwest.

The Lambs Creek watershed below the northern face of Mount San Jacinto is a protected area known as Oasis de los Osos, donated to the University by The Nature Conservancy in 1987. At the highest boundary (760 meters; 2,500 feet) cismontane chaparral dominates, including sugar bush (*Rhus ovata*) and manzanita. Cold air drainage from the steep canyon helps maintain chaparral at this relatively low elevation. At the lowest boundary (425 meters; 1,400 feet) Colorado Desert vegetation dominates, including creosote bush (*Larrea tridentata*) and brittle-bush (*Encelia farinosa*). The rainshadow from the San Jacinto Mountains limits precipitation here to less than 10 centimeters (4 inches) a year. The ecotone of desert to chaparral characterizes most of the site.

The perennial water supply of Lambs Creek supports a riparian woodland community that includes cottonwoods (*Populus fremontii*), willows, and mature fan palms (*Washingtonia filifera*).

Wildlife is abundant. Notable species include the endangered least Bell's vireo (*Vireo bellii*) and peninsular bighorn sheep (*Ovis canadensis cremnobates*).

Until about 1920, Oasis de los Osos was part of an active Cahuilla Indian village. Several rock paintings, middens, and shelters distinguish the archaeological significance of the site. The remains of a turn-of-the-century homestead still stand at the base of the canyon. Current plans include developing a camping area

on this old foundation to accommodate researchers from the James Reserve.

**Cahuilla Mountain Candidate RNA:** On the southwest slopes of the San Jacinto Mountains, the steep granitic escarpment of Cahuilla Mountain rises abruptly from the valley floor. The mountain resembles a mesa with a broad, relatively flat top reaching to just over 1,700 meters (5,600 feet). Part of the San Bernardino National Forest, 300 hectares (740 acres) of black oak savanna, pine-oak woodland, chaparral, and grassy open areas are being proposed as a Research Natural Area.

Steep slopes on the south and east and chaparral thickets on the north and west restrict access to the mountaintop, leaving the area ungrazed and relatively pristine. The only recorded disturbance was a fire in 1928 that engulfed most of the mountaintop. Today much of the area is in a state of successional recovery as a result of that fire.

Besides the dynamics of plant succession, the mountain displays a remarkable mixture of plants from different geographical areas. Some species are typical of Southern California mid-montane habitats. Others more typical of low coastal habitats grow here at their upper elevation limits. Still others more typical of arid desert conditions grow here at their most coastal distribution. The factors controlling distribution of such diverse species invite investigation.

Coulter pines and black oaks grow over much of the mountaintop in dense stands and open woodlands. On surrounding slopes and ridges, where soil is thin, grows a variety of chaparral types, including redshank, manzanita, chamise, woodland, and escarpment chaparrals.

A mixture of coastal sage scrub, valley grassland, and savanna covers parts of the mountaintop where soils may be a few meters deep. Unlike most other areas in Southern California, the grassy openings of Cahuilla Mountain are dominated by native, rather than introduced, species. Although these grassy openings are relatively small, their undisturbed nature holds valuable research possibilities.

**Garner Valley:** Parallel to the San Jacinto fault system at an elevation of about 1,400 meters (4,600 feet), Garner Valley is a broad upland valley noted for



*little brown bats (Myotis lucifugus)*

its high density of rare and endemic plants. Although residential development presses into the eastern end of the valley, the U.S. Forest Service has set aside significant tracts of open space to protect critical areas.

One such tract, a 40-hectare (100-acre) wetland meadow, soon will be fenced to exclude livestock and human disturbance. The enclosure will protect critical natural elements and allow the natural diversity of the meadow to revive.

Seven plant species listed with the California Natural Diversity Data Base grow in this part of Garner Valley. Johnston's rock cress (*Arabis johnstonii*) is found only in the dry clay conglomerates fringing the wet meadows of the valley. The species has declined with increased residential development; a more extensive survey of its distribution is needed. California beards-tongue (*Pentstemon californicus*), endemic to the San Jacinto and Santa Rosa Mountains, also has declined due to residential pressure and grazing. The beautiful Munz's hedgehog cactus (*Echinocereus engelmannii* var. *munzii*) is threatened by collectors as well as bulldozers. Ziegler's tidy tips (*Layia ziegleri*), a rare wet meadow wildflower, grows only in Garner Valley. Other critical elements include *Chaenactis parishii*, four-leaved pinyon pine (*Pinus quadrifolia*), and bedstraw (*Galium californicum* ssp. *prinum*).

## MANAGEMENT

In order to protect these and other areas in the San Jacinto Mountains for research and teaching, the Resident Director works closely with resource managers from other agencies represented in the range. The James Reserve serves as a clearinghouse of resource information through Reserve-based newsletters, public lectures, and consultation.

The Resident Director is also working to provide researchers with an integrated database available on microcomputer, including updated species lists, weather records, computerized maps of vegetation and terrain, and on-line access to selected scientific publications. Scientists and students at the James Reserve can use the database to research and produce reports specific to a site, a community, or a species.

Ongoing projects include establishing a fire-control system on the Reserve, stabilizing point source erosion throughout the canyon, and monitoring critical elements in the area. The San Jacinto transect, developed by the James Reserve, provides a valuable tool for monitoring natural elements and processes through a broad range of elevations.

## RESTRICTIONS

Due to the many people who use the James Reserve throughout the year, groups and individuals must make arrangements with the Resident Director well in advance of their visit. All visitors must sign in and out at the gate, and park only in designated areas.

Reserve users are expected to keep the site clean, packing out all garbage from the campground and other areas throughout the canyon. Open fires are forbidden; cooking with camp stoves and smoking are permitted only in the campground. Hunting and fishing are strictly prohibited.

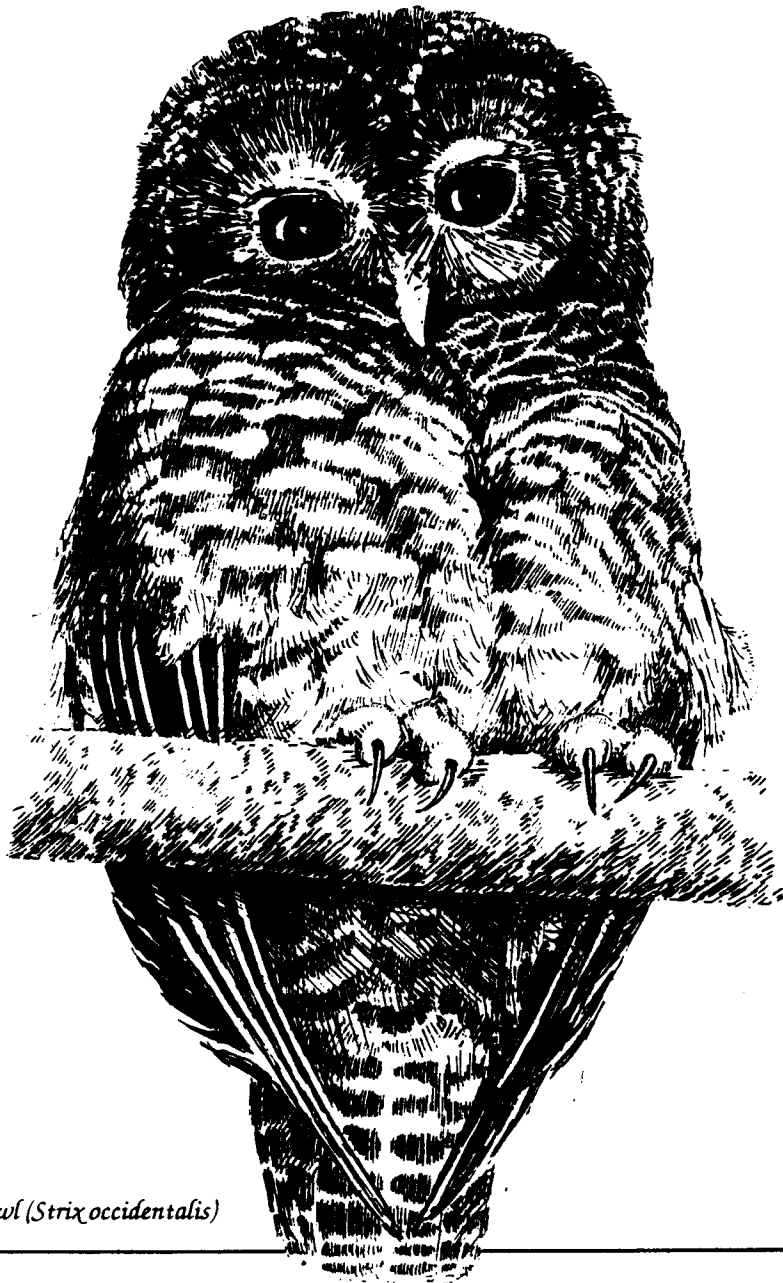
In particular, users must:

- coordinate all research projects with the Resident Director before beginning work;
- clearly mark all established research plots when work is begun;
- remove all research plots when work is complete;
- not disturb other research plots;
- obtain prior approval from the Resident Director for any manipulation of plants, animals, or habitats;
- obtain permits from the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the U.S. Forest Service, as required.

Researchers are requested to contribute to the James Reserve database with written reports of their investigations in Hall Canyon or in any of the other San Jacinto research sites.

## RECOMMENDED READING

- Berg 1982. Hall Canyon annotated floristic list. University of California Natural Reserve System. 33 pp.
- Berg, K. 1982. Hall Canyon annotated vertebrate list. University of California Natural Reserve System. 27 pp.
- Brown, A. R. and R. W. Ruff, eds. 1981. *Geology of the San Jacinto Mountains: Annual Field Trip Guidebook No. 9*. South Coast Geological Society, Santa Ana, CA. 219 pp.
- Garrett, K. and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Artisan Press, Los Angeles, CA. 408 pp.
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spotted owl (*Strix occidentalis*)

## UNIVERSITYWIDE ADMINISTRATION

The Natural Reserve System (NRS) consists of 27 sites, including the James San Jacinto Mountains Reserve. Each is assigned to one of the eight UC general campuses for administration, maintenance, and management.

Unlike wilderness areas that are available for recreation, the University reserves are devoted entirely to teaching and research. Qualified students and faculty from any institution of higher education may use the reserves as outdoor classrooms for studying natural processes directly from nature. The reserves also serve as living laboratories, where researchers can pose questions of the natural world that can only be answered by intensive field study.

A Universitywide program, the Reserve System is part of the Division of Agriculture and Natural Resources. For more information on the NRS as a whole, or for a free subscription to the NRS newsletter, the *Transect*, contact:

Editor  
Natural Reserve System  
University of California  
2120 University Ave., 4th floor  
Berkeley, CA 94720  
(415) 644-4211 / ATSS 532-4211

## RESERVE ADMINISTRATION

The UC Riverside campus oversees the James San Jacinto Mountains Reserve. A campus advisory committee provides guidelines to the Resident Director who is responsible for the day-to-day administration. No one may enter the Reserve without permission. Information and applications are available through:

Resident Director  
James San Jacinto Mountains Reserve  
P.O. Box 1775  
Idyllwild, CA 92349  
(714) 659-3811

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