

STAFF SUMMARY FOR AUGUST 22-23, 2018

19. COAST YELLOW LEPTOSIPHON (CONSENT)**Today's Item**Information Action

Consider adopting findings for the decision to list coast yellow leptosiphon (*Leptosiphon croceus*) as an endangered species under the California Endangered Species Act (CESA).

Summary of Previous/Future Actions

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| • Received petition | May 25, 2016 |
| • Transmitted petition to DFW | May 27, 2016 |
| • Published notice of receipt of petition | Jun 10, 2016 |
| • Approved DFW request for 30-day extension | Aug 24-25, 2016; Folsom |
| • Received DFW evaluation and recommendation | Oct 19-20, 2016; Eureka |
| • FGC determined listing may be warranted | Dec 7-8, 2016; San Diego |
| • Received DFW's status review report | Feb 7-8, 2018; Sacramento |
| • Determined listing is warranted | Apr 18-19, 2018; Ventura |
| • Today consider adopting findings | Aug 22-23, 2018; Fortuna |
| • Adoption hearing for regulation change | Oct 17-18, 2018; Fresno |

Background

On Apr 19, 2018, FGC made a finding pursuant to Fish and Game Code Section 2075.5, that the petitioned action to list coast yellow leptosiphon as endangered under CESA is warranted. FGC staff has completed a draft notice of findings substantiating FGC's action, for FGC's consideration today (Exhibit 1).

After findings are adopted, staff will submit a rulemaking to add coast yellow leptosiphon to the list of endangered plants in Section 670.2 of Title 14.

Significant Public Comments (N/A)**Recommendation**

FGC staff: Adopt FGC staff's proposed notice of findings that the petitioned action to list coast yellow leptosiphon as endangered is warranted pursuant to Section 2075.5 (e)(2) of the Fish and Game Code.

Exhibits

1. [Draft notice of findings](#)

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the consent calendar, items 19-21.

California Fish and Game Commission

DRAFT NOTICE OF FINDINGS

Coast Yellow Leptosiphon
(*Leptosiphon croceus*)

NOTICE IS HEREBY GIVEN that the California Fish and Game Commission (Commission), at a meeting in Ventura, California on April 19, 2018, found pursuant to Fish and Game Code Section 2075.5, that the information contained in the petition to list coast yellow leptosiphon (*Leptosiphon croceus*) and other information in the record before the Commission, warrants adding coast yellow leptosiphon to the list of endangered species under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.). (See also Cal. Code Regs., tit. 14, § 670.1, subs. (i).)

NOTICE IS ALSO GIVEN that, at its August 23, 2018 meeting in Fortuna, California, the Commission adopted the following findings outlining the reasons for its determination.

I. Background and Procedural History

Petition History

On May 25, 2016, the Commission received a petition (Petition) from Ms. Toni Corelli, co-sponsored by the California Native Plant Society (CNPS), to list coast yellow leptosiphon as an endangered species pursuant to CESA (Fish & G. Code, § 2050 et seq.).

On May 27, 2016, the Commission referred the Petition to the California Department of Fish and Wildlife (Department) for evaluation.

On June 10, 2016, as required by Fish and Game Code Section 2073.3, the Commission published notice of receipt of the Petition in the California Regulatory Notice Register (Cal. Reg. Notice Register 2016, No. 24-Z, p.1002). The Department on July 25, 2016, pursuant to Fish and Game Code Section 2073.5, requested a 30-day extension of time to complete its evaluation report. The Commission approved the extension at its August 24-25, 2016 meeting in Folsom, California.

On September 26, 2016, the Department provided the Commission with a report, "Evaluation of the Petition from Ms. Toni Corelli and the California Native Plant Society to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California Endangered Species Act" (Evaluation). Based upon the information contained in the Petition, the Department concluded, pursuant to Fish and Game Code, Section 2073.5, subsection (a), that sufficient information exists to indicate that the petitioned action may be warranted, and recommended to the Commission that the Petition should be accepted and considered.

On December 8, 2016, at its scheduled public meeting in San Diego, California, the Commission considered the Petition, the Department's Evaluation and recommendation, and comments received. The Commission found that sufficient information existed to indicate the petitioned action may be warranted and accepted the Petition for consideration.

Subsequently, on December 23, 2016, the Commission published its Notice of Findings for coast yellow leptosiphon in the California Regulatory Notice Register, designating coast yellow leptosiphon as a candidate species (Cal. Reg. Notice Register 2016, No. 52-Z, p. 2197).

Department Review

The Commission's action designating coast yellow leptosiphon as a candidate species triggered the Department's process for conducting a status review to inform the Commission's decision on whether to list the species. The Commission received the Department's status review report at its February 7-8, 2018 meeting in Sacramento, California. On April 19, 2018, in Ventura, California, the Commission found that the information contained in the petition and the other information in the record before the Commission warrants listing coast yellow leptosiphon as an endangered species under the CESA.

Species Description

Coast yellow leptosiphon is a low-growing annual plant in the Phlox family (Polemoniaceae) that was first described in 1904. It is known from only one small population that occupies approximately 167 square meters (1,800 square feet), located on Vallemar Bluff in Moss Beach, San Mateo County, California. This population is located in coastal prairie habitat atop a sea bluff at the edge of the coastline.

II. Statutory and Legal Framework

The Commission, as established by the California Constitution, has exclusive statutory authority under California law to designate endangered, threatened, and candidate species under CESA. (Cal. Const., art. IV, § 20, subd. (b); Fish & G. Code, § 2070.) The CESA listing process for coast yellow leptosiphon began in the present case with the Petitioners' submittal of the Petition to the Commission on May 25, 2016. The regulatory and legal process that ensued is described in some detail in the preceding section above, along with related references to the Fish and Game Code and controlling regulation. The CESA listing process generally is also described in some detail in published appellate case law in California, including:

- *Mountain Lion Foundation v. California Fish and Game Commission* (1997) 16 Cal.4th 105, 114-116;
- *California Forestry Association v. California Fish and Game Commission* (2007) 156 Cal.App.4th 1535, 1541-1542;
- *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597, 600; and
- *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104, 1111-1116.

The "is warranted" determination at issue here for coast yellow leptosiphon stems from Commission obligations established by Fish and Game Code Section 2075.5. Under this provision, the Commission is required to make one of two findings for a candidate species at the end of the CESA listing process; namely, whether the petitioned action is warranted or is

not warranted. Here, with respect to coast yellow leptosiphon, the Commission made the finding under Section 2075.5(e)(2) that the petitioned action is warranted.

The Commission was guided in making its determinations by statutory provisions and other controlling law. The Fish and Game Code, for example, defines an endangered species under CESA as “a native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, over exploitation, predation, competition, or disease.” (Fish & G. Code, § 2062.) Similarly, the Fish and Game Code defines a threatened species under CESA as “a native species or subspecies of a bird, mammal, fish, amphibian, reptile or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter.” (*Id.*, § 2067.)

The Commission also considered Title 14, Section 670.1, subsection (i)(1)(A), of the California Code of Regulations in making its determination regarding coast yellow leptosiphon. The provision provides, in pertinent part, that a species shall be listed as endangered or threatened under CESA if the Commission determines that the species’ continued existence is in serious danger or is threatened by any one or any combination of the following factors:

1. Present or threatened modification or destruction of its habitat,
2. Overexploitation,
3. Predation,
4. Competition,
5. Disease, or
6. Other natural occurrences or human-related activities.

Fish and Game Code Section 2070 provides similar guidance. The section provides that the Commission shall add or remove species from the list of endangered and threatened species under CESA only upon receipt of sufficient scientific information that the action is warranted. Similarly, CESA provides policy direction not specific to the Commission per se, indicating that all state agencies, boards, and commissions shall seek to conserve endangered and threatened species and shall utilize their authority in furtherance of the purposes of CESA. (Fish & G. Code, § 2055.) This policy direction does not compel a particular determination by the Commission in the CESA listing context. Nevertheless, “[l]aws providing for the conservation of natural resources’ such as the CESA ‘are of great remedial and public importance and thus should be construed liberally.” (*California Forestry Association v. California Fish and Game Commission*, supra, 156 Cal. App.4th at pp. 1545-1546, citing *San Bernardino Valley Audubon Society v. City of Moreno Valley* (1996) 44 Cal.App.4th 593, 601; Fish & G. Code, §§ 2051, 2052.)

Finally in considering these factors, CESA and controlling regulations require the Commission to actively seek and consider related input from the public and any interested party (see, e.g., *Id.*, §§ 2071, 2074.4, 2078; Cal. Code Regs., tit. 14, § 670.1, subs. (h).). The related notice obligations and public hearing opportunities before the Commission are also considerable (Fish & G. Code, §§ 2073.3, 2074, 2074.2, 2075, 2075.5, 2078; Cal. Code Regs., tit. 14, § 670.1, subs. (c), (e), (g), (i); see also Gov. Code, § 11120 et seq.). All of these obligations are

in addition to the requirements prescribed for the Department in the CESA listing process, including an initial evaluation of the petition and a related recommendation regarding candidacy, and a review of the candidate species' status culminating with a report and recommendation to the Commission as to whether listing is warranted based on the best available science (Fish & G. Code, §§ 2073.4, 2073.5, 2074.4, 2074.6; Cal. Code Regs., tit. 14, § 670.1, subs. (d), (f), (h).).

III. Factual and Scientific Bases for the Commission's Final Determination

The factual and scientific bases for the Commission's determination that designating coast yellow leptosiphon as an endangered species under CESA is warranted are set forth in detail in the Commission's record of proceedings including the Petition, the Department's Evaluation; the Department's status review; written and oral comments received from members of the public, the regulated community, tribal entities, and the scientific community; and other evidence included in the Commission's record of proceedings.

The Commission determines that the continued existence of coast yellow leptosiphon in the state of California is in serious danger or threatened by one or a combination of the following factors as required by the California Code of Regulations, Title 14, Section 670.1, subsection (i)(1)(A):

1. Present or threatened modification or destruction of its habitat,
2. Overexploitation,
3. Predation,
4. Competition,
5. Disease, or
6. Other natural occurrences or human-related activities.

The Commission also determines that the information in the Commission's record constitutes the best scientific information available and establishes that designating the coast yellow leptosiphon as an endangered species under CESA is warranted. Similarly, the Commission determines that coast yellow leptosiphon is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

The items highlighted here and detailed in the threats section represent only a portion of the complex issues aired and considered by the Commission during the CESA listing process for coast yellow leptosiphon. Similarly, the issues addressed in these findings represent some, but not all of the evidence, issues, and considerations affecting the Commission's final determination. Other issues aired before and considered by the Commission are addressed in detail in the record before the Commission, which record is incorporated herein by reference.

Background

The Commission bases its "is warranted" finding for coast yellow leptosiphon most fundamentally on the rarity of coast yellow leptosiphon in combination with the threats identified in the next section.

Threats

Present or Threatened Modification or Destruction of Habitat

Habitat loss is considered the primary cause for species extinctions at local, regional, and global scales (Dirzo and Raven 2003). Most of the coastal prairie habitat, which provides potential habitat for coast yellow leptosiphon, has been destroyed or modified due to urban development, agriculture, and invasion of non-native plant species (Ford and Hayes 2007). Coast yellow leptosiphon was likely present over a larger geographic area prior to the development of the San Mateo coast and conversion of coastal prairie habitat. Most of the habitat surrounding the coast yellow leptosiphon population has been eliminated or altered due to road construction, residential development, and invasion by non-native plant species, particularly the invasive freeway iceplant which covers the coastal bluff adjacent to the coast yellow leptosiphon population (Departmental observation). Installation of hardscape and storm drainage systems related to urban development have altered runoff patterns and hydrology in and around occupied coast yellow leptosiphon habitat. Although it is likely that coast yellow leptosiphon has always been rare and restricted in range, past modification and destruction of habitat has contributed to the limited availability of suitable habitat for this species. These past changes affect the ability of coast yellow leptosiphon to survive and reproduce.

Development or changes in land use could directly destroy plants and living seeds in the seed bank and destroy both occupied and potential habitat. Threats to coast yellow leptosiphon may occur from development and changes in land use near the existing population. A residential development project is proposed on the parcels immediately adjacent to the coast yellow leptosiphon population (County of San Mateo 2017; Midcoast Community Council 2017). The area proposed for development consists of seven lots, which will be consolidated into four lots for the project. The proposed project will build four, three-story single-family residences, between 4,740 and 4,859 square feet in size, and is pending design review approval by the San Mateo County Coastsides Design Review Committee (CDRC 2017).

Coast yellow leptosiphon has been buffered from impacts from the adjacent highway by the 1.0-hectare (2.5-acre) undeveloped coastal prairie that provides a natural buffer between Highway 1 and the coast yellow leptosiphon population. Habitat buffers provide protection from edge effects (Saunders et al. 1991; Given 1994), which are changes in community structure that occur at the boundary of two habitats. Habitat buffers also provide extra protection from human activities, allow for a more natural habitat boundary, slow the speed of water runoff, and filter sediments, fertilizers, pesticides, heavy metals, and pathogens from runoff (Given 1994; Godfrey 2015; USDA 2017).

Any change in land use on this adjacent property is expected to result in indirect impacts to the coast yellow leptosiphon population. The proposed development will alter the hydrologic regime of the site. This will involve increased, altered, and unseasonal runoff patterns resulting from addition of hard, impervious surfaces, installation of drainage features such as storm drains and drainage pipes (Mesiti-Miller Engineering, Inc. 2017), and installation and use of landscape irrigation systems. Development often leads to unseasonal summer moisture resulting from watering landscape plants, washing cars, and other human activities. In addition, residential development will lead to an increase in use of fertilizers and nutrients, herbicides, pesticides, and other household chemicals and products which will run off and disperse into habitat occupied by coast yellow leptosiphon and could impact the plants as well as alter the

soil chemistry. Increased nutrient load and unseasonal moisture resulting from human activities creates conditions that promote the spread of non-native plant species, which can outcompete the native plants for light, space, nutrients, water and other factors (Smil 1997; Vitousek et al. 1997; Line and White 2007). Furthermore, development will increase the number of human visitors using the area, result in soil disturbance and compaction, increase garbage and pollution, and create conditions that are favorable for the spread of non-native plant species.

Construction of houses on the parcels adjacent to the coast yellow leptosiphon population will lead to an increase in human use of the area. Walking paths exist on the bluff, and one heavily used path exists immediately adjacent to the coast yellow leptosiphon population. Increased human use of the area will increase the impacts to the habitat from foot traffic, will increase the spread of weed seeds and introduce nutrients from dog walking, and will increase the risk of trampling and killing of coast yellow leptosiphon plants. In addition, development of the area will modify the aesthetics and accessibility of the bluff, potentially resulting in alterations of walking patterns in the area. People may create new paths through the remaining portions of the habitat accessible on Vallemar Bluff, potentially through the coast yellow leptosiphon population.

Predation

The introduction of non-native slugs into the area from neighboring residential landscapes could pose a threat to the coast yellow leptosiphon population (DFW 2017 Status Review). Non-native slugs are generalist herbivores that have been shown to negatively affect seedling survival of a wide range of plant species (Rathcke 1985; Buschmann et al. 2005; Strauss et al. 2009), and could potentially be grazing on coast yellow leptosiphon. Generalist herbivores such as slugs can reduce plant density and biomass, as well as alter species diversity within vegetation communities (Buschmann et al. 2005). The Department does not have any specific information on the impacts of non-native slugs to coast yellow leptosiphon, but it is possible that herbivory from slugs could negatively impact this species' survival.

Impacts from Invasive Species (Competition and other Factors)

Invading alien species cause major environmental damages and losses and are a significant risk factor leading to extinction of threatened and endangered species (Pimentel et al. 2004; Conser and Conner 2009), second only to habitat loss and fragmentation (Wilcove et al. 1998; Randall and Hoshovsky 2000). Compared to other threats to biodiversity, invasive non-native plants present a complex problem that is difficult to manage and has long-lasting effects. North America has accumulated the largest number of naturalized plants in the world (van Kleunen et al. 2015), and many non-native plant species have established within California, dramatically changing the state's ecological landscape (Conser and Connor 2009). Many studies hypothesize or suggest that competition is the process responsible for observed invasive species impacts to biodiversity; however, invasive species may also impact native ecosystems by altering environmental conditions and resource availability (D'Antonio and Vitousek 1992; Levine et al. 2003). Invasive species may threaten native populations through competition for light, water, or nutrients; allelopathic mechanisms; alteration of soil chemistry; thatch accumulation that inhibits seed germination and seedling recruitment; changes in natural fire frequency; disruptions to pollination or seed-dispersal mutualisms; changes in soil microorganisms; or other mechanisms. The magnitude of invasive species impacts in

Mediterranean habitats, such as those in California, largely depends on characteristics of the invading species and the habitat being invaded (Fried et al. 2014). The invader's life form and ability to form very dense stands have an effect on the magnitude of impacts, with creeping plant species such as freeway iceplant having greater effect (Gaertner et al. 2009; Fried et al. 2014). Invasive species may also influence native species colonization rates, and may thus lead to declines in local diversity over longer timescales (Yurkonis and Meiners 2004). Studies have not been conducted on the impact of invasive species on coast yellow leptosiphon specifically; however, negative impacts of plant invasions on Mediterranean ecosystems have been well demonstrated (Gaertner et al. 2009; Fried et al. 2014).

The coast yellow leptosiphon population is threatened by encroachment of non-native invasive plants, especially invasive freeway iceplant that is a highly-rated noxious weed by the California Invasive Plant Council (Cal-IPC 2017). Freeway iceplant is a low-growing, creeping succulent perennial plant that roots at the nodes and often forms deep mats covering large areas. Originating from South Africa, is one of the most widespread, non-native plants in the Mediterranean coastal ecosystems throughout the world, and is considered a severe threat to the native plant communities it invades (Albert 1995; Santoro et al. 2011). In California, it occurs along the coast and on the Channel Islands, especially in areas with a warm winter climate (Cal-IPC 2017). Originally introduced into California in the early 1900s to stabilize soil along railroad tracks, the California Department of Transportation soon began using it widely to line highways. It has also been widely promoted as an ornamental plant for home gardens (Albert 1995, 2000). Because this plant spreads easily by seed and vegetative means, it has spread beyond landscape plantings and has invaded coastal habitats, including the coastal prairie where coast yellow leptosiphon grows. Freeway iceplant forms nearly impenetrable mats that dominate the landscape, and it competes directly with native plant species for light, nutrients, water, and space (D'Antonio and Haubensak 1998). The fleshy fruits often bear more than one thousand small seeds (Bartomeus and Vilà 2009) that are eaten and widely dispersed by several mammals such as rabbits (D'Antonio 1990) and rats (Bourgeois et al. 2005). It competes aggressively with native plant species, achieving high rates of space colonization, which suppresses growth and establishment of other plants (D'Antonio and Mahall 1991; Albert 1995; Suehs et al. 2004; Vilà et al. 2006). Furthermore, it also interacts indirectly with native vegetation by altering soil chemistry by lowering pH (Conser and Connor 2009). Although freeway iceplant was originally used to stabilize soil and control erosion, it can actually contribute to erosion and landslides. It has shallow roots that do not hold soil well, and it absorbs ample water during rain events, becoming so heavy that it can slump off of steep hillsides and cliffs, pulling soil down with it (Spitzer 2002). Freeway iceplant covers the bluffs in much of the habitat near the coast yellow leptosiphon population, and it is growing on the bluff immediately adjacent to the coast yellow leptosiphon population and is encroaching into the population.

Other non-native plant species, such as rough cat's ear, rye grass, hare barley, and cut-leaved plantain, are also present growing in and around the coast yellow leptosiphon population. These invasive species may threaten the coast yellow leptosiphon population through a variety of mechanisms, including competition for light, water, or nutrients; thatch accumulation that inhibits seed germination and seedling recruitment; disruptions to pollination or seed-dispersal mutualisms; or other mechanisms (D'Antonio and Haubensak 1998).

The coast yellow leptosiphon population will likely continue to experience ongoing and increasing inputs of invasive plant propagules from nearby populations and other sources. The

area is frequently used by pedestrians, who can serve as vectors for invasive species into the area. Habitat disturbances resulting from the close proximity of the population to urban development also provides opportunities for invasive species populations to establish and expand. In addition, the proposed development on the adjacent property would likely increase the input of invasive plant species from the spread of landscape plants into the area, and will increase disturbance and habitat modification, providing favorable habitat for invasive species.

Other Natural Events or Human-Related Activities

Bluff-Top Erosion and Rising Ocean Levels—The coast yellow leptosiphon population is located on Vallemar Bluff, approximately 8 meters (27 feet) from the edge of the bluff, and bluff-top erosion and rising ocean levels pose a serious threat to this species. Rainfall and wave splash or spray cause erosion of the bluff face. Additionally, slope instability results in landslides along the coastal bluff face, resulting in landward recession of the top edge of the coastal bluff. Coastal bluff landslides are caused by undermining the base of the bluff or from saturation of the bluff edge or bluff face (Haro, Kasunich & Associates, Inc. 2015). A coastal bluff recession study was prepared by Haro, Kasunich & Associates, Inc., Consulting Geotechnical and Coastal Engineers (2015). Historical satellite photos and maps were reviewed and compared with the bluff edge position as surveyed in 2014. The results indicated that the coastal bluff had receded inland up to 14.6 meters (48 feet) between 1908 and 2014, which is a long term historical bluff recession rate of about 0.14 meter (0.45 foot) per year. Results of the study also indicated that about 3 to 5 meters (10 to 18 feet) of bluff recession occurred between 1986 and 2014, which is a long term historical bluff recession rate of about 0.11 to 0.20 meters (0.36 to 0.64 feet) per year. Future bluff and coastal recession risk was estimated using the long-term historical average annual erosion rates as a minimum. Results suggested that a minimum of 6.9 meters (22.5 feet) of bluff recession will occur at Vallemar Bluff in the next 50 years (by the year 2065). Mean sea level along the California coast is expected to rise between 1.0 to 1.4 meters (3.3 to 4.6 feet) by the year 2100 due to climate change (Heberger et al. 2009), and the accelerating rate of sea level rise will likely result in increased future recession rates compared to average historical rates (Haro, Kasunich & Associates, Inc. 2015). Accelerated future sea level rise is expected to result in an estimated additional 1.7 meters (5.5 feet) of recession over the next 50 years, for a total of 8.6 meters (28 feet) of recession (Haro, Kasunich & Associates, Inc. 2015).

Projected future bluff edge recession was measured from where the bluff is considered stable as determined by Haro, Kasunich & Associates, Inc. (2015). They used the projected stable edge to project future recession and arrived at an estimated 50-year coastal recession setback line for development on Vallemar Bluff using the projected rates of recession described above. The 50-year setback is considered the minimum distance necessary to provide a stable building site of a 50-year lifetime of a proposed structure. The portion of the bluff seaward of the 50-year setback line, which supports a large portion of the coast yellow leptosiphon population, is considered to be vulnerable to erosion over the next 50 years. It is likely that the coast yellow leptosiphon population, which is perched near the bluff edge, has been steadily reduced by cliff erosion. Based on the study conducted by Haro, Kasunich & Associates, Inc., the coast yellow leptosiphon population is located on a portion of the bluff that is highly susceptible to erosion over the next 50 years. If the bluff erodes to the 50-year setback line that accounts for rising sea level, approximately 80 percent of the coast yellow leptosiphon population will be destroyed. Erosion of the bluff presents a significant threat to coast yellow leptosiphon and could lead to the extinction of the species.

Direct physical impacts—The coast yellow leptosiphon population is threatened by other human-related activities, specifically trampling from foot traffic. People commonly walk on the bluff where the coast yellow leptosiphon population occurs, which may damage or kill coast yellow leptosiphon individuals through direct trampling of plants. In addition, there is nothing to prevent people from riding their bicycles on the bluff, which would further impact the coast yellow leptosiphon population. The property is easily accessible to the public, and a foot trail has been worn along the bluff that passes along the edge of the coast yellow leptosiphon population. A bench is present near the population overlooking the ocean, attracting visitors to cut through the coast yellow leptosiphon population to view the ocean. In addition to direct trampling of plants, human use of the site also increases disturbance and compaction of soil and facilitates the spread of invasive plant species. No barriers exist around the coast yellow leptosiphon population to protect plants from foot traffic and trampling. The proposed development will result in increased human activity in the area, thus increasing the threat to coast yellow leptosiphon from foot traffic and other human impacts.

Climate Change—Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia (IPCC 2014). Climate change presents a major challenge to the conservation of California's natural resources, and it will intensify existing threats and create new threats to natural systems. Department staff conducted an assessment of the vulnerability of coast yellow leptosiphon to climate change using the NatureServe Climate Change Vulnerability Index Version 3.02 (NatureServe 2016). Based upon the Department's assessment, coast yellow leptosiphon likely has a climate change vulnerability index value of Highly Vulnerable (HV), indicating that available evidence suggests that abundance and/or range extent within the geographical area of the species is likely to decrease significantly by the year 2050. However, some ecological and life history information used for the climate change vulnerability assessment is not yet known for coast yellow leptosiphon. In particular, the Department does not know the mechanisms or species required for effective pollination of coast yellow leptosiphon, the mechanisms used by coast yellow leptosiphon for seed dispersal, or coast yellow leptosiphon's seed dispersal distance. Furthermore, the Department does not know whether or to what extent competing plant species such as freeway iceplant will be favored by projected future climates. Despite the lack of information about some of the ecological and life history information for coast yellow leptosiphon, the confidence in the vulnerability index score is very high based on the results of the Monte Carlo simulation used in the index (Young et al. 2015).

Vulnerability of Small Populations—Coast yellow leptosiphon has an exceptionally limited distribution, with only one population that occupies a very small area. The Department recognizes that species with small numbers of populations and small population sizes are highly vulnerable to extinction due to stochastic (chance) demographic, environmental, and genetic events (Shaffer 1981, 1987; Dirzo and Raven 2003; Groom et al. 2006; Primack 2006). Chance events such as a landslide at the bluff edge could result in the loss of all or a significant part of the coast yellow leptosiphon population. Species with small numbers of populations or small populations may also be subject to increased genetic drift and inbreeding, which can affect population viability (Menges 1991; Ellstrand and Elam 1993). Due to the vulnerability and rarity of coast yellow leptosiphon, the loss of any portion of the population would represent the loss of a significant portion of this species' genetic diversity and total range, and could result in its extinction.

IV. Final Determination by the Commission

The Commission has weighed and evaluated the information for and against designating coast yellow leptosiphon as an endangered species under CESA. The information includes scientific and other general evidence in the Petition; the Department's Evaluation; the Department's status review; the Department's related recommendations; written and oral comments received from members of the public, the regulated community, various public agencies, and the scientific community; and other evidence included in the Commission's record of proceedings.

Based upon the evidence in the record, the Commission has determined that the best scientific information available indicates that the continued existence of coast yellow leptosiphon is in serious danger or threatened by present or threatened modifications or destruction of the species' habitat, predation, competition, disease, or other natural occurrences or human-related activities, where such factors are considered individually or in combination. (see generally Cal. Code Regs., tit. 14, § 670.1, subs. (i)(1)(A); Fish & G. Code, §§ 2062, 2067.)

The Commission determines that there is sufficient scientific information to indicate that designating coast yellow leptosiphon as an endangered species under CESA is warranted at this time and that, with adoption and publication of these findings, coast yellow leptosiphon for purposes of its legal status under CESA and further proceedings under the California Administrative Procedure Act, shall be listed as endangered.

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