California Fish and Game Commission
Notice of Findings for
Foothill Yellow-Legged Frog
(*Rana boylii*)

March 10, 2020

NOTICE IS HEREBY GIVEN that the California Fish and Game Commission (Commission), at its meeting in Sacramento, California on December 11, 2019, made a finding pursuant to California Fish and Game Code Section 2075.5, in response to a petition requesting that the Commission add the foothill yellow-legged frog (*Rana boylii*) to the list of threatened or endangered species under the California Endangered Species Act (CESA) (Fish and Game Code, Section 2050 et seq.; see also California Code of Regulations, Title 14, Section 670.1, Subsection (i)). The Commission made the finding as follows:

1. Listing the Southwest/South Coast, West/Central Coast, and East/Southern Sierra clades as endangered is warranted;
2. Listing the Northeast/Northern Sierra and Feather River clades as threatened is warranted; and
3. Listing the Northwest/North Coast clade is not warranted at this time.

NOTICE IS ALSO GIVEN that, at its February 21, 2020 meeting in Sacramento, California, the Commission adopted the following findings outlining the reasons for its determination.

I. Background and Procedural History

Petition History

A petition to list the foothill yellow-legged frog (*Rana boylii*) as threatened under CESA (Petition) was submitted to the Commission on December 14, 2016 by the Center for Biological Diversity (Petitioner). Commission staff transmitted the petition to the California Department of Fish and Wildlife (Department) pursuant to Fish and Game Code Section 2073 on December 22, 2016 and published a formal notice of receipt of the petition on January 20, 2017 (California Regulatory Notice Register 2017, No. 3-Z, p. 46).

A petition to list or delist a species under CESA must include “information regarding the population trend, range, distribution, abundance, and life history of a species, the factors affecting the ability of the population to survive and reproduce, the degree and immediacy of the threat, the impact of existing management efforts, suggestions for future management, and the availability and sources of information. The petition shall also include information regarding the kind of habitat necessary for species survival, a detailed distribution map, and any other factors that the petitioner deems relevant” (Fish and Game Code, Section 2072.3).

On April 17, 2017, the Department provided the Commission with its evaluation of the petition, *Evaluation of the Petition from the Center for Biological Diversity to List the Foothill Yellow-legged Frog (Rana boylii) as Threatened under the California Endangered Species Act*, to assist the Commission in making a determination as to whether the petitioned action may be warranted based on the sufficiency of scientific information (Fish and Game Code, sections 2073.5 & 2074.2; California Code Regulations, Title 14, Section 670.1, subsections (d) & (e)).

Focusing on the information available to the Department relating to each of the relevant categories, the Department recommended to the Commission that the petition be accepted.

At its scheduled public meeting on June 21, 2017 in Smith River, the Commission considered the petition, the Department's petition 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. Upon publication of the Commission's notice of its findings, the foothill yellow-legged frog was designated a candidate species on July 7, 2017 (California Regulatory Notice Register 2017, No. 27-Z, p. 986).

The Commission's action designating the foothill yellow-legged frog as a candidate species triggered the Department's process for conducting a status review to inform the Commission's decision on whether listing the species is warranted. At its scheduled public meeting on June 21, 2018 in Sacramento, the Commission granted the Department a six-month extension to complete the status review and facilitate external peer review.

The Department completed its review and submitted *Report to the Fish and Game Commission a Status Review of the Foothill Yellow-Legged Frog* (*Rana boylii*) *in California* (Status Report) at the Commission's October 2019 meeting. The report represents the Department's final written review of the status of the foothill yellow-legged frog and is based upon the best scientific information available to the Department.

Species Description

Foothill yellow-legged frogs are small- to medium-sized frogs that are typically gray, brown, olive, or reddish with brown-black flecking and mottling, which often matches the local substrate. Foothill yellow-legged frogs have a relatively squat body and granular skin, giving them a rough appearance like toads, and their dorsolateral folds are indistinct compared to other western North American ranids.

Their abdomen is white with variable amounts of dark mottling on the chest and throat, and as their name suggests, the undersides of their hind limbs are often yellow. Foothill yellow-legged frogs reach sexual maturity around two to three years old and can live over a decade. Adult females likely lay one clutch of eggs per year. Egg masses resemble a cluster of grapes with several hundred embryos, and tadpoles metamorphose in the same season the eggs were laid.

Foothill yellow-legged frogs historically ranged from the Willamette River drainage in Oregon west of the Sierra-Cascade crest to at least the San Gabriel River drainage in Los Angeles County in California, and a disjunct population was discovered in the mid-1960s in the Sierra San Pedro Mártir, Baja California Norte, México. In California, the species has been reported from foothill and mountain streams in the Klamath, Cascade, Sutter Buttes, Coast, Sierra Nevada, and Transverse ranges from sea level to 6,400 ft, although rarely above 5,000 ft. Foothill yellow-legged frog populations exhibit strong genetic variation across their range.

Genetic divergence is often depicted as a phylogenetic tree, which visually summarizes the evolutionary relationships among populations and taxa. A branch on a phylogenetic tree that contains a group of lineages comprised of an ancestor and all its descendants is referred to as a monophyletic group, or a clade. Clades are nested hierarchically in a phylogenetic tree, and effective conservation strategies often identify the "major" clades, which represent populations

from the most divergent lineages in that tree, as key management units. These major clades may be sufficiently differentiated into diagnosable species or subspecies, or they may diverge to that point if the evolutionary process continues. Two recent landscape genomics studies recovered five and six deeply divergent clades, respectively. (McCartney-Melstad et al. 2018 and Peek 2018). Genetic diversity within clades is generally lower in the southern part of the foothill yellow-legged frog's range, making them less capable of adapting to changing conditions.

Federal Status

The foothill yellow-legged frog is currently under review for possible listing as threatened or endangered under the federal Endangered Species Act (ESA) in response to a July 11, 2012 petition submitted by the Center for Biological Diversity. On July 1, 2015, the U.S. Fish and Wildlife Service (USFWS) published its 90-day finding that the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted and initiated a status review of the species (USFWS 2015). On March 16, 2016, the Center for Biological Diversity sued the USFWS to compel issuance of a 12-month finding on whether listing under the ESA is warranted. On August 30, 2016, the parties reached a stipulated settlement agreement that the USFWS shall publish its 12-month finding in the Federal Register on or before September 30, 2020 (Center for Biological Diversity v. S.M.R. Jewell (D.D.C. Aug. 30, 2016, No. 16-CV-00503)).

II. Statutory and Legal Framework

The Commission, as established by the California State Constitution, has exclusive statutory authority under California law to designate endangered, threatened, and candidate species under CESA. (California Constitution, Article. IV, Section 20, Subdivision (b); Fish and Game Code, Section 2070.) The CESA listing process for foothill yellow-legged frog began in the present case with the Petitioners' submittal of the Petition to the Commission. 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:

- *Central Coast Forest Association v. California Fish and Game Commission (2018)* 18 Cal. App. 5th 1191;
- *Central Coast Forest Association v. California Fish and Game Commission (2017) 2 Cal. 5th 594;*
- *Center for Biological Diversity v. California Fish and Game Commission* (2008) 166 Cal.App.4th 597;
- *California Forestry Association v. California Fish and Game Commission* (2007) 156 Cal.App.4th 1535;
- *Mountain Lion Foundation v. California Fish and Game Commission* (1997) 16 Cal.4th 105; and
- *Natural Resources Defense Council v. California Fish and Game Commission* (1994) 28 Cal.App.4th 1104.

The "is warranted" determination at issue here stems from Commission obligations established by Fish and Game Code Section 2075.5. Under this provision, the Commission is required to

make a finding regarding the candidate species status at the end of the CESA listing process as follows: that the petitioned action is not warranted, that the petitioned action is warranted, or that the petitioned action is not warranted, but listing the candidate species at a different status than that requested by the petitioner is warranted.

The Commission made the finding under Fish and Game Code Section 2075.5(e)(1) that listing the Northwest/North Coast clade is not warranted. The Commission made the finding under Section 2075.5(e)(2) that listing the Feather River and Northeast/Northern Sierra clades as threatened is warranted and that listing the East/Southern Sierra, West/Central Coast, and Southwest/South Coast clades as endangered is warranted.

The Commission was guided in making these 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 and Game Code, Section 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.*, Section 2067.)

The Commission also considered Title 14, Section 670.1, subsection (i)(1)(A), of the California Code of Regulations in making its determination. This 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; this 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 and Game Code, Section 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 and Game Code, sections 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., sections 2071, 2074.4, 2078; California Code of Regulations, Title 14, Section 670.1, Subsection (h).) The related notice obligations and public hearing opportunities before the Commission are also considerable. (Fish and Game Code, sections 2073.3, 2074, 2074.2, 2075, 2075.5, 2078; California Code Regulations, Title 14, Section 670.1, subsections (c), (e), (g), (i); see also Government Code, Section 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 and Game Code, sections 2073.4, 2073.5, 2074.4, 2074.6; California Code of Regulations, Title 14, Section 670.1, subsections (d), (f), (h).)

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

The Commission has determined that each of the six foothill yellow-legged frog genetic clades described in the Status Report— Northwest/North Coast, Feather River, Northeast/Northern Sierra, East/Southern Sierra, West/Central Coast, and Southwest/South Coast—qualify as a "species or subspecies" under CESA and listing the foothill yellow-legged frog by genetic clade is the prudent approach based on the genetic divergence among the six clades, the genetic diversity within the six clades, the reproductive isolation of the six clades, the relative connectivity of populations within each of the six clades, and due to the disparate degrees of imperilment among the six clades; these bases are supported in the Department's Status Report and presentation to the Commission on December 11, 2019. The clades are as described in the Status Report sections 3.2.2 through 3.2.7 and corresponding figures 7 through 18 and depicted in slide number 8 of the Department's December 11, 2019 PowerPoint presentation to the Commission.

The factual and scientific bases for the Commission's identification of the six clades, the determination that designating three clades as an endangered species under CESA is warranted, the determination that designating two clades as a threatened species under CESA is warranted, and the determination that designating one clade as a threatened or endangered species is not warranted, are set forth in detail in the Commission's record of proceedings including the Petition, the Department's petition evaluation report, the Department's Status Report, written and oral comments received from members of the public, the regulated community, tribal entities, the scientific community, and other evidence included in the Commission's record of proceedings. 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.

Threats

Present or Threatened Modification or Destruction of Habitat

The most widespread, and potentially most significant, threats are associated with dams and their flow regimes, particularly in areas where they are concentrated and occur in a series along a river. (DFW 2019). Dams and their operations can result in several factors that contribute to population declines and possible extirpation; these factors include confusing breeding cues, scouring and stranding of egg masses and tadpoles, reducing the quality and

quantity of breeding and rearing habitat, diminishing tadpole growth rate, creating barriers to gene flow, and supporting the establishment and spread of non-native species (Hayes et al. 2016). Subpopulations of foothill yellow-legged frogs on regulated rivers are more genetically isolated, and the type of water operations significantly affects the degree of connectivity and associated gene flow among them (Peek 2010, 2018; DFW 2019). Reservoirs created behind dams are often uninhabitable and represent barriers to gene flow (Bourque 2008; Peek 2010, 2018). This decreased connectivity can lead to loss of genetic diversity, which can reduce a species' ability to adapt to changing conditions (Palstra and Ruzzante 2008). Dams can result in aseasonal or asynchronous breeding cues, scouring and stranding of egg masses and tadpoles, reduction in quality and quantity of breeding and rearing habitat, slower tadpole growth rate, barriers to gene flow among populations, and establishment and spread of non-native species (Hayes et al. 2016). These impacts appear to be most severe when the dam is operated for the generation of hydropower that use hydropeaking and pulse flows (Kupferberg et al. 2009c, Peek 2018). Foothill yellow-legged frog abundance below dams is an average of five times lower than in unregulated rivers (Kupferberg et al. 2012). The number, height, and distance upstream of dams in a watershed influenced whether foothill yellow-legged frogs still occurred at sites that were occupied in 1975 (Ibid.)

The other widespread threat to foothill yellow-legged frog habitat is climate change. While drought, wildland fires, floods, and landslides are natural, and ostensibly necessary, disturbance events for preservation of native biodiversity, climate change is expected to result in increased frequency and severity of these events in ways that may exceed species' abilities to adapt (Williams et al. 2008, Hoffmann and Sgrò 2011, Keely and Syphard 2016). These disturbance events, which can lead to local extirpations, will occur across a landscape of mostly fragmented and small populations, so the likelihood of natural recolonization will be highly impaired (DFW 2019). Climatic changes in flow regime can lead to increased competition, predation, and disease transmission as species become concentrated in areas that remain wet into the late summer (Adams et al. 2017a, Kupferberg and Catenazzi 2019). Loss of riparian vegetation from wildland fires can result in increased stream temperatures or concentrations of nutrients and trace heavy metals that inhibit growth and survival (Spencer and Hauer 1991, Megahan et al. 1995, Burton et al. 2016). Stream sedimentation from landslides following fire or excessive precipitation can destroy or degrade breeding and rearing habitat (Harvey and Lisle 1998, Olson and Davis 2009, Kupferberg et al. 2011b). At least some models predict unprecedented dryness in the latter half of the century (Cook et al. 2015).

Several other activities have the potential to destroy or degrade foothill yellow-legged frog habitat, but they are less common across the range (DFW 2019); they also tend to have relatively small areas of impact, although they can be significant in those areas, particularly if populations are already small and declining (DFW 2019). Activities that lead to potential impacts include mining, cannabis cultivation, vineyard expansion, overgrazing, timber harvest, recreation, and some stream habitat restoration projects (Harvey and Lisle 1998, Belsky et al. 1999, Merelender 2000, Pilliod et al. 2003, Bauer et al. 2015).

Predation

Predation is a likely contributor to foothill yellow-legged frog population declines where the habitat is degraded by one or many other risk factors (Hayes and Jennings 1986). Several studies have demonstrated the synergistic impacts of predators and other stressors: foothill yellow-legged frogs, primarily as demonstrated through studies on tadpoles, are more susceptible to predation when exposed to some agrochemicals, cold water, high velocities,

excess sedimentation, and even the presence of other species of predators (Harvey and Lisle 1998, Adams et al. 2003, Olson and Davis 2009, Kupferberg et al. 2011b, Kerby and Sih 2015, Catenazzi and Kupferberg 2018). Foothill yellow-legged frog tadpoles appear to be naïve to chemical cues from some non-native predators; they have not evolved those species-specific predator avoidance behaviors (Paoletti et al. 2011). Furthermore, early life stages are often more sensitive to environmental stressors, making them more vulnerable to predation, and foothill yellow-legged frog population dynamics are highly sensitive to egg and tadpole mortality (Kats and Ferrer 2003, Kupferberg et al. 2009c). Predation pressure is likely positively associated with proximity to anthropogenic changes in the environment, so in more remote or pristine places, it probably does not have a serious population-level impact (DFW 2019).

Disease

Perhaps the most widely recognized amphibian disease is chytridiomycosis, which is caused by the fungal pathogen *Batrachochytrium dendrobatidis* (Bd). Previous studies suggested foothill yellow-legged frogs may not be susceptible to Bd-associated mass mortality; skin peptides strongly inhibited growth of the fungus in the lab, and the only detectable difference between Bd+ and Bd- juvenile foothill yellow-legged frogs was slower growth (Davidson et al. 2007). At Pinnacles National Park in 2006, 18% of post- metamorphic foothill yellow-legged frogs tested positive for Bd; all were asymptomatic and at least one Bd+ foothill yellow-legged frog subsequently tested negative, demonstrating an ability to shed the fungus (Lowe 2009). However, recent studies have found historical evidence of Bd contributing to the extirpation of foothill yellow-legged frogs in southern California, an acute die-off in 2013 in the Alameda Creek watershed, and another in 2018 in Coyote Creek (Adams et al. 2017a,b; Kupferberg and Catenazzi 2019). Bd is likely present in the environment throughout the foothill yellow-legged frog's range, and with bullfrogs and treefrogs acting as carriers, it will remain a threat to the species; however, given the dynamics of the two recent die-offs in the San Francisco Bay area, the probability of future outbreaks may be greater in areas where the species is under additional stressors like drought and introduced species (Adams et al. 2017a, Kupferberg and Catenazzi 2019). Therefore, as with predation, foothill yellow-legged frogs are less likely to experience the adverse impacts of diseases in more remote areas with fewer anthropogenic changes to the environment (DFW 2019).

Other Natural Events or Human-Related Activities

Agrochemicals, particularly organophosphates that act as endocrine disruptors, can travel substantial distances from the area of application through atmospheric drift and have been implicated in the disappearance and declines of many species of amphibians in California including foothill yellow-legged frogs (LeNoir et al. 1999, Davidson 2004, Lind 2005, Olson and Davis 2009). Foothill yellow-legged frogs appear to be significantly more sensitive to the adverse impacts of some pesticides than other native species (Sparling and Fellers 2009, Kerby and Sih 2015).

The prevalence of small populations is a threat. Many foothill yellow-legged frog populations are small, isolated from other populations, and possess low genetic diversity (McCartney-Melstad et al. 2018, Peek 2018). Genetic diversity is important in providing a population the capacity to evolve in response to environmental changes, and connectivity among populations is important for gene exchange and in minimizing probability of local extinction (Lande and Shannon 1996, Williams et al. 2008, Eriksson et al. 2014). Small populations are at much

greater risk of extirpation primarily through the disproportionate impact of demographic, environmental, and genetic stochasticity than robust populations (Lande and Shannon 1996, Palstra and Ruzzante 2008). Based on a foothill yellow-legged frog population viability analysis, populations in regulated rivers face a 4- to 13-fold greater extinction risk in 30 years than populations in unregulated rivers due to smaller population sizes (Kupferberg et al. 2009c). The threat posed by small population sizes is significant and the general pattern shows increases in severity from north to south; however, many sites, primarily in the northern Sierra Nevada, in watersheds with large hydropower projects are also at high risk (DFW 2019).

Endangered Clades

The Commission determined that the continued existence of the Southwest/South Coast, West/Central Coast, and East/Southern Sierra clades in the State of California are in serious danger or threatened by one or a combination of the factors described above.

The Commission also determined that the information in the Commission's record constitutes the best scientific information available and established that designating the Southwest/South Coast, West/Central Coast, and East/Southern Sierra clades as endangered species under CESA is warranted.

The species has disappeared from nearly all known historically-occupied locations of the Southwest/South Coast clade and only two populations from this clade are known to be extant (DFW 2019, McCartney-Melstad et al. 2018, Peek 2018). These populations appear to be extremely small and rapidly losing genetic diversity, making them at high risk of extirpation (McCartney- Melstad et al. 2018, Peek 2018).

Foothill yellow-legged frogs appear to be extirpated from a relatively large proportion of historically occupied sites within the West/Central Coast clade, particularly in the heavily urbanized northern portion around the San Francisco Bay. In the northern portion of the clade, nearly all the remaining populations are located above dams, which line the mountains surrounding the Bay Area, and two are known to have undergone recent disease-associated die-offs (DFW 2019). These higher elevation sites are more often intermittent or ephemeral streams than the lower in the watersheds. As a result, the more frequent and extreme droughts that have dried up large areas may have contributed to recent declines (DFW 2019). Illegal cannabis cultivation, historical mining effects, overgrazing, and recreation likely contributed to declines and may continue to threaten remaining populations (DFW 2019).

Like the Southwest/South Coast clade, widespread extirpations in the East/Southern Sierra clade were observed as early as the 1970s (DFW 2019). Dams and introduced species were credited as causal factors in these declines in distribution and abundance, and mining and disease may also have contributed (DFW 2019). This area is relatively arid, and drought effects appear greater here than in northern areas that exhibit both more precipitation and a smaller difference between drought years and the historical average (DFW 2019). There is a relatively high number of hydropower generating dams in series along the major rivers in this clade and at least one new proposed dam near one of the remaining populations (DFW 2019). Some of the most dramatic declines experienced by any frog in the family that includes foothill yellow-legged frogs in California occurred in the Sierra Nevada east of the San Joaquin Valley, where over half of the state's total pesticide usage occurs (Sparling et al. 2001). Like the Southwest/South Coast clade, the East/Southern Sierra clade has low genetic variability and a trajectory of continued loss of diversity (Peek 2018).

Threatened Clades

The Commission determined that the Feather River and Northeast/Northern Sierra clades in the state of California, while not presently threatened with extinction, are likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by CESA.

The Northeast/Northern Sierra clade occupies a relatively small area with many hydropower dams (DFW 2019). The general pattern in the Northeast/Northern Sierra clade, and across the range, is that unregulated rivers or reaches have more areas that are occupied more consistently over time and in larger numbers than regulated rivers or reaches (DFW 2019). The area is also more mesic and experienced less of a change in precipitation during the recent drought than more southern clades (DFW 2019). However, this pattern may not continue as some models suggest loss of snowmelt will be greater in the northern Sierra Nevada, and one of the climate change exposure models suggests that a comparatively large proportion of the lower elevations will experience climatic conditions not currently known from the area by the end of the century (DFW 2019).

Despite the Feather River clade being included in the Northeast clade as defined in one recent study, the Feather River clade is very distinct and located primarily in Plumas and Butte counties (DFW 2019, Peek 2018). The Feather River clade is the smallest, has a high density of hydropower dams (DFW 2019), and recently experienced one of the largest, most catastrophic wildfires in California history (DFW 2019). Despite the threats, foothill yellow-legged frogs appear to continue to be relatively broadly distributed within the clade, although with all the dams in the area, most populations are likely disconnected (DFW 2019). The clade is the only clade where foothill yellow- legged frogs and Sierra Nevada yellow-legged frogs overlap and can hybridize (DFW 2019). The genetic variation within the clade is greater than the other clades except for the Northwest/North Coast (DFW 2019). Most of the area within the clade's boundaries is U.S. Forest Service-managed, and little urbanization pressure or known extirpations exist in this area (DFW 2019). The Feather River clade shares many of the same threats as the Northeast/Northern Sierra clade (e.g., relatively small area with many hydropower dams) (DFW 2019).

Not Warranted Determination

The Commission determined that the Northwest/North Coast clade in the State of California, is not presently threatened with extinction and is not likely to become endangered in the foreseeable future in the absence of the special protection and management efforts required by CESA.

The Northwest/North Coast clade is the largest, with the most robust populations and the greatest genetic diversity (McCartney-Melstad et al. 2018, Peek 2018). The area is the least densely populated by humans; contains relatively few hydropower dams, particularly further north; and has the highest precipitation in the species' California range (DFW 2019). The species is still known to occur in most, if not all, historically occupied watersheds; presumed extirpations are mainly concentrated in the southern portion of the clade around the heavily urbanized San Francisco Bay area (DFW 2019). This is the only clade with an increasing trend in genetic diversity (Peek 2018). The proliferation of cannabis cultivation, particularly illicit grows in and around what is known as the Emerald Triangle (Humboldt, Mendocino and Trinity counties), the apparent increase in severe wildland fires in the area, and potential climate

change effects are cause for concern (DFW 2019). As a result, this clade does not currently warrant listing as either endangered or threatened (DFW 2019).

IV. Final Determination by the Commission

The Commission has weighed and evaluated the information for and against designating the six clades as threatened or endangered under CESA. The information includes scientific and other general evidence in the Petition; the Department's Petition evaluation report; the Department's Status Report; 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 the Northwest/North Coast clade of foothill yellow-legged frog is not 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 California Code Regulations, Title 14, Section 670.1, Subsection (i)(2); Fish and Game Code, Section 2075.5, Subdivision (a)(1).) The Commission determines that there is sufficient scientific information to indicate that designating the Northwest/North Coast clade as threatened or endangered is not warranted.

Based upon the evidence in the record the Commission has determined that the best scientific information available indicates that the continued existence of the Feather River clade, Northeast/Northern Sierra clade, East/Southern Sierra clade, West/Central Coast clade, and Southwest/South Coast clade are 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 California Code Regulations, Title 14, Section 670.1, Subsection (i)(1)(A); Fish and Game Code, sections 2062, 2067.) The Commission determines that there is sufficient scientific information to indicate that designating the East/Southern Sierra, West/Central Coast, and Southwest/South Coast clades as endangered species under CESA and designating the Feather River and Northeast/Northern Sierra clades as a threatened species under CESA is warranted at this time. With the adoption and publication of these findings, each of these five clades of foothill yellow-legged frog for purposes of its legal status under CESA and, for further proceedings under CESA, shall be listed as follows:

- Southwest/South Coast clade – endangered;
- West/Central Coast clade – endangered;
- East/Southern Sierra clade – endangered;
- Northeast/Northern Sierra clade – threatened; and
- Feather River clade – threatened.

With the adoption and publication of these findings the foothill yellow-legged frog shall be removed from the list of candidate species maintained pursuant to Fish and Game Code Section 2074.2.

V. References

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