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7 **CALIFORNIA STATE WATER RESOURCES CONTROL BOARD**
8

9 **IN RE CALIFORNIA WATERFIX,
CALIFORNIA DEPARTMENT OF
10 WATER RESOURCES AND U.S.
BUREAU OF RECLAMATION'S
11 PETITION FOR CHANGES IN
WATER RIGHTS, POINTS OF
12 DIVERSION/RE-DIVERSION**
13

**WRITTEN TESTIMONY OF ERIC
HANSEN ON BEHALF OF
GRASSLAND WATER DISTRICT**

14
15 **I. INTRODUCTION**

16 I am a professional wildlife biologist and a principal with my own environmental
17 consulting firm. A Statement of my Qualifications is submitted concurrently with my
18 written testimony, as Exhibit GWD-10. I am responsible for designing and implementing
19 field surveys and research on threatened and endangered reptiles and amphibians, with
20 specific emphasis on the giant garter snake in California's Central Valley. I have been
21 employed as a consulting environmental biologist since 1998. During this period, I have
22 also developed and investigated projects pertaining to the giant garter snake for the
23 Central Valley Project Improvement Act (CVPIA) Habitat Restoration Program, and
24 served as an expert panelist to review research proposals related to the giant garter snake
25 on behalf of local, state, and federal agencies.

26 I am an adjunct assistant professor of biology at Sacramento City College, and
27 hold federal and state permits to collect and intensively research giant garter snakes. I

1 hold a Master of Science degree in zoology and animal biology from the California State
2 University at Chico, and a Bachelor of Science degree in evolutionary biology and
3 ecology from the University of California at Davis. I have published peer-reviewed
4 scientific papers on the population trends and habitat needs of giant garter snakes, and
5 was a contributor to the U.S. Fish and Wildlife Service’s 2017 Final Recovery Plan for
6 the Giant Garter Snake (Exhibit GWD-13).

7 In this testimony, I will explain the importance to wildlife species of the wildlife
8 habitat areas (“refuges”) located south of the Delta, which receive Central Valley Project
9 (CVP) water supply. (Exhibit GWD-5.) My testimony will first review the history of
10 protections and programs intended to ensure the continued health of California species of
11 special concern. I will then explain the ecological significance of refuge water deliveries
12 from the CVP. My testimony concludes with my professional opinions about the adverse
13 impacts to wildlife that would occur if the California WaterFix project is operated in a
14 way that interferes with water deliveries from the Delta to the refuges.

15 **II. AQUATIC SPECIES OF SPECIAL CONCERN**

16 Dozens of reptile and amphibian species inhabit and rely on the refuges that
17 receive CVP water from the Delta. Among them are California species of special concern
18 that are largely aquatic, including the California tiger salamander (*Ambystoma*
19 *californiense*), western pond turtle (*Edemys marmorata*), and giant garter snake
20 (*Thamnophis gigas*). In the San Joaquin Valley, these species are dependent on reliable
21 deliveries of refuge water supplies. The same water-supply factors that affect the giant
22 garter snake affect other reptiles and amphibians of concern (as well as waterfowl and
23 shorebirds), and therefore my testimony will focus on the giant garter snake as a
24 representative for aquatic species of special concern. (Exhibit GWD-13, p. 23.)

25 The giant garter snake is endemic to and found only in California’s Sacramento
26 and San Joaquin River Valleys. (*Id.*, p. 11.) The California Department of Fish and
27 Wildlife listed it as a threatened species under the California Endangered Species Act in

1 1971, and the U.S. Fish and Wildlife Service (USFWS) listed it as a threatened species
2 under the federal Endangered Species Act in 1993. The USFWS issued a Draft Recovery
3 Plan for the giant garter snake in 1999, and published five-year species reviews in 2006
4 and 2012 (Exhibit GWD-12), culminating in a final Recovery Plan issued in 2017
5 (Exhibit GWD-13). The goal of the Recovery Plan is to recover the giant garter snake so
6 that it can be removed from the list of threatened species. (*Id.*, pp. 35-36.)

7 The Recovery Plan creates nine watershed-based geographical areas called
8 Recovery Units that are “essential to the recovery of the giant garter snake as a species.”
9 (*Id.*, pp. 24-25.) The San Joaquin Basin Recovery Unit contains the public and private
10 wetlands of the Grasslands Ecological Area (GEA), and the Tulare Basin Recovery Unit
11 contains the Mendota Wildlife Area and the Kern and Pixley National Wildlife Refuges.
12 (*Id.*, pp. 33-35.) These two Recovery Units in the San Joaquin Valley contain all 14 of the
13 CVPIA-designated refuges located south of the Delta that receive water from the U.S.
14 Bureau of Reclamation. (Exhibit GWD-5.)

15 The USFWS Recovery Plan calls for the establishment and protection of at least
16 10 giant garter snake preserves in the San Joaquin Basin Recovery Unit and at least 2
17 preserves in the Mendota Wildlife Area portion of the Tulare Basin Recovery Unit. Each
18 preserve will require 1,078 acres of core aquatic habitat (at least 13,000 acres total) with
19 additional acreage required to create a 1/3-mile surrounding buffer of compatible wetland
20 habitat, and 1/2-mile aquatic corridors connecting the preserves. (Exhibit GWD-13, pp.
21 36-38.) It is my opinion that the majority of these preserves will be located on refuges
22 that receive CVP surface water deliveries from the Delta.

23 One primary objective of the Recovery Plan is to “restore and conserve healthy
24 Central Valley wetland ecosystems that function to support the giant garter snake and
25 associated species and communities of conservation concern such as Central Valley
26 waterfowl and shorebird populations.” (*Id.*, p. 5.) The giant garter snake requires water to
27 be present in its aquatic habitat from March through November. (*Id.*, p. 12.) The

1 Recovery Plan describes how “changes in water availability,” as well as “water
2 management and water deliveries which do not account for the giant garter snake,” are
3 current threats to the survival and recovery of the species. (*Id.*, p. 21.)

4 Accordingly, one of the recovery criteria is that areas in the designated Recovery
5 Units with known populations of giant garter snake are “supplied with sufficient clean
6 water during the spring and summer to maintain necessary aquatic habitat.” (*Id.*, pp. 36-
7 37.) Annual water delivery requirements will be identified for the planned giant garter
8 snake reserves, with a focus on improving water quality for those preserves located in the
9 GEA including the Volta Wildlife Area (*Id.*, pp. 38, 43.)

10 Securing adequate water supplies for the giant garter snake will be a primary
11 activity under the Recovery Plan, and the USFWS will work with the Bureau of
12 Reclamation and other agencies including the State Water Resources Control Board to
13 meet the water supply requirements of the species. (*Id.*, pp. 43, 50.) A 20-year monitoring
14 period will ensue, including “one 3-year drought to ensure that giant garter snakes are no
15 longer threatened by an insufficient water supply.” (*Id.*, p. 7.)

16 **III. SIGNIFICANCE OF CVP WATER DELIVERIES**

17 The natural habitat of the giant garter snake is the tule marshes and seasonal
18 flooded wetlands of the Central Valley, and 95% of that habitat has been lost. (Exhibit
19 GWD-13, pp. 11, 17.) In particular, giant garter snakes in the San Joaquin Valley “have
20 suffered an extensive reduction in their abundance and distribution compared to historical
21 times.” (*Id.*, p. 18.) The Grasslands Ecological Area in Merced County and the nearby
22 Mendota Wildlife Area in Fresno County depend on CVP water provided by the U.S.
23 Bureau of Reclamation. They also host the last populations of giant garter snake in the
24 southern extent of its range, which once spanned southward to Kern County. (*Id.*, pp. 19-
25 20.)

26 As explained in the USFWS 2012 five-year review, the most important remaining
27 strongholds for the giant garter snake in the San Joaquin Valley include the GEA (in

1 particular the Volta Wildlife Area, Los Banos Wildlife area, and Grassland Water
2 District) and the Mendota Wildlife Area, which marks “the southern-most currently
3 known occurrence of giant garter snakes.” (Exhibit GWD-12, pp. 9-10.) Low numbers of
4 giant garter snakes in the San Joaquin Valley places those populations at high risk of
5 extirpation. (*Id.*, p. 9.) Water delivered from the CVP accomplishes three things on
6 CVPIA refuges: provides aquatic habitat during the snake’s active season, promotes the
7 growth of wetland vegetation, and produces food supply.

8 Giant garter snakes are active in the spring, summer, and early fall months. They
9 breed in March and April with females giving birth to live young from late July through
10 early September. The provision of adequate fresh water to the refuges allows the snakes
11 to move across the landscape, find mates, and successfully breed. Water deliveries also
12 promote the growth of emergent herbaceous wetland plants, which allow giant garter
13 snakes to escape predators and forage for food. Finally, water deliveries produce the
14 small fishes, tadpoles and frogs on which giant garter snakes feed. (Exhibit GWD-12, p.
15 2.) The four resulting benefits for the giant garter snake and other similar wildlife species
16 include improved health, lower mortality rates from predation, increased reproductive
17 rates, and better genetic diversity.

18 The delivery of water supplies from the Delta to CVPIA refuges is the primary
19 driver for preventing extirpation of the giant garter snake in the San Joaquin Valley.
20 Water delivered in a reliable and timely manner is critical for the health and survival of
21 the giant garter snake in this large portion of its range, and also for the health and survival
22 of similar species of concern, such as the California tiger salamander and western pond
23 turtle.

24 **IV. POTENTIAL IMPACTS OF THE CALIFORNIA WATER FIX**

25 The proposed WaterFix Project would change the water right permits held by the
26 Bureau of Reclamation for the CVP and the permits held by the Department of Water
27 Resources for the State Water Project (SWP). These changes would allow CVP and SWP

1 water to be diverted through new water intakes and delivered through an isolated
2 conveyance system to water users south of the Delta. Without appropriate conditions put
3 in place to protect the quantity and timing of refuge water deliveries, operations of the
4 WaterFix Project could decrease the supply, timing, and reliability of water to CVPIA
5 refuges and cause significant adverse effects on wildlife.

6 Under the CVPIA, each refuge receives water in accordance with its monthly
7 water supply needs. The refuges require water in the spring and summer months that
8 support the active period for the giant garter snake. (*E.g.* Exhibit GWD-6, pp. 235, 253,
9 268, 338.) The Bureau of Reclamation delivers CVP water in accordance with the
10 refuges' Level 2 water needs, on a priority basis. Shortages of up to 25% are imposed in
11 critically dry years. Accordingly, refuges are among the last CVP water users who
12 receive water from the Delta to have their CVP water supplies reduced. The WaterFix
13 Project was modeled and proposed in a way that would maintain these priority CVP
14 water deliveries. However, an operational plan for the Project has not been agreed upon,
15 and much uncertainty exists whether CVP supplies could be reprioritized for other
16 purposes.

17 The recent drought provided a short-term example of the kind of longer-term
18 impacts that would occur if CVPIA refuges do not continue to receive CVP water on a
19 priority basis and in accordance with their water delivery schedules. In 2014 and 2015,
20 for the first time, the Bureau of Reclamation reduced Level 2 refuge water deliveries
21 from the Delta to 65% and 75% (accordingly) and restricted the schedule of refuge water
22 deliveries. (Exhibit GWD-8, pp. 2-3.) Irrigations of wetland plants on south-of-Delta
23 refuges fell by 60% to 70%, and very little aquatic habitat was provided during the spring
24 and summer active period of the giant garter snake. Essential aquatic habitat and aquatic
25 prey were eliminated.

26 I conducted surveys for giant garter snakes in the north GEA during this time
27 period. Instances of giant garter snakes that were observed throughout this area from


1 2006-2008 were not detected during identical, intensive trapping surveys conducted
2 during 2015-2016. Aquatic (fish and frog) prey species were also not detected, or
3 detected in exceptionally low numbers. This population of giant garter snake was nearly
4 extirpated, which would constitute the loss of approximately half of the known genetic
5 diversity of giant garter snake in the northern GEA. Loss of genetic diversity is
6 permanent, and reduces the species' ability to adapt to changing conditions or withstand
7 stressors such as disease.

8 It is my professional opinion that without conditions to protect the priority of CVP
9 refuge water supplies, including refuge water delivery schedules, the WaterFix Project
10 could result in habitat decline and significant wildlife impacts caused by reduced aquatic
11 habitat, lack of emergent wetland vegetative cover, and reduced food supply. These
12 factors would create adverse impacts including depressed breeding rates, increased
13 predation, and depleted health, which would decrease survival and reproductive rates as
14 well as genetic diversity. It is my opinion that similar results would occur for other reptile
15 and amphibian species of special concern, including the California tiger salamander and
16 western pond turtle.

17 I additionally believe that if refuge water supplies are deprioritized, there is a
18 likelihood that the remaining naturally occurring populations of giant garter snake in the
19 GEA and Mendota Wildlife Area, which comprise the most significant populations in the
20 San Joaquin and Tulare Basins, would be permanently extirpated.

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23 Executed on November 25, 2017 in

24 CARMICHAEL CALIFORNIA

25 
Eric Hansen