



January 4, 2023

Sibley Simon
Envision I, LLC
189 Walnut Ave
Santa Cruz, CA 95060

Subject: Follow-up (Winter 2022) Monarch Butterflies Surveys of Peace United Church Property (APN 001-022-40), Santa Cruz, CA.

Dear Mr. Simon,

EcoSystems West Consulting Group (EcoSystems West) is providing this letter-report regarding monarch butterfly surveys of the Peace United Church property (APN 001-022-40) located at 900 High Street in the City of Santa Cruz. A follow-up survey of monarch butterfly habitat was conducted to determine if monarchs occupied the eucalyptus grove on site during the winter of 2022/23. EcoSystems West conducted a survey during the peak roosting period as described below. Visits to nearby monarch roosting reference sites were also conducted at Natural Bridges and Lighthouse Field State Parks. This letter report summarizes our findings.

METHODS

EcoSystems West conducted a follow-up monarch winter roost survey of the Peace United Church property and suitable habitat within approximately ¼ mile. Monarchs arrive at overwintering sites in late September and the first half of October to form fall aggregations. By mid-November they form more stable aggregations, which persist through January or February (Pelton et al. 2016). An EcoSystems West biologist identified the arrival time of migrating monarchs, based on their presence at known roost sites in the area. We tracked the formation of autumnal and winter roosts to determine the timing of stable winter roosts in the region and reviewed current and recent data for the area on roost formation. We conducted a follow-up survey on December 17, 2022, timed accordingly to determine if the site was being utilized by monarchs as a winter roost site. No autumnal roost survey was conducted in 2022.

Monarchs typically emerge from a state of nocturnal torpor and begin to fly at temperatures around 55° Fahrenheit. Below this temperature, monarchs are unable to fly and are often killed or injured if dislodged from their roosts. A monarch roost site consists of the trees upon which the butterflies cluster, as well as the surrounding trees that provide wind protection. In addition, overwintering habitat includes nectar plants and water sources surrounding the roost site, since monarchs may fly some distance to obtain these resources (Pelton et al. 2016, Griffiths and Villablanca 2015).

EcoSystems West conducted a morning survey of the eucalyptus groves when temperatures were below 55° to determine if the site was being used for roosting, or as wind protection for nearby roost sites. The biologist used binoculars to conduct a throughout ocular search for aggregate clumps of butterflies hanging from the undersides of leaves and count the number of butterflies, if present. After temperatures increased to above 55°, EcoSystems West searched for flying or sunning monarchs and identified nectaries being used by monarchs, if present.

MONARCH BUTTERFLY

The monarch butterfly (*Danaus plexippus plexippus*) is a candidate for listing under the FESA (USFWS 2023). On July 21, 2022, the International Union for Conservation of Nature (IUCN) listed the monarch as Endangered (IUCN 2022). Winter roost sites of the monarch butterfly are listed by NatureServe as imperiled/vulnerable (S2/S3) within California (CNDDDB 2022). In the City of Santa Cruz 2030 General Plan, the monarch butterfly is identified as a special-status species in Natural Resources and Conservation 2.4.1 and in Table 1, which lists avoidance and minimization measures (City of Santa Cruz 2012). The City of Santa Cruz also identifies the overwintering habitat of the monarch as a sensitive habitat area (City of Santa Cruz 2012). The overwintering monarch population has seen an overall decline of 99% in coastal California (Xerces Society 2020) and of 74% in less than the last 20 years (IELP and Xeres Society 2012, Pelton et al. 2016).

The life history of the monarch butterfly can be divided into two temporally defined periods: a spring/summer reproductive period and a fall/winter non-reproductive (wintering) period. During the spring and summer, monarchs exploit the widely distributed North American milkweed flora (*Asclepias* spp.) as food for their larvae. In the fall, the adult butterflies that are produced during the latter part of summer migrate to wintering habitats in coastal California or central Mexico to spend the winter months. Monarchs spend from 1 to 9 months as adults, depending on when they become reproductive. If they become reproductive immediately, they live 1 to 2 months as adults. Monarch adults that emerge from August through October typically migrate and overwinter before becoming reproductive the following spring. These monarchs live approximately 8 to 9 months as adults.

The monarch butterfly utilizes eucalyptus, Monterey pine, or Monterey cypress tree groves for winter roost sites, typically within 1.5 miles (2.4 kilometers) of the Pacific Ocean. Monarchs form aggregations on the underside of peripheral branches. The suitability of the stand is determined by both abiotic and biotic factors including:

- periodic exposure to (dappled) sunlight (often southeast aspect);
- cool shady roost areas for periods of warm weather;
- primary and secondary wind protection;
- proximity to nectaries (fall or winter blooming flowers);
- humidity; and
- water sources.

Winter roost sites are sufficiently heterogeneous to permit localized shifts of roost location in accord with prevailing weather conditions and seasonal variation in insulation. The grove of eucalyptus trees within the Study Area is located approximately 1.8 miles from the coast, just over the typical distance of winter roost sites. This grove consists of mature trees that lack lower, spreading limbs and most likely lack sufficient wind protection to serve as primary winter roost habitat; however, these trees may serve as buffer trees for the groves located to the northeast where monarchs were observed during autumnal surveys. Kalkar Quarry and Westlake Pond provide nearby water sources; the landscaped areas and grassland of the Study Area provide marginal nectaring habitat. Autumnal and overwintering monarch roosts are known to occur in the eucalyptus grove at Home of Peace Cemetery approximately 0.5 miles southwest of the Study Area.

Follow-up Monarch Butterfly Winter Roost Survey of the Peace United Church Property

RESULTS

On the morning of December 17, 2022, the temperature ranged from 41.1 to 57.4 degrees F with a light WNW wind averaging 3.1 mph. No monarchs were observed roosting, flying or sunning. Prior to visiting the site (earlier that morning), the biologist observed more than 1,000 monarchs clustering in Lighthouse Field and Natural Bridges State Beach.

DISCUSSION

The Study Area provides marginal habitat for the following reasons:

- The grove's location is further from the coast than typical winter roost sites;
- The grove is positioned on the second marine terrace that is more exposed to prevailing winds; and
- The grove lacks preferred habitat features, in that the grove consists of mature trees that lack lower, spreading limbs and most likely lack sufficient wind protection to serve as primary winter roost habitat.

It is unlikely that monarchs would select the marginal habitat of the eucalyptus groves on the Peace United Church property as a winter roost site in the near future. These trees may serve as buffer trees for the groves located to the northeast, for transitory autumnal roosts.

CONCLUSION

Wintering monarchs are presumed absent from the Peace United Church property and no additional surveys are recommended for the site. To avoid potential impacts to autumnal roosting monarch butterflies that may be present near the property, conduct tree removal outside of the autumnal roosting period (typically September 15 – November 15).

Please let us know if you have any questions.

Sincerely,

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