

**PECE EVALUATION FOR THE SAN FERNANDO VALLEY SPINEFLOWER
2017 CANDIDATE CONSERVATION AGREEMENT**

January 19, 2018

Introduction

On September 15, 2016, we published a proposed rule (81 FR 63454) to list the San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*; spineflower) as a threatened species under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*). Since publication of the proposed rule in the Federal Register, the U.S. Fish and Wildlife Service (Service) and the Newhall Land and Farming Company (Newhall Land) developed a Candidate Conservation Agreement (CCA) for the spineflower to implement conservation measures to improve the status of the species. Under Section 4(b)(6) of the Act, the Service is required to make a final listing determination within one year from the publication of the proposed rule, by publishing either a final listing rule or a withdrawal of the proposed rule, or extending the final determination by not more than six months under certain circumstances as specified in the statute. On July 19, 2017, the Service published a six-month extension of the final determination of whether to list the spineflower and reopened the comment period for an additional thirty days (82 FR 33035). Upon publication of the proposed rule, and again with this extension of the comment period, the Service requested that the public comment on the proposed rule and provide any additional information on the status of the species or its habitat, so that we could analyze this additional information as part of the final listing process. As part of our analysis, we are evaluating the effectiveness of the additional conservation measures that the CCA signatories have committed to implement.

The CCA provides for Newhall Land to voluntarily implement conservation measures described in the San Fernando Valley Spineflower Enhancement and Introduction Plan (Introduction Plan) with the goal of establishing new, protected spineflower occurrences within its historical range. These actions in the CCA are intended to contribute to reducing and eliminating current and/or potential future threats to the persistence of the spineflower as a species by: (1) expanding the area of protected conservation land for spineflower, (2) increasing the number and extent of protected spineflower occurrence locations, and (3) providing protection for spineflower introduction sites from development-related stressors. The actions in the CCA should result in at least two new, self-sustaining and persistent spineflower occurrences and should increase the number of ecoregions in which spineflower is represented.

On March 28, 2003 (FR 68 15100), the Service and National Oceanic and Atmospheric Administration (NOAA) Fisheries published the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE). The purpose of PECE is to ensure consistent and adequate evaluation of recently formalized conservation efforts when making listing decisions. The policy provides guidance on how to evaluate conservation efforts that have not yet been implemented or have not yet demonstrated effectiveness. The evaluation focuses on the certainty that the conservation actions will be implemented and effective. The policy reviews nine criteria for evaluating the certainty of implementation and six criteria for evaluating the certainty of effectiveness for conservation actions. The evaluation criteria are as follows:

The certainty that the conservation effort will be implemented:

1. The conservation effort, the party(ies) to the agreement or plan who will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.
2. The legal authority of the party(ies) to the agreement or plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.
3. The legal procedural requirements (e.g., environmental review) necessary to implement the effort are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.
4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation effort are identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the effort will obtain these authorizations.
5. The type and level of voluntary participation (e.g., number of landowners allowing entry to their land, or number of participants agreeing to change management practices and acreage involved) necessary to implement the conservation effort is identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain that level of voluntary participation (e.g., an explanation of how incentives to be provided will result in the necessary level of voluntary participation).
6. Regulatory mechanisms (e.g., laws, regulations, ordinances) necessary to implement the conservation effort are in place.
7. A high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain the necessary funding.
8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.
9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

The certainty that the conservation effort will be effective:

1. The nature and extent of threats being addressed by the conservation effort are described, and how the conservation effort reduces the threats is described.
2. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.
3. The steps necessary to implement the conservation effort are identified in detail.
4. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured, are identified.

5. Provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.
6. Principles of adaptive management are incorporated.

These criteria are not considered comprehensive evaluation criteria. The certainty of implementation and effectiveness of a formalized conservation effort may also depend on species-specific, habitat-specific, location-specific, and effort-specific factors. We consider all appropriate factors in evaluating formalized conservation efforts. The specific circumstances will also determine the amount of information necessary to satisfy these criteria.

To consider that a formalized conservation effort contributes to forming a basis for not listing a species or for listing a species as threatened rather than endangered, we must find that the conservation effort is sufficiently certain to be implemented and effective so as to have contributed to the elimination or adequate reduction of one or more threats to the species identified through the section 4(a)(1) analysis. The elimination or adequate reduction of section 4(a)(1) threats may lead to a determination that the species does not meet the definition of threatened or endangered, or is threatened rather than endangered. An agreement or plan may put in place one conservation effort that is designed to address the primary threats to the species, or may contain numerous conservation efforts, not all of which are sufficiently certain to be implemented and effective. Any conservation effort that is not sufficiently certain to be implemented and effective cannot contribute to a determination that listing is unnecessary, or a determination to list as threatened rather than endangered. Regardless of the adoption of a conservation agreement or plan, however, if the best available scientific and commercial data indicate that the species meets the definition of “endangered species” or “threatened species” on the day of the listing decision, then we must proceed with appropriate rule-making activity under section 4 of the Act. Below is our analysis regarding the application of PECE to the certainty of effectiveness and implementation of the 2017 CCA for the spineflower.

Background

Historical Abundance and Distribution

Historically, the spineflower was known from at least 10 locations in Los Angeles and Orange Counties (CDFG 2002, p. 14) (see Figure 1, below). The species was last collected in 1929, was not seen for 70 years (1929–1999), and was presumed extinct by the botanical community because the species was extirpated from all of the areas where it was originally collected (Reveal and Hardham 1989, p. 149). The majority of the historical collections of the spineflower from the greater Los Angeles metropolitan area were made in areas where urban, agricultural, and industrial development have replaced native habitats. Numerous field botanists had tried to rediscover it (Reveal and Hardham 1989, p. 149).

In 1999, the spineflower was discovered along the southern rim of Laskey Mesa within the footprint of the proposed Ahmanson Ranch development project in southeastern Ventura County, California (GLA 2000, p. 1). At the time, this was the only known extant population of this plant. The area occupied by the spineflower in 1999 was estimated to be approximately 6 acres (ac) (2.4 hectares (ha)), comprised of approximately 23,000 plants (GLA 2000, p. 6). The potential

threats to the spineflower population at this site were reduced in 2003, when the Ahmanson Ranch project did not occur as planned and the property was acquired by the State of California through the Wildlife Conservation Board and transferred to the Santa Monica Mountains Conservancy for purposes of wildlife habitat preservation, corridor protection, restoration and management, wildlife-oriented education and research, and for compatible public uses, consistent with wildlife habitat preservation and protection of sensitive biological resources (Dudek 2010, p. 7). The former Ahmanson Ranch property was dedicated as public parkland in 2004, and is now called the Upper Las Virgenes Canyon Open Space Preserve. However, due to historical land uses at this site, the population has been impacted by loss of habitat and invasive, nonnative grasses.

In 2000, the spineflower was discovered near Santa Clarita in Los Angeles County, California, on land owned by Newhall Land Company. The 2000 survey data did not include population estimates. This population is within the footprint of the proposed Newhall Ranch development project.

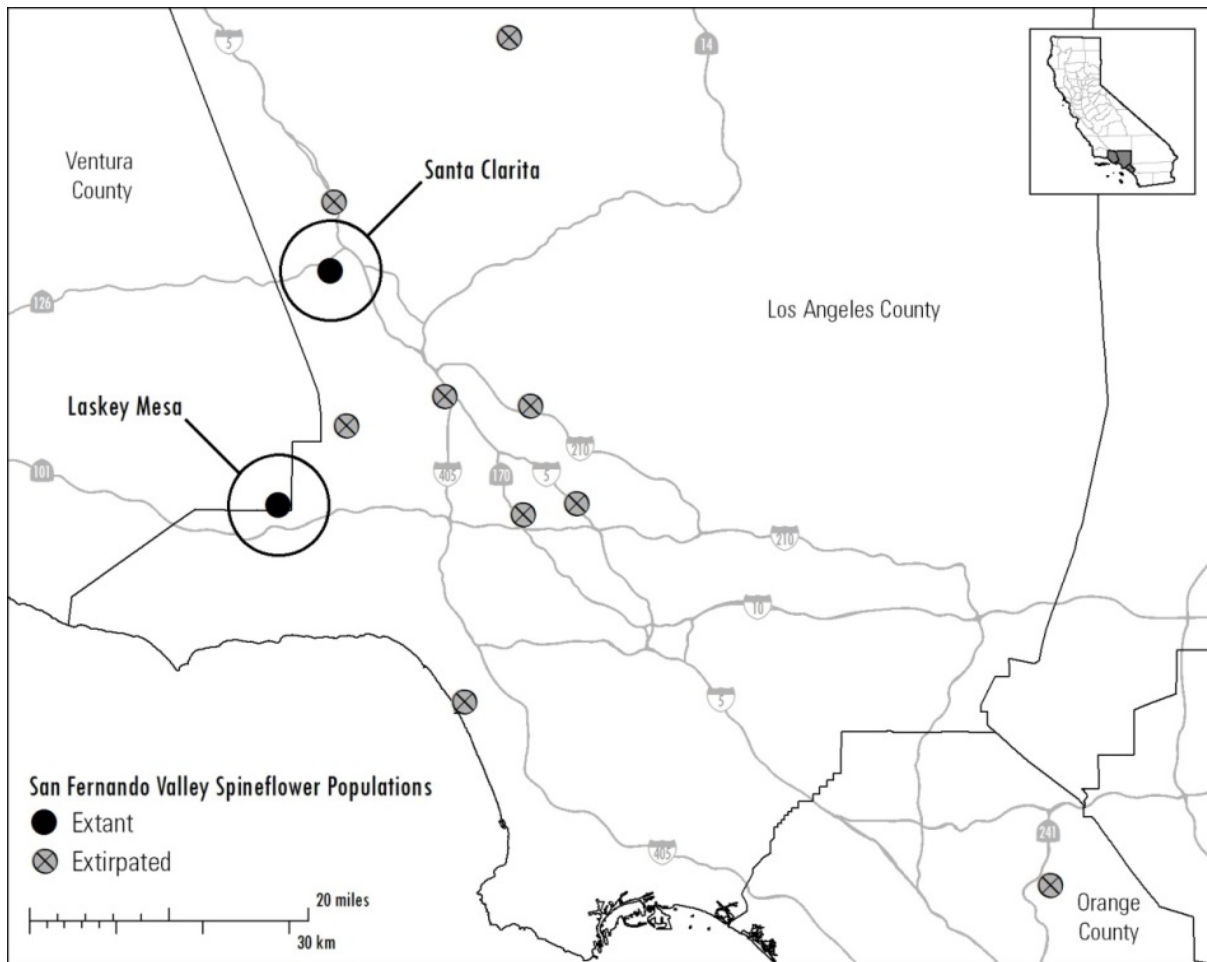


Figure 1. Historical and current San Fernando Valley spineflower population locations in California.

Current Abundance and Distribution

The spineflower currently occupies up to a total of 35–40 ac (14–16 ha) from two populations in Southern California that are 17 miles (mi) (27 kilometers (km)) apart (see Figure 1, above). The Laskey Mesa population is in Ventura County, California, within the Upper Las Virgenes Canyon Open Space Preserve on land owned by the Santa Monica Mountain Conservancy (SMMC) and the Mountains Recreation Conservation Authority (MRCA) (L.A. Mountains 2015). The Santa Clarita population is in Los Angeles County on land owned by Newhall Land Company (Dudek 2010, pp. 16–17). The Laskey Mesa population currently occupies approximately 15–20 ac (6.1–8.1 ha) (GLA 2000, p. 6; Sapphos 2001, p. 5-2; Sapphos 2003a, p. 3; Cooper 2015, pp. 8–10); the Santa Clarita population currently occupies approximately 20 ac (8.2 ha) (Dudek 2010, p. 63).

Comparing annual numbers of spineflower individuals over time is complicated because: (1) different methodologies and levels of effort have been used to estimate population numbers across both extant populations during survey efforts since 1999; and (2) as is typical of many annual plants, the spineflower shows inter-annual variation in abundance by several orders of magnitude, ranging from hundreds to millions of individuals. Therefore, occupied area or distribution of the populations is an appropriate surrogate measure for plant population size. The Santa Clarita population has roughly the same occupied acreage as Laskey Mesa but is more widely distributed across the landscape, scattered over a range of 4 mi (6.4 km) from east to west, and 4 mi (6.4 km) north to south.

Resiliency, Representation, and Redundancy

In our September 15, 2016, proposed rule (81 FR 63454) to list the spineflower as a threatened species we concluded that, overall, redundancy and representation are currently reduced and resiliency is likely to decrease in the future, bringing into question whether the spineflower can sustain itself in the face of environmental fluctuations and random, naturally occurring events. We determined that the spineflower warrants listing based on two of the five factors (Factors A and E), including historical and future loss of habitat and individuals from development (Factors A and E); having small, isolated populations (Factor E); presence of invasive, nonnative plants (Factors A and E); proliferation of Argentine ants (*Linepithema humile*) (Factor E); and potentially climate change (Factors A and E). Please refer to the Potential Stressors section in the San Fernando Valley Spineflower (*Chorizanthe parryi* var. *fernandina*) Species Report (Service 2016, pp. 20–78) for a more detailed discussion of our evaluation of the biological status of the plant and the factors that may affect its continued existence.

In our proposed rule, first we determined that loss of habitat and individuals and the associated edge effects (i.e., proliferation of invasive, nonnative plants and Argentine ants) at the Santa Clarita population is likely to decrease habitat quality, reducing resiliency at this population and increasing the overall risk to the plant from random, naturally occurring events. Second, we determined that with only two extant populations, there may not be sufficient redundancy to sustain the species over the long term, given current and future stressors acting upon the populations. Third, we determined that the distribution of spineflower populations across ecological settings, which may comprise the breadth of genetic and environmental diversity within and among populations, has been reduced. Currently, the two spineflower populations occur in only one level IV ecoregion. Historically, spineflower occurrences were distributed

across five level IV ecoregions. Ecoregions are areas where ecosystems (and the type, quality, and quantity of environmental resources) are generally similar and we therefore use ecoregion as a surrogate for ecological setting. Level IV is the finest ecoregion level developed by the Environmental Protection Agency (Environmental Protection Agency (EPA) 2016) meaning this classification system breaks the landscape down into the most detailed ecoregions (<https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states>). Because representation has been reduced from five to one ecoregion, the ability of the plant to adapt to changing environmental conditions into the future may be reduced.

Overall, we concluded that there may not be sufficient resiliency, redundancy, or representation to sustain the spineflower over the long term, given current and future stressors acting upon the plant.

2017 Candidate Conservation Agreement

Based on information provided in the proposed rule, the CCA signatories established a 2017 agreement that outlines several new conservation actions that will be implemented to address the threats identified in our September 15, 2016, proposed rule (81 FR 63454). The CCA provides for Newhall Land to voluntarily implement additional conservation measures described in the San Fernando Valley Spineflower Enhancement and Introduction Plan (Introduction Plan) with the goal of enhancing the status of the species. The Introduction Plan provides for Newhall Land to voluntarily establish new, protected spineflower occurrences within its historical range that will increase the resiliency of the existing populations and expand the redundancy and representation of the species. Newhall Land will voluntarily conserve an additional 1,498 acres of its property for the benefit of the spineflower, and carry out additional spineflower conservation activities within portions of those 1,498 acres and within an approximately 7 acre portion of the existing CDFW Petersen Ranch Mitigation Bank. Spineflower introduction will occur on a total of at least 10 acres within the Additional Conservation Areas. These actions will contribute to reducing and eliminating current and/or potential future threats to the persistence of the spineflower as a species by expanding the area of protected conservation land for spineflower, increasing the number and extent of protected spineflower occurrence locations, and providing protection for spineflower introduction sites from development-related stressors. The actions in the CCA will result in at least two new self-sustaining and persistent spineflower occurrences and will increase the number of ecoregions in which spineflower is represented.

The Introduction Plan builds on conservation measures required by the California Department of Fish and Wildlife (CDFW) under the Newhall Ranch Spineflower Conservation Plan (SCP). The CDFW approved the SCP and issued an incidental take permit (Permit No. 2081-2008-012-05, the ITP) under the California Endangered Species Act, California Fish and Game Code §§2050-2085 (CESA), in 2010 for the SCP and proposed Newhall Land development within the SCP area. Through the SCP, the CDFW has required Newhall Land to provide for the perpetual conservation and management of seven spineflower preserves within the Santa Clarita population, totaling 228 acres, located within the SCP Enrolled Lands on Newhall Land property. The SCP spineflower preserves contain approximately three-quarters of the cumulative occupied spineflower habitat on Newhall Land property, totaling approximately 15.4 acres. Newhall Land has granted conservation easements to the CDFW over all of the SCP spineflower preserves. The SCP Conservation Measures include habitat enhancement and creation measures

for spineflower, and experimental introduction of spineflower in areas outside of existing occupied habitat. Newhall Land has already provided more than \$4 million in endowments to fund management and monitoring of the SCP spineflower preserves, and will provide approximately \$2 million more in SCP endowments as required by the ITP. The SCP also includes management actions within the preserves to reduce indirect effects of the proposed development (including those from nonnative, invasive grasses and Argentine ants) (Dudek 2010, p. 141; Dudek 2014, p. 22). The Spineflower Adaptive Management Working Group has been formed to evaluate completed management actions and define explicit objectives for future management. The rest of the SCP will be implemented as ground is broken for the Newhall Ranch project, including construction monitoring, habitat restoration, fencing and signing, and water control at the Santa Clarita population. Newhall Land has also provided an endowment of approximately \$1.15 million under the SCP for perpetual management of the spineflower population at the Laskey Mesa population within the Upper Las Virgenes Canyon Open Space Preserve. The funding is to be used for on-the-ground management activities that include research studies, fencing, weeding, surveys, annual reporting, and other activities. When this funding becomes accessible, we anticipate that the MRCA will implement the identified management activities. The Additional Conservation Areas in the 2017 CCA are intended to further increase the distribution of the spineflower within its historic range and include approximately 1,505 acres (see Figure 2 below): (1) three Additional Conservation Areas totaling approximately 825 acres are contiguous with or adjacent to the existing San Martinez Grande and Potrero spineflower preserves established under the SCP (all of which would be considered part of the Santa Clarita population, Areas 1-3 in Figure 2); (2) an Additional Conservation Area of 357 acres is located in the Simi Valley watershed on the southern boundary of Newhall Land property in Ventura County (Area 5 in Figure 2); (3) an Additional Conservation Area of approximately 316 acres is located on Newhall Land property in the Castaic Mesa area in northern Los Angeles County, near a known extirpated population location (Area 4 in Figure 2); and (4) an Additional Conservation Area containing spineflower introduction sites is located in a 7 acre portion of the Petersen Ranch Mitigation Bank adjacent to Elizabeth Lake, also near a known extirpated population location (Area 6 in Figure 2). Spineflower introduction will occur on a total of at least 10 acres within the Additional Conservation Areas.

In carrying out the Additional Conservation Measures as described in the CCA, Newhall Land will introduce spineflower within portions of the Additional Conservation Areas with the goal of establishing at least two new, self-sustaining and persistent spineflower occurrences—at least one of which will be in a different ecoregion from the existing populations. Spineflower introduction will occur on a total of at least 10 acres within the Additional Conservation Areas. Newhall Land will also cause permanent conservation instruments to be recorded over each of the Additional Conservation Areas to ensure that spineflower habitat values are maintained. Newhall Land will fund all initial habitat enhancement and spineflower introduction activities within the Additional Conservation Areas, estimated at approximately \$3.35 million, and will fund one or more endowments to provide perpetual management and monitoring within the Additional Conservation Areas, based on a Property Analysis Record, currently estimated at a total of approximately \$4.1 million.

Newhall has begun implementation of the 2017 CCA. Seeding trials began in 2016. Newhall has recorded restrictive covenants over each of the Additional Conservation Areas on their property and has secured an easement agreement with Land Veritas to perform spineflower introductions

on the Peterson Ranch Mitigation Bank. Funding for all initial habitat enhancement and introduction activities within the Additional Conservation Areas has been deposited into an escrow account (approximately \$3.35 million).

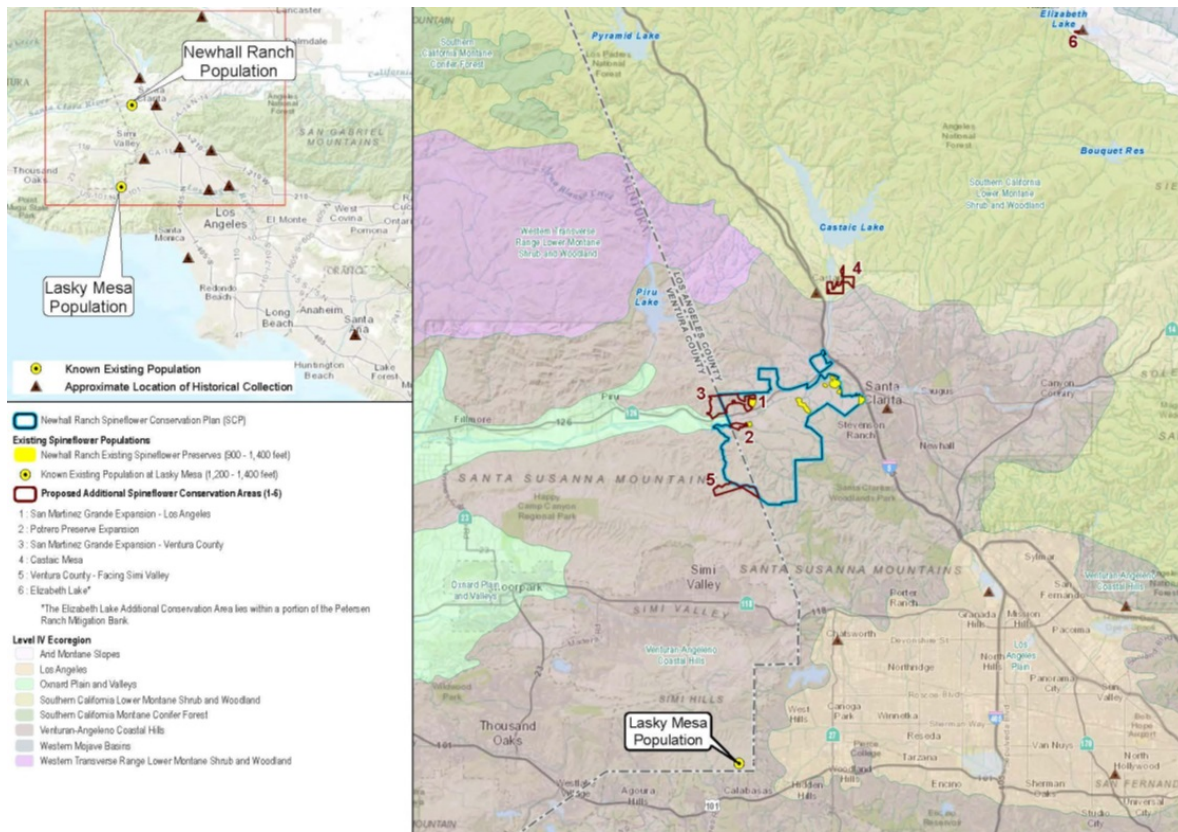


Figure 2. Additional Conservation Areas proposed in the San Fernando Valley spineflower Introduction Plan.

PECE Analysis

The certainty that the conservation effort will be implemented:

1. The conservation effort, the party(ies) to the agreement or plan who will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.

Conservation Efforts

The 2017 CCA provides for Newhall Land to implement the Introduction Plan with the goal of establishing at least two new, self-sustaining and persistent spineflower occurrences within the historic range of the species. Spineflower introduction will occur on a total of at least 10 acres within the Additional Conservation Areas. Newhall Land will cause permanent conservation instruments to be recorded over each of the Additional Conservation Areas and will fund: (1) all initial habitat enhancement and spineflower introduction activities within the Additional Conservation Areas, estimated at approximately \$3.35 million and has been deposited into an escrow account, and (2) perpetual management and monitoring within the Additional

Conservation Areas estimated at a total of approximately \$4.1 million, which will be placed into one or more endowments that will last in perpetuity.

Parties to the Agreement

The signatories to the 2017 CCA include the Service and Newhall Land. Newhall Land has management authority over their lands, which include Conservation Areas 1-5 in Figure 2.

The Petersen Ranch location is a CDFW-approved mitigation bank with conservation instruments already covering portions of the property, which includes Area 6 in Figure 2. Because this Additional Conservation Area is within the Petersen Ranch Mitigation Bank which is already designated for conservation purposes as a mitigation bank, Newhall Land will not set aside or conserve any additional acreage at the Elizabeth Lake Additional Conservation Area. Newhall Land has obtained the consent of the landowner, Land Veritas, to perform spineflower introduction within a portion of the Mitigation Bank consisting of approximately 7 acres at Elizabeth Lake, containing approximately 2 acres of areas identified in the Introduction Plan as potential spineflower introduction sites. The Elizabeth Lake Additional Conservation Area will be managed consistent with the management practices for the other Additional Conservation Areas and will exist within the larger conserved area of the surrounding mitigation bank. Land Veritas has agreed to establish a conservation easement over the sites on its lands, as necessary or appropriate.

Funding

Newhall Land will cause permanent conservation instruments to be recorded over each of the Additional Conservation Areas in which spineflower is established to ensure that spineflower habitat values are maintained. Restrictive covenants have been placed over all Additional Conservation Areas; easements will be placed over each of the Additional Conservation Areas in which spineflower is established. Newhall Land has funded all initial habitat enhancement and spineflower introduction activities within the Additional Conservation Areas, estimated at approximately \$3.35 million, and will fund one or more endowments to provide perpetual management and monitoring within the Additional Conservation Areas, based on a Property Analysis Record, currently estimated at a total of approximately \$4.1 million.

As evidence of Newhall Land's track record, which contributes to our analysis of certainty of implementation, we note that through the SCP, the CDFW has required Newhall Land to provide for the perpetual conservation and management of seven spineflower preserves. Newhall Land has provided more than \$4 million in endowments to fund management and monitoring of the preserves, and will provide approximately \$2 million more in SCP endowments as required by the ITP. Newhall Land has also provided an endowment of approximately \$1.15 million under the SCP for perpetual management of spineflower at the Laskey Mesa population.

In summary, we conclude that the conservation effort, the parties to the agreement who will implement the effort, and funding necessary to implement the effort are identified in the 2017 CCA.

2. The legal authority of the party(ies) to the agreement or plan to implement the formalized conservation efforts, and the commitment to proceed with the conservation efforts are described.

The majority of efforts described in the 2017 CCA will take place on Newhall Land property. The CCA is intended to provide a formal agreement with Newhall Land and commitment by the

signed parties to carry out the agreed to actions and activities. Petersen Ranch is also private property. Newhall Land has obtained the consent of the landowner, Land Veritas, to perform spineflower introduction within a portion of the Petersen Ranch. The easement was entered into on September 7, 2017.

In summary, we have a high degree of certainty that the parties to the CCA have the legal authority and direction to implement conservation efforts for the spineflower.

3. The legal procedural requirements (e.g., environmental review) necessary to implement the efforts are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the efforts.

We conducted a screening of the CCA under the National Environmental Policy Act (NEPA). We found that the agreement meets the qualifications for a CCA whose implementation represents a class of actions that do not individually or cumulatively have a significant effect on the human environment. Therefore, the action is categorically excluded from further NEPA documentation.

4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation efforts are identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the effort will obtain these authorizations.

Newhall Land has management authority over their lands, which include Conservation Areas 1-5 in Figure 2. The Petersen Ranch location is a CDFW-approved mitigation bank with conservation instruments already covering portions of the property, which includes Conservation Area 6 in Figure 2. Newhall Land has obtained the consent of the landowner, Land Veritas, to perform spineflower introduction within a portion of the Petersen Ranch identified in the Introduction Plan as potential spineflower introduction sites. The easement was entered into on September 7, 2017. The spineflower is listed by the State of California as an endangered species. The CDFW requires a Scientific Collecting or Research Permit for the collection, possession, transplantation or propagation of rare, threatened or endangered plants or manipulation of their habitat. These permits are free and are required for activities conducted on both private and public land. The CDFW has already issued such a permit to conduct the on-going San Fernando Valley Spineflower Experimental Habitat Manipulation and Seeding Project at Newhall Ranch.

In summary, authorization is not needed on the majority of occupied habitat, since it is largely owned by CCA signatory, Newhall Land. Other entities have provided consent or have agreed to cooperate in the actions in the CCA. A Scientific Collecting or Research Permit from CDFW will be required to implement the Introduction Plan. We have a high degree of certainty that the proper authorizations are and will be in place to implement conservation actions for the spineflower on lands where the actions will occur.

5. The type and level of voluntary participation (e.g., number of landowners allowing entry to their land, or number of participants agreeing to change practices and acreage involved)

necessary to implement the conservation effort is identified, and a high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain that level of voluntary participation (e.g., an explanation of how incentives to be provided will result in the necessary level of voluntary participation).

As described under criterion 4 (above), authorization is not needed on the majority of occupied habitat, since it is largely owned by CCA signatory, Newhall Land. Other entities have provided consent or have agreed to cooperate in the actions in the CCA. Therefore, there is a high level of certainty that the conservation actions in the CCA will obtain a high level of voluntary participation in spineflower conservation.

6. Regulatory mechanisms (e.g., laws, regulations, ordinances) necessary to implement the conservation efforts are in place.

As discussed in criterion 2 (above), the parties to the 2017 CCA have the legal and regulatory authority to implement the agreement.

7. A high level of certainty is provided that the party(ies) to the agreement or plan who will implement the conservation effort will obtain the necessary funding.

As discussed in criterion 1 (above), as evidence of their track record, which contributes to our analysis of certainty of implementation, we note that Newhall Land has already provided more than \$4 million in endowments to fund management and monitoring of the SCP spineflower preserves, and will provide approximately \$2 million more in SCP endowments as required by the ITP. Newhall Land has also provided an endowment of approximately \$1.15 million under the SCP for perpetual management of the spineflower population at Laskey Mesa.

Newhall Land has placed restrictive covenants over all of the Additional Conservation Areas and will cause permanent conservation instruments to be recorded over each of the Additional Conservation Areas in which spineflower is established to ensure that spineflower habitat values are maintained. Newhall Land has established an escrow account and deposited the amount of \$3.35 million (less any amount already expended by Newhall Land to implement the Introduction Plan) into the account, guaranteeing funding for implementation of the Introduction Plan. The escrow instructions provide for release of funds to Newhall Land annually, after written authorization by the Service, in an amount not to exceed the budgeted costs of Introduction Plan implementation tasks scheduled for the coming year or completed by Newhall Land at its own expense in the prior year. Newhall Land will fund one or more endowments sufficient to support perpetual management and monitoring of the Additional Conservation Areas as described in the Introduction Plan, based on one or more Property Analysis Records, currently estimated at a total amount of approximately \$4 million.

Therefore, we have a high degree of certainty that funding will continue to be available to implement conservation actions for the spineflower.

8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.

In the 2017 CCA, Newhall Land has agreed to implement the Introduction Plan in accordance with the implementation schedule defined therein, which includes a phased approach. A phased approach will provide lead time to conduct seed bulking and wild seed collections needed to acquire the necessary seed resources to implement spineflower introduction in the various areas. The Phased Implementation Schedule outlined in Section 4.2 of the Introduction Plan and shown below includes a sequential schedule of steps to be implemented during the program at each introduction site.

Newhall Land began implementation of the Introduction Plan in 2016 by commencing site investigations to identify the Additional Conservation Areas and suitable spineflower introduction sites within the Additional Conservation Areas, and by commencing spineflower seeding trials within the San Martinez Grande Preserve Expansion – Los Angeles County and Potrero Preserve Expansion Additional Conservation Areas. Newhall Land will continue to conduct spineflower seeding trials within each of the Additional Conservation Areas in accordance with the Introduction Plan.

Phased Implementation Schedule

Phase	Introduction Areas	Implementation Sequence
1	Potrero Preserve Expansion San Martinez Grande Preserve Expansion – Los Angeles	Implementation began in 2016 with initiation of seeding trials at both locations; commencement of full-scale spineflower introduction in 2018
2	San Martinez Grande Preserve Expansion – Ventura County Castaic Mesa	Site investigations completed in 2017. Implementation will continue with seeding trials beginning in 2018, followed by full-scale spineflower introduction
3	Ventura County – Facing Simi Valley Elizabeth Lake	Site investigations completed in 2017. Implementation will continue with seeding trials beginning in 2020, followed by full-scale spineflower introduction

For each of the three phases in the Phased Implementation Schedule, Newhall Land will implement the Task Implementation Schedule below (Section 4.2 of the Introduction Plan). The first step for each introduction site is the establishment of seeding trials. A series of initial seeding trials will be implemented at the proposed introduction areas prior to widespread introductions. The seeding trials are expected to take a minimum of 2 years to implement and obtain meaningful results. The seeding trials will be followed by more widespread spineflower introductions. The locations for widespread introductions will be based on where seeding trials demonstrate a reasonable probability of success and will occur on a minimum of 10 acres within the Additional Conservation Areas.

Task Implementation Schedule

Year	Task	Seasonality	Stage of Program
Ongoing	Procure seed through wild collections and seed bulking at a nursery	November–June	Ongoing as needed to provide adequate seed in advance of planned seeding events
1–2	Implement Seeding Trials	Apply seed in fall or early winter	Start in fall and continue through two growing seasons
1–10	Conduct biological monitoring	Monthly during the growing season in Year 1 (November–June); four times per year thereafter	In Years 1 and 2, monitoring of seeding trials; Years 3–10, monitoring of introduction sites

Task Implementation Schedule

Year	Task	Seasonality	Stage of Program
2	Determine relative suitability of introduction area based on results of seeding trials and confer with Spineflower Adaptive Management Working Group about whether to proceed with widespread introductions	Summer of second year	After second year results are known, but early enough to plan for spineflower introductions in the fall
2	Conduct pre-disturbance surveys for any other special status species within Additional Conservation Area	Spring or summer	Complete surveys in the appropriate season prior to spineflower introduction if land disturbance is planned
2	Prepare introduction site (fencing, weed control, thatch removal, scraping/compaction, etc.)	Summer or fall (July–October)	Complete site preparation prior to fall of spineflower introduction
2	Salvage and transfer topsoil (if applicable)	Summer or Fall (July–October)	Complete site preparation prior to fall of spineflower introduction
3	Apply spineflower seed (collected and bulked seed)	Fall or early winter (November–December)	Start prior to onset of rainy season at beginning of third year
3	Map spineflower introduction areas	Fall or Winter after seeding	At the beginning of the spineflower introduction stage
3–4	Implement supplemental watering	During the growing season only if natural rainfall is lacking for a period of greater than approximately 3 weeks	Only as needed during the first and second year after spineflower introduction
3–10	Perform maintenance and weed control	Monthly during the growing season (November–June), and as needed during the dry season (July–October)	Maintenance will continue through duration of 10-year period

Task Implementation Schedule

Year	Task	Seasonality	Stage of Program
4-5	Perform habitat enhancement in buffer areas	Fall or early winter	1-2 years after spineflower introduction
4-5	Apply native seed mix in spineflower introduction areas	Fall or early winter	1-2 years after spineflower introduction
8-10	Evaluate data collected in years 3-7 to examine the relationship of spineflower productivity, and whether separate standards should be applied to introduction sites in new ecoregions: account for differences in climate, elevation, and other variables that could affect spineflower productivity.	Winter	Evaluation at completion of the fifth year of conducting biological monitoring of introduction sites

Following the initial 10-year implementation period for an Additional Conservation Area under the Introduction Plan, and a determination made in consultation with the Spineflower Adaptive Management Working Group that newly occupied spineflower habitat within the Additional Conservation Area contains one or more self-sustaining spineflower occurrences, Newhall Land or its designee shall conduct long-term management (including adaptive management), monitoring, and annual reporting of the newly occupied spineflower habitat within the Additional Conservation Area in perpetuity.

Therefore, we have a high degree of certainty that an implementation schedule (including incremental completion dates) for the conservation effort is provided in the 2017 CCA.

9. The conservation agreement or plan that includes the conservation effort is approved by all parties to the agreement or plan.

The 2017 CCA includes all the conservation actions agreed to by the signatories, effective on the date signed by each party.

Summary: Certainty that Conservation Efforts will be Implemented

In summary, we have certainty that the conservation efforts will be implemented because the implementation of 2017 CCA has already begun and funding has been secured, providing certainty that funding will continue to be available to implement the conservation efforts. The

seeding trails began in 2016, restrictive covenants have been placed over the Additional Conservation Areas on Newhall Property, Land Veritas has provided consent to perform spineflower introduction within the Mitigation Bank, and the endowment for the initial phases of implementing the Introduction Plan has been established. In addition, the parties to the 2017 CCA have the legal and regulatory authority to implement the agreement, which includes an implementation schedule (including incremental completion dates) for the conservation efforts.

The certainty that the conservation effort will be effective:

1. The Nature and Extent of the Threat Is Addressed.

Our September 15, 2016, proposed rule (81 FR 63454) to list the spineflower described threats to the spineflower including reduced resiliency, representation, and redundancy across the species given current and future stressors acting upon the plant. The conservation actions outlined in the 2017 CCA are designed to significantly reduce the identified threats and their impacts to the spineflower and its habitat.

Resiliency

In our proposed rule, we determined that loss of habitat and individuals and the associated edge effects (i.e., proliferation of invasive, nonnative plants and Argentine ants) at the Santa Clarita population are likely to decrease habitat quality, reducing resiliency at this population and increasing the overall risk to the plant from random, naturally occurring events. The portions of the Introduction Plan that intend to establish additional spineflower occurrences at the Santa Clarita population (areas 1-3 in Figure 2) include three Additional Conservation Areas totaling approximately 825 acres that are contiguous with or adjacent to the existing San Martinez Grande and Potrero spineflower preserves established under the SCP. These expansion areas are intended to expand the area of protected conservation land for spineflower and increase the extent of protected spineflower occurrence locations within the Santa Clarita population to buffer it from detrimental effects of loss of habitat and individuals and the associated edge effects.

Given that invasion by invasive, nonnative plants and Argentine ants could occur, all Additional Conservation Areas will be monitored and managed for these stressors. The enhancement areas surrounding introduction sites are intended to help minimize invasion of non-native plant species, which could threaten the quality of the habitat for spineflower occupation. The overall maintenance program described in the Introduction Plan, which will occur throughout the duration of the 10-year maintenance and monitoring period, directs enhancement efforts in the Additional Conservation Areas to focus on: (1) reducing annual non-native/exotic plant species cover and competition to help facilitate spineflower establishment, persistence, and recruitment; (2) increasing native species cover and diversity in disturbed areas, particularly in areas surrounding introduction sites that function as a buffer; and (3) providing regulation and protection of the spineflower preserve boundaries from unauthorized human activity and intrusion.

As of February 2016, Argentine ants were present within two spineflower preserves at the Santa Clarita population, Entrada and Potrero (Dudek, 2016, pp. 17, 20). Therefore, the Additional Conservation Area adjacent to the existing Potrero spineflower preserve is at risk of invasion by Argentine ants. The two Additional Conservation Areas adjacent to the existing San Martinez Grande preserve are further from existing or proposed development (see Figure 2). None of the adjacent land uses near San Martinez Grande pose a heightened threat of Argentine ant invasion

(Dudek 2016, p. 6); therefore, these Additional Conservation Areas are expected to be less at risk of invasion Argentine ants and should contribute to spineflower numbers and recruitment at the Santa Clarita population. Section 2.4 of the Introduction Plan describes that annual Argentine ant monitoring will be conducted as part of the on-going habitat maintenance and appropriate control measures consistent with the Argentine Ant Control Plan for Newhall Ranch (Dudek 2014, entire) will be implemented in the event that invasion occurs. If Argentine ants invade, Newhall Land Company proposes control methods as part of an Integrated Pest Management plan to remove Argentine ants and mitigate for the absence of native pollinators within the preserves (Dudek 2014c, pp. 25–42). Qualified pest control professionals and conservation managers will review and approve any control or mitigation plan.

Overall, increasing the number and health of the plants at the Santa Clarita population with introduction and enhancement should increase the overall resiliency of the population to potential proliferation of invasive, nonnative plants and the effects of Argentine ant invasion. The two Additional Conservation Areas adjacent to the San Martinez Grande preserve are at low risk of invasion by invasive, nonnative plants and Argentine ants and should contribute to spineflower numbers and recruitment at the Santa Clarita population in the event that the Additional Conservation Area adjacent to the Potrero Preserve becomes invaded by Argentine ants and control measures are unsuccessful.

The Introduction sites outside of the Santa Clarita population include an Additional Conservation Area of 357 acres located in the Simi Valley watershed on the southern boundary of Newhall Land property in Ventura County (area 5 in Figure 2), an Additional Conservation Area of approximately 316 acres located on Newhall Land property in the Castaic Mesa area in northern Los Angeles County, near a known extirpated population location (area 4 in Figure 2), and an Additional Conservation Area located in a 7 acre portion of the Petersen Ranch Mitigation Bank adjacent to Elizabeth Lake, also near a known extirpated population location (area 6 in Figure 2). Argentine ants are not considered to be a significant long-term risk to the spineflower at these introduction sites because they are all well separated from areas supporting potential source populations, such as urban development. Supplemental watering will be delivered through a water truck rather than a permanent point of connection to a live water line to minimize the potential for the introduction of Argentine ants. The enhancement areas surrounding introduction sites are intended to help minimize invasion of non-native plant species, which could threaten the quality of the habitat for spineflower occupation.

Redundancy

In our proposed rule, we determined that with only two extant populations, there may not be sufficient redundancy to sustain the spineflower over the long term, given current and future stressors acting upon the populations. The Additional Conservation Areas proposed in the Introduction Plan are intended to further increase the number and extent of the spineflower within its historic range. The 2017 CCA provides for Newhall Land to introduce spineflower within portions of the Additional Conservation Areas with the goal of establishing at least two new self-sustaining and persistent spineflower occurrences to increase the redundancy of the species. Spineflower introduction will occur on a total of at least 10 acres within the Additional Conservation Areas: (1) three Additional Conservation Areas totaling approximately 825 acres are contiguous with or adjacent to the existing San Martinez Grande and Potrero spineflower preserves established under the SCP (all of which would be considered part of the Santa Clarita population); (2) an Additional Conservation Area of 357 acres is located in the Simi Valley

watershed on the southern boundary of Newhall Land property in Ventura County; (3) an Additional Conservation Area of approximately 316 acres is located on Newhall Land property in the Castaic Mesa area in northern Los Angeles County, near a known extirpated population location; and (4) an Additional Conservation Area containing spineflower introduction sites are located in a 7 acres portion of the Petersen Ranch Mitigation Bank adjacent to Elizabeth Lake, also near a known extirpated population location.

Representation

In our proposed rule, we determined that currently, the two spineflower populations represent only one level IV ecoregion (EPA 2016), down from five historically, decreasing the ability of the plant to adapt to changing environmental conditions into the future. The goal of the 2017 CCA is to establish at least two new, self-sustaining and persistent spineflower occurrences—at least one of which will be in a different ecoregion from the existing populations to increase the number of ecoregions in which the spineflower is represented (see Figure 2). The two existing spineflower populations are located in the Venturan-Angelino Coastal Hills ecoregion. The Additional Conservation Area in the Castaic Mesa area in northern Los Angeles County, near a known extirpated population location, is within the Southern California Lower Montane Shrubland Woodland ecoregion. The Additional Conservation Area located in the Petersen Ranch Mitigation Bank adjacent to Elizabeth Lake near a known extirpated population location is within the Arid Montane Slopes ecoregion. Establishing at least two new, self-sustaining and persistent spineflower occurrences where at least one is in a different ecoregion from the existing populations will improve the ability of the plant to adapt to changing environmental conditions into the future.

In conclusion, based on our certainty that these efforts will be implemented and be successful, we conclude that the nature and extent of threats identified in our 2016 proposed rule will be adequately addressed. The threats identified include reduced resiliency due to habitat fragmentation and associated edge effects (i.e., proliferation of Argentine ants) at the Santa Clarita population, reduced redundancy with only two extant populations, and reduced representation down to one ecoregion from five historically across the range of the species. The 2017 CCA and associated Introduction Plan have identified the types of threats to the species and include actions to address these threats including the establishment of at least two new self-sustaining and persistent spineflower occurrences—at least one of which will be in a different ecoregion from the existing populations on a total of at least 10 acres within the Additional Conservation Areas. Permanent conservation instruments will be recorded over each of the Additional Conservation Areas to ensure that spineflower habitat values are maintained, and all initial habitat enhancement and spineflower introduction activities and perpetual management and monitoring within the Additional Conservation Areas will be funded.

Rationale for outplanting effectiveness

Introduction plans for other Chorizanthe species

Attempts to introduce other *Chorizanthe* species in other areas of California have been conducted, including introductions of Ben Lomond spineflower (*Chorizanthe pungens* var. *hartwegiana*), Sonoma spineflower (*C. valida*), and Orcutt's spineflower (*C. orcuttiana*).

Populations of the Ben Lomond spineflower have been successfully established through experimental research projects, revegetation, and restoration projects within the Santa Cruz

Sandhills, the ecosystem to which this federally endangered species is narrowly endemic. Between 1998 and 2002, seed of the Ben Lomond spineflower, an annual, was sown in a series of small-scale experimental studies involving habitat manipulations designed to understand the species' responses to natural disturbance, interannual variability in precipitation, and exotic plant competition. Seed germination varied depending on the habitat conditions, but exceeded 70% in open habitat away from woody vegetation where the species naturally occurs (McGraw 2004). In conditions most conducive to Ben Lomond spineflower plant growth, such as gopher mounds, the species experienced high survivorship and growth rates, with individual plants producing up to 5,000 flowers (McGraw 2004).

Due in large part to Ben Lomond spineflower's high fecundity in areas of recent disturbance, large populations of the species have been established in restored sandhills habitat, including as part of work to revegetate former sand quarries. In fall 2014, Ben Lomond spineflower seed was sown at a rate of approximately 0.7 seeds/square foot (based on weight) into three completely denuded areas totaling 1.8 acres. Preliminary analysis of data collected in spring 2016 revealed that, 2 years following treatment, the absolute cover of Ben Lomond spineflower ranged from 16.5% to 36.25% (mean=26.8, SE=5.5) (McGraw n.d.a) and Ben Lomond spineflower was among the most abundant and frequently observed (i.e., number of plots occupied) of all plant species (native or exotic) observed during the monitoring study (McGraw n.d.b). Although quantitative monitoring was not conducted in spring 2015, photo-monitoring of the sites suggests that Ben Lomond spineflower cover was less than 10% in the first year. Population growth combined with higher rainfall in 2016 accounts for the increase observed in Year 2 (McGraw n.d.a).

Orcutt's spineflower was the subject of the Recovery and Management of Orcutt's Spineflower (*Chorizanthe orcuttiana*) Final Report (Recovery Plan) prepared by Bauder (2000). Orcutt's spineflower occurs along the coast of San Diego County. It is restricted to isolated patches of sandy soils in openings of shrublands (Bauder 2000). Three extant populations were known at the time the Recovery Plan was prepared (Bauder 2000). More recently, the Chaparral Institute has been working on Orcutt's spineflower introduction at Torrey Pines State Park. Staff from the Chaparral Institute conducted surveys based on a predictive soil model and discovered several new occurrences (Hogan, pers. comm. 2016). They collected and successfully increased the seed count through seed bulking at Rancho Santa Ana Botanic Garden to obtain a resource for a reintroduction program (RSABG 2014). In early winter 2015, they spread seed in unoccupied areas that were mapped with suitable soils and supported suitable habitat. No supplemental water was provided during the growing season of 2015–2016, when rainfall was below average. Results of the experimental introduction have demonstrated only limited success to date, with only a few plants germinating in spring 2016, but continued seed introductions are planned for subsequent seasons (Hogan, pers. comm. 2016).

Sonoma spineflower occurs on sandy substrates at the Point Reyes National Seashore, where seedlings establish in areas that are relatively free from other competing native species (Service 2002). There is only one known extant natural population of Sonoma spineflower. Similar to San Fernando Valley spineflower, this population fluctuates annually, but the distribution has remained localized. Point Reyes National Seashore has made efforts to assist the recovery of Sonoma spineflower by sowing seeds in plots located near the existing population and at a historical occurrence. The reintroduction attempts have had varying results, with some introduction plots failing and others persisting at least several years (Ryan and Parsons n.d.). At

one of the plots, Sonoma spineflower was documented expanding beyond the seeded plot (Service 2002). One of the earlier introduction attempts was made in 1999 at a historical occurrence on F Ranch, where it was documented several years later (as late as 2010). Ryan and Parsons describe four reintroduction attempts at 12 sites, with 8 of the 12 sites still supporting the species and 4 sites failing.

These introduction studies show that species of *Chorizanthe* can be successfully introduced, both into areas that were known to be previously occupied and areas that were judged to support suitable habitat but for which historical status was unknown. As additional evidence that San Fernando Valley spineflower has the ability to germinate and reproduce in unoccupied areas, Rancho Santa Ana Botanic Garden reported that an estimated 30 plants produced approximately 4,000 seeds in a gravel wildflower display bed in which 1999 seed accession chaff had been distributed after cleaning that year's seed collection (Sapphos 2002).

Introduction Site Selection

Spineflower locations, including distribution and areal extent, appear to be controlled by intrinsic environmental characteristics (e.g., soil type, slope, and aspect), while population densities are controlled by extrinsic environmental characteristics (e.g., rainfall) (Dudek 2010). Although extrinsic environmental characteristics cannot be easily modified, intrinsic factors have been evaluated to target introduction opportunities specific to spineflower occupation and persistence. Intrinsic and extrinsic environmental conditions will ultimately drive spineflower establishment and persistence; however, the Introduction Plan is expected to improve site conditions for spineflower, thereby increasing the likelihood of species establishment and persistence within the introduction sites over the long term.

The approach used in the Introduction Plan is to determine sites that best meet the identified parameters that appear to favor occupation by spineflower and introduce the species at these sites. Site selection relied heavily on the results of the Habitat Characterization Study, which compared occupied and unoccupied areas within coastal scrub and annual grassland, to identify characteristics of occupied spineflower habitat (Introduction Plan, Appendix A). In addition to selecting what appear to be the most suitable sites, the approach in the Introduction Plan is to assist the spineflower during the early establishment period in order to help the introduced population develop a foothold through habitat enhancement, ultimately resulting in a self-sustaining and persistent population.

2016 Seeding Trials

Seeding trials for San Fernando Valley spineflower were initiated on Newhall Ranch starting in October 2016 located in 10 locations (blocks) near the Potrero and San Martinez Grande preserves. The seeding locations were unoccupied by spineflower, but featured suitable habitat for spineflower based on a set of habitat indicators identified through the Spineflower Habitat Characterization Study (McGraw, *in prep.*). The spineflower seeding study was implemented by Dudek, Jodi McGraw Consulting, and FLx, with Dr. Jodi McGraw acting as the principal investigator.

The primary purpose of the seeding trials is to investigate potential strategies for establishing spineflower in new, unoccupied areas to maximize the effectiveness of implementation of the 2017 CCA. The seeding trials are designed for a 2-year period (*i.e.*, two growing seasons). The second year of the study is expected to provide additional insight into the treatment effects, and

potentially some preliminary insights into spineflower reproduction and persistence in newly seeded areas.

The first year of the seeding trials demonstrates successful plant establishment from both broadcast seeding and salvaged topsoil, documents positive effects from weeding, and documents adverse effects from pre-compaction of topsoil. The establishment of spineflower plants in the salvaged topsoil occurred at similar densities to that of seeded plots. Confirmation that the weed control method used in the seeding trials is effective in improving spineflower performance has important positive implications both for the Introduction Plan and for management of occupied habitat within the SCP spineflower preserves.

The success of the seeding trials demonstrates that spineflower can grow from seed and reproduce in new areas that were not previously occupied by the species. Spineflower germinated, flowered, and produced viable seed in all 10 study locations in 2017 (seed viability was confirmed by *ex situ* seed germination trials conducted at Rancho Santa Ana Botanical Garden). While this initial finding does not address persistence or self-sustainability at these new locations, it has positive implications for seeding success at the additional, unoccupied conservation areas identified in the Introduction Plan.

In summary, the nature and extent of threats is adequately addressed in the 2017 CCA, and the combined factors of documented success with other *Chorizanthe* introductions, the introduction site selection based on scientific analysis of occupied sites, positive results of 2016 spineflower seeding trials, and the accompanying enhancement program to aid establishment and persistence provide the rationale and optimism for successful implementation of the spineflower introduction program that should improve the resiliency, redundancy, and representation of the species.

2. Incremental Objectives Are Stated

We analyzed whether explicit incremental objectives for the conservation efforts and dates for achieving them are included in the 2017 CCA and associated documents. This criterion is designed to ensure that, if information is incomplete, implementation can nevertheless proceed to move towards incremental objectives until the additional information is available, at which time implementation can be modified in accordance with the new information (68 FR 15103, 15105-06).

The Introduction Plan (see Section 7) provides the specific goals, objectives, and success standards for the program. The success standards are intended to function as interim measures to ensure that goals are achieved. Interim success standards will be evaluated on an annual basis, and if deficient, will trigger management actions designed to improve performance toward achieving the primary goal. Comparison of the spineflower introduction sites to reference sites is a critical component of the monitoring plan. Reference sites will be established within both the Santa Clarita population and the Laskey Mesa population to ensure that the reference sites encompass the range of conditions currently supporting spineflower.

The overarching goal of establishing at least two self-sustaining and persistent spineflower populations applies across all introduction sites. Program goals and objectives include the following:

Goal 1 **Abundance:** Establish occupied spineflower habitat that exhibits sufficient abundance to support a self-sustaining population.

Objective 1A: Measure the density of introduced spineflower plants at introduction sites compared to spineflower plants at designated reference sites. Plant density will be evaluated from representative random samples from a minimum of 100 1-meter-square samples per introduction site.

Success Standard: The introduced spineflower plants shall exhibit comparable levels of spineflower plant density compared to reference sites. Spineflower density within the introduction sites will be considered successful if the metrics are within the 95% confidence interval of the mean (two standard deviations) of historical baseline data collected from the reference sites.

Objective 1B: Measure the seed productivity of introduced spineflower plants relative to spineflower plants at designated reference sites. Seed productivity will be evaluated from representative random samples of a minimum of 10 plants per introduction site.

Success Standard: The introduced spineflower shall exhibit comparable levels of seed productivity compared to reference sites. Seed productivity at the introduction sites shall be within the 95% confidence interval of the mean (two standard deviations) of seed productivity measured at the reference sites.

Objective 1C: Measure the viability of seed produced by introduced spineflower plants compared to seed produced by spineflower plants at designated reference sites. Seed viability will be evaluated from representative random samples from a minimum of 100 seeds total collected from a minimum of 10 plants per introduction site.

Success Standard: The seed of introduced spineflower plants shall exhibit comparable levels of seed viability compared to reference sites. Seed viability at the introduction sites shall be within the 95% confidence interval of the mean (two standard deviations) of seed viability measured at the reference areas.

Goal 2 **Extent:** Establish self-sustaining spineflower populations at a minimum of two introduction sites, with at least one of the sites in a different ecoregion than the existing populations.

Objective 2A: Demonstrate that at least two introduction sites, with at least one site in a separate ecoregion, have a sufficient probability of survival over time.

Success Standard: At least two introduction sites, with at least one site in a separate ecoregion, shall each support a minimum viable population size (as defined in the Introduction Plan) during Years 5–10 of the monitoring period.

Objective 2B: Demonstrate natural recruitment of introduced spineflower in at least two introduction sites, with at least one site in a separate ecoregion.

Success Standard: Natural recruitment of spineflower shall be documented outside of the footprint of the area seeded, or documented as recurring recruitment within seeded areas over a period of at least 5 years of the 10-year monitoring period without supplemental seeding, or both.

Goal 3 Resilience: Demonstrate resilience of the introduced spineflower occurrences.

Objective 3A: Document resilience of introduced spineflower following environmental stressors (e.g., drought).

Success Standard: Spineflower at introduction sites shall exhibit a stable or increasing trend (e.g., plant density, aerial extent) in 1 to 3 years following a poor spineflower year that resulted from an environmental stressor, unless poor conditions continue and/or reference populations show similar declining trends.

Goal 4 Persistence: Demonstrate persistence of spineflower at the introduction sites.

Objective 4A: Provide a minimum of 10 years of active adaptive management and in-perpetuity management thereafter of introduction sites.

Success Standard: Implement a minimum of 10 years of active adaptive management that includes addressing deficiencies if interim success standards are not met. The introduction sites shall be permanently conserved and adequate funding for in-perpetuity management shall be secured.

Objective 4B: Implement a reporting program that provides comprehensive information about spineflower performance and conservation at the introduction sites.

Success Standard: Informative project reports and sufficient documentation shall be prepared annually to enable outside observers to understand potential reasons for shortcomings or success.

Objective 4C: Document persistence of spineflower at the introduction sites.

Success Standard: Spineflower at the introduction sites shall persist for a period of at least 3 years over the final 5 years of the initial 10-year adaptive management program without supplemental seeding or watering.

The Spineflower Adaptive Management Working Group, composed of Resource Agency staff (Service and CDFW), the Land Managers (e.g., Center for Natural Lands Management), Newhall Land, and scientific experts, will continue to meet at least once annually to guide the management, monitoring, and planning activities of the program. The Adaptive Management Working Group also includes a Technical Advisory Subgroup that is specifically responsible for addressing technical scientific issues associated with management, monitoring designs, and data

analysis. The Spineflower Adaptive Management Working Group will be responsible for evaluating completed management actions and defining explicit objectives for future management actions.

Overall, we have a high degree of certainty that the specified conservation actions committed to in the 2017 CCA will be achieved as they have explicit objectives defined and the associated dates for achieving them are stated and an evaluation framework is in place.

3. Steps Necessary for Implementation Are Identified

We determined whether the steps necessary to implement the conservation actions were identified in detail. The 2017 CCA and associated documents clearly define the implementation plan for the program (see Section 4 of the Introduction Plan). Since the implementation steps are clearly defined in the Introduction Plan, and we know that similar actions have worked to provide successful conservation for other spineflower species, we have a high degree of certainty that the Introduction provides the necessary steps to ensure implementation of the conservation actions. Steps necessary for implementation as detailed in the Introduction Plan are summarized below.

Implementation of the Introduction Plan began in fall 2016 with site investigations and analysis, and initiation of seeding trials at the Potrero Preserve Expansion and the San Martinez Grande Preserve Expansion that are expected to continue through summer of 2018. More widespread spineflower introductions are planned for these two introduction sites pending results of the 2-year seeding trials. Additional seeding trials and spineflower introductions are planned for the other introduction sites identified in this Introduction Plan as outlined under this criterion.

Spineflower introduction within the Additional Conservation Areas will occur in phases. The projected phasing and associated implementation schedule is provided in criterion 8 (above). The phasing provides an initial sequence for planning purposes, but selected locations in the phasing sequence may be modified as appropriate based on early results of introduction attempts. The Implementation Schedule as outlined under criterion 8 includes a sequential schedule of procedural steps to be implemented during the program at each introduction site. The first step for each introduction site is the establishment of seeding trials. The seeding trials are expected to take a minimum of 2 years to implement and obtain meaningful results. The seeding trials will be followed by more widespread spineflower introductions if the seeding trials demonstrate suitable habitat for spineflower. The locations for widespread introductions will be based on where seeding trials demonstrate a reasonable probability of success, as determined by the Project Biologist in coordination with the Spineflower Adaptive Management Working Group.

Seed application methods for spineflower will follow those determined to be the most successful based on the seeding trials. The application method may include hand-broadcast seeding, seedbank topsoil application, drill seeding, or other method determined to be successful. Specific seed sources for targeted seeding locations will rely on available information from the spineflower genetics study that is currently in progress (Rogers 2016) to ensure that the introduction program is consistent with the most current conservation principles of population genetics as well as the specific genetic characteristics of the spineflower populations.

The GPS locations of the introduction areas will be overlaid on an aerial image of the site to document the introduction and create a site map. The site map will be used in annual status

reports to illustrate the introduction areas and associated features. The site map will also serve as a permanent record that will be used for long-term biological monitoring, reporting, and management purposes. Introduction attempts will be documented in installation reports.

Supplemental watering may be conducted to facilitate the establishment of the newly planted spineflower seeds and to promote seed production in the first year. Ideally, the introduction sites will rely solely on rainfall after the initial watering-in period. However, periodic droughts are common in the region. In the first year, supplemental watering may be applied if natural rainfall is lacking for a period of greater than approximately 3 weeks. If used, supplemental watering will only be conducted during the growing season (November through May) and only in first and second years.

Enhancement activities in areas surrounding introduction sites will be implemented prior to or concurrently with spineflower introduction. Anticipated enhancement activities include passive and active revegetation of native vegetation communities. Enhancement activities will occur with an adaptive management approach that will continue beyond the 10-year maintenance and monitoring period and into the long-term management period. Targeted areas for habitat enhancement correspond with the sites identified for spineflower introduction and an approximately 50-foot area surrounding introduction sites.

All spineflower introduction sites will be closed to public access. Existing dirt access roads and utility easement access roads within the Additional Conservation Areas will function as the intended access points to the introduction sites for the Project Biologist, Landscape Contractor, utility personnel, and emergency services vehicles (e.g., police, fire, and medical). Signs identifying restricted land and discouraging unauthorized access/entry into the spineflower introduction sites will be posted on all gates providing access to introduction sites, adjacent to any roads that border introduction sites, and along any spineflower introduction site fencing. The signs will indicate that enhancement activities are in progress and that the areas are to be protected.

In summary, we have determined that the steps necessary to implement the conservation actions are identified in detail in the 2017 CCA and associated documents.

4. Quantifiable, Scientifically Valid Parameters

We determined whether quantifiable, scientifically valid parameters that demonstrate achievement of objectives and standards by which progress will be measured are identified.

The Introduction Plan describes in detail the biological monitoring of the introduction sites that will be conducted to determine the status of the introduced spineflower through monitoring and collection of qualitative and quantitative data (section 6). Monitoring will occur in the winter and spring of each year while the spineflower plants are actively growing and in bloom/seed. Additional monitoring at the sites will occur periodically throughout the year to determine the need for maintenance measures related to protecting the spineflower introduction sites from weed invasion or other disturbances.

Reference sites will be established within both the Santa Clarita population and Laskey Mesa population to ensure that the reference sites encompass the range of conditions currently supporting spineflower. A sufficient number of sampling plots will be established to capture site

variability so that collectively the reference sites are representative of the range of conditions of occupied spineflower habitat.

Annual monitoring of the introduction sites will include at least three quantitative biological assessments each year, to be timed with the peak of the growing season before plants have begun to desiccate, during the flowering period of spineflower, and during seed set (approximately February, May, and June). The quantitative monitoring methods are established for the purpose of collecting adequate data to be able to analyze the relative success or failure of the introduction program in terms of achieving the project goals (see criterion 2 above and section 7 of the Introduction Plan). Quantitative monitoring will begin in the first year after establishing seeding trials and will include monitoring of spineflower density, seed production, seed viability, spineflower population size, recruitment, and aerial extent.

Spineflower density. The density of spineflower germinants will be evaluated and measured annually by counting spineflower plants within sampling areas located in introduction sites and at reference sites. The quantity and density of spineflower germinants, as estimated from sampling, will be compared between the introduction sites and the reference sites. The quantity of samples shall be determined by using a statistical power analysis.

Seed production. Spineflower seed production will be evaluated and measured annually by estimating seed production within sampling areas located in introduction sites and at reference sites. Seed productivity will be evaluated from representative random samples of a minimum of 10 plants per introduction site. The proportion of plants producing seed as well as the number of seeds produced per plant within each of the sampling areas will be calculated for comparison with reference sites.

Seed viability. Seed viability will be evaluated from representative random samples from a minimum of 100 seeds total collected from a minimum of 10 plants per introduction site. Samples will be collected from introduction sites as well as reference sites. The seed will be sent to a lab for viability testing. The viability testing will be based on standard laboratory procedures for testing seed viability, consisting of cold stratification and germination in petri dishes.

Population size. The spineflower population size will be a calculated estimate of the total number of plants at an introduction site using the density sampling values extrapolated across the area encompassed by occupied habitat. Occupied habitat will be mapped during the blooming period, and will be a measure of the aerial extent (i.e., acreage or square feet). The definition for occupied habitat aerial extent within introduction sites will follow the methods used to map occupied habitat for the existing Santa Clarita population for purposes of the SCP. The area of polygons mapped as occupied habitat will be used with density sampling to calculate population size for each introduction site.

Recruitment. Persistence of spineflower is dependent on successful recruitment of new, reproductive spineflower plants contributing to the seed bank for future generations. Recruitment measured at an individual plant level is difficult to ascertain in the natural environment due to seed bank dynamics (e.g., seeds from different plants may respond differently to environmental conditions in any given year). Therefore, spineflower recruitment will be confirmed by documenting “spread” of spineflower beyond cumulative prior year occurrence boundaries. Additionally, spineflower recruitment will

be assumed when multiple year-over-year germination occurs without supplemental seeding. This criterion therefore will be considered successful when recruitment has been documented in new areas outside of the cumulative footprint to date, and/or the individual occurrences are self-sustaining for a period of at least 5 years within the overall 10-year monitoring period.

Areal extent. The areal extent of occupied spineflower habitat will be quantified during the blooming period. Cumulative occupied habitat combines the acreage of the mapped polygons, and takes the largest footprint of occupied habitat over the course of successive annual periods. Thus, in some years when weather conditions are not conducive to spineflower growth, the occupied habitat may be much smaller than the cumulative occupied habitat. The validity of the cumulative occupied habitat will be evaluated against reference populations and rainfall data to ensure that it does not represent a shrinking occurrence in chronic decline that is not commensurate with what would be expected from natural population variation of the species.

The monitoring period will commence upon initiation of seeding trials and continue for a period of 10 years. The schedule for biological monitoring will be determined each year by the growth and flowering activities of the spineflower, based on fluctuating environmental/seasonal conditions. The optimum period for biological monitoring is anticipated to be in the months of February, May, and June, but will be timed to coincide with the estimated peak growth stage, blooming period, and seeding stage which can vary annually. Naturally occurring spineflower occurrences will be used to compare vegetative growth and flower production with the plants at the introduction sites in order to schedule monitoring events.

An annual monitoring report will be prepared in the summer or fall of each year of the 10-year maintenance and monitoring period summarizing the information collected during that year's site visits. The annual monitoring reports will be submitted to the Spineflower Adaptive Management Working Group for review and comment on the current year summary and the proposed management actions for the upcoming year. Newhall Land will be responsible for ensuring that the annual monitoring reports are submitted to the appropriate parties.

In summary, we have a high degree of certainty that there are quantifiable, scientifically valid parameters identified that will help demonstrate achievement of the objectives in the 2017 CCA and associated documents.

5. Provisions for Monitoring

We determined whether provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort were provided. The monitoring program (described above in criterion 4) has been committed to through the 2017 CCA. Initial implementation tasks, focusing on habitat enhancement and spineflower introduction, will be implemented by Newland Land, their assignee, or the designated land manager.

Newhall Land will fund seeding trials and all habitat enhancement and spineflower introduction activities within the Additional Conservation Areas during the initial implementation period. For ongoing (in-perpetuity) management and monitoring, Newhall Land has committed to fund endowments to support perpetual management and monitoring of the spineflower

introduction sites within the Additional Conservation Areas, based on a Property Analysis Record, currently estimated at \$4.1 million. The financial amount required for the endowment for each Additional Conservation Area will be finally determined prior to beginning long-term management within that Additional Conservation Area. The endowment will fund management activities of the entire Additional Conservation Area, including the spineflower introduction and enhancement sites, starting in Year 11.

PECE specifies that the Service will track the status of conservation efforts that contribute to a decision that listing is unnecessary (i.e., not warranted) or that a species warrants listing as a threatened species as opposed to an endangered species. The policy further states that, if the Service receives any new information indicating a possible change in the status of the species, including indicating that one or more conservation efforts relied upon by the Service fails to be implemented or to achieve its objectives, or is not modified to adapt to changing circumstances, then the Service will reevaluate the status of the species and consider whether initiating the listing process is necessary (68 FR 15114). If the actions in the 2017 CCA contribute to a decision that listing of the spineflower is not warranted, the Service will evaluate implementation (based on compliance with the implementation schedule) after five years. If the implementation criteria have not been met at that time, the Service will reinitiate a status assessment for the species. The Service will undertake a full evaluation of effectiveness (based on the success criteria) after ten years. If the success criteria have not been met at that time, the Service will reinitiate a status assessment for the species.

Overall, we have a high certainty that the provisions for monitoring are adequate and that this monitoring will be implemented under the 2017 CCA.

6. Adaptive Management

We evaluated whether principles of adaptive management were incorporated into the 2017 CCA. The Introduction Plan details the adaptive management program in section 9.4, which is summarized here. A fundamental element of the adaptive management program is a repeating process of periodic review, short-term adjustment, and long-range planning. Each annual report will include an evaluation of the success of completed management actions to date, a summary of new management actions and objectives, and an annual work plan for the implementation of management actions in the upcoming year.

Monitoring will be tied directly to management actions (i.e., “effectiveness” monitoring), such that management can be evaluated as having the desired effect of maintaining or enhancing spineflower populations. Adjustments to the annual work plans for each site will rely on feedback from monitoring activities and on newly available information to guide changes in management activities or overall strategy. Adjustments to management will also be made based on the response of spineflower to experimentally designed small-scale management trials. Input from the Spineflower Adaptive Management Working Group will be sought to guide the management, monitoring, and planning activities of the adaptive management program of this Introduction Plan.

Information sharing is a critical component of the adaptive management program. Information collected under this Introduction Plan will be retained in a repository for annual work plans and monitoring data. Regional weather data, local weather information, and raw monitoring

data will also be stored and accessible in the centralized repository. The centralized repository will be the Spineflower Information Center created under the SCP, which will provide centralized storage and facilitate a structured flow of information related to all aspects of spineflower adaptive management.

We have concluded that principles of adaptive management are incorporated into the conservation actions and the 2017 CCA and that there is high certainty that adaptive management principles will be applied given the framework that will be put in place and the oversight of the Spineflower Adaptive Management Working Group.

Summary: Certainty that Conservation Efforts will be Effective

In summary, we have certainty that the conservation efforts will be effective because the nature and extent of threats is adequately addressed in the 2017 CCA, including improving resiliency of the Santa Clarita population, increasing the number of ecoregions in which the plant is represented, and adding to the overall redundancy of the species. In addition, the combined factors of documented success with other *Chorizanthe* introductions, the introduction site selection based on scientific analysis of occupied sites, positive results of 2016 spineflower seeding trials, and the accompanying enhancement program to aid establishment and persistence provide the rationale and optimism for effectiveness of the spineflower introduction program. Further, explicit objectives for the conservation efforts are defined and the associated dates for achieving them are stated. Quantifiable, scientifically valid parameters are identified that will help demonstrate achievement of the objectives. Finally, Newhall Land has funded an endowment for the initial implementation of the 2017 CCA. For ongoing (in-perpetuity) management and monitoring associated with the Introduction Plan, Newhall Land has committed to fund additional endowments. Input from the Spineflower Adaptive Management Working Group, which is already in place, will be sought to guide the management, monitoring, and planning activities of the adaptive management program of the conservation efforts.

Summary of Analysis for the Conservation Efforts

Using the criteria in PECE (68 FR 15115, March 28, 2003), we evaluated the certainty of implementation and effectiveness of the 2017 spineflower CCA. We have determined that the conservation efforts have a high certainty of being implemented. Our reasons for concluding that our level of certainty is high are because the mechanism and authorities for contributing funds are in place, the monitoring and documentation of compliance with the conservation actions are in place, and all parties have the legal authorities to carry out their responsibilities under the 2017 CCA. Implementation of CCA has already began and funding has been secured, providing certainty that funding will continue to be available to implement the conservation efforts. We have determined that the conservation efforts are effective at eliminating or reducing threats to the species because they will enhance the resiliency of the Santa Clarita population, and improve redundancy and representation across the species. The Introduction Plan contains explicit incremental objectives for the conservation effort and dates for achieving them. The steps necessary to implement the conservation effort are identified in detail. Spineflower populations and success criteria will be monitored using quantifiable, scientifically valid parameters that will demonstrate progress towards achievement of objectives. Provisions for monitoring and

reporting progress on implementation and effectiveness of the conservation effort are provided and principles of adaptive management are incorporated. We find that the conservation efforts in the 2017 CCA have a high level of certainty of implementation (for those actions not already implemented) and effectiveness and can be considered as part of the basis for our final listing determination for the spineflower.

Conclusion

Using the criteria specified in PECE (68 FR 15100, March 28, 2003), we have evaluated the certainty of future implementation and certainty of effectiveness of the 2017 spineflower CCA that is being implemented by us and Newhall Land. Based on our evaluation, we have determined that all of the PECE criteria are satisfied and we have a high level of certainty that the conservation actions will be effectively implemented in the future, and over the long-term. As such, we find that the 2017 CCA has a high level of certainty of future implementation and certainty of effectiveness, and can be considered as part of the basis for our final listing determination for the spineflower.

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