

**Monarch Overwintering Site Management Plan for
Plaskett Creek Campground, Los Padres National Forest, CA**



Photo by Carly Voight

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SECTION 1: STATUS AND THREATS

Background

Hundreds of thousands of monarch butterflies spend the winter in groves along the coast of California every year. With a greater than 80 percent decline in monarch numbers at many of California's overwintering sites since 1997, the future of this incredible migration is at risk. Although the loss of natal sites may be the most important issue in the decline of western monarchs, scientists believe that the loss and deterioration of monarch overwintering habitat is also an important factor. In order to protect this imperiled species, these habitats must be identified, preserved, and carefully managed. This report focuses on the protection of a complex of three existing and historic monarch overwintering sites at the Plaskett Creek Campground in Los Padres National Forest.

Species Range, Distribution, Abundance, and Trends

Status of *Danaus plexippus* (monarch butterfly) on the Los Padres National Forest

Three monarch overwintering sites are known to exist on lands managed by Los Padres National Forest: Plaskett Creek Campground, Prewitt Creek, and Sycamore Canyon. A fourth potential site was identified by Xerces staff in 2012, known as the Cal Trans Grove. This site is potentially on shared land between California Department of Transportation and the US Forest Service, and ownership needs to be confirmed with GIS. Plaskett Creek Campground (Fig. 1) is the largest site on Los Padres National Forest land and is currently one of the 45 largest sites in California. The southern half of the site functions as a campground while the northern portion houses the Pacific Valley School, a K-12 school for children who live in the region.

In this report we focus on three separate groves within the Plaskett Creek Campground site complex: the current overwintering grove just south of the entrance of the campground between the campground driveway and California Highway 1, a historic overwintering grove just to the east of the campground, and what is thought to be a transient or autumnal grove between the school and Hwy 1.

Habitat Description

Monarch overwintering sites are distributed along the California coast, from Mendocino to San Diego County (Nagano and Lane 1985; Sakai and Nagano 1989). The majority of the sites are within 2.37 kilometers (about 1.5 miles) from the Pacific Ocean (Leong et al. 2004), which moderates temperature fluctuations (Chaplin and Wells 1982). Migrating monarchs are thought to select sites based on a specific set of environmental conditions. This includes protection from winds and storms, absence of freezing temperatures, exposure to dappled sunlight, and the presence of high humidity (Leong 1989; Leong et al. 1991).

Local topography and forest structure determine the microclimate within monarch overwintering habitat. Many groves exist in wind sheltered areas, such as bays, coastal inlets, deep stream beds, ravines, drainages (Leong et al. 2004), or mountain valleys (Leong 1990a). In California, monarchs have been known to cluster in groves that contain Monterey pine (*Pinus radiata*), blue gum eucalyptus (*Eucalyptus globulus*), red river gum eucalyptus (*Eucalyptus camaldulensis*), Monterey cypress (*Cupressus macrocarpa*), coast redwood (*Sequoia sempervirens*), coast live oak (*Quercus agrifolia*), western sycamore (*Platanus racemosa*), willow (*Salix* spp.), and acacias (*Acacia* spp.).

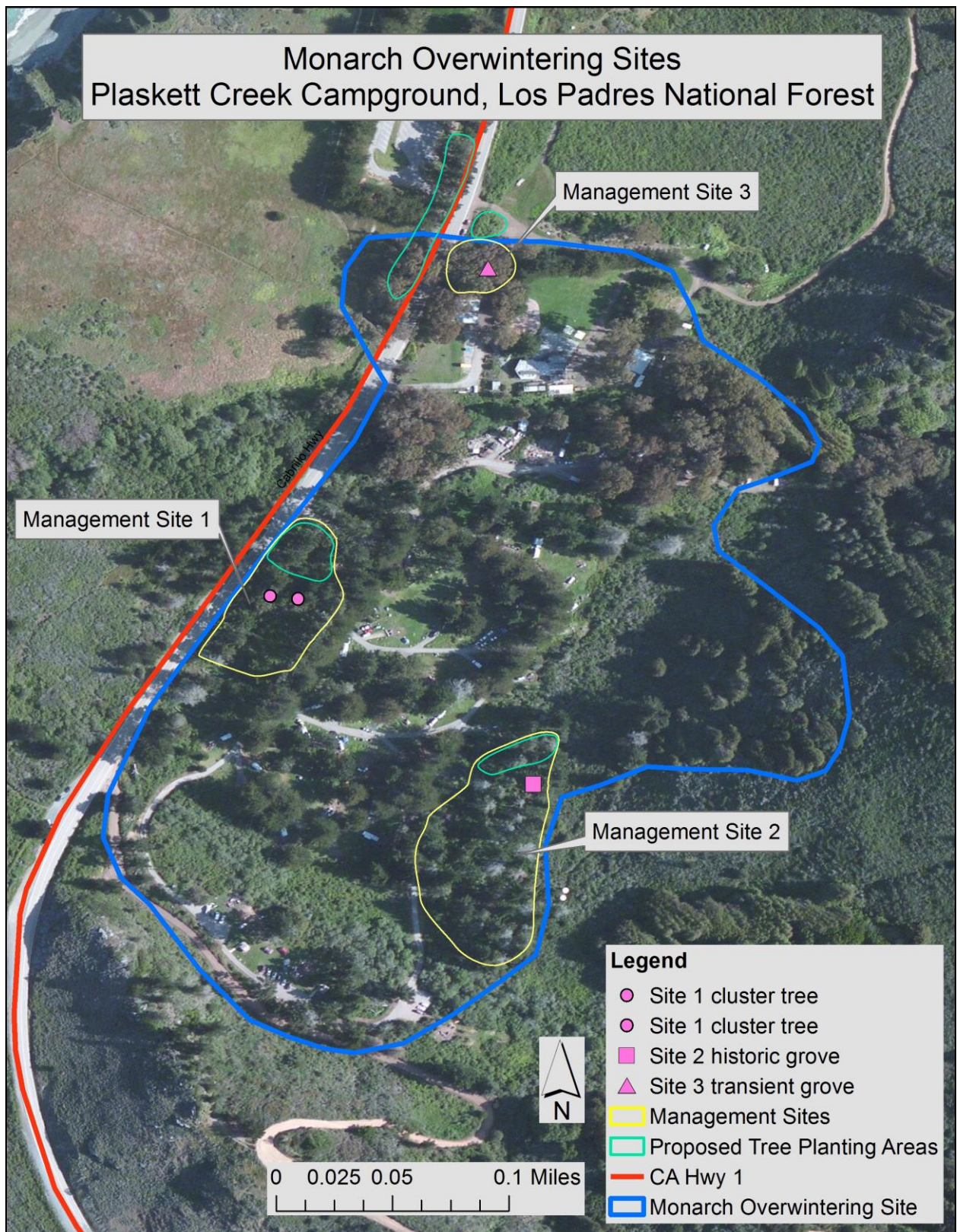


Figure 1: Monarch butterfly overwintering sites at Plaskett Creek Campground, Los Padres NF

Threats and Protection

In the western United States, the numbers of monarchs at overwintering sites have fallen by more than 80 percent at many sites since 1997 (Xerces Monarch Overwintering Database 2012). Factors impacting western monarch populations include loss of milkweed during a prolonged drought (Stevens & Frey 2004) as well as loss of milkweeds to agricultural and urban development. Pesticides, especially insecticides, may also play a role in this decline.

Pyle and Monroe (2004) suggest that the most vulnerable element of the monarch life cycle is the overwintering stage. The extent of dense groves of native trees along the California coast was historically much greater; these conifers may have hosted dense aggregations of monarchs (Lane 1984). Monarch overwintering habitat is directly threatened by urban development, and to a lesser extent, agricultural development. Habitat alterations, such as tree trimming or tree removal, or natural factors such as fire, severe storms, or disease or senescence of trees, can alter the structure and microclimate of a seasonal aggregation site and reduce its suitability for monarchs (Sakai & Calvert 1991; Commission for Environmental Cooperation 2008).

Because of the threats to western monarchs the US Forest Service has proposed that overwintering sites on Forest Service lands in the US be conferred sensitive species status. This site management plan will allow the Forest Service to take steps to manage overwintering habitat on Los Padres National Forest to protect this important resource.

SECTION 2: MANAGEMENT PLANS BY SITE

Suggested management at each overwintering site is detailed below.

Management Site 1: Current overwintering site just south of the entrance to the campground between the campground driveway and California Highway 1.

Coordinates (center of grove): N 35.92838, W -121.46752

Goal of the Site Management Plan

Sustain current monarch overwintering population through the planting of a wind buffer. Develop a plan for citizen access to view the overwintering monarchs that does not harm the site.

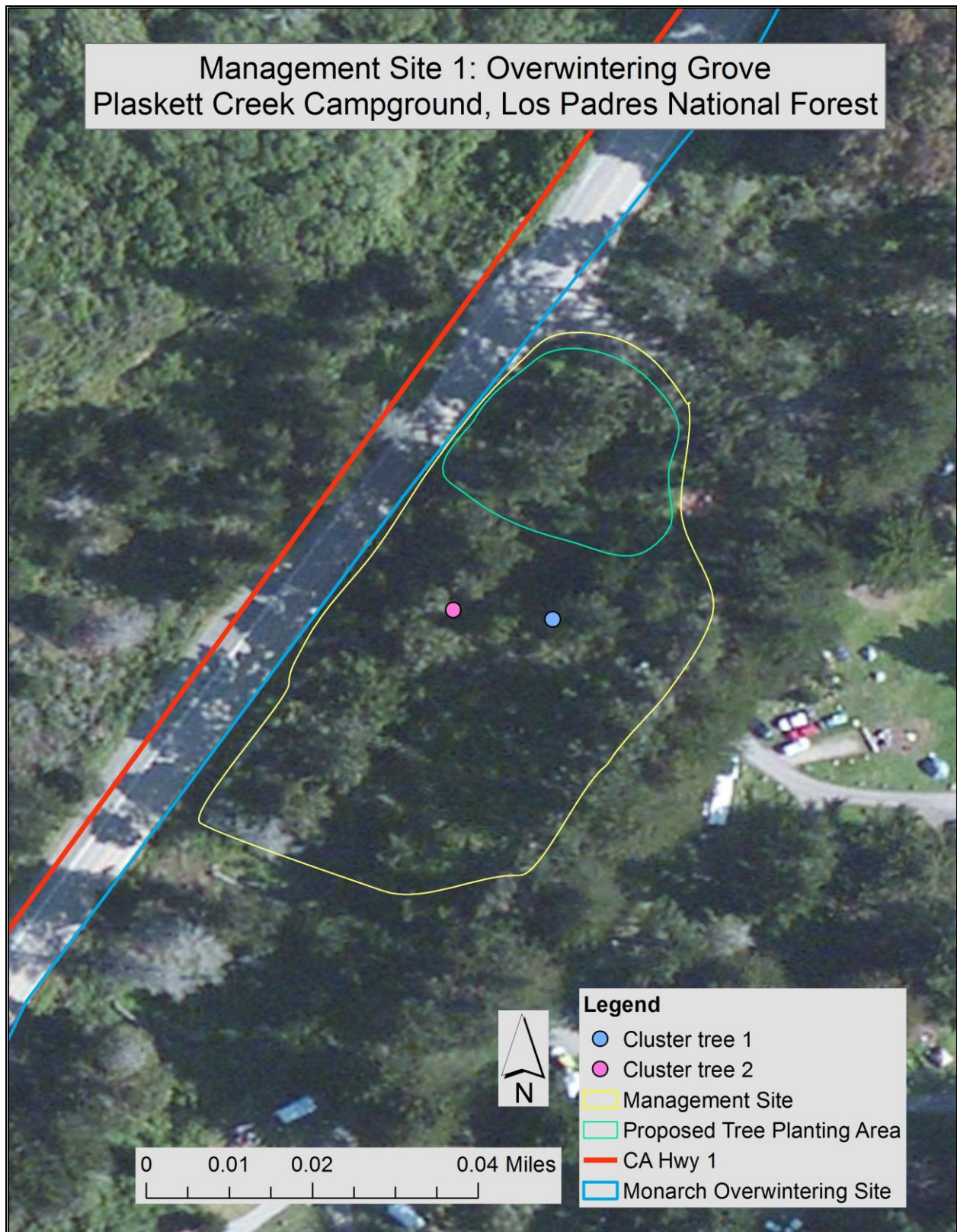


Figure 2: Management site 1 - Current overwintering grove.

Site Description

This site (Fig. 3) is located just south of the entrance to Plaskett Creek Campground, between California Highway 1 and the main campground road. There is a small stream to the north of the grove, past the entrance to the campground on the other side of the entrance road. Clusters are found here almost every year in several relatively young Monterey pine trees (*Pinus radiata*). No nectar species were in bloom during our two January 2013 visits, but species present in the understory included California blackberry (*Rubus ursinus*), hedge nettle (*Stachys* spp.), and groundsel (*Senecio* spp.).



Figure 3: Current overwintering site. Photo by Scott Hoffman Black.

Site Threats

Threats to this site include old, aging, and diseased trees both within the grove and within the trees that are part of the very important wind screen to the north and northwest of the site. Pitch canker is apparent in several of the older trees. The site is within a campground, and while the grove itself is not in close proximity to a campsite, it is potentially used by children and other campers or observers, which can impact the monarchs. The site is bordered to the west by California Highway 1, a high traffic area.

Additional threats and disturbances may include:

- The practice of raking the ground for fire hazard reduction, which can reduce ground cover needed by monarchs.
- Pavement and parking lots outside of the grove
- Possibility of overwintering trees being cut (for safety reasons)

Management Needs

Wind buffer

This site is composed of a number of aging Monterey pines, some of which are infected with pitch canker. Over time these trees will fall over or need to be removed, and other trees must take their place to preserve the viability of the grove. Wind enters this site predominantly from the north and northwest and additional wind protection in this area is a management priority. We recommend planting a buffer of mixed Monterey cypress and Monterey pine on the land just north and northwest of this site (see Fig. 4). Xerces staff or another monarch expert should flag the area where each tree should be planted. In addition, this site should be examined for natural regeneration of Monterey pines and cypress and monitored to assess the success of these younger trees to become established in a shaded understory.

Hazard tree removal

The site should be monitored for hazard trees at least every five years, with the appropriate actions taken to safely remove these trees without harm to the monarch site. Hazard trees have the potential to fall over and harm someone or take down nearby trees, including the trees that monarchs roost in, which could damage the current overwintering site. Trees should be removed during the non-overwintering months, approximately April to August, to avoid disturbing the monarchs. Xerces staff or another monarch expert should be consulted prior to removal.

Thinning

At this time we do not recommend any thinning of this site since the objective is to maintain/increase a wind block.

Interpretation

Because this active site is located within a campground, it provides an ideal interpretation opportunity. We suggest adding informative signage, a gravel viewing area, and a small fence near this grove. The monarchs are generally viewable from the interior campground road. The viewing area would need to be just large enough to accommodate several people and keep them safe from campground traffic. Xerces staff can assist in the design of signage and site-specific monarch brochures for visitors. These brochures can be kept with the camp host and distributed on request.

Management Site 2: Historic overwintering site just to the east of the campground.

Coordinates (center of grove): N 35.91722, W -121.46606

Goal of the Site Management Plan

Encourage the future use of this historic overwintering site through the planting of a wind buffer and selective thinning.

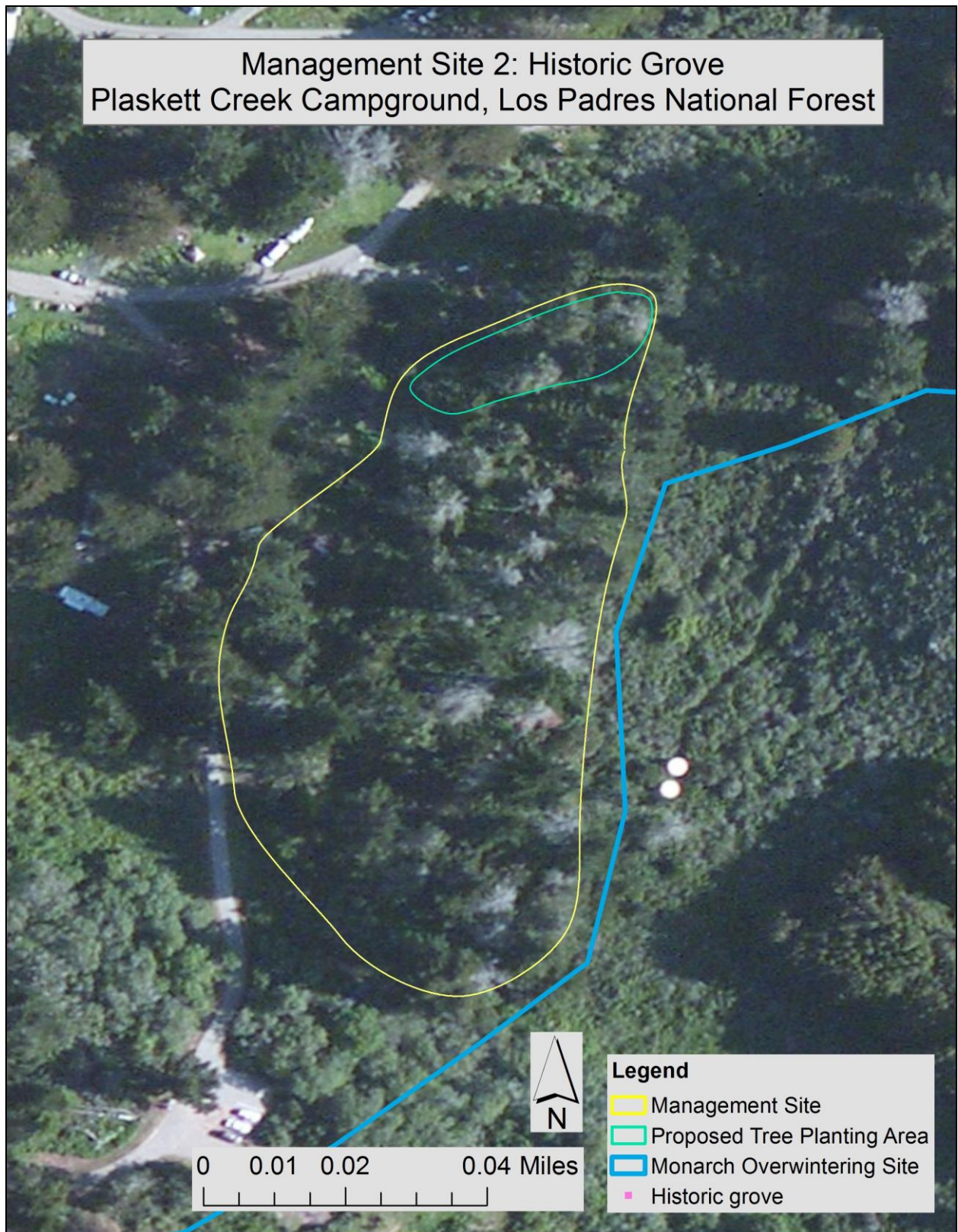


Figure 4: Management site 2 - historic overwintering grove.

Site Description

This historic grove (Fig. 5), located in the southeast section of the campground, is characterized by older Monterey pine (*Pinus radiata*) surrounding an amphitheater of new younger pines. Monterey cypress are scattered around the perimeter of the grove. There is a creek to the south of this site. Only gooseberry was in bloom during our January 2013 visits. The understory is predominantly California blackberry (*Rubus ursinus*), hedge nettle (*Stachys* spp.), coffee berry (*Rhamnus californica*), gooseberry (*Ribes* spp.), and toyon (*Heteromeles arbutifolia*). The trees here show evidence of pitch canker and many of the older trees have lost their lower branches. This has created an opening for wind from the north and northwest.



Figure 5: Historic overwintering site. Photo by Scott Hoffman Black.

Site Threats

The largest threats to this site are its aging and diseased trees. Over time these trees will fall over or need to be removed, so it is important to plant new trees to take their place. There are a number of new recruits growing up in the understory. These will need to be thinned so that the grove does not become too dense over time.

Additional threats may include:

- High visitation load by campers just outside of the grove

Management Needs

Wind buffer

This site contains a number of older trees that have lost their lower limbs. Many new Monterey pines are growing up into the space but there is a large vertical gap between these young trees and the canopies of the older trees that allows wind to enter the site. Because of this, we recommend planting a

mix of Monterey pine and Monterey cypress along the north and northwest edge of the grove. While medium to large trees would be ideal to create an immediate mid-story canopy, Xerces recognizes the expense of this endeavor and proposes instead the staggered planting of younger trees over several years to produce a multi-story canopy over time. Xerces staff or another monarch expert should flag the area where each tree should be planted.

Morning sunlight

Because the older trees are tall with gaps below the canopy (Fig. 6), some morning sunlight can enter into the grove. However, the grove could use some more light to the southeast. As the older trees on the southeast edge of the site age and die, gaps will open up for morning light. We recommend letting this happen naturally so long as it doesn't endanger campers or the future viability of the grove. Alternatively, these trees can be actively removed to allow additional sunlight to enter the grove. Xerces staff or another monarch expert should flag the trees to be removed, in consultation with the Forest Service forester.



**Figure 6: Older trees may fall to provide more sunlight.
Photo by Scott Black.**

Hazard trees

The site should be monitored every five years to identify potential hazard trees and plan appropriate removal of these trees. Trees should be removed in the summer, when overwintering monarchs are not present. Tree removal should be discussed with Xerces staff or a monarch expert.

Tree thinning

There are a number of young Monterey pines (Fig. 7) growing in the understory of this site. We recommend thinning out these younger trees that are in the center of the grove. Several trees of various ages should be left to the north and northwest to provide additional wind protection. Xerces staff or another monarch expert should mark the appropriate trees for thinning. This should be done in consultation with the appropriate Forest Service foresters.



Figure 7: Understory of young Monterey pines. Photo by Scott Black.

Fencing

Because this site is located adjacent to existing campsites, fencing may be desired to direct campers and/or hikers around this area. This option should be explored in depth particularly if this site becomes an active overwintering site in the future.

Management Site 3: Autumnal overwintering site between the school and Highway 1.

Coordinates (center of grove): N 35.92036, W -121.46633

Goal of the Site Management Plan

Sustain the use of this site as an autumnal stopover and encourage the use of this site as a climax site through the planting of a wind buffer.

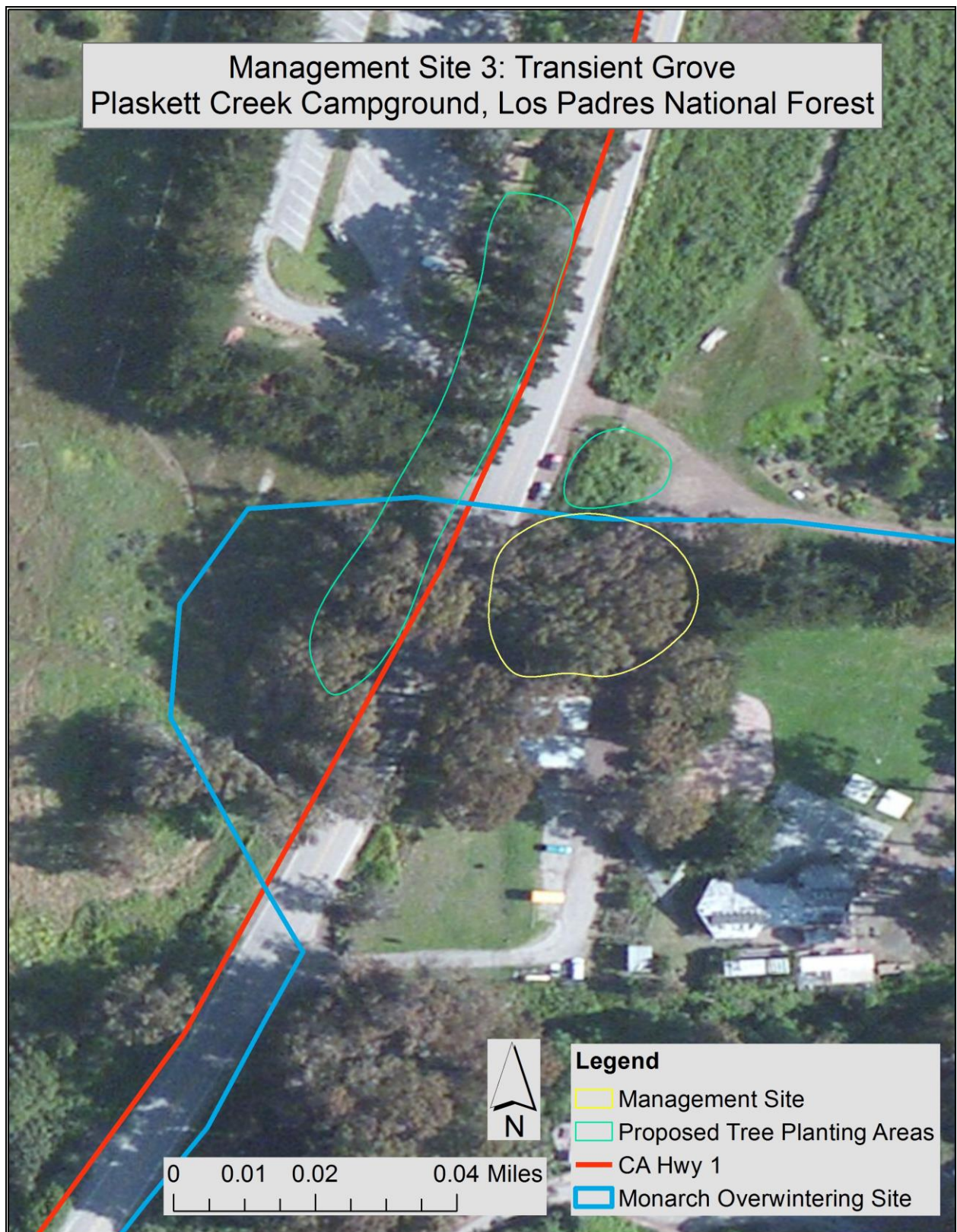


Figure 8: Management site 3 - current transient grove.

Site Description

This site (Fig. 9) is located directly adjacent to the school. It is composed of blue gum eucalyptus (*Eucalyptus globulus*), Monterey cypress (*Cupressus macrocarpa*), and Monterey pine (*Pinus radiata*), although the monarchs are usually found in the eucalyptus. A system of wetlands and native California coastal scrub lies directly to the northeast of this site, which is in the process of being restored. No nectar species were in bloom during our January 11, 2013, site visit; however, *Vinca major* and *Oxalis* spp. were both in bloom during our January 24, 2013, visit. A school garden to the northeast may provide some additional early season nectar.



Figure 9: Current autumnal site. Photo by Scott Hoffman Black.

Site Threats

This site is located next to Pacific Valley School, a K-12 school. It is located just to the east of California Highway 1 and has a smaller access road running through it.

Additional disturbances include:

- Cut trees
- Paved surfaces, including roads and a parking lot
- Several school buildings

Management Needs

Wind buffer

This site is also open to the north and northwest and needs additional trees to act as a wind buffer. We recommend planting new trees across the road (Fig. 10), by the picnic area and parking lot, to accomplish this. These trees should be a mix of Monterey cypress and Monterey pine. One or two Monterey cypress and Monterey pine trees could be planted between the eucalyptus and the service road as well (see Fig. 8). In addition, directly across Highway 1 from the site, several trees could be planted in between the eucalyptus that is currently there.



Figure 10: Additional trees can be planted across Hwy 1 to provide a wind buffer.
Photo by Scott Hoffman Black.

Section 3: Next Steps

- 1) FS: Complete the necessary paperwork and NEPA for the activities outlined in this report.
- 2) Xerces: Complete a floral resources plan for the site, including documentation of current resources and a plan for planting additional native nectar species.

Literature Cited

- Chaplin, S.B. and P.H. Wells. 1982. Energy reserves and metabolic expenditures of monarch butterflies overwintering in southern California. *Ecological Entomology*. 7:249-256.
- Commission for Environmental Cooperation. 2008. North American Monarch Conservation Plan. CEC Office of the Secretariat. Montreal, Canada.
- Lane, J. 1984. The status of monarch butterfly overwintering sites in Alta California. *J. Alta*. 9:17-20.
- Leong, K.L.H. 1989. Final report: monarch lane butterfly survey.
- Leong, K.L.H. 1990. Microenvironmental factors associated with the winter habitat of the monarch butterfly (Lepidoptera: Danaidae) in Central California. *Annals of the Entomological Society of America* 83:907-910.
- Leong, K.L.H., D.F. Frey, A. Brenner, S. Baker, and D. Fox. 1991. The use of multivariate analyses to characterize the monarch butterfly (Lepidoptera: Danaidae) winter habitat. *Annals of the Entomological Society of America* 84:263-267.
- Leong, K.L.H., W.H. Sakai, W. Bremer, D. Fauerstein, and G. Yoshimura. 2004. Analysis of the pattern of distribution and abundance of monarch overwintering sites along the California coastline. Pages 177-185 *In* K. Oberhauser and M. Solensky, editors. *The Monarch Butterfly: Biology and Conservation*. Cornell University Press, Ithaca, NY.
- Nagano, C. and J. Lane. 1985. A survey of the location of monarch butterfly (*Danaus plexippus* [L.]) overwintering roosts in the state of California, U.S.A: First year 1984/1985. Report to the World Wildlife Fund - U.S. WWF-US grant #US-374.
- Sakai, W., C. Nagano, et al. 1989. The wintering colonies of the monarch butterfly (*Danaus plexippus* L. Nymphalidae: Lepidoptera) in the state of California, USA. Sacramento, CA, California Department of Fish and Game.
- Sakai, W.H., and W.C. Calvert. 1991. Statewide monarch butterfly management plan for the state of California Department of Parks and Recreation. Final Report, June 1991. Interagency Agreement No. 88-11-050 between California Department of Parks and Recreation and Santa Monica College. 160 pp.
- Stevens, S. and D. Frey. 2004. How the other half lives: monarch population trends west of the great divide. Biological Sciences Department, California Polytechnic State University. Unpublished report. 7pp.
- Xerces Society Database of Western Monarch Overwintering Locations. 2012. The Xerces Society for Invertebrate Conservation.