

# S1: Golden Gate National Recreation Area CPP Monitoring Guide

Version 1 (June 2013)

## Revision History Log:

Version #	Revision Date	Author	Changes Made	Reason for Change

***Phenological monitoring guide:  
Golden Gate National Recreation Area***

A designated monitoring site of  
The California Phenology Project



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# I. Introduction

*Phenology* is the study of the timing of seasonal biological events such as the flowering and fruiting of plants; the annual emergence of insect pollinators and pests; and the migration of birds and mammals. With funding from the National Park Service (NPS) Climate Change Response Program, the **California Phenology Project (CPP)**; [www.usanpn.org/cpp](http://www.usanpn.org/cpp) was launched in 2010 as a pilot project to develop and test protocols and to create tools and infrastructure to support long-term phenological monitoring and public education activities in California's national parks. On-the-ground pilot activities focused on seven California parks: Joshua Tree National Park (JOTR), Santa Monica Mountains National Recreation Area (SAMO), Golden Gate National Recreation Area (GOGA), John Muir National Historic Site (JOMU), Lassen Volcanic National Park (LAVO), Sequoia and Kings Canyon National Parks (SEKI), and Redwood National Park (REDW).

The goals of the *California Phenology Project* are to: (1) recruit and to train NPS staff in the Divisions of Resource Management, Education, and Interpretation; formal and informal educators; students; and the public in the skills needed for recording and interpreting phenological data; (2) establish baseline phenological patterns and track long-term phenological trends to document the effects of climate change on wild plants and animals; and (3) guide adaptive management of California's natural resources. For a detailed description of the CPP's scientific goals, please refer to the *Plant Phenology Monitoring Protocol*.

Products of the pilot period include a *Plant Phenology Monitoring Protocol* (with step-by-step instructions for conducting monitoring) and *park-specific monitoring guides* for each of the seven pilot parks. The material in this monitoring guide is meant to serve as a reference for CPP participants who are observing plants at **Golden Gate National Recreation Area (GOGA)**. It identifies and describes all of the CPP and USA-NPN resources that observers will need to start monitoring plants at GOGA (e.g., USA-NPN datasheets, GOGA monitoring sites and locations, and CPP species profiles). This guide, however, is not meant to replace participation in an official training event, nor is it meant to provide detailed background information about phenology and the USA-NPN monitoring protocols. Please refer to the *Plant Phenology Monitoring Protocol* for detailed monitoring instructions. For more information about the USA-NPN monitoring protocols, visit the USA-NPN's *How to Observe* webpage (<http://www.usanpn.org/how-observe>). To learn more about phenology, visit the CPP ([www.usanpn.org/cpp](http://www.usanpn.org/cpp)) and USA-NPN websites ([www.usanpn.org](http://www.usanpn.org)), where you can download newsletters, project briefs, presentations, and more (<http://www.usanpn.org/cpp/resources>).

## II. Points of Contact

### CPP contacts at GOGA:

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For volunteer opportunities regarding phenology research, including data collection or individual projects, please visit <http://www.volunteer.gov/gov/results.cfm?ID=12477> and fill out the volunteer application available at the end of that web page.

### Other CPP contacts:

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### III. CPP Species Monitored at GOGA

There are **five** species targeted for monitoring at Golden Gate NRA: California live oak (*Quercus agrifolia*), California poppy (*Eschscholzia californica*), common cowparsnip (*Heracleum maximum*), coyotebrush (*Baccharis pilularis*), and sticky monkeyflower (*Diplacus aurantiacus*).

Two-sided CPP species profile cards for each species are available for download from the CPP website (front and back images are also included below): <http://www.usanpn.org/cpp/AllSpecies>. The species profiles include a brief description of each species, as well as photos for most phenophases. Please note that some profiles are missing photos of observed phenophases - we encourage CPP participants to continue collecting photos and updating the species profiles.

Table 1. CPP species monitored at GOGA.

<b>Common name</b>	<b>Latin name</b>	<b>Nature's Notebook Category</b>	<b>Parks</b>
California live oak	<i>Quercus agrifolia</i>	Broadleaf Evergreen Trees & Shrubs (with pollen)	GOGA; SAMO
California poppy	<i>Eschscholzia californica</i>	Forbs	GOGA
Common cowparsnip	<i>Heracleum maximum</i>	Forbs	GOGA; REDW
Coyotebrush	<i>Baccharis pilularis</i>	Broadleaf Evergreen Trees & Shrubs (with pollen, no leaf buds)	GOGA; SAMO; REDW; JOMU
Sticky monkeyflower	<i>Diplacus aurantiacus</i>	Semi-deciduous Trees & Shrubs	GOGA

To see the complete list of CPP focal species, please visit <http://www.usanpn.org/cpp/AllSpecies>

A brief description of the five species targeted for monitoring at GOGA is provided below.

### 3.1 California live oak (*Quercus agrifolia*)

- CPP four letter code : **QUAG**
- Download the USA-NPN datasheet and the CPP profile for QUAG here: (<http://www.usanpn.org/cpp/QUAG>)
- California live oak is a perennial species in the Beech family and is a dominant tree in the lower-elevation mixed evergreen woodlands of California. It blooms from March through May and the flowers are monoecious, meaning both male and female flowers occur on the same tree. This species is easy to identify and has potential for exploring interactions with co-evolved insects (e.g., moths and caterpillars). It is a species of management concern for a variety of reasons, including the spread of sudden oak death (SOD), predicted range shifts (e.g., models predict range expansion in some coastal National Park units, such as Point Reyes), and its importance to wildlife (e.g., coast live oak communities support many bird species, including two federally endangered species, [Bell's vireo and least tern]). This oak is currently monitored at Golden Gate NRA, Santa Monica Mountains NRA, and John Muir NHS.

Table 2. Count of live oak individuals monitored at each GOGA location and site.

MARIN HEADLANDS (OLBU)		PRESIDIO (LDML)		MORI POINT (MORI)	
Site name	Count	Site name	Count	Site name	Count
OLBU 1	0	LDML 1	0	MORI 1	0
OLBU 2	0	LDML 2	1	MORI 2	0
OLBU 3	0	LDML 3	0	MORI 3	0
OLBU 4	0	LDML 4	1	MORI 4	0
OLBU 5	0	LDML 5	<i>future site</i>	MORI 5	0
OLBU 6	0	LDML 6	<i>not active</i>	MORI 6	0
		LDML 7	2		
		LDML 8	2		
		LDML 9	2		
<b>TOTAL:</b>	0		8		0

California live oak, *Quercus agrifolia*, species profile (Version 2; March 2012):

**California Phenology Project:**  
species profile for  
**California Live Oak**  
(*Quercus agrifolia*)



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**CPP site(s) where this species is monitored:** Golden Gate National Recreation Area, Santa Monica Mountains National Recreation Area



Photo credit: randomtruth (Flickr)

**What does this species look like?**  
This large evergreen tree has a dark grey, stout, short trunk and wide spreading branches. The leathery leaves are shiny on the upper surface and dull on the lower surface, which is covered with fuzzy hairs. The leaf margins are spiny and holly-like. The individuals are monoecious; each tree bears both male and female flowers but the male flowers produce only anthers and the female flowers produce only pistils. The yellow-green male flowers are clustered in elongated, drooping catkins that are 4-10 cm long, and the female flowers are clustered in reddish green spikes.

**When monitoring this species, use the USA-NPN broadleaf evergreen (with pollen) trees and shrubs datasheet.**

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**Species facts!**

- The CPP four letter code for this species is QUAG.
- This oak is very fire resistant. Adaptations to fire include evergreen leaves, thick bark, and the ability to sprout post-fire from the roots, trunk, and upper crown.
- Individuals can live up to 250 years.
- Susceptible to Sudden Oak Death disease.
- Wind pollinated.
- Each acorn takes a full year to develop from a pollinated flower.



Photo credit: randomtruth (Flickr)

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Photo credit: Jerry Kirkhart (Flickr)

**Where is this species found?**

- In valleys, slopes, mixed-evergreen forest, and woodlands at elevations less than 1500 meters.
- Endemic to California; found in North Coast Ranges, Central Western California, and SW California.
- Occurs on soils ranging from silts and clays to weathered granite.

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For more information about phenology and the California Phenology Project (CPP), please visit the CPP website ([www.usanpn.org/cpp](http://www.usanpn.org/cpp)) and the USA-NPN website ([www.usanpn.org](http://www.usanpn.org))

Version 2, March 2012

**California Phenology Project:**  
species profile for  
**California Live Oak**  
(*Quercus agrifolia*)



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Crystal Anderson

**Breaking leaf buds**  
This phenophase can be difficult for this species; remember, you can circle ? if you are unsure of what you are seeing!



Crystal Anderson

**Young leaves**  
Young leaves are generally thinner and lighter colored than mature leaves.



Crystal Anderson

**Flowers or flower buds**  
The male inflorescence is a catkin, which is initially compact and stiff, but eventually unfolds, lengthens, and hangs loosely from the branch. Female flowers are very small and petal-less, emerging from the growing stem at the point where a new leaf is attached.



Bri Weldon

**Open flowers**  
The male flowers will open once the compact catkin has unfolded and is hanging loosely. Female flowers are open when the pistils are visible, but will be very difficult to see where they are out of reach.



Ralph Waycott

**Fruits**  
The fruit is an acorn that changes from green to light brown.



Ralph Waycott

**Ripe fruits**  
The fruit is ripe when it is light brown and drops from the plant. Since fruits (acorns) drop from the plant when ripe, do not observe the Ripe Fruits phenophase for this species. (Leave this line on the datasheet blank.)

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**Important Note:** NPN flower and fruit phenophases are nested. If you say "Y" to "open flowers" you should also have said "Y" to "flowers or flower buds" and if you say "Y" to "ripe fruits" you should also have said "Y" to "fruits"

Instead of recording ripe fruits, observe **Recent fruit or seed drop** (as pictured above).

Phenophase not pictured: **Pollen release**

Version 2, March 2012

### 3.2 California Poppy (*Eschscholzia californica*)

- CPP four letter code: **ESCA**
- Download the USA-NPN datasheet and the CPP profile for ESCA here: <http://www.usanpn.org/cpp/ESCA>
- California poppy is in the Poppy family and can be annual or perennial.
- The flowers typically bloom from February through October, but the peak is often in March through May.
- The genus is named after Dr. Johann - Friederich Eschscholtz, a Russian medical doctor who was one of the first scientists to explore California in 1816. The California poppy was scientifically named from a specimen that Eschscholtz collected at the Presidio of San Francisco on that expedition.
- The fruit is a long, slender pod that dries from green to tan or light brown, and splits open, shooting tiny round black seeds. Poppy seeds and seed banks can lay dormant underground for many years. During a heavy rain period, the seeds rapidly germinate and prolific poppy bloom may create a carpet of “gold” on California hills. This species is only being monitored in the Golden Gate NRA. However, due to gopher herbivory, the number of poppies being monitored in this park has declined.

Table 3. Number of individuals being monitored (per location and site)

MARIN HEADLANDS (OLBU)		PRESIDIO (LDML)		MORI POINT (MORI)	
Site name	Count	Site name	Count	Site name	Count
OLBU 1	0	LDML 1	0	MORI 1	3
OLBU 2	0	LDML 2	0	MORI 2	0
OLBU 3	0	LDML 3	0	MORI 3	0
OLBU 4	0	LDML 4	0	MORI 4	0
OLBU 5	0	LDML 5	<i>future site</i>	MORI 5	3
OLBU 6	0	LDML 6	<i>not active</i>	MORI 6	0
		LDML 7	0		
		LDML 8	0		
		LDML 9	0		
<b>TOTAL:</b>	0		0		6

California poppy, *Eschscholzia californica* species profile (Version 2; March 2012):

**California Phenology Project:**  
species profile for  
**California Poppy**  
(*Eschscholzia californica*)



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CPP site(s) where this species is monitored: Golden Gate National Recreation Area



Photo credit: Vslon (Wikipedia)

**What does this species look like?**

This herbaceous plant is an annual (but occasionally perennial) in habit and grows up to 60 centimeters in height. The blue-green leaves are subdivided into long segments. The flowers have four petals and range in color from yellow to orange. They are bisexual, having both male and female parts within each flower. The petals close at night and in cold or windy weather.

*When monitoring this species, use the USA-NPN forbs datasheet.*

**Species facts!**

- The CPP four letter code for this species is **ESCA**.
- The official state flower of California; April 6<sup>th</sup> is California Poppy Day.
- Although considered toxic, Native Americans used the roots and leaves for pain relief and the leaves for food.
- California Poppy is primarily pollinated by honeybees, bumblebees, and solitary bees, although it is visited by a large variety of insects.



Photo credit: Brian (PYHOOYA, Flickr)

**Where is this species found?**

- Found in grassy, open, and desert habitats.
- Grows well in disturbed areas.
- Found in sites with well drained soil.
- Occurs at elevations between 0-2000 meters.
- Ranges from Southern Washington to Baja California.



Photo credit: Brian Michelsen (Flickr)

For more information about phenology and the California Phenology Project (CPP), please visit the CPP website ([www.usanpn.org/cpp](http://www.usanpn.org/cpp)) and the USA-NPN website ([www.usanpn.org](http://www.usanpn.org))

Version 2, March 2012

**California Phenology Project:**  
species profile for  
**California Poppy**  
(*Eschscholzia californica*)



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Cindy Roessler

**Initial growth**

Look for cotyledons that appear with germination, before the first leaves unfold.



nociveglia

**Leaves**

Each leaf is divided into long thin sections.



nakae

**Flowers or flower buds**

Flowers of this species appear singly; count individual flowers when measuring abundance. Because the flowers close when the air is cool, it can be difficult to distinguish un-open from open flowers on cool days or evenings.



Liz Matthews

**Open flowers**

These flowers have both male and female parts. **Note:** flower phenophases are nested; if you record Y for "open flowers" you should also record Y to "flowers or flower buds"



Cindy Roessler

**Fruits**

The fruit is a capsule; changes from green to tan or brown; and then splits open at its base.



Photo credit: Brian (PYHOOYA, Flickr)

**Ripe fruits**

The fruit is ripe when it splits open at its base. **Note:** fruit phenophases are nested; if you record Y for "ripe fruits" you should also record Y to "fruits".

Phenophases not pictured: **Recent fruit or seed drop**

Version 2, March 2012

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### 3.3 Common cowparsnip (*Heracleum maximum*)

- CPP four letter code: HELA (Species formerly named *Heracleum lanatum*).
- Download the USA-NPN datasheet and the CPP profile for HELA here: <http://www.usanpn.org/cpp/HELA>
- Cowparsnip is a perennial herbaceous plant in the Carrot family.
- It typically blooms from February through September.
- Cowparsnip can be found in woodlands, forest openings, grasslands, riparian areas (wet meadows, stream terraces, floodplains, stream and lake margins).
- This species is the only member of the genus *Heracleum* native to North America. It has a wide distribution across the country but is listed as endangered in Kentucky and a species of special concern in Tennessee.
- The plant attracts birds and butterflies, especially the larvae of the Anise swallowtail butterfly.

Table 64 Count of cowparsnip individuals monitored at each location and site.

MARIN HEADLANDS (OLBU)		PRESIDIO (LDML)		MORI POINT (MORI)	
Site name	Count	Site name	Count	Site name	Count
OLBU 1	3	LDML 1	0	MORI 1	0
OLBU 2	0	LDML 2	0	MORI 2	1
OLBU 3	0	LDML 3	0	MORI 3	0
OLBU 4	0	LDML 4	0	MORI 4	0
OLBU 5	0	LDML 5	<i>future site</i>	MORI 5	0
OLBU 6	0	LDML 6	<i>not active</i>	MORI 6	0
		LDML 7	0		
		LDML 8	2		
		LDML 9	1		
<b>TOTAL:</b>	3		3		1

## Common cowparsnip, *Heracleum maximum* species profile (Version 2; March 2012):

California Phenology Project:  
species profile for  
**Common Cowparsnip**  
(*Heracleum maximum*)



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CPP site(s) where this species is monitored: Golden Gate National Recreation Area, Redwood National Park



Photo credit: Jerry Oldenettel (Flickr)

**What does this species look like?**  
Common cow parsnip is a perennial, herbaceous plant growing 3 to 10 feet tall. The large broad leaves are lobed and it has thick, hairy stems. On an individual plant, the small white flowers either have both male and female parts or have only male parts. Flowers are grouped into small clusters that are assembled into larger, showier, flat-topped clusters that resemble umbrellas. This is a type of compound inflorescence called an "umbel".

When monitoring this species, use the USA-NPN forbs datasheet.

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**Species facts!**

- The CPP for letter code for this species is **HELA** (this species was formerly named *Heracleum lanatum*).
- In the carrot family, Apiaceae.
- This species is phototoxic; meaning when compounds are exposed to photons and come into contact with skin they react to cause a rash.
- Common cowparsnip was used by Native Americans for food and medicine; the toxic effects were reduced avoided by peeling the stalks, and selecting the youngest growth.



Photo credit: Jerry Oldenettel (Flickr)

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Photo credit: James Gaither (Flickr)

**Where is this species found?**

- In moist to semi-wet, well-drained soils.
- Prefers loam and sandy loam soils and clay and gravelly substrates.
- Found in woodlands, forest openings, grasslands, and riparian areas.
- Found at elevations less than 2900 meters (Note: according to the Jepson manual).

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For more information about phenology and the California Phenology Project (CPP), please visit the CPP website ([www.usanpn.org/cpp](http://www.usanpn.org/cpp)) and the USA-NPN website ([www.usanpn.org](http://www.usanpn.org))

Version 2, March 2012

California Phenology Project:  
species profile for  
**Common Cowparsnip**  
(*Heracleum maximum*)



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Initial growth



Leaves

Miguel Miera

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Flowers or flower buds

When monitoring flower or flower bud abundance for this species, count each inflorescence as a single flowering structure! For example, if there are two inflorescences with many flowers or buds each, then abundance should be recorded as <3.

Brian Haggerty



Open flowers

Each small flower typically has both male and female parts; many small flowers make up each cluster. Proportion of open flowers should be recorded at the scale of individual flowers, not inflorescences (i.e. count individual flowers!).

Brian Haggerty

Note: flower phenophases are nested; if you record Y for "open flowers" you should also record Y for "flowers or flower buds"

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Fruits

The fruit is a tiny flattened capsule that changes from green to light-green, white, tan, or brown and displaying four conspicuous vertical purple lines.

Steven Krause



Ripe fruits

The fruit is ripe when it is dry and light-green, white, tan, or brown, and displaying four conspicuous vertical purple lines. Note: fruit phenophases are nested; if you record Y for "ripe fruits" you should also record Y to "fruits"

Brian Haggerty

Phenophases not pictured: Recent fruit or seed drop

Version 2, March 2012

### 3.4 Coyotebrush (*Baccharis pilularis*)

- CPP four letter code – BAPI
- Download the USA-NPN datasheet and the CPP profile for BAPI here: <http://www.usanpn.org/cpp/BAPI>
- Coyotebrush is a perennial shrub in the Aster family that is widespread and common in coastal California vegetation types. It flowers from July through October, so it is a nice choice for CPP participants who want to monitor at that time of the year.
- Coyotebrush is dioecious where each individual plant has flowers with either all male or female parts; and BAPI observations might be used to explore how dioecious species respond to climate change. It is also considered an important "nursery" plant to species palatable to deer (e.g., allows oaks to grow above the browse line when oaks "hide" in coyote brush).
- Coyotebrush is widespread on California's public lands and is currently monitored at: Redwood National Park, Golden Gate NRA, John Muir NHS, and Santa Monica Mountains NRA.

Table 5. Count of coyotebrush individuals monitored at each GOGA location and site.

MARIN HEADLANDS (OLBU)		PRESIDIO (LDML)		MORI POINT (MORI)	
Site name	Count	Site name	Count	Site name	Count
OLBU 1	3	LDML 1	3	MORI 1	4
OLBU 2	3	LDML 2	4	MORI 2	3
OLBU 3	3	LDML 3	4	MORI 3	3
OLBU 4	3	LDML 4	3	MORI 4	0
OLBU 5	3	LDML 5	<i>future site</i>	MORI 5	2
OLBU 6	3	LDML 6	<i>not active</i>	MORI 6	3
		LDML 7	0		
		LDML 8	1		
		LDML 9	3		
TOTAL:	18		18		15

Coyotebrush, *Baccharis pilularis*, species profile (Version 2; March 2012):

**California Phenology Project:**  
species profile for  
**Coyotebrush**  
(*Baccharis pilularis*)



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**CPP site(s) where this species is monitored:** Golden Gate National Recreation Area, Redwood National Park, Santa Monica Mountains National Recreation Area



Photo credit: stonebird (Flickr)

**What does this species look like?**

This shrub can be up to three meters tall. The leaves are toothed, oval, and sticky. Coyotebrush is dioecious, meaning that each plant either produces flowers with only male parts or with only female parts. The male flowers produce yellow pollen and appear yellowish from a distance, and the female flowers produce fruit and are white. The flower heads appear round and disc-like.

*When monitoring this species, use the USA-NPN broadleaf evergreen (with pollen, no leaf buds) trees and shrubs datasheet.*

**Species facts!**

- The CPP four letter code for this species is BAPI.
- BAPI is a member of the sunflower family (Asteraceae).
- This species arrives as a secondary pioneer species after fire or grazing.
- *Baccharis* derives from the Greek word "bakkaris", referring to plants with fragrant roots, and *pilularis* refers to sticky globs on the flower buds.
- Native Americans used the heated leaves to reduce swelling, and the wood to make arrow shafts and houses.
- This species is an important nectar source for wasps, flies, and butterflies.



Insect gall (note: do not confuse galls for flower buds on this species!)

Photo credit: Jess Gambel

**Where is this species found?**

- Found in many habitats including coastal bluffs and oak woodlands.
- Found from 0 to 750 meters elevation, but occasionally up to 1500 meters.
- This species is occasionally found on serpentine soil.



Photo credit: Jerry Kirkhart (Flickr)

For more information about phenology and the California Phenology Project (CPP), please visit the CPP website ([www.usanpn.org/cpp](http://www.usanpn.org/cpp)) and the USA-NPN website ([www.usanpn.org](http://www.usanpn.org))

Version 3, April 2012

**California Phenology Project:**  
species profile for  
**Coyotebrush**  
(*Baccharis pilularis*)



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Brian Haggerty

**Young leaves**

Young leaves are generally thinner and lighter colored than mature leaves.



Crystal Anderson

The flowers pictured to the left have only male parts (anthers) and will not produce fruit.



Miguel Viera

**Flowers or flower buds**

When monitoring flower and flower bud abundance for this species, count each inflorescence as a single flowering structure! For example, if there are two inflorescences with many flowers or buds each, then abundance should be recorded as <3.



Crystal Anderson

The flowers pictured to the right have only female parts and will produce fruit. Each flower may produce a single seed.



Steven Krause

**BAPI flower buds;**  
Do not mistake for a gall (pictured on the front)



Steven Krause

**Open flowers**

Can you see the anthers or stigma? **Proportion of open flowers** should be recorded at the scale of individual flowers, not inflorescences (i.e. count individual flowers!)

**Note:** USA-NPN flower phenophases are nested; if you record Y for "open flowers" you should also record Y for "flowers or flower buds"



Crystal Anderson

**Fruits**

The fruit is a tiny, one-seeded capsule tipped with a tuft of white hairs. Fruits are grouped in a seed head and change from yellow-green to tan or light brown as they ripen. When fully dry, the fruits are blown from the plant.



Steven Krause

**Ripe fruits**

The fruit is considered ripe when it is tan or light brown. **Note:** fruit phenophases are nested; if you record Y for "ripe fruits" you should also record Y to "fruits"

**Phenophases not pictured: Pollen release, Recent fruit or seed drop**

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### 3.5 Sticky monkeyflower (*Diplacus aurantiacus*)

- CPP four letter code – **MIAU** (this species was formerly named *Mimulus aurantiacus*).
- Download the USA-NPN datasheet and the CPP profile for MIAU here: <http://www.usanpn.org/cpp/MIAU>
- Sticky monkeyflower is a perennial shrub species in the Figwort family that typically blooms from March through August.
- MIAU can be found in coastal scrub, oak woodland, and chaparral habitats in the states of California and Oregon.
- Because of its long blooming season, the sticky monkeyflower is a good source of nectar for hummingbirds and insects.

Table 6. Count of monkeyflower individuals monitored at each location and site.

MARIN HEADLANDS (OLBU)		PRESIDIO (LDML)		MORI POINT (MORI)	
Site name	Count	Site name	Site name	Count	Site name
OLBU 1	0	LDML 1	0	MORI 1	0
OLBU 2	3	LDML 2	3	MORI 2	0
OLBU 3	2	LDML 3	2	MORI 3	0
OLBU 4	2	LDML 4	2	MORI 4	0
OLBU 5	0	LDML 5	<i>future site</i>	MORI 5	3
OLBU 6	4	LDML 6	<i>not active</i>	MORI 6	3
		LDML 7	0		
		LDML 8	2		
		LDML 9	1		
<b>TOTALS</b>	11		10		6

## Sticky monkeyflower, *Diplacus aurantiacus*, species profile (Version 2; March 2012):

California Phenology Project:  
species profile for  
**Sticky Monkeyflower**  
*(Diplacus aurantiacus)*



USA **npn**  
National Phenology Network

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CPP site(s) where this species is monitored: Golden Gate National Recreation Area

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Photo credit: Maggie Smith (Flickr)

**What does this species look like?**

This perennial plant occurs as either a shrub or a subshrub and can grow up to 1.5 meters tall. The foliage can be hairy or glabrous. The leaves are deep green and linear, with edges (margins) that roll under and are generally sticky. Flower color can range from white to yellow, orange, or red. Flowers are tubular with five broad lobes.

*When monitoring this species, use the USA-NPN semi-deciduous trees and shrubs datasheet.*

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**Species facts!**

- The CPP four letter code for this species is **MIAU** (this species was formerly named *Mimulus aurantiacus*).
- Host plant for the larvae of the Common Checkerspot butterfly.
- Pollinated by both bees and hummingbirds.
- The flowers and roots were used medicinally by Native Americans to heal scrapes and burns.



Photo credit: Brian Haggerty

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Photo credit: Jerry Kirkhart (Flickr)

**Where is this species found?**

- Occurs on rocky hillsides, cliffs, canyon slopes, disturbed areas, borders of chaparral and within open forest.
- Found at elevations less than 1600 meters.
- Can tolerate serpentine soil.

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For more information about phenology and the California Phenology Project (CPP), please visit the CPP website ([www.usanpn.org/cpp](http://www.usanpn.org/cpp)) and the USA-NPN website ([www.usanpn.org](http://www.usanpn.org))

Version 2, March 2012

California Phenology Project:  
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**Young Leaves**



Bri Weldon

**Leaves**

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Brian Haggerty

**Flowers or flower buds**

Flowers of this species appear singly; count individual flowers when measuring abundance.



Jason Hollinger

**Open flowers**

These flowers have both male and female parts. Can you see the anthers and stigma?

**Note:** flower phenophases are nested; if you record Y for "open flowers" you should also record Y for "flowers or flower buds"

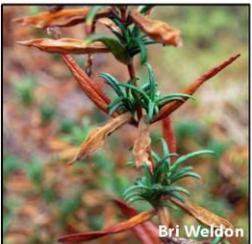
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Brian Haggerty

**Fruits**

The fruit is a capsule that changes from green to tan or brown; it then splits open to expose the seeds. Do not include empty capsules that have already dropped all of their seeds.



Bri Weldon

**Ripe fruits**

A fruit is ripe when it has turned tan or brown and has split open to expose the seeds. Do not include empty capsules that have dropped all of their seeds.

**Note:** USA-NPN fruit phenophases are nested; if you record Y for "ripe fruits" you should also record Y for "fruits".

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Phenophases not pictured: **Recent fruit or seed drop**

Version 2, March 2012

## IV. GOGA Monitoring Locations and Maps

There are four CPP monitoring locations at Golden Gate National Recreation Area (Table 7; Figure 1): Old Bunker Road Trail (OLBU) in the Marin Headlands; Lobos Dunes/Mountain Lake Trail (LDML) in the Presidio; Crissy Marsh Overlook (MAOV), near Crissy Field; and Mori Point (MORI).

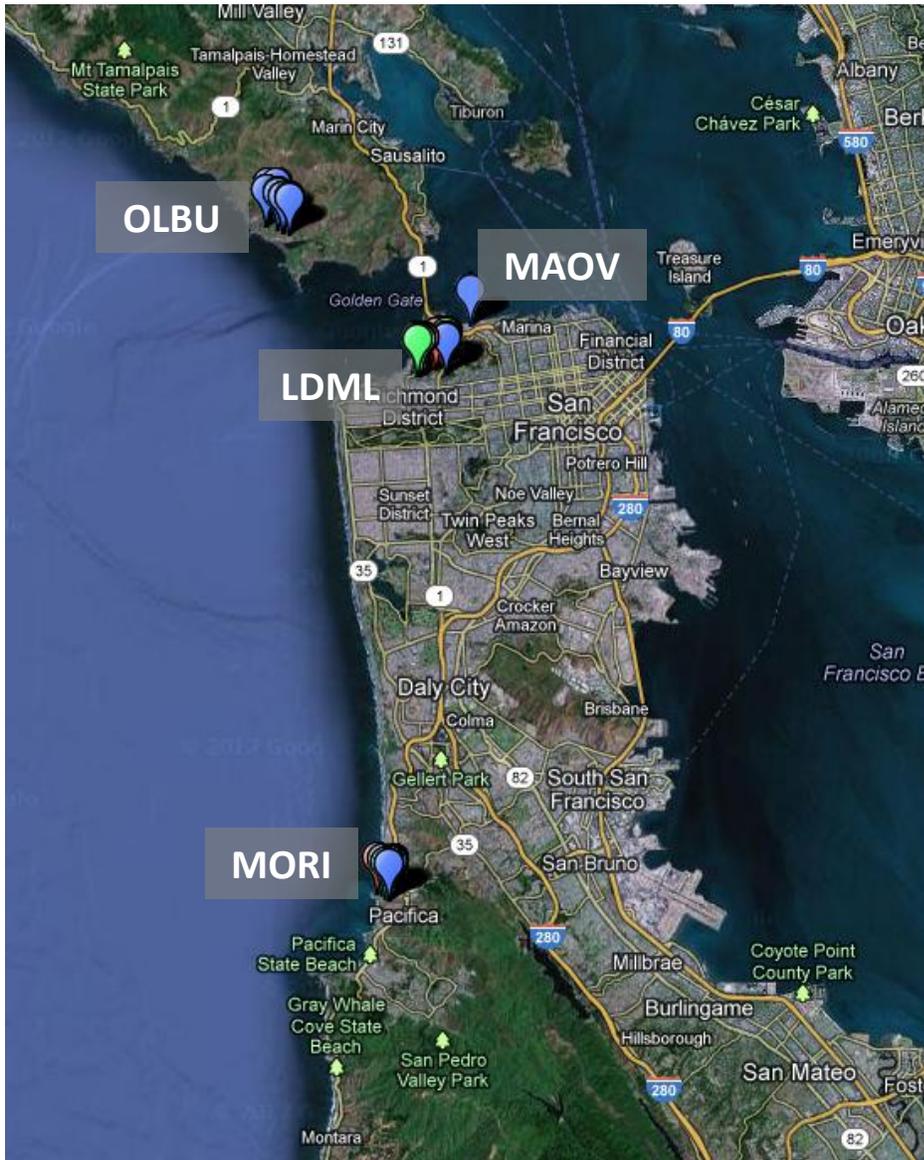
Maps of GOGA monitoring locations are available for download at:

<https://www.usanpn.org/cpp/GOGA/maps>

**Table 7.** GOGA monitoring locations, target plant species at each location (with number of targeted individuals), and the approximate phenologically active season for each phenophase category at each location. Estimates of the phenologically active season at each location are based on observations recorded in 2011, 2012, and 2013; these estimates should be revised as additional years are represented in the dataset.

	<b>Location (4-letter code)</b>	<b>Target Species (# of individuals)</b>	<b>Year monitoring initiated</b>	<b>Approximate Phenologically Active Season</b>
(1)	Old Bunker Road Trail (OLBU)	<i>Baccharis pilularis</i>	2011	Leaves: Flowers: Fruit:
		<i>Diplacus aurantiacus</i>	2011	Leaves: Flowers: Fruit:
		<i>Heracleum maximum</i>	2011	Leaves: Flowers: Fruit:
(2)	Lobos Dunes/Mountain Lake Trail (LDML)	<i>Baccharis pilularis</i>	2011	Leaves: Flowers: Fruit:
		<i>Diplacus aurantiacus</i>	2011	Leaves: Flowers: Fruit:
		<i>Quercus agrifolia</i>	2011	Leaves: Flowers: Fruit:
		<i>Heracleum maximum</i>	2011	Leaves: Flowers: Fruit:
(3)	Mori Point (MORI)	<i>Baccharis pilularis</i>	2011	Leaves: Flowers: Fruit:
		<i>Diplacus aurantiacus</i>	2011	Leaves: Flowers: Fruit:
		<i>Eschscholzia californica</i>	2011	Leaves: Flowers: Fruit:
		<i>Heracleum maximum</i>	2011	Leaves: Flowers: Fruit:
(4)	Crissy Marsh Overlook	<i>Baccharis pilularis</i>	2012	Leaves: Flowers: Fruit:

Note that the timing of phenophases may vary with interannual variation in temperature and precipitation (e.g., in years where spring temperatures are warmer than average, phenophases may appear earlier than average). As such, the USA-NPN and the CPP recommend that monitoring should continue during the phenologically inactive season, although monitoring may continue at a lower frequency. In the 2-4 weeks before the phenologically active season, monitoring frequency should increase in order to catch the onset of the early phenophases.



**Figure 1.** GOGA monitoring locations labeled with their four letter codes.

All plants targeted for monitoring are marked with unique identifiers, and most CPP plants at GOGA are identified with two tags. The first tag includes a 4-part code, which identifies the individual plant as part of the CPP network, and then identifies the park, monitoring location, site, species (and individual number). The identifier code for each plant follows the same format:

CPP-PARK-LOCA#-GESP#.

LOCA# represents the location name in a four letter code (e.g., Old Bunker Road Trail= OLBU) and the site at each location (e.g., site 2 at Old Bunker Road Trail= OLBU2).

GESP# represents the four letter code for each genus species combination (e.g. *Baccharis pilularis*= BAPI) and the individual plant number at each site (e.g. the third *Baccharis pilularis*= BAPI3).

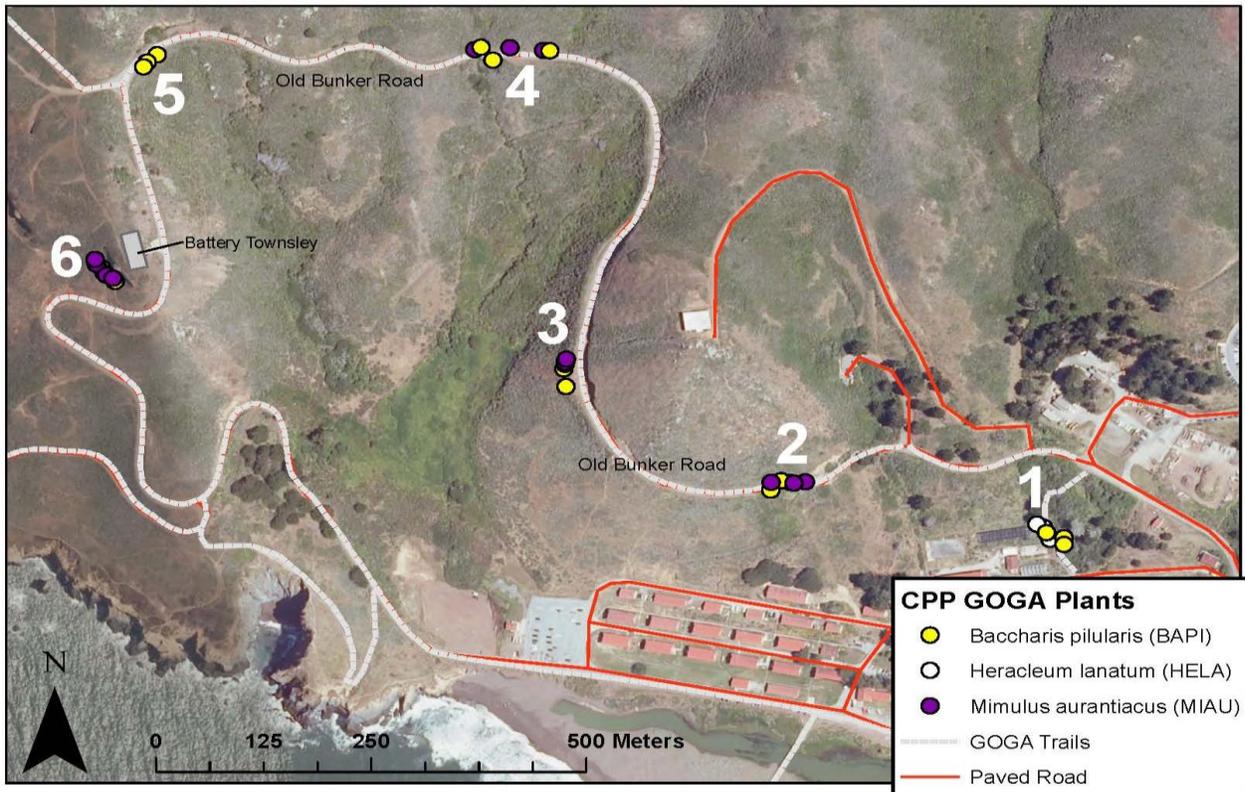
A second tag includes a unique number identifier (e.g., **450**); this number must be unique to the individual plant at a given park. When the targeted plants are registered in *Nature's Notebook*, both identifiers should be used in the plant nickname (e.g., "ERFA1 (479)").

The CPP plants at GOGA are marked with two metal tags. The first tag includes the 4-part code described above. The second tag includes a unique number identifier; this number is unique to the individual plant. It is used in the tables below and in *Nature's Notebook*. See *Establishing Monitoring Sites SOP#5* for additional information about the tags used to mark CPP plants.

#### 4.1 Marin Headlands – Old Bunker Road Trail

The Old Bunker Road (OLBU) sites are on the first mile of the Old Bunker Road Trail, beginning at the Marin Headlands nursery. There are 6 sites at this trail and a total of 33 plants. Target species being monitored are *Baccharis pilularis*, *Diplacus aurantiacus*, and *Heracleum maximum*.

- TRAIL LENGTH – 1 mile
- MONITORING TIME – 60 minutes
- ELEVATION GAIN – 75 feet (Site 1) to 326 feet (Site 6)



**OLBU SITE PHOTOS:**

**Old Bunker Road Site #1 (CPP-GOGA-OLBU1)**

Site Notes: This site is approach from the Marin Headlands nursery, heading north. Elevation is 75ft (22m).



Site	Species	Individual	Unique ID	UTM-northing	UTM-easting	Notes
OLBU1	HELA	1	4	4187432	541021	on L side of trail
OLBU1	HELA	3	6	4187442	541013	on L; last individual up the trail at this site
OLBU1	BAPI	1	1	4187435	541018	L side of trail, between CA sage
OLBU1	BAPI	2	2	4187431	541026	R side of trail
OLBU1	BAPI	3	3	4187427	541027	R side of trail

**Old Bunker Road Site #2 (CPP-GOGA-OLBU2)**

Site Notes: Uphill from Marin Headlands nursery, heading NW. Take a left at the service vehicle parking lot, near the concrete rubble pile. Elevation 144ft (44m).



Site	Species	Individual	Unique ID	UTM-northing	UTM-easting	Notes
2	BAPI	1	9	4187482	540787	on the R side of the trail
2	BAPI	2	10	4187483	540782	R side of trail
2	BAPI	3	12	4187480	540770	on the L, orange cone under individual, on edge of trail
2	MIAU	1	7	4187482	540790	R side of trail
2	MIAU	2	299	4187482	540787	R side of trail
2	MIAU	3	11	4187484	540773	R side of trail

**Old Bunker Road Site #3 (CPP-GOGA-OLBU3)**

Site Notes: Across from the tilted geologic formation on the R side of the trail. Elevation 186 feet.



Site	Species Code	Individual	Unique ID	UTM-northing	UTM-easting	Notes
3	BAPI	1	13	4187581	540584	on the L side of the trail
3	BAPI	2	14	4187599	540582	on the L
3	BAPI	3	17	4187604	540583	on the L
3	MIAU	1	15	4187606	540583	on the L
3	MIAU	2	16	4187609	540584	on the L

**Old Bunker Road Site #4 CPP-GOGA-OLBU4)**

Site Notes: Clearing on the L side of trail for the overlook, large willow on the R side of the trail. Elevation 254 feet.



Site	Species Code	Individual	Unique ID	UTM-northing	UTM-easting	Notes
4	MIAU	1	19	4187927	540560	on the R surrounded by yellow bush lupine, sagebrush, coyotebush
4	MIAU	3	23	4187929	540503	on the R past willow; surrounded by <i>poison oak</i> ; last individual up the trail at this site.
4	BAPI	1	18	4187926	540560	on the R side of the trail; surrounded by yellow bush lupine, sagebrush, and monkey flower.
4	BAPI	2	21	4187915	540525	on the L; surrounded by <i>poison oak</i> .
4	BAPI	3	22	4187928	540504	on the R past willow; surrounded by <i>poison oak</i> .

**Old Bunker Road Site #5 (CPP-GOGA-OLBU5)**

Site Notes: Continuing up trail, across from Marine Mammal Center Sign. Elevation 321 feet.



Site	Species	Individual	Unique ID	UTM-northing	UTM-easting	Notes
5	BAPI	1	24	4187921	540196	on the L; base of plant surrounded by <i>poison oak</i> and a horsetail.
5	BAPI	2	25	4187918	540191	on the L; surrounded by a patch of horsetail.
5	BAPI	3	26	4187916	540191	on the L; last plant up the trail at this site; surrounded by a patch of horsetail.

**Old Bunker Road Site #6 (CPP-GOGA-OLBU6)**

Site Notes: From site 5, walk West towards Battery Townsley, through the entrance towards the trail. Elevation 326 feet.



Site	Species Code	Individual	Unique ID	UTM-northing	UTM-easting	Notes
6	BAPI	1	27	4187704	540152	on the R side of the trail
6	MIAU	1	300	4187704	540152	on the R side of the trail
6	MIAU	2	29	4187705	540146	on the R; surrounded by sagebrush



Site	Species	Individual	Unique ID	UTM-northing	UTM-easting	Notes
6	BAPI	2	30	4187699	540157	on the L side of trail, right in front of the battery tunnel
6	BAPI	3	33	4187686	540167	on the R, near sagebrush and dried yellow-bush lupine
6	MIAU	3	31	4187699	540157	on the L side of the trail, right in front of the battery
6	MIAU	4	32	4187689	540165	on the R

## 4.2 Presidio – Lobos Dunes/Mountain Lake Trail

The Lobos Dunes-Mountain Lake (LDML) sites are on the first mile of the Lobos Dunes to Mountain Lake Trail, beginning at the Lobos Dunes trail head at Lincoln Boulevard and Howard Road (1-4). This trail follows the Lobos Dunes boardwalk, up to the Presidio Hills (7), and down into Mountain Lake (8, 9). This trail is relatively flat with one uphill climb and one set of stairs. There are 9 sites at this trail (Site 5 has yet to be established and Site 6 is decommissioned) and a total of 39 plants being monitored. Target species monitored at this location include: *B. pilularis*, *D. aurantiacus*, *Q. agrifolia*, and *H. maximum*.

- TRAIL LENGTH – ~ 1 mile
- MONITORING TIME – 60 minutes
- ELEVATION GAIN – 72 FEET (Site 1) to 150 feet (Site 9)

When stepping off trail at this monitoring location, please be careful to avoid stepping on the endangered San Francisco Lessingia plant (*Lessingia germanorum*), pictured to the right.

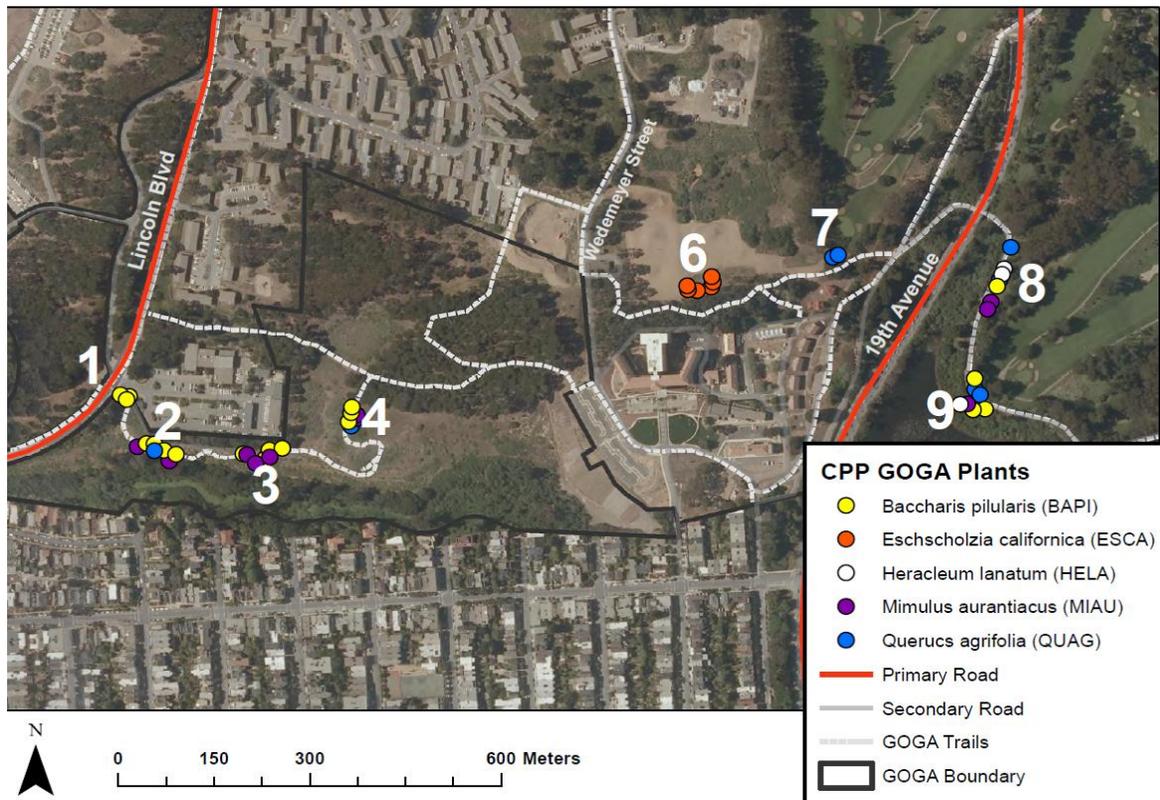


Figure X. Monitoring sites at LDML.

**LDML SITE PHOTOS:**

**Lobos Dunes-Mountain Lake Site #1 (CPP-GOGA-LDML 1)**

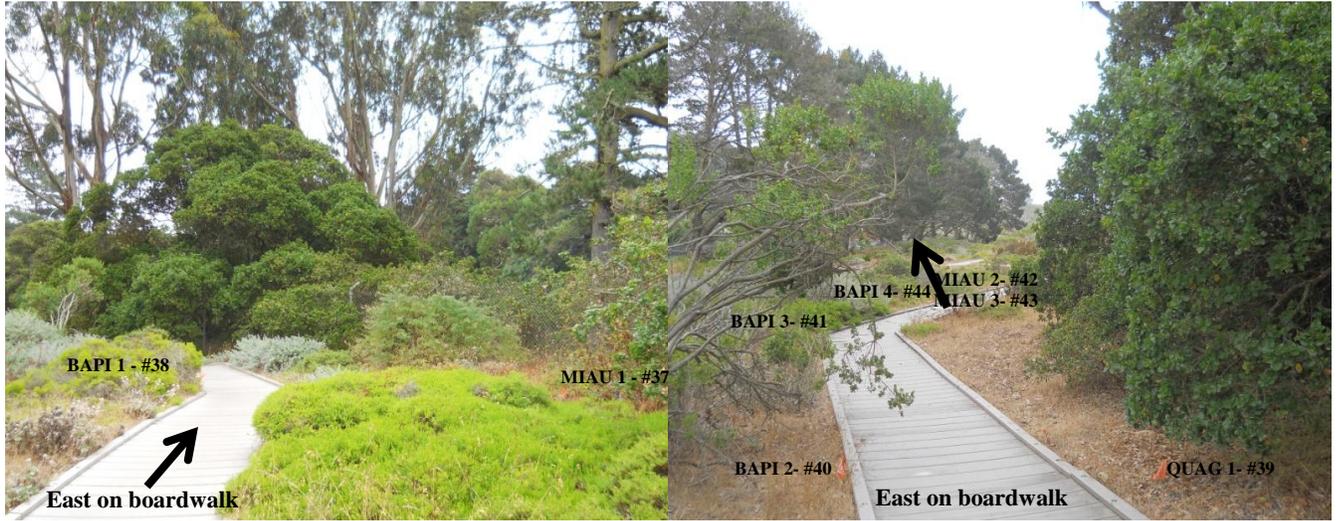
Site Notes: Start of Lobos Creek boardwalk trail. Elevation 72 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
1	BAPI	<i>Baccharis pilularis</i>	1	34	4182474	545588	on the R; shrubby (erect) individual, corner of boardwalk
1	BAPI	<i>Baccharis pilularis</i>	2	35	4182475	545578	behind bench; shrubby (erect) individual
1	BAPI	<i>Baccharis pilularis</i>	3	36	4182468	545583	R, after Lobos Creek Trail sign; shrubby individual

**Lobos Dunes-Mountain Lake Site #2 (CPP-GOGA-LDML2)**

Site Notes: On the LDML trail headed E. Elevation 68 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
2	BAPI	<i>Baccharis pilularis</i>	1	38	4182394	545623	on the L, near edge of boardwalk; prostrate
2	BAPI	<i>Baccharis pilularis</i>	2	40	4182393	545631	on the L, shrubby individual
2	BAPI	<i>Baccharis pilularis</i>	3	41	4182393	545634	on the L, shrubby individual
2	BAPI	<i>Baccharis pilularis</i>	4	44	4182399	545652	on the L, across from the Eucalyptus
2	MIAU	<i>Diplacus aurantiacus</i>	1	37	4182395	545621	on the R, ~2 meters off trail
2	MIAU	<i>Diplacus aurantiacus</i>	2	42	4182395	545645	on the R, under Eucalyptus
2	MIAU	<i>Diplacus aurantiacus</i>	3	43	4182395	5456465	on the R, under Eucalyptus
2	QUAG	<i>Quercus agrifolia</i>	1	39	4182390	545633	on the R, hanging over the fence (tag is right by the fence line)

### Lobos Dunes-Mountain Lake Site #3 (CPP-GOGA-LDML3)

Site Notes: On LDML trail headed E. Elevation 70 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
3	BAPI	<i>Baccharis pilularis</i>	1	46	4182399	545652	on the L, prostrate
3	BAPI	<i>Baccharis pilularis</i>	2	48	4182391	545660	on the R, prostrate and surrounded by bare ground
3	BAPI	<i>Baccharis pilularis</i>	3	50	4182399	545770	on the L; shrubby individual
3	BAPI	<i>Baccharis pilularis</i>	4	51	4182396	545781	on the L; shrubby individual, under cypress tree
3	MIAU	<i>Diplacus aurantiacus</i>	1	45	4182395	545744	on the L
3	MIAU	<i>Diplacus aurantiacus</i>	2	47	4182392	545753	on the R

**Lobos Dunes-Mountain Lake Site #4 (CPP-GOGA-LDML4)**

Site Notes: On the trail headed N to Presidio Hills leading up to the stairs entering historic forest. Elevation 92 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE PLANT IDENTIFIER	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
4	BAPI	<i>Baccharis pilularis</i>	1	79	4182442	545870	on the L, prostrate
4	BAPI	<i>Baccharis pilularis</i>	2	80	4182442	545872	on the R, prostrate and surrounded by bare ground
4	BAPI	<i>Baccharis pilularis</i>	3	81	4182449	545872	on the L; shrubby individual
4	MIAU	<i>Diplacus aurantiacus</i>	1	77	4182439	545873	right hand side of the trail, first MIAU after coffee berry.
4	MIAU	<i>Diplacus aurantiacus</i>	2	78	4182440	545873	on the R
4	QUAG	<i>Quercus agrifolia</i>	1	76	4182437	545870	on the R side of the trail between silver bush lupine. First and only QUAG on site.

**Lobos Dunes-Mountain Lake Site #5 (CPP-GOGA-LDML5)**

Site Notes: Site 5 is not established due to future plans for tree removal.

**Lobos Dunes-Mountain Lake Site #6 (CPP-GOGA-LDML6)**

Site Notes: headed E on Mountain Lake extension trail, Merchant Marine Overlook (*This site has been temporarily decommissioned*).

**Lobos Dunes-Mountain Lake Site #7 (CPP-GOGA-LDML7)**

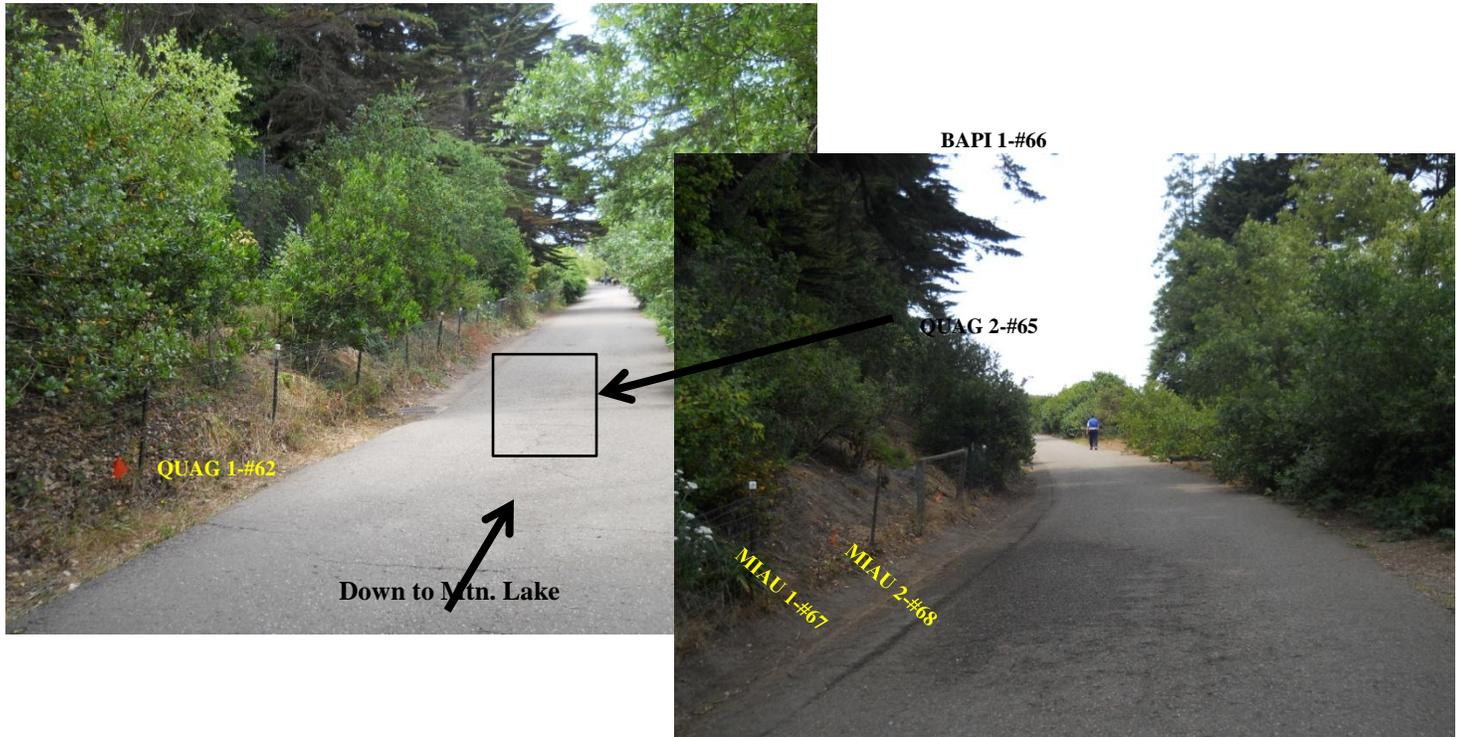
Site Notes: Headed SE on boardwalk past lessingia patch, towards stairs leading down to Mountain Lake. Elevation 245 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
7	QUAG	<i>Quercus agrifolia</i>	1	196	4182652	546467	fourth boardwalk step; across from cypress tree
7	QUAG	<i>Quercus agrifolia</i>	2	197	4182655	546474	sixth boardwalk step at bend before going down stairs; across from

**Lobos Dunes-Mountain Lake Site #8 (CPP-GOGA-LDML8)**

Site Notes: Through 19<sup>th</sup> Ave overpass, headed E towards Mountain Lake 3-bench overlook.  
Plants are 1 ft. behind the fence in the buffer strip. Elevation 162 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
8	QUAG	<i>Quercus agrifolia</i>	1	62	4182666	546688	first oak headed east towards seating overlook. Under cypress tree. Third fence pole down on L.
8	QUAG	<i>Quercus agrifolia</i>	2	65	4182633	546671	
8	HELA	<i>Heracleum lanatum</i>	1	63	4182637	546673	
8	HELA	<i>Heracleum lanatum</i>	2	64	4182636	546673	
8	BAPI	<i>Baccharis pilularis</i>	1	66	4182623	546668	Above storm drain
8	MIAU	<i>Diplacus aurantiacus</i>	1	67	4182590	546655	To the right of Douglas Iris and red elderberry.
8	MIAU	<i>Diplacus aurantiacus</i>	2	68	4182587	546652	Under twinberry on L.

**Lobos Dunes-Mountain Lake Site #9 (CPP-GOGA-LDML9)**

Site Notes: Headed E towards overlook, past woodchip area on right. Some plants are across entrance to overlook in buffer strip, others are along the wood chipped path down to the overlook. Elevation 150 feet.

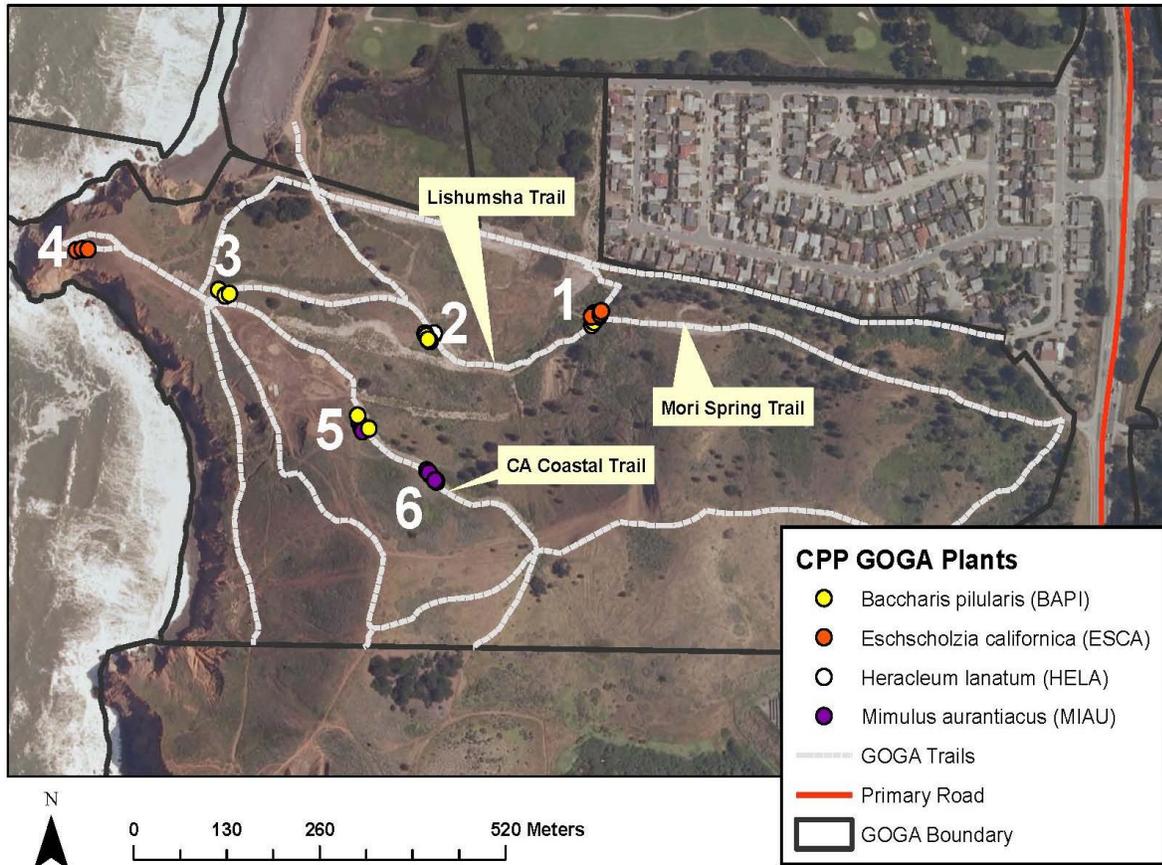


SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE ID CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
9	QUAG	<i>Quercus agrifolia</i>	1	70	4182477	546646	Across from entrance to 3-bench Mountain Lake overlook, in front of toyon.
9	QUAG	<i>Quercus agrifolia</i>	2	71	4182475	546651	Under cypress tree, across from entrance to 3-bench Mountain Lake overlook.
9	BAPI	<i>Baccharis pilularis</i>	1	69	4182497	546640	Behind fence
9	BAPI	<i>Baccharis pilularis</i>	2	72	4182463	546650	On the left of trail down to overlook (upright.)
9	BAPI	<i>Baccharis pilularis</i>	3	503	4182463	546625	across from middle bench on 3-bench ML overlook. On R. Prostrate.
9	MIAU	<i>Diplacus aurantiacus</i>	1	504	4182493	546639	across from entrance to 3-bench ML overlook
9	HELA	<i>Heracleum maximum</i>	1	75	4182461	546630	on right along trail down to benches.

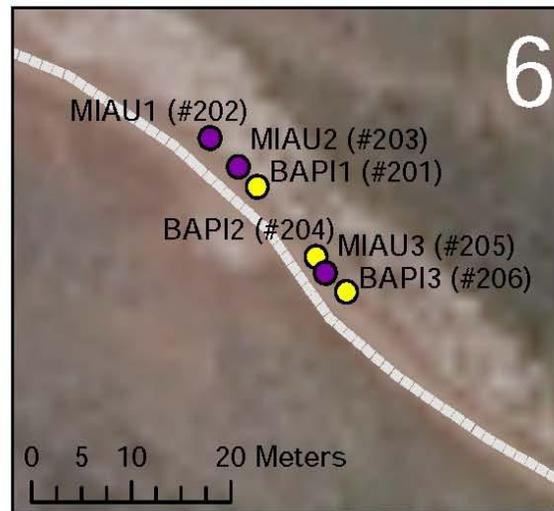
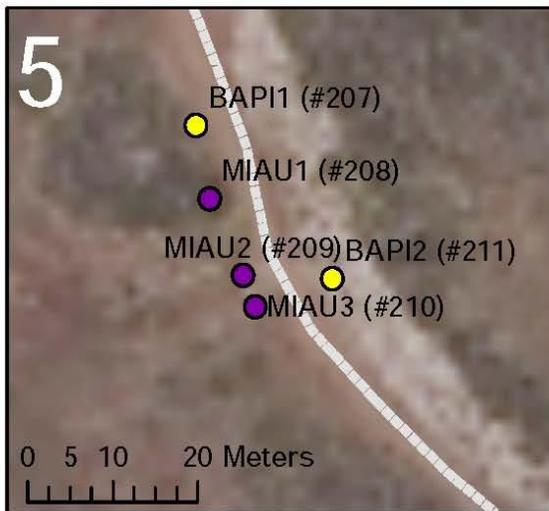
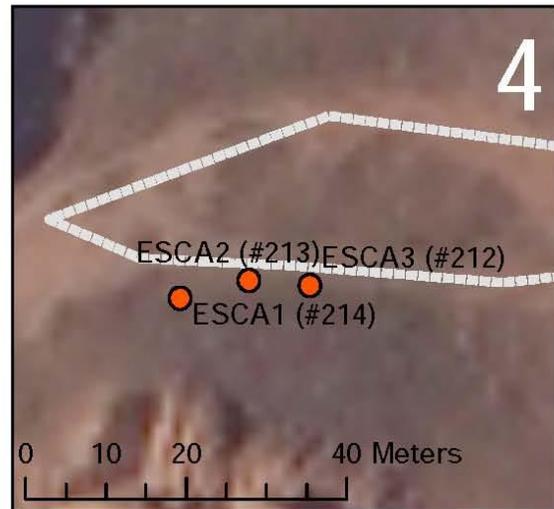
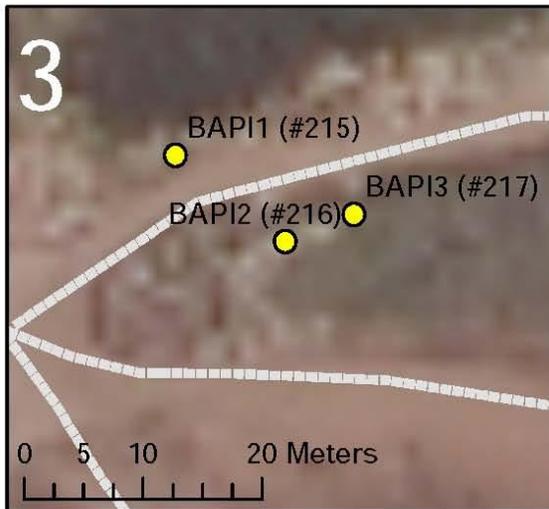
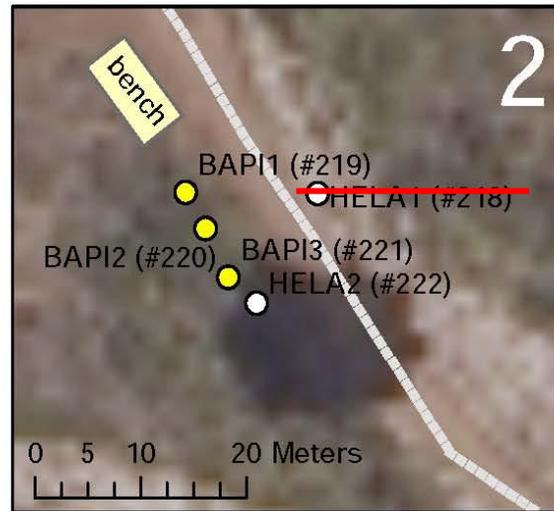
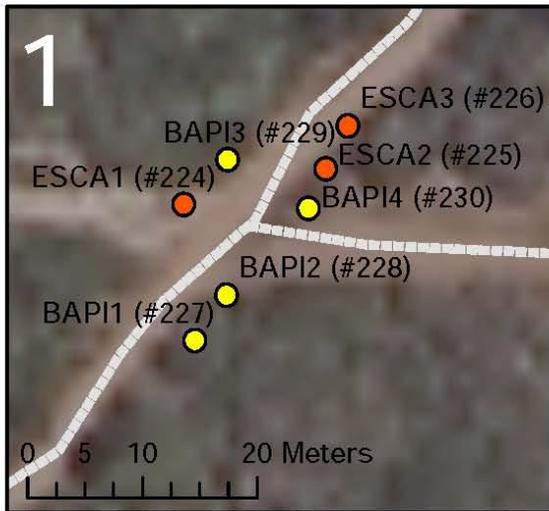
### 4.3 Pacifica – Mori Point trails

The Mori Point (MORI) sites are located along multiple uphill trails. First three sites are along the Lishumsha Coastal trail. The fourth site is on the trail headed towards the point. The remaining trails are along the Timigtac Coastal (CA Coastal) trail. There are 6 sites at this trail and a total of 28 plants being monitored. Target species being monitored are *B. pilularis*, *D. aurantiacus*, and *H. maximum*.

- TRAIL LENGTH – 0.5 miles
- MONITORING TIME – 50 minutes
- ELEVATION GAIN – 35 feet (Site 1) to 185 feet (Site 6)



# CPP GOGA Mori Point (MORI) Monitoring Sites and Plants



**CPP-GOGA MORI SITE 1 AND SITE 2**

**Mori Point Site #1 (CPP-GOGA-MORI1)**

Site Notes: Headed SW on the Lishumsha trail, near intersection of Lishumsha and Upper Mori trail. Elevation 35 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
1	BAPI	<i>Baccharis pilularis</i>	1	405	4163707	544853	on L on top of berm/jute netting, prostrate, last individual at site, past trail sign
1	BAPI	<i>Baccharis pilularis</i>	2	228	4163709	544859	on the L, shrubby individual, 3 ft into Upper Mori Trail heading east
1	BAPI	<i>Baccharis pilularis</i>	3	229	4163718	544859	on the R, shrubby (tree-like) individual
1	BAPI	<i>Baccharis pilularis</i>	4	230	4163719	544861	on L, prostrate individual, ~2 ft up from trail on top of berm/jute netting
1	ESCA	<i>Eschscholzia californica</i>	1	224	41637185	544856	on R, past BAPI 3, near fence
1	ESCA	<i>Eschscholzia californica</i>	2	225	4163717	544862	on L, on top of netting
1	ESCA	<i>Eschscholzia californica</i>	3	226	4163719	544865	on L, near edge of trail

**Mori Point Site #2 (CPP-GOGA-MORI2)**

Site Notes: Headed W on the Lishumsha – Coastal Trail headed uphill to bench. Elevation 66 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
2	HELA	<i>Heracleum maximum</i>	2	222	4163691	544676	on L, first individual at site
2	BAPI	<i>Baccharis pilularis</i>	1	219	4163639	544672	on L, last individual at site, shrubby individual
2	BAPI	<i>Baccharis pilularis</i>	2	220	4163692	544674	on L, 1 meter east of BAPI 1, shrubby individual
2	BAPI	<i>Baccharis pilularis</i>	3	221	4163691	544675	on L, 1 meter east of BAPI 2, shrubby individual

**Mori Point Site #3 (CPP-GOGA-MORI3)**

Site Notes: Headed W. on the Lishumsha - Coastal trail ~ 5m from overlook bench. Elevation 134 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
3	BAPI	<i>Baccharis pilularis</i>	1	215	4163737	544447	on R, last individual at site
3	BAPI	<i>Baccharis pilularis</i>	2	216	4163733	544450	on L
3	BAPI	<i>Baccharis pilularis</i>	3	217	4163735	544452	on L

**Mori Point Site #4 (CPP-GOGA-MORI4)**

Site Notes: Headed W towards the point, flora patch on left side of trail. Elevation 97 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
4	ESCA	<i>Eschscholzia californica</i>	1	214	4163782	544295	on L
4	ESCA	<i>Eschscholzia californica</i>	2	213	4163781	544293	on L
4	ESCA	<i>Eschscholzia californica</i>	3	212	4163782	544289	on L, 8 paces down from ESCA 2, 6 feet from trail

**Mori Point Site #5 (CPP-GOGA-MORI5)**

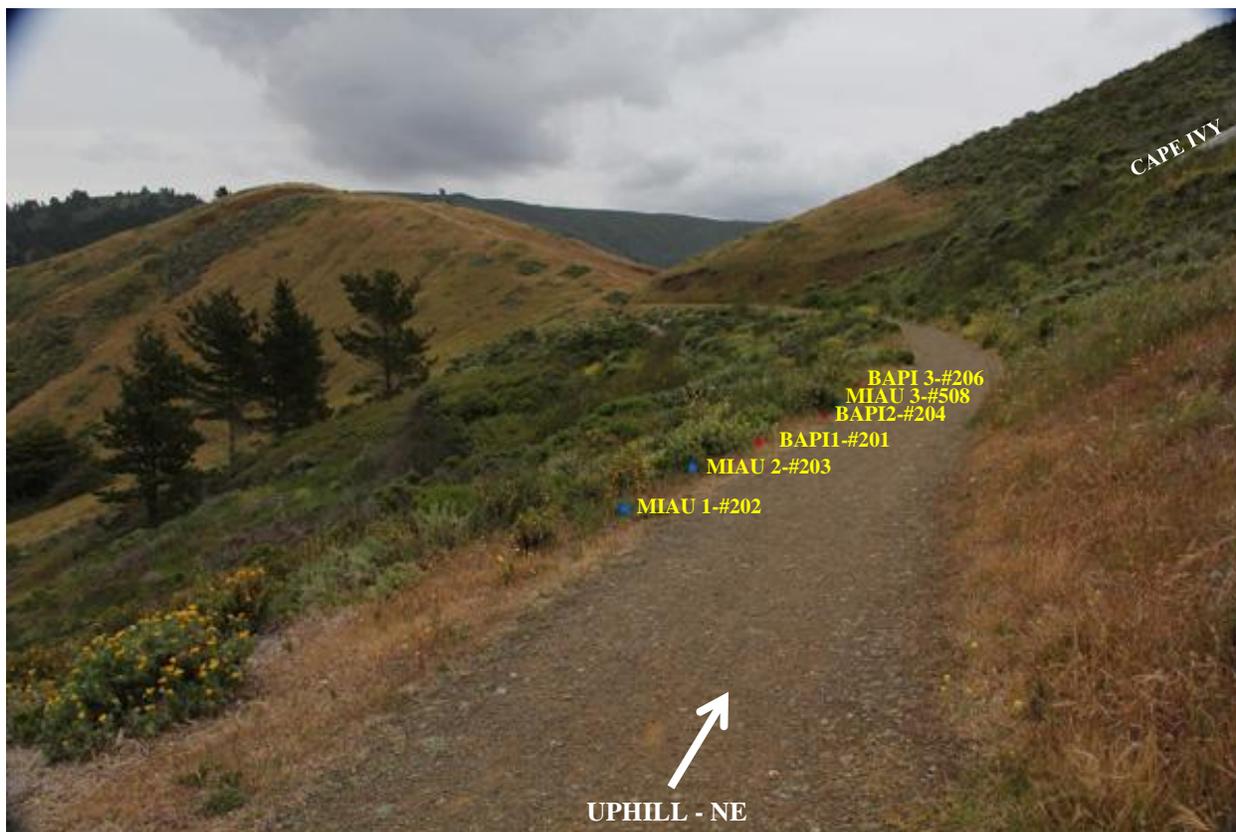
Site Notes: on the coastal trail to Timigtac Trail, past ephemeral ponds, uphill. Elevation 151 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
5	MIAU	<i>Diplacus aurantiacus</i>	1	208	4163605	544598	on R
5	MIAU	<i>Diplacus aurantiacus</i>	2	209	4163601	544600	on the right, ~ 2 feet up slope from trail.
5	MIAU	<i>Diplacus aurantiacus</i>	3	210	4163601	544600	on the right, ~ 2 feet up slope from trail.
5	BAPI	<i>Baccharis pilularis</i>	1	207	4163607	544599	On the right ~ 3 feet up from trail (on slope). Upright individual.
5	BAPI	<i>Baccharis pilularis</i>	2	211	4163603	544602	On the left, ~ 2 feet downslope from trail edge. Upright individual.

**Mori Point Site #6 (CPP-GOGA-MORI6)**

Site Notes: on the coastal trail to Timigtac Trail headed towards highway (east), before cape ivy patch (currently covered with tarp). Elevation 185 feet.



SITE	SPECIES CODE	SPECIES NAME	INDIVIDUAL	UNIQUE IDENTIFIER CODE	NORTHING	EASTING	NOTES REGARDING PLANT POSITION
6	BAPI	<i>Baccharis pilularis</i>	1	201	41636543	544679	on L
6	BAPI	<i>Baccharis pilularis</i>	2	204	4163542	544681	on L
6	BAPI	<i>Baccharis pilularis</i>	3	206	4163542	544680	on L
6	MIAU	<i>Diplacus aurantiacus</i>	1	202	4163545	544674	on L
6	MIAU	<i>Diplacus aurantiacus</i>	2	203	4163545	544676	on L
6	MIAU	<i>Diplacus aurantiacus</i>	3	508	4163542	544681	on L

## V. Frequency of Monitoring and Estimated Time Investment

As described in detail in the *CPP Plant Phenology Monitoring Protocol*, ideally plants should be monitored *at least* twice weekly to accurately detect changes in the onset and duration of phenophases. More frequent monitoring will maximize the ability to detect and to measure phenological change, although some CPP monitoring sites may be established primarily for interpretive purposes and monitored less frequently.

Although data entry is not time-sensitive, uploading observations to *Nature's Notebook* at least 4 times a year will minimize a back-log of data entry. Entering data more frequently (e.g., after each monitoring event or at the end of every week), however, is helpful in preventing confusion or correcting observation errors on the datasheets, since observers may remember the monitoring events well enough to correct errors during data-entry.

It is best to have only a small number of well-trained observers monitoring a site. Novices tend to interpret phenophase abundances or “quantities” differently, and if there are many observers with little experience recording abundance estimates, percentages and quantities may be estimated inconsistently on the data sheets.

## **VI. Datasheets and Data Entry**

Datasheets for all CPP species can be downloaded from the CPP website on the individual species pages (direct links to the datasheets are provided below) or from two locations on the USA-NPN website ([www.usanpn.org](http://www.usanpn.org)). See *Phenology Site and Trail Monitoring SOP #6* for additional instructions for downloading and using USA-NPN datasheets.

### **Direct links to datasheets for GOGA species:**

Step-by-step instructions for data entry into the National Phenology Database (NPDb) curated by the USA-NPN are provided in *Data Entry and Data Management SOP # 7*.

## **VII. Preliminary Phenological Calendars for GOGA focal taxa: estimates of phenophase onset and duration**

*Coming soon*

## **VIII. Suggestions for Interpretative Programs for the Public**

The CPP has developed a variety of educational and interpretive programs that can be downloaded from the *Education* page on the CPP website (<http://www.usanpn.org/cpp/education>). Whether you're looking for a simple hands-on activity for the backyard or schoolyard, or you're in need of a guide to plan, install, and use a phenology garden for year-round scientific and educational activities, you'll find over 25 phenology-focused resources on the *Education* page. These resources are designed by CPP scientists and educators for a variety of ages and scientific abilities.

The CPP Interpretive Guide is also available for download on the website on the *Resources* page (<http://www.usanpn.org/cpp/resources>). We expect this guide will help park interpreters and educators to introduce the CPP to park visitors. This guide also provides suggestions for ways in which — through hands-on activities — park staff can help visitors to learn how park scientists and volunteers are detecting the effects of environmental variation and climate change on the seasonal cycles of plants and animals.