

CASE STUDY: CAJON CREEK HABITAT CONSERVATION MANAGEMENT AREA

LINDA MITROVICH, Solution Strategies, Inc., San Diego, CA

SHARON LOCKHART, Lockhart and Associates, Orange, CA

DOUGLAS W. SPRAGUE, Vulcan Materials-CalMat Division, Los Angeles, CA.

ABSTRACT: As California's population and economy continue to grow, the challenge will be to maintain biodiversity while providing for economic development. CalMat's Cajon Creek Project serves as a model to meet this challenge. This project preserves and manages an approximately 558-hectare Habitat Conservation Management Area for 24 sensitive species. The establishment of the Habitat Conservation Management Area provides mitigation for adjacent mining and industrial developments which will create 11,000 new jobs and provide construction materials to build and maintain homes, schools, hospitals, roads and businesses. In addition, the project established a 610-acre mitigation bank for sensitive species. The management plan includes a major Riversidian alluvial fan sage scrub revegetation effort and was recently modified to add management activities for the San Bernardino kangaroo rat (*Dipodomys merriami parvus*) listed as endangered in 1998. The management efforts to protect the sensitive resources of the 6-mile habitat corridor have been successful. Success in establishing and managing the property has been due to dedicated and cooperative efforts of the company and the responsible public agencies. Thoughtful attention to public policy and community concerns combined with reliance on scientific information and protocols provided the common ground needed for the parties to work together. Together, CalMat and the wildlife agencies were able to finalize an agreement that provides public benefit by protecting the environment and preserving economic opportunity.

Key words: Cajon Creek, habitat conservation, mitigation, San Bernadino Kangaroo rate, *Dipodomys merriami parvus*.

1999 TRANSACTIONS OF THE WESTERN SECTION OF THE WILDLIFE SOCIETY 35:57-62

INTRODUCTION

The permitting of CalMat's Cajon Creek Project and San Bernardino Facility raised several habitat protection issues, notably impacts to sensitive species. Initially, the company and the wildlife agencies had a difference of opinion as to both the species of concern and the nature of the impacts. This led to the wildlife agencies alleging Endangered Species Act (ESA) violations. CalMat, nevertheless, was committed to finding a solution which addressed the agencies' concerns and did so. This paper discusses the projects and the resolution of the conflict.

Description of the Habitat Conservation Management Area

The Cajon Creek Habitat Conservation Management Area is a six-mile habitat corridor in the Cajon Creek, San Bernardino, California. Established by an agreement between CalMat, the U.S. Fish and Wildlife Service (Service), the California Department of Fish and Game (Department) and the U.S. Army Corps of Engineers (Corps) in 1996, this management area protects approximately 558 hectares of Riversidian alluvial fan sage scrub (RAFSS) habitat, a vegetation type that supports 24 sensitive species and is considered rare by the wildlife agencies.

The management area consists of approximately 311 hectares of conservation lands and an approximately 271-hectare mitigation bank. The conservation lands offset the impacts associated with two of CalMat's projects: the San Bernardino Facility and Cajon Creek Project. The mitigation bank is land that may be used for future mitigation requirements. Since 1996, CalMat has been managing and protecting the entire area under an agreement between CalMat and the agencies. CalMat will continue to do so until the property is donated to a permanent management entity such as the California Department of Fish and Game. To ensure the corridor's continued preservation, CalMat also is creating an annuity to cover future operation and maintenance costs.

Brief Description of CalMat's Two Projects

CalMat owns two major, adjoining parcels of land on Cajon Creek: the San Bernardino Facility, an approximately 416-hectare site of which CalMat owns approximately 288 hectares and leases the remainder, and the Cajon Creek Project, a site of approximately 503 hectares. Both sites are within state designated construction aggregate resource zones (State Mining and Geology Board 1985).

The San Bernardino Facility, located at the confluence of Cajon and Lytle Creeks, was acquired by CalMat in

the mid-1980s. The property had been mined by several companies since the 1920s. On acquiring the site, CalMat modified the mine plan to reestablish the natural dynamics of the river by reducing the depth of excavation to its profile of equilibrium and to reclaim the site using native plant materials collected from the site. The site has supplied and continues to supply the region's need for construction aggregate materials and employs about 25 people. The revised mining and reclamation plan (Mining and Reclamation Plan No. 90M-011) was approved by the County of San Bernardino in 1990. In 1991, the Department issued a Section 1603 Streambed Alteration Agreement (Agreement No. 5-259-91). CalMat also applied to the Corps for a Clean Water Act permit (No. 91-00248-AJS) to the Corps in 1991. The Corps did not issue its permit until 1995. Special conditions to that permit served as the basis for establishing the Cajon Creek Habitat Conservation Management Area.

The Cajon Creek Project is upstream of the San Bernardino Facility on Cajon Creek. This mining and industrial development project will create 11,000 jobs over its 25-year buildout (i.e., 6,500 jobs on-site and 4,500 jobs off-site). It is located in an industrial area at a prime rail/highway hub. The San Bernardino City Council approved the master plan for this project in 1993, after three years of environmental review and study.

As initially proposed by CalMat, both projects included open space designations on over 70 percent of the lands CalMat owned within the portions of Lytle and Cajon Creek floodplain. This open space included both undisturbed habitat and mined lands that were to be restored as RAFSS. These open space lands formed the basis for a habitat conservation corridor.

Riversidian Alluvial Fan Sage Scrub Habitat

Riversidian alluvial fan sage scrub is a type of alluvial scrub adapted to the harsh conditions of the outwash fans located at the mouths of canyons along the coastal side of several southern California mountain ranges, including the San Bernardino Mountains. This plant community is adapted not only to porous, low fertility substrates, but also able to survival of intense, periodic flooding and erosion. Such episodes of erosion and deposition create a series of step-like terraces above wash channels. These terraces generally exhibit different successional phases of the plant community. Three successional phases within the 100-Year Floodplain have been recognized (Lockhart and Chambers Group 1994). The phases are related to the amount of time that has elapsed since the most recent flood created that terrace level.

About 150 species of plants have been reported from CalMat's properties (Tierra Madre Consultants 1990 and Chambers Group 1994). Of these, approximately 13

percent or 20 plant species are non-native to the area. Native plants associated with this community include such shrubs as California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*) and scalebroom (*Lepidospartum squamatum*). These two species may be the most abundant shrubs in this community (Martha Blane and Associates 1992). Other shrubs found in the area include black sage (*Salvia mellifera*), California sagebrush (*Artemisia californica*), white sage (*Salvia apiana*) and yerba santa (*Eriodictyon trichocalyx*). Subshrub diversity is also high and includes deerweed (*Lotus scoparius*), cotton thorn (*Tetradymia comosa*), matchweed (*Gutierrezia bracteata*), and tarragon (*Artemisia dracuncululus*). The rich herbaceous flora is composed of common fiddleneck (*Amsinckia intermedia*), slender buckwheat (*Eriogonum gracile*), branching phacelia (*Phacelia ramosissima*), chia (*Salvia columbariae*), peony (*Peonia californica*), woolly star (*Eriastrum densifolium*), thurber's buckwheat (*Eriogonum thurberi*), and California croton (*Croton californicus*).

This community supports twenty-four plant and animal species that are considered to be sensitive (Lockhart and Chambers Group 1994). The list of sensitive species includes several that are listed as either threatened or endangered by the Service. The endangered plants include the Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*) and slender-horned spineflower (*Dodecahema leptoceras*); the endangered wildlife is the San Bernardino kangaroo rat (*Dipodomys merriami parvus*); and the threatened wildlife are the California red-legged frog (*Rana aurora draytonii*) and the coastal California gnatcatcher (*Polioptila californica californica*) (CalMat Company 1994). The other sensitive species present include Parry's spineflower (*Chorizanthe parryi* var. *parryi*), coastal western whiptail (*Cnemidophorus tigris multiscutatus*), orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*), San Diego coast horned lizard (*Phrynosoma coronatum blainvillei*), coast patch-nosed snake (*Salvadora hexalepis virgulata*), coastal rosy boa (*Lichanura trivirgata roseofusca*), San Bernardino ringneck snake (*Diadophis punctatus modestus*), coastal cactus wren (*Campylorhynchus brunneicapillus couesi*), yellow warbler (*Dendroica petechia brewsteri*), loggerhead shrike (*Lanius ludovicianus*), California horned lark (*Eremophila alpestris actia*), Bell's sage sparrow (*Amphispiza belli belli*), ferruginous hawk (*Buteo regalis*), Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), southern grasshopper mouse (*Onychomys torridus ramona*), San Diego desert woodrat (*Neotoma lepida intermedia*), San Diego black-tailed jackrabbit (*Lepus californicus*

bennettii), and spotted bat (*Eurdeima maculatum*). Of these, only fifteen sensitive species have been observed in the vicinity on the project sites.

CalMat's Revegetation Plan for Riversidian Alluvial Fan Sage Scrub

The objective of the revegetation project is to restore natural components of Riversidian alluvial fan sage scrub plant community to the extent practicable to provide suitable plant and wildlife habitats. The reclamation/revegetation project includes both pre- and post-1977 mined lands (Martha Blane and Associates 1992). The reclamation program was designed to be implemented in six phases, each phase concentrating on a specific area of CalMat's San Bernardino property. Phase I, the initial phase, was started in late 1991 and the revegetation standards were met three years later, in 1994 (Martha Blane and Associates 1994). Phase II was initiated in 1993 and the revegetation standards were met in 1996 (Martha Blane and Associates 1996). Recontouring and revegetation of the Phase III through Phase VI areas is underway.

The revegetation plan was further defined in 1996 (Martha Blane and Associates 1996). In preparing an area for revegetation, the cut slopes of the mined areas are regraded to create natural looking slopes (i.e., slopes with a 5:1 ratio, that is 5 feet horizontal to 1 foot vertical). Non-native species, if any, are removed. Soil salvaged from areas stripped prior to mining is placed over the regarded areas. Just prior to planting, these areas are cross ripped on the contour leaving the soil surface in as rough condition as possible. Seeding using hydroseeding or imprinting methods and hand planting of container stock is performed and completed during the winter rainy season. The newly created slopes are first planted with container plants propagated from seeds and/or cuttings taken from the site. The slopes are then hydroseeded or imprinted using a seed mix representative of the Riversidian alluvial fan sage scrub community.

Seed collection and plant propagation occurs one to two years prior to planting. All container materials are grown in a "deep" one gallon size. To plant container stock, holes are augered to three feet or more and then filled with water several times and drained. The plants placed with the root crown one to two inches above the surrounding grade and the holes backfilled with native soil. A large basin is built around each plant and the plant is watered. Rock mulch is used around each plant.

Hydroseeding of locally collected seeds occurs after the first substantial rainfall of the season and only at times when winds are calm. Hydroseeding consists of a hydraulic application of a homogeneous slurry mixture

consisting of water, seed, organic soil stabilizer, and cellulose wood fiber mulch. It is planned to use imprint seeding on Phases III through VI.

The plant mix includes the following species are listed in Table 1.

Table 1: Plant Mix Used in the Riversidian Sage Scrub Revegetation Efforts

Trees and Shrubs - container stock

<i>Cercocarpus betuloides</i>	Birch leaf mountain mahogany
<i>Juglans californica</i>	California walnut
<i>Platanus racemosa</i>	California sycamore
<i>Populus fremontii</i>	Fremont's cottonwood
<i>Prunus ilicifolia</i>	Holly leaf cherry
<i>Salix lasiolepis</i>	Arroyo willow
<i>Sambucus mexicana</i>	Mexican elderberry

Plant Mix - hydroseed mix

<i>Adenostoma fasciculatum</i>	Chamise
<i>Artemisia californica</i>	California sagebrush
<i>Artemisia dracunculus</i>	Tarragon
<i>Baccharis glutinosa</i>	Mulefat
<i>Cercocarpus betuloides</i>	Birch-leaf mountain mahogany
<i>Chrysopsis villosa</i>	Golden aster
<i>Croton californicus</i>	California croton
<i>Elymus condensatus</i>	Giant wildrye
<i>Eriastrum densifolium</i>	Unidentified woolly star
<i>Eriodictyon trichocalyx</i>	Yerba santa
<i>Eriogonum fasciculatum</i>	California buckwheat
<i>Eriogonum gracile</i>	Slender buckwheat
<i>Eriogonum thurberi</i>	Thurber's buckwheat
<i>Gutierrezia bracteata</i>	Matchweed
<i>Haplopappus linearifolius</i>	Goldenbush
<i>Lepidospartum squamatum</i>	Scalebroom
<i>Lotus scoparius</i>	Deerweed
<i>Nicotiana biglovii</i>	Bigelow tobacco
<i>Phacelia ramosissima</i>	Branching phacelia
<i>Rhamnus crocea</i>	Red berry
<i>Rhus trilobata</i>	Basket bush
<i>Salvia apiana</i>	White sage
<i>Salvia columbariae</i>	Chia
<i>Salvia mellifera</i>	Black Sage
<i>Senecio douglasii</i>	Butterweed
<i>Tetradymia comosa</i>	Cotton thorn
<i>Yucca whipplei</i>	Chaparral Yucca

Watering of container stock is also provided during the first growing season. Weeding is also undertaken, as may be necessary.

Following planting, the revegetation area is monitored horticulturally to track the health of the plantings throughout the year. Each phase also is monitored biologically during the spring of the second or third year to validate that standards have been met.

Annual reports have been submitted to local, state and federal agencies for previously implemented phases of the project. Based on monitoring results, natural processes occurring in the revegetation areas indicate that a self-sufficient and functioning habitat is present. The natural processes noted include soil development, nutrient cycling, plant succession, natural regeneration, wildlife movement, and recovery from disturbance.

Regulatory Framework

Projects, such as those proposed by CalMat, require local, state and federal approvals. Over a five year period, beginning in 1989, CalMat expended over \$1.8 million to permit both the San Bernardino Facility and the Cajon Creek Project. By January 1994, CalMat had completed the local and state approval processes for both projects. This approval process included biological field investigations to determine the environmental baseline. No listed threatened or endangered species were found on the sites during these investigations. The City and County of San Bernardino had zoned the lands in the conservation area as open space. The only outstanding issues were the pending Corps' permit application for the San Bernardino Facility and a decision as to if and when such an application needed to be filed with the Corps for implementation of the Cajon Creek Project. At this time, the company was beginning to shift efforts from permitting to project development.

Sensitive Species Issues Raised by Service, Department and RARE

When CalMat was finishing processing local and state approvals, the Service wrote CalMat and alleged that the federally listed endangered plant, the Santa Ana River woolly star, was present on these sites and two other federally protected species, the endangered slender-horned spineflower and the threatened coastal California gnatcatcher, were possibly present on the site. The Service further alleged that CalMat had "taken" these species in violation of the ESA. The Department wrote a similar letter to CalMat. Based on the contents of these letters, a citizens' group known as Residents Against Rural Extinction (RARE) filed a Notice of Intent (under the federal Endangered Species Act) to sue CalMat and the Corps for violations of the Act and subsequently sued both CalMat and the Corps. CalMat disagreed with the assertions regarding the possible presence of the state and federal listed endangered plant spe-

cies on its properties and the possible presence of the threatened gnatcatcher. CalMat's position was based on the results of over four years of site specific studies and its review of other biological studies related to these species. For example, during the initial biological surveys of the two properties, the Santa Ana River woolly star had not been found. The more common chaparral woolly star, *Eriastrum densifolium* ssp. *elongatum*, was observed on the northern and southern properties. This taxonomy of the plant was confirmed by Dr. Robert Patterson, the authority on the genus *Eriastrum* (Chambers Group 1994).

This finding was supported by other evidence. In a report the State of California and federal government relied on when listing the Santa Ana River woolly-star as endangered (Zemba and Kramer 1984), a population of the Santa Ana River woolly star was reported to be located on the west side of the Lytle Creek, just south of Highland Avenue, downstream of CalMat's properties. CalMat's properties were included in this survey, but no Santa Ana River woolly stars were reported to have been found.

The identification of the woolly star population in Lytle Creek as the endangered Santa Ana River woolly star was questioned by others (Bright and Associations, 1988). Most of the woolly stars collected in Lytle Creek during earlier studies, while identified as the ssp. *sanctorum*, did not fit the description of this subspecies. This finding was also reported by Wheeler (1988). The Chambers Group also conducted a series of site specific studies during the flowering season of the plant for CalMat and compared plant morphologies from a known population of the Santa Ana River woolly stars with the woolly star plants found in Lytle Creek. This study also concluded that the endangered Santa Ana River woolly star was not present at the CalMat sites (Chambers Group 1991, 1992, and 1994)

In November 1993, the "Final Management Plan for the Santa Ana River Woolly Star, *Eriastrum densifolium* ssp. *sanctorum*" was issued by the Corps. That report noted that the Lytle Creek populations are not the same as endangered woolly star.

Because of this evidence, CalMat believed that the weight of the scientific and field survey evidence indicated conclusively that the endangered Santa Ana River woolly-star is not present at the CalMat sites. Rather, the plants present were either the non-endangered chaparral woolly star, or a hybrid, or an intermediate between the chaparral and Santa Ana River woolly star, or, possibly, a new taxon. None of these are listed as having any special status by either the state or federal Endangered Species Acts.

Resolving the Sensitive Species Issues

In spite of the scientific evidence regarding the woolly star plant on its project sites, CalMat voluntarily restricted mining activities so as not to impact the habitat areas of concern to the Service and the Department. This was done in an effort to reach a reasonable solution acceptable to the wildlife agencies and without litigation.

CalMat and the wildlife agencies "agreed to disagree" about the identification of the woolly star found on the sites. By doing this, the parties were able to move beyond the issue of the identification of one species and focus on the protecting the habitat as an ecosystem while preserving their litigative positions should this effort fail.

It was suggested by the Service that the Corps and CalMat enter into a Section 7 consultation as provided for in the Endangered Species Act as part of the permit review process. This would address impacts of the project on sensitive species should the agencies be correct in their position that the woolly star was the listed subspecies or that other listed species were present. As the agencies and CalMat begin to work together, it was also agreed that the best approach was to treat all 24 sensitive plant and wildlife species as if they were protected by the Endangered Species Act and present on the sites. CalMat agreed to enter this process, provided that it encompassed both projects and the 24 sensitive species. Furthermore, CalMat agreed that the consultation process should treat all sensitive species that could be present on the sites as if they were listed species and present and to mitigate any potential impacts appropriately. By taking this approach, CalMat assured the agencies that all impacts to sensitive species and the habitat that supported them were addressed and once addressed that the projects could go forward.

In the context of the Section 7 consultation process, CalMat repropoed the creation of the habitat conservation corridor as mitigation for impacts related to the San Bernardino Facility and the Cajon Creek Project. Because only about one-half of the habitat corridor was needed for such purposes, CalMat proposed the establishment of a mitigation bank for the remainder of the corridor that could be used by CalMat or others to offset impacts from future projects. Recognition of the conservation lands for CalMat's mitigation and the establishment of a mitigation bank were formalized in the special conditions of the Section 7 consultation and the Corps' permit.

Memoranda of Agreement (agreements) and the associated Habitat Enhancement and Management Plan (HEMP) were the implementing agreements for the habitat management area. These documents were completed and signed by the Service, Department, Corps, and CalMat in 1996. This was a positive outcome to what could have become a protracted and non-productive le-

gal battle. The 558 hectares of rare RAFSS habitat is permanently protected and CalMat continues with its mining and industrial projects.

Since the signing of the agreements and the establishment of the habitat management area, CalMat has implemented the management activities described in the HEMP to protect and conserve the resource functions and values of the habitat corridor. Several factors of note should be mentioned. From a biological perspective:

- The reclamation of the Riversidian alluvial fan sage scrub community being implemented by CalMat has been deemed to be a success by the agencies (Martha Blane and Associates 1996). The methods employed here are transferable to similar Riversidian alluvial fan sage scrub restoration projects in southern California.
- CalMat has successfully relocated San Bernardino kangaroo rats from areas to be disturbed by mining into the newly reclaimed areas. The translocated animals have not only survived but have produced young following that transfer (O'Farrell 1998).

From a businesses perspective:

- CalMat was able to avoid lengthy litigation with the agencies and the lawsuit filed against it and the agencies by the citizens' group was dismissed.
- CalMat has been able to continue working on their projects with the listing on new species, such as the San Bernardino kangaroo rat which was listed in 1998. By pre-mitigating impacts to sensitive species before they become listed, the CalMat and the agencies have been able to address and process continued compliance with the ESA in a timely manner.
- CalMat has sold the first credits from their mitigation bank. Currently, this is the only bank to offset impacts to Riversidian alluvial fan sage scrub in San Bernardino, Los Angeles and Riverside Counties.

CONCLUSIONS

From the beginning, CalMat's projects included protection of the habitat through open space designations incorporated into each project. CalMat developed a state-of-the-art restoration program for RAFSS habitat and carefully monitored and documented that this program met the agreed upon success criteria. In addition, CalMat was committed to finding a solution which addressed the agencies' concerns. These actions helped demonstrate CalMat's commitment to environmental responsibility, particularly in responding to wildlife resource agency letters alleging ESA violations. By doing so, CalMat provided economic development, new jobs and

a continued supply of construction materials to meet the region's needs.

The Cajon Creek Habitat Conservation Management Area that evolved from the dialog with the agencies is a better solution than the originally proposed plan. It offers more protections for the habitat than mere open space designation. This change protects a rare vegetation type for future generations and provides financial support for implementation of protection measures as well as providing mitigation for future projects.

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