California Fish and Game Commission
Notice of Findings for Southern California Steelhead
(*Oncorhynchus mykiss*)

February 5, 2025

NOTICE IS HEREBY GIVEN that the California Fish and Game Commission (Commission), at a meeting on April 17-18, 2024, found, pursuant to California Fish and Game Code Section 2075.5, that the information contained in the petition to list southern California steelhead (*Oncorhynchus mykiss*) and other information in the record before the Commission, warrants adding southern California steelhead to the list of 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))

NOTICE IS ALSO GIVEN that, at its February 12-13, 2025 meeting, the Commission adopted the findings herein outlining the reasons for its determination.

I. Background and Procedural History

Petition History

On June 14, 2021, California Trout submitted a petition to the Commission to list southern California steelhead as endangered under CESA. The Commission reviewed the petition for completeness and referred the petition to the California Department of Fish and Wildlife (Department) on June 23, 2021 for evaluation, pursuant to Section 2073 of the California Fish and Game Code. The Commission gave public notice of receipt of the petition on July 16, 2021 (California Regulatory Notice Register 2021, No. 29-Z, p.921). The Department transmitted to the Commission the Department's petition evaluation on November 10, 2021 and, on December 15, 2021, the Commission publicly received the Department's petition evaluation.

At its February 16-17, 2022 meeting, the Commission considered whether listing may be warranted, closed the public hearing and administrative record, and continued deliberations to its April meeting. At its April 20-21, 2022 meeting, the Commission determined that listing may be warranted, and subsequently provided notice regarding southern California steelhead's status as a candidate species (California Regulatory Notice Register 2022, No. 19-Z, p. 541.).

Status Review Overview

The Commission's action, designating southern California steelhead 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 subspecies.

On January 18, 2024, the Department transmitted to the Commission the Department's report, *Report to the Fish and Game Commission California Endangered Species Act Status Review of southern California steelhead (Oncorhynchus mykiss),* dated January 2024. The Commission publicly identified receipt of the Department's status review report as part of the Commission's February 14-15, 2024 meeting materials. On April 18, 2024, the Commission found that the information contained in the petition to list southern California steelhead and other information in the record before the Commission warranted listing southern California steelhead as an endangered species under CESA.

Species Description

O. mykiss is a species of salmonid native to Asian and North American coastal waters and streams of the Pacific Basin. While all *O. mykiss* are born in freshwater rivers, some juvenile *O. mykiss* migrate to the ocean, before returning one to four years later to spawn in their natal freshwater rivers (the anadromous life history). Other juveniles mature and remain in freshwater their entire lives (the resident life history). While anadromy and residency are the two primary life histories, *O. mykiss* life history expression is notably plastic and can be quite variable (Moyle 2002, Sloat et al. 2014). For example, while less common, individuals may exhibit a lagoon-anadromous life history, spending their first or second summer rearing in seasonal lagoons in the estuaries of streams before migrating out to the ocean (Boughton et al. 2007). Unlike other Pacific salmonids, which are semelparous and perish almost immediately after spawning, *O. mykiss* can be iteroparous (Moyle 2002), with the potential to spawn up to four times but typically not more than twice (Shapovalov and Taft 1954). Even in particular fish these elements are not fixed, as individuals may switch from one life history to another during their lifetime. The life cycle, physiology, diet, and habitat needs of *O. mykiss* are detailed in the petition and status review.

There are numerous non-taxonomic units of *O. mykiss* in California; the most commonly recognized classifications are defined by their migration types (i.e., anadromous or resident)[1] and their seasonal run timing (i.e., summer or winter), though *O. mykiss* cannot be differentiated by seasonal run timing or anadromy through classical taxonomy (Behnke 1972; Wilson et al. 1985; Hayes et al. 2008).

O. mykiss, a species native to California, once had annual runs of tens of thousands of adults returning to spawn in southern California rivers, occupying virtually every watershed connected to the ocean from San Luis Obispo County to the Mexican border (southern California); now annual runs in many of those rivers frequently number in the single digits (CDFW 2024). The current and historic presence of *O. mykiss* indicates it is native to southern California. The Department notes that the coastal area around Santa Barbara and San Luis Obispo counties is a well-studied biogeographic boundary with marked differences in coastal ecology and abiotic factors, and that *O. mykiss* south of this point, among other differences, rely more heavily on seasonal precipitation that is more variable and erratic (CDFW 2024). Therefore, for the purposes of this listing, the Commission considers “southern California” to encompass all river systems that are connected to the ocean, south of and including the Santa Maria River system, to the Mexican border. Naturally spawned anadromous *O. mykiss* in southern California originating below natural and manmade impassable barriers has been listed as an endangered distinct population segment under the federal Endangered Species Act (ESA) in some form since 1997, but its numbers have not improved, and it remains at risk of extirpation (CDFW 2024, NMFS 2006).

River and tributary reaches within southern California contain impassable barriers for *O. mykiss*, both natural and manmade (California Coastal Conservancy 2004; NMFS 2012a; CDFW 2024). These barriers may be physical or immaterial (see subsection of these findings titled “Present or Threatened Modification or Destruction of Habitat”). The lowermost

[1] Steelhead is the common name for the anadromous form of *O. mykiss*, while rainbow trout is the common name applied to the freshwater resident form (Behnke 1993; Moyle 2002). This document avoids that dual terminology and uses resident or anadromous when referencing a particular life history of *O. mykiss*.

impassable barrier, by definition, represents the uppermost terminus of where *O. mykiss* anadromy can be realized.

All *O. mykiss*, including resident and anadromous life histories, are imperiled below impassable barriers in southern California (see the petition; CDFW 2022; NMFS 2023). Prior to smolting, the morphological characteristics of an individual juvenile *O. mykiss* cannot be used to determine which life history that individual will later express. To account for both life-history forms of *O. mykiss* in the status review, the Department's analyses examined data on anadromous adult southern California steelhead separately from data on *O. mykiss* not identified as anadromous adult southern California steelhead, as most existing monitoring efforts produce datasets that use these two categories. The reason for two categories is because it is possible to distinguish anadromous adult southern California steelhead in rivers and streams due to their larger size, greater girth, and steel-gray appearance, but it is otherwise difficult to conclude which life history an individual O. mykiss that does not have the identifying characteristics of an adult fish has expressed or will express. (Dagit et al. 2020; Moyle et al. 2017). The Commission considered the status of both anadromous and resident life histories below impassable barriers in its decision.

For all abundance and trend analyses in the record before the Commission, the analyses showed declines in both anadromous adult southern California steelhead and *O. mykiss* not identified as anadromous adult southern California steelhead, with some declines being statistically significant (CDFW 2024). Adult anadromous *O. mykiss* runs have declined to precariously low levels, particularly over the past five to seven years, with declines in adult returns of 90% or more in major watersheds that historically supported the largest anadromous populations (e.g., the Santa Maria, Santa Ynez, Ventura, and Santa Clara rivers) and resident populations, indicating a sharp decline over this same time period (CDFW 2024). Since the category of *O. mykiss* not identified as anadromous does not clearly separate out resident fish, it encompasses resident fish, which necessitates that subset (resident fish) are also in danger of extinction. Therefore, based on the best available estimates, the total below-barrier population of southern California steelhead is exceedingly low, and southern California steelhead is in danger of extinction in the foreseeable future.

In addition to population numbers, the current distribution of southern California steelhead (below impassable barriers) is inadequate for its long-term persistence and viability (CDFW 2024, NMFS 2012a). Less than half of the southern California watersheds historically occupied by southern California steelhead remain occupied below complete barriers to anadromy, most commonly with individuals able to express only a freshwater-resident life-history CDFW 2024).

Southern California steelhead, as contemplated in this listing, encompasses all *O. mykiss* from the Santa Maria River system south to the U.S. border with Mexico below barriers to complete anadromy and includes resident and anadromous life histories.

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 this species began in the present case with a petition submitted to the Commission. The regulatory and legal process that ensued is

described in some detail in the preceding section, along with related references to the Fish and Game Code and controlling regulations. The CESA listing process generally is also described in some detail in published appellate case law in California, including:

- Natural Resources Defense Council v. California Fish and Game Commission (1994) 28 Cal.App.4th 1104;
- Mountain Lion Foundation v. California Fish and Game Commission (1997) 16 Cal.4th 105;
- California Forestry Association v. California Fish and Game Commission (2007) 156 Cal.App.4th 1535;
- Center for Biological Diversity v. California Fish and Game Commission (2008) 166 Cal.App.4th 597;
- Central Coast Forest Association v. California Fish and Game Commission (2017) 2 Cal.5th 594;
- Central Coast Forest Association v. California Fish and Game Commission (2018) 18 Cal.App.5th 1191; and
- Almond Alliance of California v. California Fish and Game Commission (2022) 79 Cal.App.5th 337.

The “is warranted” determination stems from Commission obligations established by Fish and Game Code Section 2075.5. Under the 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 listing a species is warranted or is not warranted. Here, the Commission made the finding under Section 2075.5, subdivision (e)(2) that listing 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, overexploitation, predation, competition, or disease” (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” (Section 2067).

The Commission also considered California Code of Regulations, Title 14, Section 670.1, subsection (i)(1)(A), in making its determination. The provision provides, in pertinent part, that the Commission will list the species or subspecies as endangered or threatened under CESA if the Commission determines that its continued existence is in serious danger or is threatened by any one or any combination of six 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, providing 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 that it is the policy of the state, not specific to the Commission per se, 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). The statutory guidance 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 and 2052).

Finally, in considering the six identified 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., Fish and Game Code, sections 2071, 2074.4 and 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 and 2078; California Code of Regulations, Title 14, Section 670.1, subsection (c), (e), (g) and (i); see also California Government Code Section 11120 et seq.) The referenced obligations are in addition to the requirements prescribed for the Department in the CESA listing process, including an initial evaluation of the petition, 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 and 2074.6; California Code of Regulations, Title 14, Section 670.1, subsections (d), (f) and (h).)

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

The factual and scientific bases for the Commission's determination that designating southern California steelhead 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 petition evaluation report; the Department's status review report; the Department's April 16, 2024 memorandum titled "Update on Supplemental Information for southern California steelhead (*Oncorhynchus mykiss*)"; 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, which is incorporated herein by reference.

The Commission determines that the continued existence of southern California steelhead in the state of California is in serious danger or threatened by one or a combination of six factors as required by 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 southern California steelhead as an endangered species under CESA is warranted. Similarly, the Commission determines that southern California steelhead 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 following threats section represent only a portion of the complex issues aired and considered by the Commission during the CESA listing process for southern California steelhead. 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.

Background

The Commission has previously listed units below the level of taxonomic subspecies, in each case making a factually-specific determination as to whether the unit was appropriate to list under CESA. In 2004, the Commission listed two evolutionarily significant units (ESUs) of coho salmon, a decision that was upheld in a reported decision of a California appellate court (*Cal. Forestry Assn.*, 156 Cal.App.4th at p. 1549). In 2016, the Commission also listed an ESU of fisher. In 2020, the Commission listed five clades of the foothill yellow-legged frog; a clade, also referred to as a monophyletic group, is a branch on a phylogenetic tree that contains a group of lineages comprised of an ancestor and all its descendants. In 2022 the Commission listed upper Klamath-Trinity river spring Chinook salmon as endangered and northern California summer steelhead as endangered, two life history variants of larger taxonomic units.

The Commission bases its "is warranted" finding for southern California steelhead on its determination that southern California steelhead qualifies as a "subspecies" as specified in CESA sections 2062 and 2067. The qualification is based on the evaluation of southern California steelhead as an independent, separable, and important population, with a substantial risk of extinction in the foreseeable future within the meaning of CESA.

Qualification for Listing

Courts have held that the term "species or subspecies" in CESA includes ESUs. (*Central Coast Forest Assn. v. Fish & Game Com.* (2018) 18 Cal.App.5th 1191, 1236, citing *Cal. Forestry Assn.*, 156 Cal.App.4th at pp. 1542 and 1549.) The Commission's authority to list necessarily includes discretion to determine what constitutes a species or subspecies. (*Id.* at p. 1237.) The Commission's determination of which populations to list under CESA goes beyond genetics to questions of policy. (*Ibid.*) The Commission's determinations of what constitutes a species or subspecies under CESA are not subject to the federal ESA, regulations based on the federal ESA, or federal ESA policies adopted by the National Marine Fisheries Service or U.S Fish and Wildlife Service, but those sources may be informative and useful to the Commission in determining what constitutes a species or subspecies under CESA.

The listing petition requests that the Commission list all *O. mykiss below manmade and natural complete barriers to anadromy,* including anadromous and freshwater-resident forms of *O. mykiss,* from and including the Santa Maria River (San Luis Obispo and Santa Barbara counties) to the U.S.-Mexico Border (CDFW 2021).[2] The listing petition uses the terms "southern California steelhead" and "Southern Steelhead" to refer to the proposed CESA listing unit.

The Department status review uses the name "southern California steelhead rainbow trout" (or "Southern SH/RT" for short) for the same CESA listing unit proposed in the petition with the name "southern California steelhead." The Department status review explains that while its name for the proposed listing unit is different from the name for that proposed listing unit that was used in the petition, Southern SH/RT captures the full scope of life history diversity included in the proposed listing unit. Regardless of the name used for the proposed listing unit in the Department status review, the Department evaluated the listing unit proposed in the petition: "all *O. mykiss* below manmade and natural complete barriers to anadromy, including anadromous and resident life histories, from and including the Santa Maria River (San Luis Obispo and Santa Barbara counties) to the U.S.- Mexico Border" (CDFW 2024).

The Department considered how the federal ESA policies related to distinct population segments (DPS) and evolutionary significant units (ESU) would apply to southern California steelhead (CDFW 2024). The Department concluded that "Southern SH/RT satisfies the first (discreteness) and second (significance) criteria of the joint DPS Policy: i.e., Southern SH/RT is markedly separate and biologically significant to the taxon to which it belongs. Accordingly, the Department concludes that Southern SH/RT is a DPS and hence a subspecies for the purposes of CESA listing." The Department's conclusion that the DPS policy criteria have value in evaluating southern California steelhead and that the two criteria are met is supported by the record and more generally demonstrates the wisdom of accepting the petition's inclusion of all *O. mykiss* below manmade and natural complete barriers to anadromy from and including the Santa Maria River (San Luis Obispo and Santa Barbara counties) to the U.S.-Mexico Border. The Commission concurs.[3]

Southern California steelhead are markedly separate from other populations of the taxon along the West Coast of North America based on unique regional biogeography, ecology, physiology, and behavior (CDFW 2024). Point Conception in southern California is a well-studied biogeographic boundary that separates different physical oceanographic processes and the abundance and distribution of many marine species (CDFW 2024). Because average precipitation is substantially lower and more variable and erratic in southern California than regions to the north, southern California steelhead are more frequently exposed to adverse environmental conditions in marginal habitats (i.e., warmer water temperatures, droughts, floods, wildfire) (Busby et al. 1996; CDFW 2024). While intraspecific genetic breaks do not

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[2] The Commission received public comment during the listing process questioning whether the listing petition clearly indicated whether resident and anadromous fish were included in the petition. This issue was addressed in litigation challenging the Commission's acceptance of the listing petition; the court determined that the petition requested "the Commission to list anadromous and resident *O. mykiss* as endangered under CESA." (*United Water Conservation District v. California Fish and Game Commission*, 22STCP02661.)

[3] Courts have given and should give a "great deal of deference" to Commission listing determinations supported by Department scientific expertise. (*Central Coast Forest Assn. v. Fish & Game Com.* (2018) 18 Cal.App.5th 1191, 1198-99.)

always coincide with biogeographic boundaries near Point Conception, the Department maintains that the DPS standards for discreteness do not require absolute separation of a DPS from other members of this species, because this can rarely be demonstrated in nature for any population of organisms (Burton 1998; CDFW 2024). The Commission concurs.

Likewise, below-barrier populations of *O. mykiss* are "markedly separate" from above-barrier populations of *O. mykiss* in watersheds that are within the geographic scope of the southern California steelhead CESA listing unit (CDFW 2024). While above-barrier populations of *O. mykiss* may, on rare occasions, contribute to below-barrier populations, they should not be expected to contribute significantly to the recovery of southern California steelhead (below-barrier *O. mykiss*) if barriers to anadromy remain (CDFW 2024). Not only are these above-barrier populations themselves fragile in that they are vulnerable to catastrophic events and cannot be naturally replenished, but spillover events which may facilitate any significant population or genetic recovery are rare (Heath et al. 2008; Clemento et al. 2009; Pearse et al. 2009; Abadia-Cardoso et al. 2019; Fraik et al. 2021; CDFW 2024). The potential for spillover has existed for decades and there has been no indication that anadromous southern California steelhead populations have increased as a consequence of spillover (see, for example, CDFW 2024 Supplemental Memo).

As stated in these findings in the subsection titled "Species Description" and detailed in the record, *O. mykiss* within the listing's geographic boundary, below complete barriers to anadromy, include fish that exhibit various life histories (including fish that exhibit purely resident life history). Preservation of both the resident and anadromous life-history components of southern California steelhead can help maintain genetic variation that provides southern California steelhead with the ability to adapt to changing environmental conditions and be more resilient to these changes over both short- and long-term time scales, which will reduce the likelihood of southern California steelhead becoming extinct (CDFW 2024). *O. mykiss* in southern California embodies the bulk of the southernmost representation of the species on the western coast of North America, and it is widely recognized that environmental conditions on the periphery of a species' range can shape a species in important ways, imparting genetic plasticity and resilience to the species as a whole (Sexton et al. 2009). As such, southern California steelhead represents an important reservoir of potential adaptations to *O. mykiss* populations elsewhere, including other areas of California (Fraser 2000).

While barriers such as large dams are stationary and ostensibly permanent, not all barriers necessarily are. New barriers may materialize below existing ones, existing barriers may disappear, and volitional fish passage through or around existing barriers may be established to varying degrees. As a result, the lowermost impassable barrier, and thus the limits of anadromy in a particular river system, is a fact-specific, case-by-case determination. Any illustrations, maps, or descriptions in the record before the Commission should be understood as a snapshot of a particular configuration at a specific time or a best estimate of where southern California steelhead presence may be expected, and not necessarily as a definitive recognition that the fish are in fact currently present where indicated. The actual presence or absence of southern California steelhead at a particular site is a fact-specific determination (CDFW 2024; CDFW 2024 Supplemental Memo).

Based on the foregoing factors, the Commission finds southern California steelhead qualifies as a subspecies under CESA.

Threats

Southern California steelhead is endangered due to:

- Present or threatened modification or destruction of its habitat and
- Other natural occurrences or human-related activities.

Present or Threatened Modification or Destruction of Habitat

Southern California steelhead is negatively impacted by a wide variety of human activities, including but not limited to urbanization, agriculture, and water development. These activities have degraded range-wide aquatic habitat conditions, particularly in the lower and middle reaches of most watersheds in the southern California steelhead's range, which have triggered widespread decline of southern California steelhead (NMFS 2012a; CDFW 2024).

Increases in a number of negative habitat impacts are attributed to extensive road and highway networks across much of the southern California steelhead range, especially in areas proximate to rivers and streams. Among these are: non-point pollution (e.g., oil, grease, and copper from braking systems); sedimentation; channel incision due to bankside erosion; substrate embeddedness; floodplain encroachment and loss of floodplain connectivity; loss of channel heterogeneity (e.g., filling of pool habitats); and higher frequencies of flood flows (NMFS 2012a). Extensive road and highway networks require many roads to cross streams (e.g., culverts and bridges) where the crossing is often improperly designed for the volitional passage of aquatic organisms (CalTrans 2007; NMFS 2012a). An assessment of roads and transportation corridor impacts on southern California steelhead demonstrated that roads and associated passage barriers have the highest impact on rivers and streams in the Santa Monica Mountains and Conception Coast regions (NMFS 2012). Road development, bridges, and other transportation corridors are also partly responsible for the significant (70-90%) reduction of estuarine habitat across the entire range of southern California steelhead (Hunt and Associates 2008).

A number of anthropogenic impacts, including water diversions, dams, and other artificial barriers, influence stream flows in most southern California steelhead watersheds (CDFW 2024). Surface water diversions and other water management activities have led to reduced downstream flows, as well as changes to the natural flow regime (e.g., magnitude, timing, and duration of flow events), stream hydrodynamics (e.g., velocity, water depth), and degradation of both habitat quality and quantity needed to support southern California steelhead (NMFS 2012a; Yarnell et al. 2015). Artificial barriers, both structural (e.g., dams, concrete channels for flood control, gravel and borrow pits, roads and utility crossings) and nonstructural (e.g., dewatering, velocity barriers, low flows, disconnected wetted habitat, poor or lethal water quality) act as physical impediments and frequently hamper *O. mykiss* spawning migrations (CDFW 2024).

Groundwater extraction for agricultural, industrial, municipal, and private use from coastal aquifers has increased with population growth in southern California since the mid-1850s (Hanson et al. 2009). Groundwater is an important input for surface flows during the summer low-flow period in many southern California watersheds (Hanson et al. 2009). Groundwater contributions can help sustain suitable over-summering southern California steelhead juvenile rearing habitat in both mainstem and tributary habitats (Tobias 2006). Unsustainable

groundwater extractions have significantly contributed to dewatering and other base flows, exasperating already low flow conditions (NMFS 2012a).

In addition to water quantity, significantly reduced water quality has contributed to southern California steelhead declines (CDFW 2024). Contaminants and pollutants can be both directly toxic to fish and instantiate secondary effects (e.g., elevated nutrients, low dissolved oxygen, increased temperature, and increased turbidity) which can influence growth, reproduction, and mortality rates (Sommer et al. 2007).

While the impacts of agricultural development on southern California steelhead and its habitats have decreased over time due to land use conversion, agricultural development has resulted in considerable cumulative regional habitat loss and degradation. These changes have led to greatly reduced habitat complexity and connectivity in the lower and middle reaches of many southern California watersheds (CDFW 2024).

Invasive species have also contributed to southern California steelhead declines. Human activity has facilitated the establishment and spread of invasive species. Non-native fish, crustaceans, plants and amphibians can reduce fish numbers though competition and predation. Invasive populations are often intensified in synergistic ways with other anthropomorphic and natural habitat degradation effects (CDFW 2024).

Estuarine habitat is critical for different stages of southern California steelhead lifecycle and southern California has experienced a significant decline in the overall amount of estuary habitat (CDFW 2024; Brophy et al. 2019; NMFS 2012a; Stein et al. 2014). The primary cause of estuarine degradation and loss in southern California is the conversion of habitat to other land use practices such as agriculture, grazing, and urban development activities, which require the construction of infrastructure and the subsequent filling, diking, and draining of coastal wetlands (NMFS 2012a). Artificial breaching of estuary closures also contributes to loss of this important habitat component.

While, to varying degrees, some of the habitat-degrading human activities have been reduced, eliminated, or mitigated, the cumulative impacts of the activities remain throughout most of the southern California steelhead's range, particularly in larger systems such as the Santa Maria, Santa Ynez, Ventura, Santa Clara, Los Angeles, San Gabriel, Santa Ana, and Santa Margarita watersheds, as well as in smaller coastal systems such as Malibu Creek (CDFW 2024). Generally, habitat conditions for southern California steelhead have continued to deteriorate over time due to numerous stressors associated with human population growth and climate change impacts (CDFW 2024).

Present or threatened modification or destruction of habitat constitutes a significant threat to the continued existence of southern California steelhead.

Other Natural Occurrences or Human-Related Activities

The climate of the United States is strongly connected to the changing global climate (USGCRP 2017), and temperatures are projected to continue to rise another 2°F (1.11°C) to 4°F (2.22°C) in most areas of the United States over the next few decades (Melillo et al. 2014). The waters of the United States are projected to lose between 4 and 20% of their capacity to support cold water-dependent fish by the year 2030 and as much as 60% by 2100 due to climate change and its impacts (Eaton and Scheller 1996). The greatest loss of this important

aquatic habitat capacity is projected for California, owing to its naturally warm and dry summer climate (O'Neal 2002; Preston 2006; Mote et al. 2018).

The broad-scale climatic factors that appear to primarily shape the habitat suitability and population distribution of southern California steelhead are summer air temperatures, annual precipitation, and severity of winter storms (NMFS 2012a). Changes to these climatic factors could lead to prolonged periods of extreme drought and increased frequency of catastrophic wildfires (NMFS 2023). These factors and their influences on the landscape are predicted to intensify under long-term, synergistically driven conditions brought about by climate change. They are also expected to exacerbate existing stressors for southern California steelhead and other cold water-dependent native aquatic organisms in stream and river systems in southern California (NMFS 2012b, NMFS 2023).

The combined anthropogenic and climate change-driven impacts may ultimately outpace southern California steelhead's capacity to adapt and persist, potentially leading to extirpation within the next 25–50-year time frame and likely leading to extirpation by 2100 without strong conservation measures (Moyle et al. 2013; Moyle et al. 2017; CDFW 2024).

Other natural occurrences or human-related activities constitute a significant threat to the continued existence of southern California steelhead.

Conclusion

The continued existence of southern California steelhead is in serious danger or threatened by significant threats, including present or threatened modification or destruction of habitat and other natural events or human-related activities. The Commission finds these factors, individually and in combination, to result in a significant threat to the continued existence of southern California steelhead as explained in the Department's status review report. This finding and the Department's explanation are supported by the whole of the record before the Commission.

IV. Final Determination by the Commission

The Commission has weighed and evaluated the information for and against designating southern California steelhead as a threatened or endangered species under CESA, including scientific and other general evidence in the petition; the Department's petition evaluation report; the Department's status review report; the Department's April 16, 2024 memorandum titled "Update on Supplemental Information for southern California steelhead (*Oncorhynchus mykiss*)"; 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 the continued existence of southern California steelhead is in serious danger or threatened by modification or destruction of the species' habitat and other natural occurrences or human-related activities, where such factors are considered individually or in combination. (see, generally, California Code of Regulations, Title 14, Section 670.1, subsection (i)(1)(A); Fish and Game Code sections 2062 and 2067.)

The Commission determines that there is sufficient scientific information to indicate that designating southern California steelhead as an endangered species under CESA is warranted, and that, with adoption and publication of these findings, southern California steelhead shall be listed as endangered for purposes of its legal status under CESA.

Citations

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