

**90-DAY FINDING ON A PETITION TO LIST THE LONG VALLEY SPECKLED DACE (*RHINICHTHYS OSCULUS SSP.*) AS AN ENDANGERED SPECIES UNDER THE ENDANGERED SPECIES ACT AND CONCURRENTLY DESIGNATE CRITICAL HABITAT OR LIST LONG VALLEY SPECKLED DACE A DISTINCT POPULATION SEGMENT (DPS) OF THE ASH MEADOWS SPECKLED DACE (*RHINICHTHYS OSCULUS NEVADENSIS*)**

**Petitioned Action Being Requested:**

- ☒ List as an Endangered or a Threatened species
- ☐ Reclassify (uplist) from a Threatened to an Endangered species

**Petitioned Entity:**

- ☐ Species
- ☒ Subspecies
- ☐ Distinct Population Segment (DPS) of vertebrates
- ☒ Subset of listed entity (species, subspecies, DPS, etc.)

**Background**

Section 4(b)(3)(A) of the Endangered Species Act (Act) requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. Our standard for substantial scientific or commercial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is “that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted” (50 CFR 424.14(b)).

**Petition History**

On June 24, 2020, the U.S. Fish and Wildlife Service (Service) received a petition, dated June 8, 2020, from the Center for Biological Diversity (CBD), requesting that the Service take several actions regarding three speckled dace entities, including the Long Valley speckled dace (*Rhinichthys osculus spp.*). The request for two of these entities (speckled dace populations in Amargosa Canyon and Owens Valley, California) did not qualify as petitions, and are therefore not addressed here. However, the request to list the Long Valley speckled dace as an endangered, separate subspecies of speckled dace (*R. osculus*) did qualify as a petition, and is addressed herein.

The CBD clearly identified their document as a petition and included the requisite identification information for the petitioner, required at 50 CFR 424.14(a). This finding addresses the petition.

**Evaluation of a Petition to List the Long Valley speckled dace as an Endangered or Threatened Species under the Act**

### *Species and Range*

Does the petition identify an entity that may be eligible for listing (*i.e.*, is the entity a species, subspecies, or DPS)?

☒ Yes

☐ No

### *Genetics*

Long Valley speckled dace has yet to be formally described but there has been extensive genetic analysis that concluded it should be a subspecies of speckled dace (*Rhinichthys osculus*) (Sada et al. 1992, p. 17; Furiness 2000, pp. 33–34; Moyle et al. 2015, pp. 1–2). Long Valley speckled dace are both morphologically distinct and monophyletic (Moyle et al. 2015, pp. 1–2). Small morphological differences among speckled dace populations isolated in different watersheds led early ichthyologists to describe 12 separate species in 1896 (Moyle et al. 2015 pp. 1–2). In the 1970s, all speckled dace were lumped into a single species, *Rhinichthys osculus*, due to their flexible nature, and plastic morphology of the species (Moyle et al. 2015, p. 2). Subsequent studies in 1995 (Sada et al., entire) have shown that all isolated populations in the Owens Valley show genetic and morphological differences from each other but only Long Valley speckled dace differs enough from the other dace populations to be regarded as a separate subspecies (Sada et al. 1995, entire, Moyle et al. 2015, p. 2).

*If yes, list common name (scientific name); and describe the current and historical range of the species.*

Long Valley speckled dace (*Rhinichthys osculus ssp.*)

Historical range: Upper Owens River watershed, Mono County, California

Current range: Whitmore Hot spring, Mono County, California (Long Valley speckled dace may be extirpated in the wild, only found in an artificial pond in Inyo County, California, outside of their historical range).

### **Statutory and Regulatory Standards for Evaluation of the Petition**

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an “endangered species” or a “threatened species.” The Act defines an endangered species as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a “threatened species” as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The Act requires that we determine whether any species is an “endangered species” or a “threatened species” because of any of the following factors:

- A. The present or threatened destruction, modification, or curtailment of its habitat or range;**
- B. Overutilization for commercial, recreational, scientific, or educational purposes;**
- C. Disease or predation;**

- D. The inadequacy of existing regulatory mechanisms; or**  
**E. Other natural or manmade factors affecting its continued existence.**

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions at the petition review stage, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that *may* ameliorate any negative effects or may have positive effects.

In reviewing the petition, we use the term “threat” to refer in general to actions or conditions that are known to, or are reasonably likely to, negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term “threat” may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species may meet the statutory definition of an “endangered species” or a “threatened species.” In determining whether a species may meet either definition, we must evaluate all identified threats by considering the expected response by the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level.

Below we present the information from the petition, our analysis of that information and our conclusion and petition finding relative to our substantial information standard, which is “that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted”. Neither the petition nor additional available science describe claims regarding *Factor B, Overutilization for commercial, recreational, scientific or educational purposes; therefore*, Factor B is not addressed further in this document.

Information in the Petition that Describes the Claims Relevant to the 5 Factor Analysis.

4(a)(1) Factor	Threat or Activity	Do the Claims made in the Petition Rely on Credible Scientific and Commercial Information Corroborating that the Threat Is Present and May Negatively Affect Individuals?	
		If No, Explain Why Not	If Yes, Briefly Describe the Credible Information (with citations) that the Petition Presents
A	Geothermal energy development		These two information sources provided by the petitioner, Sorey 2000 (p. 706) and BLM 2013 (pp. 230–231) corroborate the claims that the threat of geothermal energy development in the Long Valley caldera causing changes to surficial

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			thermal water features is present, and may negatively affect Long Valley speckled dace individuals.
A	Surface water diversions		Sada 1989 (pp. 9, 10, 13) and Moyle et al. (2015, p. 4) corroborate the petitioner's claims that the construction of Hot Creek fish hatchery and diversion of water in the 1960s likely contributed to the extirpation of Long Valley speckled dace in Hot Creek. Moyle et al (2015, p. 4) also corroborates the claim that Whitmore Hot spring has been converted into a municipal pool and subsequently been affected by chlorine and other chemical treatments.
A	Habitat Alteration/Recreation		Moyle et al. (2015, p. 4) and Parmenter (2020, pers. comm.) corroborate the claims of the petitioner that Long Valley speckled dace have experienced significant habitat alteration due to recreational development of Whitmore Hot spring. Whitmore Hot spring was developed into a municipal pool, and even though there remained sufficient effluent flows for the dace population, the threat of a potential release of highly treated water may negatively affect Long Valley speckled dace individuals.

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A	Livestock Grazing		Petitioner's citation of Moyle et al. 2015 (p. 3) corroborates the claim that livestock grazing causes reduction in riparian vegetation, increased sedimentation of streams, and trampled banks which may negatively affect Long Valley speckled dace individuals.
C	Disease and Predation		Sada 1989 (p. 12) corroborates the petitioner's claim that a heavy parasite infestation was documented in the Long Valley speckled dace population at Whitmore Hot spring.
D	Inadequacy of existing regulatory mechanisms		Petitioner's provided source of Morris et al. 2001, entire, corroborates the claims that the Clean Water Act (CWA), California Environmental Quality Act, California Groundwater Sustainable Management Act, and California Department of Fish and Wildlife's designation of Long Valley speckled dace as a species of special concern do not provide adequate protections.
E	Introduced Species		These four information sources provided by the petitioner, Sada 1989, (pp. 12–13), Moyle et al. 2015, (p. 5), Mills et al. 2004 (p. 715), and Caiola and Sostoa 2005 (p. 358) supported the claims that the threat of introduced species is present, and these introduced species may predate or outcompete Long Valley speckled dace for resources.

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E	Climate Change		These two information sources provided by the petitioner, Reich et al. 2008 (pp. 17–18) and Moyle et al. 2013 (pp. 1–9) corroborate the claim that due to climate change, the amount of snow pack available in the Sierra Nevadas spanning from Bishop to June Lake to recharge the aquifers on which the Long Valley speckled dace are dependent, will be negatively impacted.

## Evaluation of Information

In this section, we evaluate claims from the petition that we found to be based on credible information. When evaluating a petition at the 90-day finding stage, we evaluate the information in the petition and use any readily available information (e.g., in our files or published literature that we are aware of) to verify the credibility of the information presented in the petition. Conclusions in the petition based on credible information are then evaluated to determine if there is substantial information presented indicating the petitioned action may be warranted. The substantial information standard is “that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted.”

Below we discuss our evaluation of each of the claims found to be based on credible information from the petition and consider any regulatory mechanisms or conservation efforts that may ameliorate the threats the species identified in the petition. When evaluating each of the factors in section 4(a) (1) of the Act, Factor D is considered in light of the other factors, not independently. The discussion of the conclusions under each factor below includes a summary of information provided in the petition and other readily available information regarding how activities identified in the petition negatively affect the status of the entity.

## Petition Threats/Claims or Activities

*(Factor A) The present or threatened destruction, modification, or curtailment of its habitat or range*

### Geothermal Energy Development

The Long Valley caldera is a large oval-shaped depression formed 767,000 years ago during a massive volcanic eruption and contains a robust system of geothermal activity (USGS 2018, pp. 1–2). The petition claims that geothermal energy development in the Long Valley caldera has already caused significant changes to surficial thermal water features there. The petition first claims that geothermal energy development has occurred in the Long Valley caldera, and geothermal energy development is known to alter discharge quantity, geochemistry, and temperature at surficial water features adjacent to production sites (Sorey 2000, p. 706). The petition also claims that ongoing monitoring of surficial thermal water after the development of the Casa Diablo geothermal facility has shown a cessation of spring flow at Colton spring, which is 1.24 mi (2.0 km) from the facility (Sorey 2000, p. 706). Geothermal development at Casa Diablo has resulted in declines in reservoir pressure and temperature from 1985–1998 (Sorey 2000, p. 706). In 1991, there was a reservoir pressure drop of 0.25 megapascals in response to an increase in production and deepening of injection wells (Sorey 2000, p. 706). This pressure drop caused an approximately 3-ft (1.2-meters (m)) drop in water level at the Hot Bubbling Pool, which is 3.11 mi (5 km) away from the Casa Diablo facility, and a 30–40 percent reduction in thermal water content in the springs at Hot Creek Fish Hatchery since 1990 (Sorey 2000, p. 706). Thermal water discharge decreased in 1991 due to a major increase in geothermal production. However, it also varied over the entire monitoring period with precipitation; therefore, the variations are not solely attributable to variations in geothermal reservoir pressure (BLM 2013, p. 230). Hot Bubbling Pool experienced an approximately 4 ft (1.25 m) water level decline with the onset of expanded production and deeper injection in 1991, but water levels have recovered as geothermal production has shifted west to another location (BLM 2013, p. 230). The petition claims that the impacts of geothermal heat extraction may extend beyond a localized reach. Whitmore Hot spring is approximately 3.7 mi (6 km) from the Casa Diablo geothermal facility, and therefore possible that the facility could affect thermal surface water features (Sorey 2000, p. 706). Whitmore Hot spring is the location of the last known extant wild population of Long Valley speckled dace, and changes to water level, water chemistry, or water temperature could directly harm the population. The petition provides evidence that the geothermal development has or had a direct influence on water levels, geochemistry, or temperature at Whitmore Hot spring. Sorey (2000, p. 706) states that there could be natural influences that account for the reduction in thermal water as well as geothermal production. The petition claims that geothermal developer Ormat has already expanded the facility once and has discussed further expansion. The development of a new additional power plant, Casa Diablo IV, has been permitted by the Bureau of Land Management (BLM) and is scheduled for construction in calendar years 2020–2021 (BLM et al. 2013, entire). Due to the reasons listed above, there is substantial information related to the effects of geothermal energy development indicating that the petitioned action may be warranted.

### Surface Water Diversions

The petition claims that Long Valley speckled dace have been substantially impacted by surface water diversions. The petition claims that the Hot Creek fish hatchery likely contributed to the extirpation of dace in Hot Creek through diversion of water and construction activities in the 1960s (Sada 1989, pp. 9, 10, 13; Moyle et al. 2015, p. 4). Speckled dace were last found in 1962 at Hot Creek, and likely extirpated subsequently due to alterations to the system, including the operation of Hot Creek Hatchery (Moyle et al. 2013, p. 4). Long Valley speckled dace were not found at Hot Creek in 1989 (Sada 1989, p. 13). The morphometric analysis indicated this form of speckled dace was adapted to spring and not fluvial environments (Sada 1989, p. 3). Long Valley speckled dace morphology, and their disappearance from Hot Creek shortly following development of the springs for hatchery purposes, suggest this population was spring dwelling, and not stream dwelling individuals (Sada 1989, p. 13). The diversion of water through the trout hatchery at Hot Creek has modified habitat that supported the Long Valley speckled dace population and has led to the extirpation of the population (Sada 1989, p. 13). Therefore, there is substantial information related to the effects of surface water diversion indicating that the petitioned action may be warranted.

### Livestock Grazing

The petition asserts livestock grazing is one of the major factors leading to the limited amount of suitable speckled dace habitat, and a high threat for Long Valley speckled dace (Sada 1989, p. 8; Moyle et al. 2015 p. 5). The petition also claims that the reduction in riparian vegetation, and trampling of stream banks has limited Long Valley speckled dace habitat at Whitmore Hot spring, and Little Alkali Lake by increasing solar input, reducing habitat complexity and cover, and increasing sediment input into pools and channels (Moyle et al. 2015, p. 4). Large quantities of fine sediment change the structure of aquatic communities, and diminish productivity (Cooper 1965, pp. 16, 20, 23; Meehan and Platts 1978, p. 275). However, Long Valley speckled dace are broadcast spawners of adhesive eggs, which may not be affected by sedimentation of streams.

The petition also claims that heavy damage by grazing is thought to have contributed to the extirpation of the Long Valley speckled dace population in an unnamed spring at Little Alkali Lake (Moyle et al. 2015, pp. 4–5). Cattle continue to graze this area and have led to degraded Long Valley speckled dace habitats (Cooper 1965, pp. 16, 20, 23; Moyle et al. 2015, p. 5). Livestock grazing can have deleterious effects on both dace habitat and dace populations. Therefore, with livestock grazing occurring in Long Valley, the petition presents substantial information to indicate that livestock grazing may be affecting the species, indicating that the petitioned action may be warranted.

### Recreation

The petition claims that recreation impacts are a significant threat to Long Valley speckled dace. The water source that supported the last known extant wild population of Long Valley speckled dace habitat at Whitmore Hot spring has been a public swimming pool since the early 1950's (Sada 1989, pp. 10–11). The dace habitat is solely supported by spring discharge, which flows in part through the public swimming pool before entering a marsh where dace occur (Sada 1989, p. 10). The effluent from the spring is undiminished by pool operations and maintained sufficient flows to support this dace population (Moyle et al. 2015, p. 4). The town of Mammoth Lakes operates the pool as a public facility and public laws require disinfection, but a spill of over-chlorinated water could lead to the extirpation of the entire population (Moyle et al. 2015, p. 4; Parmenter 2020, pers. comm.). Surveys in 1988–89 found that the species was common at Whitmore Hot spring but they



were in poor health, and heavily infested with parasites (Sada 1989, p. 12). The petition claims that the population at Whitmore Hot spring is now thought to be extirpated. The pool at Whitmore Hot spring has modified the spring and could lead to treated water discharging into the stream. The modifications and discharge of treated water could possibly have led to the suspected extirpation at Whitmore Hot spring. Therefore, there is substantial information related to the effects of recreation on the species that the petition action may be warranted.

#### *(Factor C) Disease and Predation*

##### Introduced Species and Disease

The petition claims the introduction of predators such as largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), western mosquitofish, and Sacramento perch (*Archoplites interruptus*) into springs and small streams can rapidly drive dace populations to extinction and these invasive fish species have been implicated in the extirpation of isolated speckled dace (*R. osculus*) populations (Moyle et al. 2015, p. 4). Some invasive species can introduce non-native parasites and disease into freshwater ecosystems (Stone et al. 2007, p. 131). There was a documented heavy parasite infection in 1989 of the Long Valley speckled dace population at Whitmore Hot spring (Sada 1989, p. 12).

In 1988–89, the dace population that occupied the stream that flows into Little Alkali Lake was described as healthy, free of parasites, and composed of all age classes (Sada 1989, p. 12). This population was only seen in a stream reach of 1,800 ft (548.6 m) that averaged 2 ft (0.61 m) wide and 2 in (0.08 m) deep, and fish were absent where water exceeded 84 degrees Fahrenheit (28.9 Celsius) (Sada 1989, p. 12). The population of Long Valley speckled dace at Little Alkali Lake was extirpated concurrently with the discovery of western mosquitofish in the spring system (Moyle et al. 2015 p. 5). Western mosquitofish will aggressively compete with speckled dace for food and are known predators of fish larvae and eggs (Mills et al. 2004, p. 715; Caiola and Sostoa 2005, p. 358). The competition for resources and predation of larval dace and eggs by the mosquitofish could have led to the extirpation of dace from the Little Alkali Lake spring system. This spring system is identified by the California Department of Fish and Wildlife (CDFW) as a priority reintroduction location but only after the mosquitofish have been removed (Moyle et al. 2015, p. 7).

There are documented extirpations that are concurrent with the detection of invasive species, and these non-native species are documented vectors of both parasites and disease. These threats may result in long-term modification that renders habitat less suitable for the petitioned species. Therefore, there is substantial information related to the effects of invasive species that the petitioned action may be warranted.

#### *(Factor D) Inadequacy of Existing Regulatory Mechanisms*

The petition claims that existing regulatory mechanisms are failing to ameliorate threats to the petitioned species. Long Valley speckled dace are listed in California as a species of “special concern” (CDFW 2015, p. 23). However, the petition claims that this designation does not provide any regulatory or substantive protection for these fish populations. Even though the designation carries no formal legal status, it is intended to focus attention on the species and achieve

conservation and recovery of the species before they meet California Endangered Species Act criteria for listing. The designation allows Long Valley speckled dace to be protected under the California Environmental Quality Act (CEQA). Under CEQA, CDFW is required to be notified when a project will involve any rare species, such as Long Valley speckled dace (CDFW 2020). If the level of impacts to species of special concern are considered significant, that would require the lead agencies to prepare an Environmental Impact Report to fully analyze the effects. However, project impacts may not be analyzed if project proponents claim insignificant impacts to the species and the project only impacts a small portion of the species' range.

The CDFW conducts a pre-stocking evaluation prior to stocking any of the 850 bodies of water they currently stock (CDFW 2019). This evaluation is part of an Environmental Impact Statement, or Environmental Impact Review, and is required at least once every 5 years (Parmenter 2020, pers. comm.). This is to ensure that no native fish would be negatively affected due to the stocking of fish.

The petition also claims that the Clean Water Act (CWA) established the basic structure for regulating the discharge of pollutants into U.S waters and for regulating surface water quality standards (Morris et al. 2001, entire; EPA 2020). The CWA sets total maximum daily load that is allowed to be discharged into waterways (EPA 2020). The petition claims that the CWA contains no specific provisions to address the conservation needs of designated rare species. However, the CWA will provide general protections that limit the amount of pollutants that enters the waterway, such as the effluent at Whitmore Hot spring.

Finally, the petition claims that the California Groundwater Sustainable Management Act (CSGMA) was intended to be a plan for sustainable long-term groundwater management. The CSGMA designates basins as either low, medium, or high priority, and only basins with medium or high designations have significant protections under the act (Moran and Daniel 2014, pp.6, 14). Long Valley speckled dace habitat relies heavily on groundwater. Long Valley groundwater basin is designated as a low priority and not subject to any significant protections, which has led to declining groundwater and surface water flow. Therefore, CSGMA does not provide adequate protections for Long Valley speckled dace.

In consideration of these various regulatory mechanisms, the petition presents substantial information to indicate that certain existing regulatory mechanisms may be inadequate to address threats impacting the species and its habitat to a level that would preclude the need to list the species.

*(Factor E) Other natural or manmade factors affecting its continued existence*

Climate Change

The petition claims that the desert aquifers in the Death Valley region will likely receive less recharge as the region warms (Riggs and Deacon 2004, pp. 9–10). The petition also claims the thermal springs that comprise a major portion of Long Valley and Owens speckled dace habitat are fed by aquifers dependent on snowmelt for recharge. Current climate models project that there will be a reduction in snowpack in the eastern Sierra Nevada due to warmer temperatures and a shift in precipitating toward rainfall in late winter and early spring months (Reich et al. 2008, pp. 17–18). The petition claims that this decline in regional water supply will be compounded by growing human demand for water both locally and in southern Nevada. In 2007, Las Vegas local officials sought to obtain about 200,000 acre-feet of water per year from the aquifer that spans from Salt Lake City, Utah, to Death Valley, California (Deacon et al. 2007, p. 688). Las Vegas grew by 11.4 percent from April 1, 2010 – April 1, 2019 (United States Census 2020). In 2007, Las Vegas had one of the largest water consumptions in the United States per capita of 256.5 gallons (971 liters) per person per day (Morris et al. 1997, entire; Deacon et al. 2007, pp. 688–689). The petition claims that it is possible that snowpack will be reduced in the portion of the Sierra Nevada spanning from Bishop to June Lake -- the region closest to Long Valley speckled dace habitat. A reduction in snowpack would lead to less groundwater, and therefore less spring discharge, affecting Long Valley speckled dace habitat. Moyle et al. (2013, entire) rated Long Valley speckled dace as “critically vulnerable” to climate change, which indicated that extinction is likely within the next 100 years if measures to counter climate change effects are not taken. Considering current population growth, the demand for water, the warming climate, and reduced snowpack, all these factors could lead to dwindling suitable dace habitat (Moyle et al. 2013, entire). Therefore, there is substantial information related to the effects of climate change that the petitioned action may be warranted.

*Cumulative Impacts*

When we have a substantial finding based on one or more threats, we do not need to assess cumulative effects at the 90-day finding stage, because we will address cumulative effects of all threats in the 12-month finding. We only assess the cumulative effects of purported threats included in the petition if we find the petition does not present substantial information indicating the petitioned action may be warranted because of any one of the Factors (A, B, C, D, or E) individually.

*Summary*

During the evaluation of information presented in the petition, we relied primarily on the claims and the references, citations, and sources of information provided by petitioners. Where sources were provided but outdated at no fault of the petitioners (*i.e.*, rapidly evolving circumstances or events), or where internal files provided highly relevant or updated information, we considered that readily available information in our determinations. Therefore, those claims that we found credible were determined to be so on the basis of references provided, or a combination of references provided and information readily available.

## Petition Finding

We reviewed the petition, sources cited in the petition, and other readily available information. We considered the factors under section 4(a)(1) and assessed the effect that the threats identified within the factors—as may be ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts—may have on the species now and in the foreseeable future. We considered a “threat” as any action or condition that may be known to or is reasonably likely to negatively affect individuals of a species. This includes those actions or conditions that may have a direct impact on individuals, as well as those that may affect individuals through alteration of their habitat or required resources. The mere identification of “threats” is not sufficient to compel a finding that listing may be warranted. Based on our review of the petition and readily available information regarding Factors A, C, D, and E, we find that the petition presents substantial scientific or commercial information indicating that listing the Long Valley speckled dace (*Rhinichthys osculus ssp.*) as an endangered subspecies of speckled dace (*R. osculus*) may be warranted. The Service will fully evaluate all potential threats during our 12-month status review, pursuant to the Endangered Species Act’s requirement to review the best available scientific information when making that finding.

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### **Pers. Comm.**

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**Author**

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Paul Souza

Regional Director, Department of the Interior Region 10,  
U.S. Fish and Wildlife Service