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Mr. Michael Beck
Endangered Habitats Conservancy
P.O. Box 22438
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Dear Michael:

This letter report summarizes results of 2016 biological monitoring and management on the South Crest Preserve and Odom properties, and provides recommendations for future actions. Although not part of the scope of work, we are also including results and recommendations from rare plant monitoring on the Gibson Preserve conducted in association with 2016 regional rare plant monitoring.

Biologists from the Conservation Biology Institute (CBI) and the EHC land manager participated in the 2016 effort. Tasks included:

- Monitoring of three Management Strategic Plan (MSP)[1] priority plant species
- Management of two MSP priority plant species
- EHC land manager training

Monitoring focused on three MSP plant species identified as 2016 monitoring priorities by the San Diego Management and Monitoring Program (SDMMP): San Diego thornmint (*Acanthomintha ilicifolia*) on South Crest, variegated dudleya (*Dudleya variegata*) on South Crest and Odom, and Encinitas baccharis (*Baccharis vanessae*) on Gibson. Management focused on weed control at San Diego thornmint and variegated dudleya sites, while land manager training focused on showing the land manager key invasive plant locations and treatment methods, and providing training on rare plant monitoring and management protocols and techniques. Each task is summarized below with respect to methods, results, and recommendations.

[1] The Management Strategic Plan (MSP) for western San Diego County was developed by the San Diego Management and Monitoring Program (SDMMP 2013) and identifies regional priorities for monitoring and management.

Task 1. South Crest Preserve – MSP Rare Plant Monitoring

CBI biologists Jessie Vinje and Spring Strahm and EHC land manager Jonathan Piazza monitored San Diego thornmint and variegated dudleya on South Crest and Odom, and Jessie Vinje and Spring Strahm monitored Encinitas baccharis on Gibson per the SDMMP rare plant monitoring protocol (SDMMP 2014) and according to the schedule in Table 1. As part of the monitoring effort, we updated spatial extent mapping of populations using a hand-held GPS; these spatial data will be uploaded to CBI's Data Basin website (www.databasin.org). MSP monitoring forms were completed for all three species and will submitted to the SDMMP by the end of the year.

Table 2 summarizes 2016 MSP rare plant monitoring results, identifies threats, and provides management recommendations. Population size for San Diego thornmint increased from 237 plants in 2015 to 352 plants in 2016. This increase was likely due to climatic conditions and possibly, 2015 weed control measures. Population size decreased for variegated dudleya on both South Crest (27 plants in 2015 to 8 plants in 2016) and Odom (216 plants in 2015 to 134 plants in 2016). The cause of the decrease is not evident, but may be related to climatic conditions, invasive plants, and possibly, herbivory. Variegated dudleya plants outplanted onto South Crest to augment the onsite population were also monitored in 2016 (Table 2).

In 2015, CBI and SDMMP biologists detected Encinitas baccharis on the Gibson property. In 2016, we counted and mapped this population, and determined the sex ratio of male to female plants to the extent possible (most plants within the population did not flower in 2016). A total of 672 plants were detected, making the Gibson population one of the largest known populations of Encinitas baccharis throughout its range. The species occupies just over 5 acres of habitat and includes a mix of male and female plants, which is necessary for viable seed production and long-term persistence onsite. Direct threats to this population are minimal, although we include management recommendations to address potential impacts while they are still manageable.

Refer to Table 3 for invasive plants identified as potential threats to rare plant species. Invasive plant control should focus on those invasives that (individually or in combination) may result in detrimental impacts to MSP plant species (CBI et al. 2012). For San Diego thornmint and variegated dudleya, target invasives for control currently include *Brachypodium* and sow-thistle. Other invasive species listed may become more problematic once nonnative grasses are controlled or in response to specific climatic conditions regulating germination and growth. All target invasives in Table 3 are a potential concern for variegated dudleya. Long-leaved veldt grass is the primary concern to Encinitas baccharis at this time because of the potential for this invasive species to expand and degrade habitat.

Table 1. 2016 Monitoring and Management Actions.

Date	Biologists	Monitoring or Management Action
2/22/2016	Jessie Vinje	• Weed control (clipping): variegated dudleya
3/8/2016	Jessie Vinje	• Weed control (clipping, large stand): San Diego thornmint
3/14/2016	Jessie Vinje Spring Strahm	• Weed control (clipping): San Diego thornmint, variegated dudleya • MSP rare plant monitoring: San Diego thornmint (large stand) • MSP rare plant monitoring: variegated dudleya
3/17/2016	Spring Strahm Johnathan Piazza	• Weed control (clipping, small population): San Diego thornmint • Weed control (clipping): all variegated dudleya stands
4/4/2016	Spring Strahm	• Weed control (clipping), counting: variegated dudleya
4/6/2016	Spring Strahm Johnathan Piazza	• MSP rare plant monitoring: San Diego thornmint (small stand)
5/4/2016	Spring Strahm	• MSP rare plant monitoring: variegated dudleya
8/18/2016	Jessie Vinje Spring Strahm	• MSP rare plant monitoring: Encinitas baccharis

Following SDMMP guidelines for monitoring frequency, San Diego thornmint should be monitored annually for the next five years, at which time monitoring frequency will be re-assessed. Variegated dudleya should be monitored every two years after 2016; thus, the next monitoring period on South Crest and Odom will be 2018 for naturally-occurring populations. However, we recommend monitoring outplanted variegated dudleya individuals in 2017 to assess outplanting success and identify management needs at an early stage, thereby improving long-term survival of these plants. Encinitas baccharis monitoring should occur at 2-year intervals after 2017; thus, the next monitoring period for this species will be 2019. However, if the population burns, it will need to be assessed and re-mapped 1-3 years after the fire, regardless of monitoring schedule.

Task 2. Rare Plant Management

CBI biologists Jessie Vinje and Spring Strahm and EHC land manager Johnathan Piazza conducted targeted invasive plant management (clipping per Best Management Practices, CBI 2014) at the occupied San Diego thornmint and variegated dudleya locations on South Crest and Odom, according to the schedule in Table 1.

Table 2. 2016 Monitoring and Management Results, Threats, and Recommendations.

Species	Site	Population Size[1]	Occupied Habitat (acres)[2]	Threats	Management Recommendations
San Diego thornmint (*Acanthomintha ilicifolia*)	South Crest	352 (237)	0.014	• Invasive Plants • Erosion • Off-Highway Vehicles (OHV) and unauthorized trails	Weed control.[3] Hand-weed occupied habitat annually unless monitoring indicates less frequent weeding is appropriate.[3] Target invasives are *Brachypodium distachyon* and *Sonchus* sp. in the large population. Other species, if problematic, should be hand-pulled, as well. We do not recommend weeding the entire clay lens (large population) since it's on a slope and could impact the population (e.g., trampling, erosion). We do recommend hand-weeding the entire clay lens for the small population. Monitoring. Monitor annually to assess status, threats, and treatment success. Access control. Consider installing fence and no trespassing signs along dirt access roads adjacent to the populations.
Encinitas baccharis (*Baccharis vanessae*)	Gibson	672	5.023	• Invasive Plants • Dumping/trash • Trampling • Erosion • Soil Compaction	Weed control. Remove long-leaved veldt grass and other invasives that pose a threat to the population. Erosion. Install gravel bags in rills and gullies that are located in the dirt access road to prevent further erosion and possible loss of plants. Monitoring. Monitor every two years (or follow post-fire monitoring objectives if population burns) to assess population status, threats, and treatment success.
Variegated Dudleya	South Crest	8 (27)	0.035	• Invasive Plants	Weed control. Continue weed control (e.g.,

Table 2. 2016 Monitoring and Management Results, Threats, and Recommendations.

Species	Site	Population Size[1]	Occupied Habitat (acres)[2]	Threats	Management Recommendations
(*Dudleya variegata*)				• Thatch • OHVs • Trails (unauthorized)	hand weeding, dethatching, herbicides), as necessary, to reduce thatch and invasives. Monitoring. Monitor every 2 years to assess status and treatment success. Access control. Inspect existing fencing and signage annually to ensure they remain intact. Management. Install additional gates, fencing, and signage, if needed, to exclude OHVs and keep recreational users on authorized trails. Maintain erosion control devices to minimize erosion in or adjacent to variegated dudleya plants; install new erosion control measures, as necessary.
Variegated Dudleya (*Dudleya variegata*)	South Crest	117[4]	0.002	Same as above	Same as above
Variegated Dudleya (*Dudleya variegata*)	Odom	134(216)	0.002	Same as above	Same as above

[1] Number = 2016 population size; number in parentheses = 2015 population size.

[2] Refers to habitat occupied in 2016 (acres).

[3] See CBI 2014 for Best Management Practices for hand weeding within *Acanthomintha ilicifolia* populations.

[4] Includes individuals outplanted as part of the *Nolina-Dudleya* augmentation on South Crest; note that the 117 individuals counted were only plants in the monitoring plot. The total number of outplanted variegated dudleya plants was estimated at over 300 plants and at least 171 of these individuals flowered in 2016.

Table 3. Invasive Plants in or near MSP Rare Plant Occurrences.

Covered Species	Site	Invasive Plants	
		Scientific Name	Common Name
San Diego thornmint	South Crest	*Brachypodium distachyon*[1]	Purple false-brome
		Brassica tournefortii	Saharan mustard
		Bromus madritensis	Red brome
		Centaurea melitensis	Tocalote
		Erodium cicutarium	Red-stemmed filaree
		Hedypnois cretica	Crete weed
		Hirschfeldia incana	Short-podded mustard
		Lysimachia (formerly Anagallis) arvensis	Scarlet pimpernel
		Sisymbrium irio	London rocket
		Sonchus oleraceus	Sow-thistle
Variegated Dudleya	South Crest Odom	*Avena barbata*	Slender oat
		Brachypodium distachyon	Purple false-brome
		Bromus madritensis	Red brome
		Hirschfeldia incana	Short-podded mustard
		Centaurea melitensis	Tocalote
		Erodium cicutarium	Red-stemmed filaree
		Lactuca serriola	Prickly lettuce
		Lysimachia (formerly *Anagallis*) *arvensis*	Scarlet pimpernel
		Sonchus oleraceus	Sow-thistle
Encinitas baccharis	Gibson	*Ehrharta longiflora*[1]	Long-flowered veldt grass
		Hypochaeris glabra	Smooth cat's ear
		Silene gallica	Common catchfly

[1] Species considered a priority for regional management per the Invasive Plant Strategic Plan (CBI et al. 2012).

Task 3: Land Manager Support and Training

CBI biologists Jessie Vinje and Spring Strahm provided support to EHC land manager Johnathan Piazza by (1) providing a field overview of invasive plant populations on the preserves that require management and discussing appropriate control treatments and schedules, (2) creating invasive plant maps for land manager use, and (3) identifying and demarcating areas which support MSP priority plant species. In addition, they demonstrated MSP monitoring protocols and best management practices to Mr. Piazza during the monitoring and management tasks.

Please do not hesitate to contact me at (858) 254-9199 or pgordonreedy@consbio.org if I can provide further information.

Sincerely,

Patricia Gordon-Reedy

Biologist/Vegetation Ecologist
Conservation Biology Institute

References

Conservation Biology Institute (CBI), Dendra, Inc., and California Invasive Plant Council (Cal-IPC). 2012. Management priorities for invasive non-native plants: a strategy for regional implementation, San Diego County, California. Prepared for San Diego Association of Governments (SANDAG), contract no. 5001322. 83 pp.

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