5-YEAR REVIEW

Verbesina dissita
(Big-leaved Crownbeard)

GENERAL INFORMATION:

Species: *Verbesina dissita* (Big-leaved crownbeard), a plant species

Date listed: October 7, 1996

FR citation(s): USFWS 1996 (61 FR 52370-52384)

Classification: Threatened

BACKGROUND:

Most recent status review: USFWS [U.S. Fish and Wildlife Service]. 2010. *Verbesina dissita* (Big-leaved crownbeard); 5-year Review: Summary and Evaluation. Carlsbad Fish and Wildlife Office, Department of the Interior. 38 pp.

FR Notice Citation Announcing This Status Review: USFWS 2018. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 50 Species in California, Nevada, and the Klamath Basin of Oregon. June 18, 2018. *Federal Register* 83: 28251-28254. No Comments Relative to *Verbesina Dissita* were received.

ASSESSMENT:

Information acquired since the last status review:

This 5-year Review was conducted by the USFWS's Carlsbad Fish and Wildlife Office. Data for this review were solicited from interested parties through a *Federal Register* notice announcing this review on June 18, 2018. We also contacted the California Department of Fish and Wildlife, the Orange County Chapter of the California Native Plant Society, the Natural Communities Coalition, the City of Laguna Beach, the Laguna Canyon Foundation and species experts to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

Summary of new information since 2010:

Distribution

At the time of listing, *Verbesina dissita* was known to occur in southern maritime chaparral at two general locations totaling 20 to 25 acres {ac [8 to 10 hectares (ha)]; USFWS 1996, p. 52373, 2010, p. 5}. The largest location is known as Niguel Hill (EO 1) and includes the south flank of Temple Hill, Esslinger Ridge, Goff Ridge, Portafina Canyon, Arch Beach Heights, and Hobo Canyon. The second location occurs on Temple Hill (EO 2) located primarily in Ceonothus Canyon, in Laguna Beach, California. In the 2010 5-year Review, we reported that EO 1 and EO 2 had been

combined by the California Natural Diversity Database (CNDDB) because of recent surveys and a historical report (Marsh 1992) that indicated numerous localities within the two element occurrences (EO) were within 0.25 mile [400 meters (m) of each other (Figure 1)]. In addition, two new locations were reported on the eastern side of Niguel Hill, west of the Aliso Summit Trail (EO 3), which extended the known range an additional half mile east from the coast to 2 miles [3.2 kilometers (km)] inland (USFWS 2010, p. 8). Based on this information, the 2010 5-year Review estimated 30 ac (12 ha) of occupied habitat within the two occurrences.

Since the 2010 5-year Review, numerous new locations have been recorded within the existing occurrences that increase the acreage of occupied habitat (Figure 1). The Laguna Canyon Foundation recorded approximately 11 new locations in EO 1 during their monitoring of the City of Laguna Beach fuel modification activities (Kaufman 2019, pers. comm.; Calflora 2020). Approximately nine new patches were identified on the slopes around Nyes Place. To the south, new patches of *Verbesina dissita* was noted near the northern end of Driftwood Drive and a large new polygon was recorded above Ocean Vista Circle. Additional survey efforts documented two large patches of *V. dissita* in Hobo Canyon on the Pacific Horizon Preserve, including historically occupied habitat and new locations (Glen Lukos Associates 2019, p. 4). In 2017, four new locations were recorded on a ridge below Badlands Park and Le Conte Street, within the Aliso and Wood Canyons Wilderness Park (CalFlora 2020). Multiple survey efforts also documented new patches of plants along Valido Trail.

Verbesina dissita was also recorded during the spring of 2019 in upper Wood Canyon following the 2018 Aliso Fire, expanding the known inland distribution again by 1.75 miles (1.21 km) to the north (Figure 1; Roberts and Leatherman 2019, p. 9). At this location 150 *V. dissita* patches were observed, where discrete patches of plants were distinguished by having a distance of at least 2 to 3 feet from the nearest neighboring *V. dissita* plant (Roberts 2020, pers. comm.) This occurrence was previously unknown and the location was likely opportunistically surveyed for *V. dissita* for the first time following the Aliso Fire. Given the vigor of the above ground growth, it is likely that the plants sprouted from existing underground rhizomes (Roberts 2020, pers. comm.). This occurrence is within the Aliso and Wood Canyons Wilderness Park and is part of the preserve system for the Orange County Central-Coastal Natural Communities Conservation Plan/Habitat Conservation Plan (Figure 2).

The updated estimate of occupied *Verbesina dissita* habitat is 314.7 ac (127.4 ha; Figure 1). The current estimate represents a 10 fold increase in the distribution of *V. dissita* relative to the 2010 5-year review (30 ac, 12 ha) and approximately 43 percent of the potentially suitable habitat (718 ac, 201 ha) identified at that time (USFWS 2010, p. 27). In addition to the new occurrences described above, this estimate includes data from the South Laguna Biological Resources Inventory that was previously incorporated as potential *V. dissita* habitat in the 2010 5-year Review and is not identified as occupied habitat (Marsh 1992, entire; USFWS 2010, p. 9). Upon further review and discussion with a contributing botanist and species expert, the report represents the best available information on distribution and abundance, particularly in areas not surveyed since 1992 (Roberts 2020, pers. comm.).

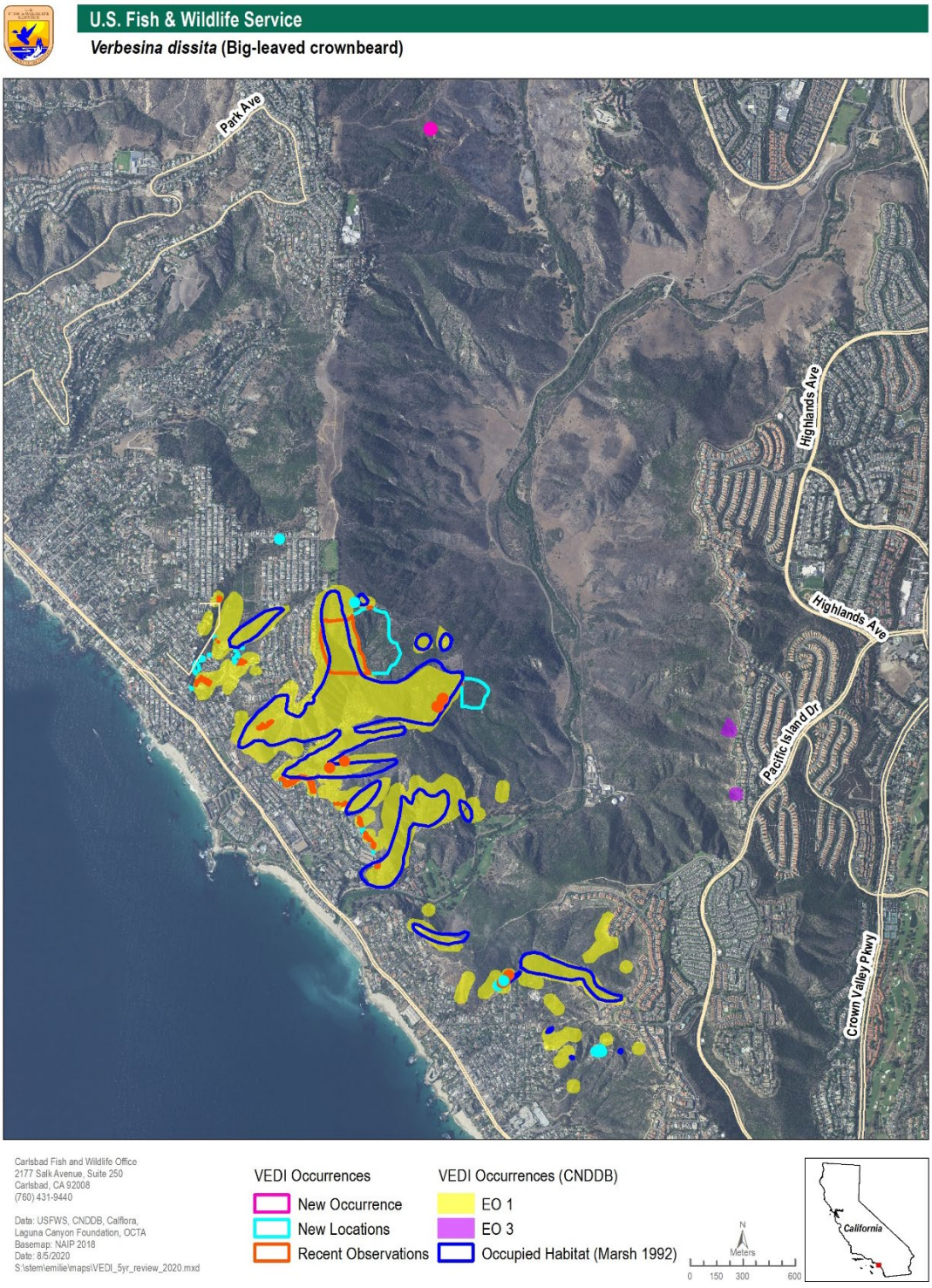

Figure 1. Distribution of *Verbesina dissita*. Map of coastal Orange County in the vicinity of Laguna Beach indicating historical occurrences documented by CNDDB and new observations since the last 5-year Review.

The current distribution of *Verbesina dissita* extends from the coast in Laguna Beach to upper Wood Canyon in Aliso Viejo, California, and is comprised of three distinct occurrences described within this document. Two of these occurrences are acknowledged by CNDDB: EO 1, along the coast in Laguna Beach; and EO 3, along Aliso Summit Trail in Laguna Niguel. The third occurrence includes the new inland observation by Roberts and Leatherman (2019) within Wood Canyon in Aliso Viejo. However, potentially suitable habitat exists between these three occurrences and it is possible that the acreage of occupied habitat will increase as additional patches of *V. dissita* plants are recorded during future investigations.

Genetics

A molecular genetic study was conducted in coordination with California Department of Fish and Wildlife to investigate clonal and population structure in *Verbesina dissita* (Ayers and Showers 2006, entire). Potential individuals or genetic units were defined in the field as distinct patches of plants ranging in size from less than one meter to several meters in diameter (Ayres and Showers 2006, p.1). Four locations were sampled across the known distribution at the time of the study (EO 1): 20 patches of plants were sampled from three locations in Laguna Beach and 9 patches were sampled from Laguna Niguel. The distance between patches ranged from 0.17 miles (0.27 km) between the two northern patches in Laguna Beach (Nyes Place and Hobo Canyon), to 1.5 miles (2.4 km) between the Laguna Beach and Laguna Niguel, to the south. The study found that each patch represented one to a few genotypes and addressed the concern that, due to its rhizomatous growth form, individual patches and even occurrences may only represent a single genotype. Although there are still field constraints to assessing population size, these results support the likely presence of hundreds to thousands of individuals within the U.S. portion of the species range and greater genetic diversity than was previously understood (USFWS 1996, p. 52373).

Ayers and Showers (2006) also evaluated population structure utilizing the same genetic sampling framework described above. No evidence of population or subpopulation structure was observed, although the number of polymorphic markers may be too low to make a definitive conclusion about the genetic distinctiveness of the documented occurrences (Ayres and Showers 2006, p. 5). This study did not include the new occurrences in the eastern portions of its range (e.g., EO3 and Wood Canyon).

Biology

Our understanding of sexual reproduction in *Verbesina dissita* is based on a pollination biology study conducted by the University of California Davis and California Department of Fish and Wildlife (Ayres and Showers 2006, p. 1). The study evaluated self-compatibility within *V. dissita* by excluding a portion of the inflorescences from pollinator visitation using a mesh barrier. The study concluded that *V. dissita* was self-incompatible based a higher seed set in open flowers (2.4 +/- 0.54) compared to closed or excluded flowers (0 +/- 0.57) ($p=.01$; Ayres and Showers 2006, p. 1; Ayers 2019, pers. comm.).

Threats

In the listing rule, destruction and modification of habitat by residential development, urbanization, and fuel modification activities were cited as threats to *Verbesina dissita* and its habitat (USFWS 1996, p. 52377). In the 2010 5-year review, development was no longer considered an imminent threat because the steep slopes where *V. dissita* occurs were thought to have been developed to their full potential (USFWS 2010, p. 14). However, some ongoing development continues to impact the species in the area known as Nyes Place (Simonsen 2020, pers. obs.; Osborne 2020, *in litt*.). Although the acreage of the impacts is relatively small, it occurs in some of the highest quality *V. dissita* habitat. Habitat loss due to development and fuel modification is a greater threat to *V. dissita* on private lands and remains a moderate threat to the species.

Within Laguna Beach, residential developments are subject to the City of Laguna Beach Fire Department Landscape/Fuel Modification Guidelines and Maintenance Program that requires a minimum fuel modification area of 195 feet (59.4 m) from development in areas near or adjacent to undeveloped vegetated areas (City of Laguna Beach Fire Department 2010, p. 2). To minimize potential impacts to *Verbesina dissita*, the implementation of fuel modification practices have been modified to include flagging of *V. dissita* and establishment of a 15 foot (4.6 m) buffer (Simonsen 2019, pers. obs.). There is evidence of *V. dissita* persisting in fuel modification zones in the vicinity of Nyes Place. However, years of fuel modification have also resulted in fuel modifications zones dominated by nonnative plants, particularly annual grasses, which are invading adjacent *V. dissita* habitat. In some cases, maritime chaparral shrubs (e.g., *Ceanothus* spp.) within fuel modification areas have died, particularly on drier west facing slopes (Simonsen 2020, pers. obs.). Potential sources of mortality include competition with nonnative plants, extended periods of drought, and the absence of the canopy cover, which may result in increased soil temperatures and evaporation. *Verbesina dissita* is unlikely to persist in the absence of shrub canopy cover (USFWS 2010, p. 5).

Conservation

At listing, 10 to 20 percent of the known distribution of *Verbesina dissita* occurred within the Aliso and Woods Canyon Wilderness Park in the Central/Coastal Reserve of Orange County (USFWS 2010, p. 6). In the 2010 5-year Review, the occupied habitat preserved increased to include the new occurrence at Aliso Summit Trail that is also located in Aliso and Woods Canyon Wilderness Park.

Two recent conservation easements and a preserve have been established since the 2010 5-year review totaling 232.6 ac (106.3 ha; Figure 2).). The Hobo-Aliso Ridge Conservation Easement occurs to the south and east of the Nye's Place development. It is centered on Hobo Canyon, which includes high quality habitat occupied by *Verbesina dissita* (Marsh 1992, p. 37). The parcel is a Coastal Commission Offers to Dedicate (OTD) easement to address unpermitted development activities. The Coastal Conservancy holds the conservation easement and Driftwood LLC holds fee title to the 75 ac (30.4 ha) parcel, which will be protected as open space.

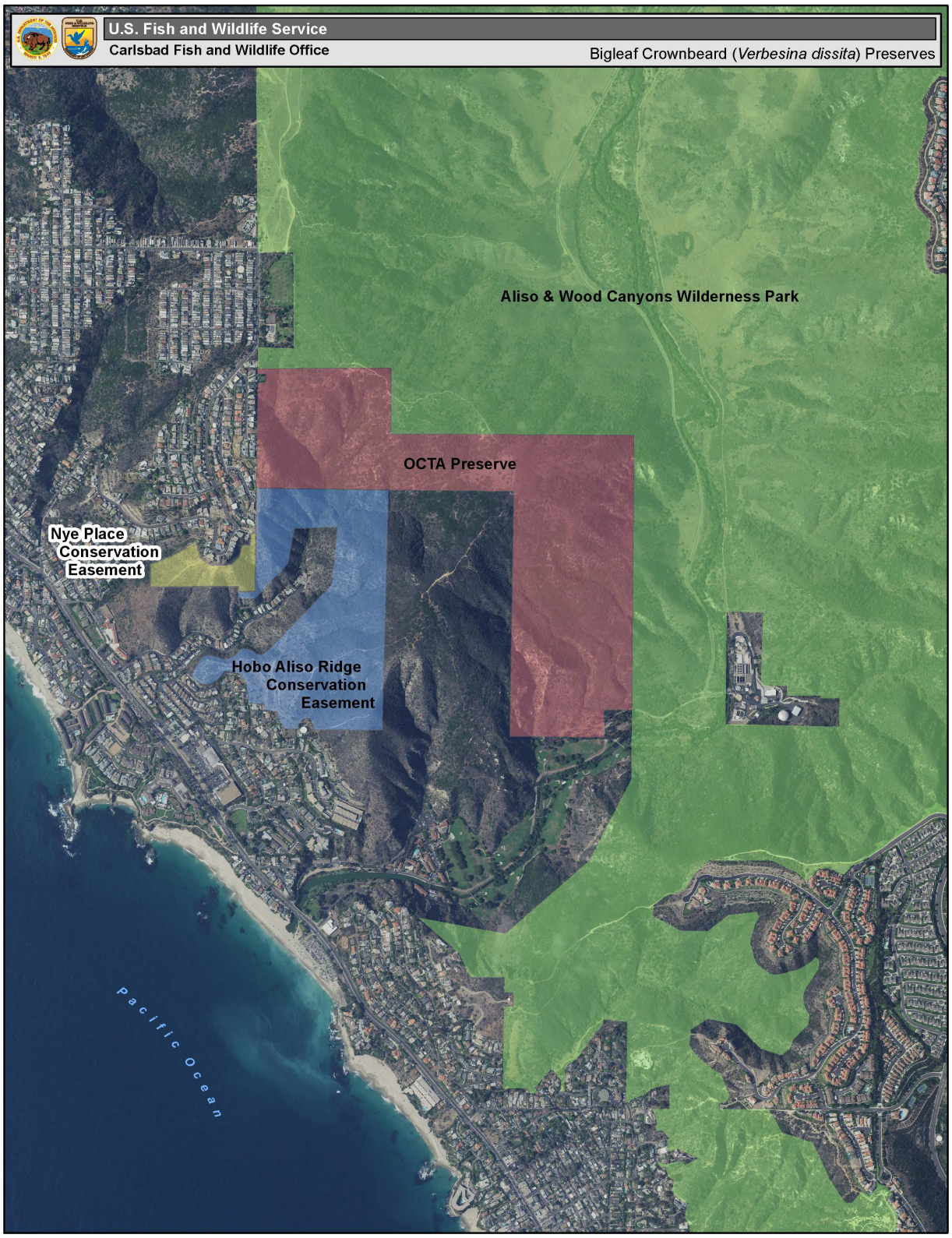

Figure 2. Location of preserved lands for the benefit of *Verbesina dissita*.

The Orange County Transportation Authority (OCTA) 152 ac (61.5 ha) Pacific Horizon Preserve was established in 2015 as part of the measure M2 Freeway Environmental Mitigation Program and is located to the north and east of Hobo-Aliso Ridge Conservation Easement (Figure 2; Bonterra Psomas 2015, p. 2; OCTA 2018, p. 1-4). OCTA conducts monitoring, including for *Verbesina dissita,* and is actively managing habitat within the preserve (OCTA 2018, p. 3-4; Glen Lukos Associates 2019, p. 4). *Verbesina dissita* occurs within the Pacific Horizon Preserve along the southwest trending ridge-line below Moulton Meadows Park that extends over the ridge and down-slope to Aliso Creek (Bonterra Psomas 2015, p. 35).

A conservation easement for the preservation of *Verbesina dissita* was deeded to the California Department of Fish and Wildlife (CDFW) in 2008 (Figure 2; City of Laguna Beach 2008, p. 1). The 5.6 ac (2.3 ha) conservation easement is located on Goff Ridge below the Nyes Place development. It occurs within an 8.8 ac (3.6 ha) parcel previously zoned as open space (APN 656-062-30). The conservation easement was developed to facilitate mitigation of *V. dissita* for landowners within the City and to meet the requirements of the California Fish and Game Code Section 2081 (b), including transplantation of material salvaged from residential developments. The Laguna Canyon Foundation has successfully transplanted *V. dissita* in the conservation easement through container plants propagated from seed and salvaged rhizomes (Simonsen 2019, pers. obs.). The north facing slopes of this conservation easement include high quality southern maritime chaparral that provides the most appropriate receiver site for translocated plants. The other slopes and ridgelines are less suitable for *V. dissita* because they are more sparsely vegetated and are being colonized by nonnative annuals and grasses coming from the fuel modification zone upslope (Simonsen 2020, pers. obs.).

The City of Laguna Beach owns the parcel between the Hobo Aliso Ridge conservation easement and the Pacific Horizon (OCTA) Preserve, which is split-zoned Open Space-Conservation and Residential Hillside Protection (Figure 2; Jedynak 2019, pers. comm.) The parcel includes moderate to high quality *Verbesina dissita* habitat; and the species is known from Aliso Ridge and the south-trending ridgelines north of Country Club Drive. There are no current deed restrictions on this 96 ac (39 ha) parcel known as Pacific Triangle and it is not afforded any specific protection. However, the parcel is likely to remain undeveloped because it is inaccessible due to surrounding development.

Due to the conservation efforts described above, 157.6 acres (63.8 hectares) or 50 percent of occupied *Verbesina dissita* habitat is preserved. The new occurrence at Wood Canyon and the Aliso Summit Trail occurrence (EO 3) are preserved in their entirety within Aliso and Wood Canyons Wilderness Park. Along the coast (EO 1), 122.7 ac (49.7 ha) or 45 percent of the occupied habitat is preserved between the preserve, conservation easements, and Aliso and Wood Canyons Wilderness Park.

Conclusion:

After reviewing the best available scientific information, we conclude that *Verbesina dissita* remains a threatened species. The evaluation of threats affecting the species under the factors in

4(a)(1) of the Act and analysis of the status of the species in our 2010 5-year Review remains an accurate reflection of the species current status.

RECOMMENDATIONS FOR FUTURE ACTIONS:

Since listing, efforts have been made to conserve habitat since habitat loss and degradation continues to be the primary threat. Conserving high quality habitat has helped conserve the species. Recovery will require a greater understanding of the species distribution, breeding system and genetic diversity throughout its range. We have identified these recommendations to aid recovery of *Verbesina dissita*:

1. Develop and test a habitat suitability model to define potential suitable habitat and inform our understanding of the species distribution.

2. Create and implement a protocol for range wide surveys to better understand the distribution and abundance of the species, including surveying potentially suitable habitat in Aliso and Wood Canyons Wilderness Park.

3. Research genetic variability and population structure including the eastern occurrences and Mexican distribution.

4. Characterize the breeding system including potential pollinators, average seed set, the relative contribution of sexual and asexual reproduction, and conditions for seed germination.

5. Develop a monitoring plan to track occurrences over time and to investigate variations in plant phenology tied to weather conditions.

6. Conserve and restore suitable habitat including occurrences threatened by nonnative plant species.

7. Research transplantation opportunities outside of the core occupied habitat along the coast, to minimize the risk of stochastic events.

8. Utilize outreach and other techniques to limit future development impacts in occupied habitat.

9. Continue to conduct research to fill important gaps in species ecology (e.g., genet age to evaluate persistence, timing and triggers for germination, impact of nonnative plants particularly annual grasses on germination, threshold for rhizome persistence/carbohydrate storage following fires or fuel modification).

REFERENCES CITED

Ayres, D. and M.A. Showers, 2006. Recommendation for Fire Management by Grazing of Verbesina dissita Habitat in Laguna Beach, CA. Final Report to California Department of Fish and Wildlife. May 24, 2006.

Bonterra Psomas. 2015. Baseline Biological Surveys Technical Report for the Aliso Canyon Property. Measure M2 Freeway environmental Mitigation Program Acquisition Properties Evaluation in Orange County, California. Prepared for Orange County Transportation Authority. October 2015.

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Glen Lukos and Associates. 2019. Biological Monitoring Report for OCTA M2 Preservers: Pacific Horizon, Bobcat Ridge, Silverado Chaparral, Wren's View, Live Oak Creek and Eagle Ridge. Prepared for the Orange County Transpiration Authority. March 2019.

Marsh, K.G. 1992. South Laguna Biological Resources Inventory. Prepared for the City of Laguna Beach, CA.

[OCTA] Orange County Transportation Authority. 2018. Pacific Horizon (Aliso Canyon) Preserve Resource Management Plan. Dated September 2018.

Roberts. F. and S. Leatherman. 2019. Rare and Sensitive Plants of the Aliso Fire, Aliso and Wood Canyons Wilderness Park. 2019 Interim Report (Updated February 2020). Prepared for the Natural Communities Coalition. 28 pp.

[USFWS] U.S. Fish and Wildlife Service. 1996. Determination of Endangered or Threatened Status for Four Southern Maritime Chaparral Plant Taxa from Coastal Southern California and Northwestern Baja California, Mexico; final rule. *Federal Register* 61:52370–52384.

[USFWS] U.S. Fish and Wildlife Service. 2010. *Verbesina dissita* (Big-leaved crownbeard) 5-year review: Summary and evaluation. U.S. Fish and Wildlife Service, Carlsbad, California. 38 pp.

[USFWS] U.S. Fish and Wildlife Service. 2020. Initiation of 5-Year Status Review of 50 Species in California, Nevada, and the Klamath Basin of Oregon. *Federal Register* 83:28252–28254.

PERSONAL COMMUNICATION

Jedynak, E. 2019. Associate Planner, City of Laguna Beach. Email communication to Julie Simonsen, Fish and Wildlife Biologist, USFWS, Carlsbad Fish and Wildlife Office, Carlsbad. California. Dated October 29, 2019. Subject: Zoning designation and protection for City of Laguna Beach parcel located west of the Hobo-Aliso Ridge Preserve and attachments.

Osborne, M. 2020. Botanist, California Department of Fish and Wildlife. Email communication to Julie Simonsen, Fish and Wildlife Biologist, USFWS, Carlsbad Fish and Wildlife Office, Carlsbad. California. Dated July 28, 2020. Subject: Big-leaf Crownbeard Incidental Take Permits.

Roberts, F. 2020. Botanist. Phone call correspondence to Julie Simonsen, Fish and Wildlife Biologist, USFWS, Carlsbad Fish and Wildlife Office, Carlsbad, California. Dated April 21, 2020. Subject: Status of *Verbesina dissita* new and historical occurrences.

Simonsen, J. 2019. Field notes for visit to *Verbesina dissita* occurrences with Fred Roberts, Botanist, and Alan Kaufman, Laguna Canyon Foundation. Dated October 10, 2019.

Simonsen, J. 2020. Field notes for visit to Nyes Place development site and mitigation sites with CDFW. Dated July 15, 2020.

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service

☒ Approve

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