



December 5, 2022

Via Electronic and Certified Mail

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**Re: Emergency Listing Request for the Clear Lake Hitch (*Lavinia exilicauda chi*)**

Dear Secretary Haaland and Director Williams:

Considering the urgent and significant risk of extinction facing the Clear Lake hitch (*Lavinia exilicauda chi*) (“hitch”), the Center for Biological Diversity, together with the Big Valley Band of Pomo Indians (“Big Valley”), Robinson Rancheria of Pomo Indians, Habematolel Pomo of Upper Lake (“HPUL”), and Scotts Valley Band of Pomo Indians request that the Secretary direct the U.S. Fish and Wildlife Service to list the hitch on an emergency basis under the Endangered Species Act, 16 U.S.C. § 1533(b)(7).<sup>1</sup> We are grateful that the Service will reconsider the hitch’s status and make a new listing decision by January 12, 2025.<sup>2</sup> But due to exceptionally dire circumstances, we request that the Service use its authority under section 4(b)(7) of the ESA to emergency list the hitch as an endangered species.

**I. THE CLEAR LAKE HITCH WARRANTS EMERGENCY LISTING**

All available data suggest that the Clear Lake hitch is at imminent risk of extinction, with a serious risk of disappearing in the next few years if action is not taken. The hitch has not had successful spawning since 2017.<sup>3</sup> Given the hitch’s typical life span of six years, a five-year juvenile recruitment failure is the equivalent of a human population going childless for 50 years. Thus, the 2023 spring spawning season is crucial for the continued existence of the species.

The hitch’s spawning failures are due to extensive losses of stream spawning habitat and wetland rearing habitat (estimated at 92% and 85%, respectively) due to excessive withdrawals of water, including illegal diversions, and drought. Clear Lake’s tributaries are dry for much of

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<sup>1</sup> The undersigned groups request that the Secretary and the Service also treat this request as a petition to list the hitch as an endangered species under section 4(b) of the Endangered Species Act (“ESA”), 16 U.S.C. § 1533(b), and its implementing regulations, 50 C.F.R. § 424.14(a), and, in the alternative, as a rulemaking petition under section 553(e) of the Administrative Procedure Act (“APA”), 5 U.S.C. § 553(e), and its implementing regulations, 43 C.F.R. § 14.2.

<sup>2</sup> Stip. Settlement Agreement and Order, ECF No. 36, *Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv.*, No 21-6323 (D.D.C. 2021).

<sup>3</sup> See Feyrer et al. (2022) (“Attachment A”) at 14.

the spring spawning season, forcing the hitch to attempt spawning in any available habitat, including the lake itself. But the hitch's lake-spawning efforts do not result in new hitch being added to the population, which has led to a persistent lack of juvenile recruitment. The dry creeks further pose a serious threat to the hitch by amplifying the many threats present in Clear Lake including, but not limited to, predation, pollution, harmful algal blooms, and parasites.<sup>4</sup> Climate change has only made these threats more serious. Since the hitch was first petitioned for listing in 2012, the population is swiftly disappearing. Clear Lake hitch are more likely to be seen during rescue efforts (when creeks run dry) than during surveys in the wild.

The California Department of Fish and Wildlife ("CDFW") listed the hitch as threatened with extinction under the California Endangered Species Act in 2014.<sup>5</sup> In 2020, a lead CDFW biologist working on the hitch observed the worst spawning year in eight years, and in 2021, expressed concern that the hitch could be gone within a few years due to loss of spawning habitat and in-lake predation. Recent U.S. Geological Survey ("USGS") survey reports confirm this grim reality.<sup>6</sup>

The hitch both plays an integral role in the ecosystem of the Clear Lake region and is a culturally significant species to the Big Valley and Robinson Rancheria Tribes. Since time immemorial, the Tribes of the region have long depended on the hitch—also known as "chi" as named by the Xa-Ben-Na-Po Band of Pomo people—for survival. The Pomo people have inhabited the Clear Lake area for over 11,800 years, where the hitch has been an important part of food security and trading economies of the region. The hitch remains an essential part of Clear Lake's Tribal community, culture, and physical and spiritual sustenance, as well as an essential aspect of the Tribes' nutritional health and wellbeing.<sup>7</sup> Annual Tribal hitch collections and harvest allow the transfer of traditional values and reinforce inter- and intra-tribal relationships.<sup>8</sup>

This is an emergency situation that requires immediate action. The best available science and, indeed, the Service's own prior findings show that the hitch is on the brink of extinction, but it can be restored through a series of clearly-defined emergency measures, including captive rearing, action to stop illegal water withdrawals, action to work with legitimate water rights holders to leave more water instream, and initiation of non-native fish control. Therefore, we urge the Service to use its emergency listing authority to list the hitch as an endangered species.

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<sup>4</sup> See SSA ("Attachment B") at 88.

<sup>5</sup> See CDFW 2014 Status Review ("Attachment C") at 2.

<sup>6</sup> See, e.g., Attachment A at 14-15.

<sup>7</sup> See Irenia Quitiquit Decl., ECF No. 28-3, *Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv.*, No 21-6323 (D.D.C. 2021); Ron Montez, Sr. Decl., ECF No. 28-4, *Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv.*, No 21-6323 (D.D.C. 2021); see also Peter B. Moyle et al., Saving Clear Lake's Endangered Chi, California Water Blog (July 17, 2022).

<sup>8</sup> Tribal elders, members, and staff from Big Valley and Robinson Rancheria provided testimony at the August 2022 California Fish and Game Commission meetings and requested that State officials take every possible action to save the hitch. The following week, the Tribes' members and staff attended a Government-to-Government meeting with CDFW Director Chuck Bonham to develop an action plan for the hitch. At the October Commission meeting, the Commission unanimously voted to send a letter requesting Secretary Haaland to direct the Service to list the hitch on an emergency basis under the ESA. See FGC Letter (2022) ("Attachment D"). The Commission also suggested that the Tribes host an emergency summit for the hitch, which is scheduled to occur this December 2022.

## II. ENDANGERED SPECIES ACT LISTING AND EMERGENCY LISTING

Congress enacted the ESA “to halt and reverse the trend toward species extinction, whatever the cost.”<sup>9</sup> To that end, Secretary of the Interior, through the Service, must protect species that it determines are endangered or threatened by listing them under the Act.<sup>10</sup> The Service must list a species as “endangered” if it “is in danger of extinction throughout all or a significant portion of its range.”<sup>11</sup> The Service must list a species as “threatened” if it is “likely to become an endangered species within the foreseeable future.”<sup>12</sup>

Section 4 of the ESA requires the Service to assess five categories of threats when making listing determinations: (1) the present or threatened destruction, modification or curtailment of the species’ habitat or range; (2) overutilization for commercial, recreational, scientific or educational purposes; (3) predation or disease; (4) the inadequacy of existing regulatory mechanisms; and (5) other threats to the species’ continued existence.<sup>13</sup> If a species meets the definition of “endangered” or “threatened” because of *any one or a combination* of these five factors, the Act requires the Service to list the species.<sup>14</sup>

In situations where there exists an “emergency posing a significant risk to the well-being of any species of fish or wildlife or plants,” the ESA authorizes the Secretary to bypass ESA and APA rulemaking procedures and issue regulations, including a listing, that take immediate effect upon publication in the Federal Register.<sup>15</sup> This statutory provision provides, in full:

Neither paragraph (4), (5), or (6) of this subsection nor section 553 of Title 5 shall apply to any regulation issued by the Secretary in regard to any emergency posing a significant risk to the well-being of any species of fish or wildlife or plants, but only if—

- (A) at the time of publication of the regulation in the Federal Register the Secretary publishes therein detailed reasons why such regulation is necessary; and
- (B) in the case such regulation applies to resident species of fish or wildlife, or plants, the Secretary gives actual notice of such regulation to the State agency in each State in which such species is believed to occur.

Such regulation shall, at the discretion of the Secretary, take effect immediately upon the publication of the regulation in the Federal Register. Any regulation promulgated under the authority of this

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<sup>9</sup> *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, at 184 (1978).

<sup>10</sup> 16 U.S.C. § 1533(a).

<sup>11</sup> *Id.* § 1532(6).

<sup>12</sup> *Id.* § 1532(20).

<sup>13</sup> *Id.* § 1533(a)(1); 50 C.F.R. § 424.11(c).

<sup>14</sup> *Id.*; see also *Fed’n of Fly Fishers v. Daley*, 131 F. Supp. 2d 1158, at 1164 (N.D. Cal. 2000) (“These factors are listed in the disjunctive; any one or a combination can be sufficient for a finding that a particular species is endangered or threatened.”).

<sup>15</sup> *Id.* § 1533(b)(7).

paragraph shall cease to have force and effect at the close of the 240-day period following the date of publication unless, during such 240-day period, the rulemaking procedures which would apply to such regulation without regard to this paragraph are complied with. If at any time after issuing an emergency regulation the Secretary determines, on the basis of the best appropriate data available to [her], that substantial evidence does not exist to warrant such regulation, [s]he shall withdraw it.<sup>16</sup>

As the ESA makes clear, the Secretary is to provide “detailed reasons” for emergency listing in the Federal Register but need not issue a proposed regulation or provide notice.<sup>17</sup> Emergency listing regulations remain in effect for 240 days, unless the agency follows the conventional listing procedures and issues a new regulation within the 240-day period.<sup>18</sup>

### III. CLEAR LAKE HITCH LIFE HISTORY AND HABITAT REQUIREMENTS

Endemic to the Clear Lake watershed in Northern California (*See* Figure 1 below), the Clear Lake hitch is in imminent danger of extinction. Though it was once highly abundant, its population has declined to less than one percent of past abundance as the watershed has been altered and degraded.<sup>19</sup> Many threats have reduced hitch spawning runs from being as “spectacular as any salmon run on the Pacific coast,”<sup>20</sup> and “numbering in the tens of thousands,”<sup>21</sup> to only a few thousand spawners annually.<sup>22</sup>

Although hitch spend most of the year in Clear Lake, each spring they migrate into the tributaries to spawn.<sup>23</sup> Before the first heavy spring rain, adult hitch congregate around the mouths of creeks, which are typically dry, to await sufficient flows to support migration into the creeks to spawn. When the creeks have enough water flowing, hitch have a brief opportunity to migrate upstream, spawn, and return to the lake before the rapidly drying creeks are dewatered.<sup>24</sup> Hitch rely on the creeks for spawning, in part, to escape the many predatory fish that live in the lake and prey on eggs and juvenile hitch.<sup>25</sup> Young hitch seek out nursery areas with tule (*Schoenoplectus acutus*)—a native marshland reed that provides ideal rearing habitat for hitch—and other emergent vegetation to provide cover from the lake’s many predators to rear for up to 152 days.<sup>26</sup> Once they reach an appropriate size, typically in the fall, the maturing hitch migrate from nursery areas into the open water of the lake.

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<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> Much of the hitch’s natural history and biology has been laid out in the SSA (“Attachment A”) and the Center’s 2012 petition to list the hitch under the ESA (“Attachment E”), which are both attached and incorporated here by reference.

<sup>20</sup> *See* Baumsteiger et al. (2019) (“Attachment F”).

<sup>21</sup> *See* Attachment C.

<sup>22</sup> *See* Attachment B at 59; Attachment C at 15.

<sup>23</sup> *See* Attachment B at 9.

<sup>24</sup> *Id.* at 9, 12-13.

<sup>25</sup> *See* Feyrer (2019)c (“Attachment G”) at 231.

<sup>26</sup> *See* Feyrer et al. (2019)a (“Attachment H”) at 1693.

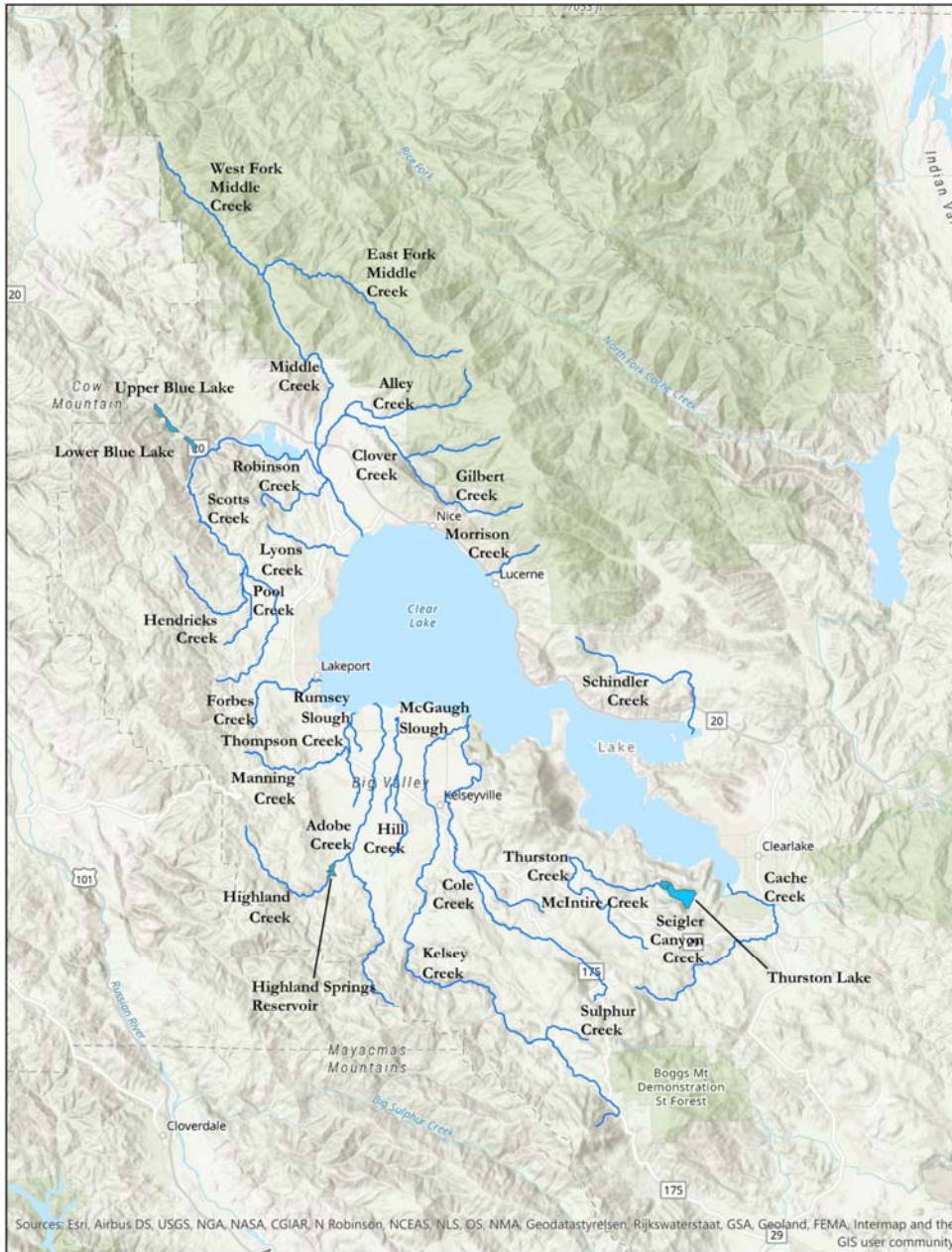


Figure 1 Clear Lake Watershed Map

The hitch requires specific habitat features to survive into adulthood and complete its life cycle. In the lake, hitch need clean, well-oxygenated and minimally contaminated lake water and an adequate food supply, and they must avoid the lake’s many predators.<sup>27</sup> As hitch expert Dr. Peter Moyle has clearly stated, however, “[t]he fate of Clear Lake hitch is tied to restoring spring flows to spawning streams, along with barrier removal and other habitat restoration actions.”<sup>28</sup>

<sup>27</sup> *Id.* at 14; see Species Assessment Form (“Attachment I”) at 15-1.

<sup>28</sup> See Peter B. Moyle et al., Saving Clear Lake’s Endangered Chi, California Water Blog (July 17, 2022), available at <https://californiawaterblog.com/2022/07/17/saving-clear-lakes-endangered-chi/>.

For spawning, the creeks must provide unimpeded access, have sufficient flow to provide hydrological connectivity to the lake, and maintain sufficient flow for long enough to support spawning, egg development and hatching, and out-migration of adults and young hitch—a process that takes many weeks.<sup>29</sup> This entire process must be completed before the creeks dry again or before reduced water flow and depth create barriers to downstream migration, which often results in stranding, as in Figure 2 below. Accordingly, adequate flows must be maintained from early February through at least July.



*Figure 2 - Hitch stranded in Adobe Creek 2014, Photo Courtesy of Sarah Ryan, Environmental Director for Big Valley*

In addition to sufficient flow and access in the tributary creeks, the hitch also requires water temperatures to be within a specific range—between 14-18 C (57-64 F)—to trigger spawning and egg hatching,<sup>30</sup> and the creeks must be free of barriers because the hitch is not a very strong jumper.<sup>31</sup>

#### **IV. PRIMARY THREATS TO THE HITCH'S SURVIVAL**

##### **A. Loss of Stream Spawning Habitat and Wetland Rearing Habitat**

The primary threat to the hitch has been loss of habitat.<sup>32</sup> It has lost over 92 percent of its stream spawning habitat and over 85 percent of its wetland nursery habitat and now struggles to spawn and survive on what remains of its highly degraded habitat.<sup>33</sup> Municipal and agricultural water diversions, overgrazing, legacy contaminants from mercury mining on the lakeshore, pesticide and nutrient runoff from agriculture, and increased drought and wildfire frequency have

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<sup>29</sup> See Attachment B at 9-13.

<sup>30</sup> See Attachment B at 9.

<sup>31</sup> See Attachment B at 13, 19.

<sup>32</sup> See Attachment B at 75.

<sup>33</sup> See Attachment C at 24-25.

vastly reduced and degraded the hitch’s habitat.<sup>34</sup> Even Kelsey and Adobe Creeks—the hitch’s last bastion of spawning habitat—are often too dry to support spawning.<sup>35</sup> Any remaining spawning habitat is further threatened by over-appropriation and consumptive uses of surface and groundwater, pollution, increased wildfire risk, and prolonged drought. Diversions (both permitted and illegal) rapidly dewater the creeks, which dry progressively earlier each year, a trend that will only accelerate with climate change.<sup>36</sup> These threats risk further spawning failures and are the same conditions that substantially contributed to the extinction of the hitch’s closest relative, the Clear Lake splittail, which has not been seen since the 1970s.<sup>37</sup> Each year that the hitch faces the continued loss of its spawning habitat, it inches closer to extinction.

Streams that once ran freely from fall through late spring or even early summer now run intermittently, only during heavy storm runoff, or sometimes barely at all. High volumes of water are diverted from Clear Lake tributaries for agricultural production, vineyard frost protection, irrigation, and domestic water supply, with about 60 percent taken from groundwater wells in close proximity to the creeks.<sup>38</sup> Frost protection—which overlaps with the hitch spawning season—has been shown to reduce creek flows by as much as 95 percent,<sup>39</sup> and while high-volume withdrawals may be permitted, it is “unknown” what long-term harm they are causing to the hydrology of the streams and to the hitch itself.<sup>40</sup> Sporadic groundwater pumping occurs in April and early May for frost protection of pears and wine grapes, and it can deplete the flows of nearby creeks, as it has in the Napa and Russian River valleys.<sup>41</sup> Indeed, results of the Big Valley Integrated Hydrologic Model show significant drawdown of Adobe Creek due to groundwater pumping in April—the heart of hitch spawning.<sup>42</sup> Heavy groundwater pumping to irrigate pears begins in early June. Although Lake County has a monitoring system for several wells, well and groundwater levels near hitch spawning streams must be evaluated during the spawning season, especially in Big Valley creeks, and the impacts of groundwater pumping must be fully analyzed. The overall lack of monitoring or enforcement of water permitting, and, in particular, monitoring for California Fish and Game Code § 1602 violations, must be addressed to prevent the hitch’s extinction.

Numerous barriers such as road crossings, bridges, dams, and weirs on the creeks block hitch passage to suitable spawning grounds and hasten stranding in the drying creeks. Physical barriers in Adobe, Kelsey, Scotts, Middle and Clover Creeks include rock weirs, low water crossings, dams, and culverts, and have deprived hitch of access to spawning habitat for over 30

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<sup>34</sup> See Attachment B at 25-28, 35-38.

<sup>35</sup> *Id.* at 58; Attachment I at 52; Attachment C at 15.

<sup>36</sup> See Attachment B at 25, 50.

<sup>37</sup> *Id.* at 27; Attachment B at 28.

<sup>38</sup> See Attachment B at 28; Attachment C at 27.

<sup>39</sup> *Id.*

<sup>40</sup> See Attachment B at 28.

<sup>41</sup> See Attachment E at 23-24, citing State Water Resources Control Board, Division of Water Rights Staff Report, *Russian River Watershed: Proposed Actions to be Taken by the Division of Water Rights on Pending Water Right Applications within the Russian River Watershed* (August 15, 1997); M.J. Deitch, et al. (2009) (“Attachment J”).

<sup>42</sup> See Flow West Analysis (2022) (“Attachment K”); BVG Plan 2C (“Attachment L”); and BVR Comment Letter (“Attachment M”).

years.<sup>43</sup> Although CDFW, in cooperation with Lake County and the California Department of Transportation, have begun to address some fish passage problems, many barriers remain. The impact of tributary dams and impoundments needs to be investigated and corrected.

Around 85 percent of the hitch’s wetland nursery habitat has also been destroyed.<sup>44</sup> The few wetland areas that remain are largely disconnected hydrologically from the creeks where hitch are born, so young hitch must avoid predators by seeking out the lake’s few remaining nearshore emergent wetlands to rear—an effort that is often unsuccessful.<sup>45</sup> Numerous non-native fish prey on young hitch and compete for resources in the lake.<sup>46</sup>

Successful reproduction and recruitment are crucial for the hitch’s survival and long-term viability.<sup>47</sup> But while female hitch are highly fecund—producing thousands of eggs when spawning—hitch have low reproductive success because most eggs do not develop into adults that reproduce.<sup>48</sup> To compensate for their low reproductive success, hitch need to achieve a high survival rate from early life to adulthood to remain viable—and this depends on spawning in the tributaries.<sup>49</sup> Despite limited evidence of hitch spawning in Clear Lake, there is no evidence that lake spawning supports the hitch’s long-term viability due to its limited ability to add to the next generation.<sup>50</sup> Recent USGS data show that, for the last few years, fewer hitch have been successfully spawning, even fewer have been surviving to reproductivity, and nearly no hitch are being born.<sup>51</sup> Increased runoff from agricultural pesticide use around the lake has degraded water quality and contributes to increased cyanobacteria and toxic algal blooms, which cause periodic fish kills—including countless dead hitch.<sup>52</sup> In 2020, Dr. Moyle concluded that the hitch’s extinction “is expected if measures are not taken to improve spawning and lake habitats.”<sup>53</sup>

## **B. Predation and Competition**

Up to 20 non-native fish species thrive in Clear Lake today, and many prey on hitch and compete for resources.<sup>54</sup> When the creeks lack sufficient water for spawning, the hitch is forced to spawn elsewhere, such as the shallow, rocky areas of the lake itself, but lake spawning does not meaningfully contribute to recruitment due, in large part, to heavy predation on hitch eggs and larvae by carp, bass, and other invasive fishes.<sup>55</sup> With vastly reduced wetland nursery areas, young hitch seek out available rearing areas around Clear Lake’s shoreline.<sup>56</sup> Due to limited

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<sup>43</sup> See Attachment E at 27, citing D. McGinnis & E. Ringelberg, Lake County Fish Barrier Assessment, Technical Memo (2008).

<sup>44</sup> See Attachment B at 35.

<sup>45</sup> *Id.* at 13.

<sup>46</sup> *Id.* at 11, 20, 41-43.

<sup>47</sup> *Id.* at iv, x.

<sup>48</sup> *Id.* at 18.

<sup>49</sup> *Id.* at 18-19, 22.

<sup>50</sup> *Id.* at 11, 18, 20, 44, 50, 55.

<sup>51</sup> See Feyrer (2019)b (“Attachment N”).

<sup>52</sup> See Attachment B at 35.

<sup>53</sup> See Attachment E at 21, citing Moyle et al., In Review (2020).

<sup>54</sup> See Attachment B at 41.

<sup>55</sup> See Attachment B at 11; Attachment C at 8.

<sup>56</sup> *Id.* at 9.



available habitat, these areas are also home to Mississippi silversides, largemouth bass, black bass, sunfish, and catfish, which prey on all life stages of hitch.<sup>57</sup> Dr. Peter Moyle found that while adult hitch are most vulnerable to predation during spawning, the “primary concern” is predation on young hitch from introduced fish species in the lake, and young hitch are “routinely found in the stomachs of bass caught in the lake.”<sup>58</sup> As a result, in-lake spawning does not significantly contribute to hitch production and recruitment.<sup>59</sup> Invasive fish also compete for habitat and food resources in the lake.<sup>60</sup> Thus, predation and competition limit successful spawning and recruitment of hitch, and these threats will continue to negatively affect the hitch throughout its range unless they are mitigated.<sup>61</sup> Although bass are a sportfish frequently targeted by area fishing tournaments,<sup>62</sup> many of these contests practice “catch and release” of bass, returning large bass back to the lake to feed on more hitch eggs and juveniles. Although Phase I of a program to remove invasive carp from Clear Lake has already been completed,<sup>63</sup> the State of California has been, thusfar, reluctant to eliminate bass from Clear Lake.

### C. Climate Change, Drought, and Wildfire

Climate change threatens the hitch’s remaining habitat, further risking its extinction.<sup>64</sup> Already, the region has been facing severe and prolonged drought that is likely to continue to occur frequently in the future due to climate change.<sup>65</sup> With the increased frequency, intensity, and duration of drought, Clear Lake tributaries are drying progressively earlier, shortening the hitch’s already brief spawning window even further.<sup>66</sup> The threats from lost habitat, predation and competition, and drought, will be made worse by climate change’s worsening effects; if hitch maintain their current trajectory, their risk of extirpation will only increase.<sup>67</sup> Dr. Moyle determined that the hitch is “critically vulnerable” to climate change, specifically, the change in spring hydrograph.<sup>68</sup> For these reasons, in 2013 Moyle determined the hitch was endangered.<sup>69</sup>

Along with drought, climate change also threatens the region with increased wildfire risk. Fires in the watershed increase stream bank erosion and channelization, decreasing the amount of water retained in the creeks.<sup>70</sup> When the Service completed its Species Status Assessment Form

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<sup>57</sup> See Attachment B at 43.

<sup>58</sup> See Moyle et al. (2014) (“Attachment O”).

<sup>59</sup> See USGS (2018) (“Attachment P”) at 64.

<sup>60</sup> See Attachment B at 43.

<sup>61</sup> *Id.* at 23, 44; Attachment I at 29.

<sup>62</sup> See CDFW Clear Lake Fishing Contests (2020) (“Attachment Q”).

<sup>63</sup> See Blue Ribbon Committee for the Rehabilitation of Clear Lake 2022 Project Proposals for Committee Consideration, May 11, 2022; Clear Lake Restoration Through Invasive Common Carp and Goldfish Management - Phase 2, at 67, available at <https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Clearlake-BRC/20220525-BRC-Project-Proposals-for-Consideration.pdf>.

<sup>64</sup> See Attachment B at 44, 48-51, 55, 77, 86.

<sup>65</sup> *Id.* at 22.

<sup>66</sup> *Id.* at 44.

<sup>67</sup> *Id.* at 88.

<sup>68</sup> *Id.* at 50; Moyle et al. (2013) (“Attachment R”) at 3, 7.

<sup>69</sup> See Moyle et al. (2013)(S1) (“Attachment S”).

<sup>70</sup> See Attachment I at 18.

in July 2020, the 2018 Mendocino Complex was the largest fire on record in California.<sup>71</sup> The very next month, however, the August Complex surpassed the Mendocino Complex as the state's largest fire.<sup>72</sup> In fact, the record-breaking fire season of 2020 saw 6 of the top 20 largest wildfires in California's history.<sup>73</sup> These massive wildfires are only expected to intensify in severity and frequency with even modest climate models, further threatening the hitch's spawning habitat.<sup>74</sup> More wildfires will deposit more nutrients in the lakes, which can cause more frequent algal blooms.<sup>75</sup> "Existing evidence suggests that lake nutrients, primary and secondary productivity, ions, sediments, and organic matter should increase in response to fires, whereas water clarity and thermal habitat for cold-water fishes are expected to decrease."<sup>76</sup>

## V. CHANGES IN DISTRIBUTION AND ABUNDANCE OF CLEAR LAKE HITCH

As a result of the many interconnected and compounding threats, the hitch's population has been swiftly disappearing, displaying limited reproductive success, diminished recruitment, and a low overall survival rate.<sup>77</sup> Historically, hitch were found in many lakes and ponds in the watershed, including Clear Lake, Thurston Lake, Upper Blue Lake, Lower Blue Lake, and Lampson Pond.<sup>78</sup> Settlement of the region and the resulting degradation of the hitch's habitat led to its extirpation from the Upper and Lower Blue Lakes, and it is unknown whether Lampson Pond still exists.<sup>79</sup> Only two vastly reduced hitch populations remain, one in Clear Lake and another in Thurston Lake.<sup>80</sup> Thurston Lake and its tributary Thurston Creek have always been isolated from Clear Lake, and while hitch did not historically occur in Thurston Lake, local opinion is that hitch were introduced there by a resident less than 50 years ago.<sup>81</sup> The hitch likely once spawned in all of Clear Lake's tributaries, since all are relatively low gradient in lower reaches and accessible to spawning hitch. Hitch also spawned in marshlands, wetlands, streams, and flooded fields around the lake, and were once so abundant that they were a staple food for area Tribes. Early accounts discuss hitch spawning in all tributary creeks, and elders from Tribes around the lake recount that hitch formerly spawned in all the creeks.<sup>82</sup> For example, members of Elem Indian Colony historically collected hitch from Seigler Creek.<sup>83</sup> Schools of migrating hitch were once almost unimaginably abundant, and annually clogged the tributaries during spring

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<sup>71</sup> *Id.* at 17-18.

<sup>72</sup> See Shelby Grad, *Six of California's Largest Fires in History Ignited This Year. Here's What We Know*, L.A. Times (Sept. 11, 2020), available at <https://www.latimes.com/california/story/2020-09-11/six-of-californias-largest-fires-in-history-are-burning-right-now>.

<sup>73</sup> *Id.*

<sup>74</sup> See California's Fourth Climate Change Assessment at 28-30, available at [https://www.energy.ca.gov/sites/default/files/2019-11/Statewide\\_Reports-SUM-CCCA4-2018-013\\_Statewide\\_Summary\\_Report\\_ADA.pdf](https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf).

<sup>75</sup> See McCullough *et al.* (2019) ("Attachment T") at 2,846.

<sup>76</sup> *Id.* at 2,850.

<sup>77</sup> See Attachment B at 60-61, 74.

<sup>78</sup> *Id.* at 6.

<sup>79</sup> *Id.*

<sup>80</sup> *Id.* at 71.

<sup>81</sup> *Id.* at 6-7.

<sup>82</sup> *Id.*

<sup>83</sup> See Attachment E at 12.

spawning runs.<sup>84</sup> Longtime residents vividly recall vast numbers of hitch spawning in every tributary to Clear Lake, and Tribal elders remember that it was said that one could “walk across Kelsey Creek on the backs of the chi.”

Currently, the hitch spawns in vastly reduced numbers, primarily in only two creeks: Kelsey Creek and Adobe Creek. In recent years, no hitch have been sighted in some of Clear Lake’s major tributaries during the spawning season, and only small numbers of hitch have been reported in recent years in Middle, Scotts, Cole and Manning Creeks. No hitch were found in Seigler Creek during surveys from 2004 through 2011. Visual reports of juvenile hitch must be confirmed by trained biologists, as hitch can be easily misidentified as Sacramento blackfish or introduced Mississippi silversides.

In CDFW’s 2020 spawning survey report, biologists found that since 2014, hitch have been spawning in alarmingly low numbers in only a few creeks each year and are not spawning at any biologically meaningful scale in any other creeks.<sup>85</sup> Below average rainfall during 2020’s wet season resulted in low turbidity, which made viewing hitch in the creeks easier.<sup>86</sup> However, it also caused low creek flows, so there were fewer tributaries where hitch could spawn, and most creeks were completely devoid of water during the survey period, preventing any hitch migration upstream. In fact, although the total number of hitch observed was relatively high compared to previous surveys at 1,672 fish, all hitch were observed at only one site on one creek: Kelsey Creek.<sup>87</sup>

In CDFW’s 2021 spawning survey report, staff observed only 120 hitch, the lowest number on record.<sup>88</sup> In 2022, CDFW observed only 306 hitch, the second lowest on record.<sup>89</sup> Below average rainfall during 2022’s rainy season resulted in low to no stream flows, greatly reducing the amount of spawning in the creeks.<sup>90</sup> All hitch were seen at three sites on only two creeks.<sup>91</sup> Most creeks did not have any water, preventing any opportunity for the hitch to migrate upstream to spawn.<sup>92</sup> Both Kelsey and Adobe Creeks were completely dry.<sup>93</sup> Although the hitch may have been spawning in Clear Lake, lake spawning is not ideal due to the susceptibility of predation on eggs by non-native predatory fish species in the lake, such as bass and carp.<sup>94</sup> CDFW also noted in its 2022 report that any hitch that were able to spawn in Adobe and Kelsey Creeks likely had many of their eggs desiccated due to the rapidly receding streams.<sup>95</sup>

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<sup>84</sup> *Id.* at 8.

<sup>85</sup> *Id.*; *see also* Attachment B at 59.

<sup>86</sup> *See* CDFW 2020 Surveys (“Attachment U”) at 8.

<sup>87</sup> *Id.* at 7.

<sup>88</sup> *See* CDFW 2022 Surveys (“Attachment V”) at 7.

<sup>89</sup> *Id.*

<sup>90</sup> *Id.* at 8.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

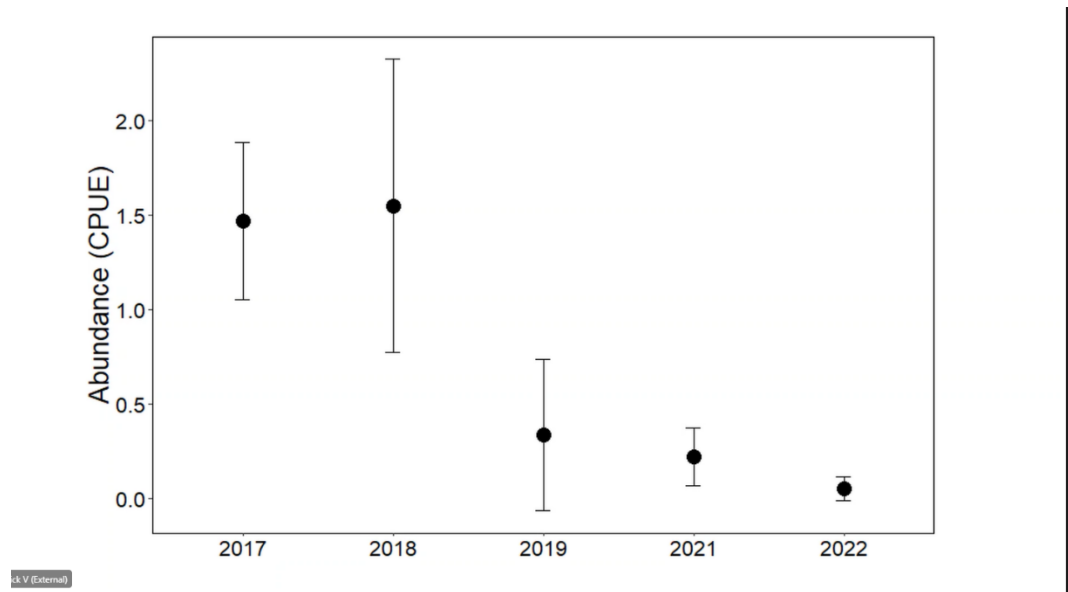
<sup>93</sup> *Id.* at 2, 7.

<sup>94</sup> *Id.* at 11.

<sup>95</sup> *Id.* at 8.

The USGS has been studying the abundance of Clear Lake hitch since 2017. The data show that in 2019, the vastly reduced population in Clear Lake crashed, falling by almost 75 percent.<sup>96</sup> No survey occurred in 2020 due to the coronavirus pandemic. Then, in 2021, the population fell by another 40 percent. USGS collected 280, 290, and 76 hitch in 2017, 2018, and 2019 respectively, but only 40 hitch in 2021.<sup>97</sup>

In a July 2022 Clear Lake Hitch Conservation Strategy meeting, USGS scientist Frederick Feyrer reported that his team saw only 6 hitch this summer and had to do 30 nettings to collect just one fish. Below are graphs shared at that meeting, showing the USGS survey data since 2017.<sup>98</sup> The first graph represents the total estimated abundance based on catch per unit of effort (“CPUE”)—the best scientific method to measure of the overall abundance of hitch.



The next graph demonstrates the hitch’s juvenile recruitment failure and abundance trends for different age classes of hitch, with the last successful spawning recorded in 2017.<sup>99</sup> While a cohort of young hitch grew into reproductive-aged adults in 2018, there were alarmingly few juveniles in 2019, nearly no young hitch in 2021, and only a handful in 2022.<sup>100</sup>

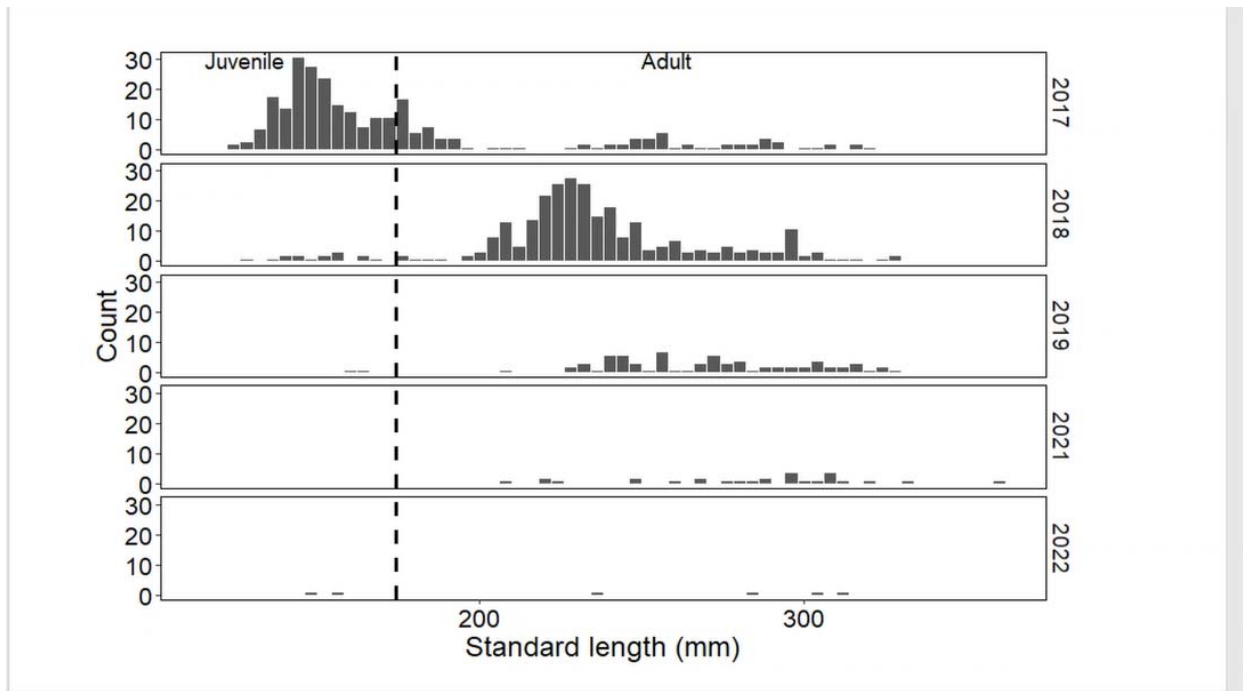
<sup>96</sup> See Attachment N; Attachment A at 14.

<sup>97</sup> See Attachment V at 11; Attachment A.

<sup>98</sup> See Attachment A at 14.

<sup>99</sup> *Id.* at 15.

<sup>100</sup> No sampling occurred in 2020 due to the coronavirus pandemic.



**VI. 2022 HITCH STRANDING REPORTS AND RESCUES**

This year there have been multiple efforts to rescue stranded hitch in streams that rapidly lost water. The first rescue occurred on Adobe Creek in late April. While conducting weekly monitoring on Adobe Creek at Soda Bay Road, Big Valley staff observed 20 to 30 fish that appeared to be hitch in a pool of water that was disconnected upstream but still appeared to be connected downstream. Adobe Creek had no water flowing at that time. Early the next morning, Big Valley staff emailed to alert CDFW of the pooling occurring on Adobe Creek and to ask for help identifying the fish. Staff also advised CDFW that a resident reported possible hitch stranded on Adobe Creek upstream of the Finley Road crossing. At the same time, Lake County staff received calls about possible hitch stranding in Adobe Creek below Soda Bay Road. County staff found 20 to 30 dead hitch, and a group 15 to 20 hitch stranded in a medium sized pool. (Figure 3 below). CDFW planned to rescue the stranded fish the next morning, April 28, 2022. Big Valley staff monitored the rescue and collected many dead hitch to be weighed, measured, and inventoried for analysis. In responding to the reports of stranded hitch upstream of the Finley Road crossing, CDFW reported rescuing nearly 300 hitch from multiple pools.



*Figure 3 Dead Hitch Adobe Creek at Soda Bay, Apr. 27, 2022, Sarah Ryan, Big Valley Environmental Director*

Another rescue occurred on Cooper Creek on August 8, 2022, after CDFW advised Robinson Rancheria and Lake County Game Wardens about a potential stranding of hitch on Highway 20 Near Whitter Springs Road.<sup>101</sup> As the hitch were netted, they were kept in coolers with aeration and water from Upper Blue Lake to acclimate the fish to the water temperature without shocking them when released.<sup>102</sup> In addition to CDFW and Robinson Rancheria, staff from HPUL and the County Department of Water Resources assisted with netting and translocating at total of 295 hitch to Upper Blue Lake, with 11 hitch dying in transit.<sup>103</sup>

## **VII. CONCLUSION**

We appreciate that the Service intends to reevaluate the status of the hitch and make a new listing decision by January 2025. However, the hitch may be gone before then. The 2023 spawning season is crucial for the continued existence of the hitch. Accordingly, we urge the Secretary to direct the Service to list the hitch on an emergency basis and extend endangered species protections to the hitch without any further haste.

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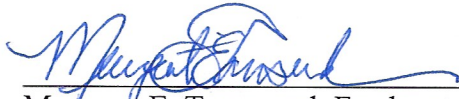
<sup>101</sup> See Santana (2022) (“Attachment W”) at 2.

<sup>102</sup> *Id.* at 2.

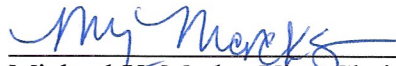
<sup>103</sup> *Id.*

Please contact the undersigned if you have any questions or would like to discuss this matter.

Sincerely,



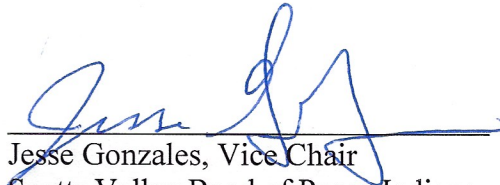
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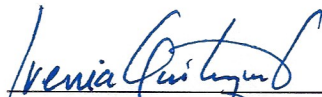
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Attachments

Signature for submittal of Clear Lake Hitch Emergency Listing Letter with Center for Biological Diversity

DocuSigned by:  
  
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11/23/2022

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Philip Gomez, Chairman

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11/22/2022

Big Valley Band of Pomo Indians



## LIST OF ATTACHMENTS

Attachment A	Feyrer et al. (2022)	Frederick Feyrer et al., <i>Species on the Brink: Protracted Recruitment Failure in Clear Lake Hitch</i> ; 2022 Am. Fisheries Soc’y Annual Conf., Spokane, Wa. (2022).
Attachment B	SSA	U.S. Fish and Wildlife Serv., Species Status Assessment for the Clear Lake Hitch ( <i>Lavinia exilicauda chi</i> ) (2020).
Attachment C	CDFW 2014 Status Review	Cal. Dep’t of Fish and Wildlife, Status Review of Clear Lake Hitch (2014).
Attachment D	FGC Letter (2022)	Letter from Samantha Murray, President, Cal. Fish and Game Comm’n, to Martha Williams, Director, U.S. Fish and Wildlife Serv., <i>Re: Support for listing Clear Lake hitch under the Endangered Species Act on an emergency basis</i> (Nov. 3, 2022).
Attachment E	2012 Listing Petition	Center for Biological Diversity, Petition to List the Clear Lake Hitch ( <i>Lavinia exilicauda chi</i> ) As Endangered or Threatened Under the Endangered Species Act, submitted to the U.S. Fish & Wildlife Serv. (Sept. 25, 2012).
Attachment F	Baumsteiger et al. (2019)	Jason Baumsteiger et al., <i>Using the Distinct Population Segment (DPS) Concept to Protect Fishes with Low Levels of Genomic Differentiation: Conservation of an Endemic Minnow (Hitch)</i> , Trans. Am. Fisheries Soc’y 148:406-416 (2019).
Attachment G	Feyrer (2019)c	Frederick Feyrer, <i>Observations of the Spawning Ecology of the Imperiled Clear Lake Hitch</i> , 105 Cal. Fish & Game 4 (2019).
Attachment H	Feyrer et al. (2019)a	Frederick Feyrer et al., <i>Strontium isotopes reveal ephemeral streams used for spawning and rearing by an imperiled potamodromous cyprinid Clear Lake hitch Lavinia exilicauda chi</i> , 70 Marine & Freshwater Research 1689-1697 (2019).

Attachment I	Species Assessment Form	U.S. Fish and Wildlife Serv. Species Assessment and Listing Priority Assignment Form (2020).
Attachment J	Deitch, et al. (2009)	Matthew J. Deitch et al., <i>Hydrologic Impacts of Smallscale Instream Diversions for Frost and Heat Protection in the California Wine Country</i> , 25 River Research & Applications 118-134 (2009).
Attachment K	Flow West Analysis (2022)	Flow West, <i>Preliminary Analysis of Big Valley Subbasin Groundwater Sensor and Stage Transducer Data</i> (Nov. 11, 2022).
Attachment L	BVG Plan 2C	Big Valley Groundwater Sustainability Agency, Groundwater Sustainability Plan for Big Valley Basin (5-015), Appendix 2C, Technical Memorandum: Big Valley Integrated Hydrologic Model, Figures 4-17 and 4-18 (January 2022).
Attachment M	BVR Comment Letter	Letter from Sarah Ryan, Environmental Director, Big Valley Band of Pomo Indians, to Paul Gosselin, Deputy Director, Sustainable Groundwater Mgmt. Office, Cal. Dep't of Water Res.; <i>Re: Public Comment Letter for Big Valley Subbasin Groundwater Sustainability Plan</i> (April 29, 2022).
Attachment N	Feyrer (2019)b	Frederick Feyrer, Presentation: USGS Clear Lake Hitch Res. (2019).
Attachment O	Moyle et al. (2014)	Peter B. Moyle, et al., U. Cal., Davis Center for Watershed Sci., Clear Lake Hitch <i>Lavinia exilicauda chi</i> (Hopkirk) Account (February, 2014).
Attachment P	USGS (2018)	Frederick Feyrer, Cal. Water Sci. Center, U.S. Geological Survey, <i>Information to Aid the Listing Decision and Critical Habitat Designation of the Clear Lake Hitch: Identifying Spawning Habitats, Population Structure, and Habitat Associations</i> , Final Report, Prepared for the U.S. Fish and Wildlife Serv. (December 2018).

Attachment Q	CDFW Clear Lake Fishing Contests (2020)	
Attachment R	Moyle et al. (2013)	Peter B. Moyle, <i>et al.</i> , <i>Climate Change Vulnerability of Native and Alien Freshwater Fishes of California: A Systematic Assessment Approach</i> (2013).
Attachment S	Moyle et al. (2013)(S1)	Peter B. Moyle, <i>et al.</i> , <i>Climate Change Vulnerability of Native and Alien Freshwater Fishes of California: A Systematic Assessment Approach</i> (2013) (Table S1).
Attachment T	McCullough <i>et al.</i> (2019)	Ian McCullough <i>et al.</i> , <i>Do Lakes Feel the Burn? Ecological Consequences of Increasing Exposure of Lakes to Fire in the Continental United States</i> , <i>Global Change Biology</i> (2019).
Attachment U	CDFW 2020 Surveys	CDFW Clear Lake Hitch Visual Surveys on Clear Lake Tributaries (2020).
Attachment V	CDFW 2022 Surveys	CDFW Clear Lake Hitch Visual Surveys on Clear Lake Tributaries (2022).
Attachment W	Santana (2022)	Luis Santana, Report, Clear Lake Hitch Rescue from Cooper Creek (Aug. 18, 2022).