United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish and Wildlife Office
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Sacramento, California 95814

In reply refer to:
2024-0093832-S7-001

Memorandum

To: Manager, Bay Delta Office, U.S. Bureau of Reclamation, Sacramento, CA

From: Field Supervisor, San Francisco Bay-Delta Fish and Wildlife Office, U.S. Fish and Wildlife Service, Sacramento, CA

DONALD RATCLIFF Digitally signed by DONALD RATCLIFF
Date: 2025.01.07 17:13:09 -08'00'

Subject: Formal Consultation on the Sacramento River Settlement Contractor's Water Reduction Program

This letter is in response to the U.S. Bureau of Reclamation's (Reclamation) August 5, 2024 request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Sacramento River Settlement Contractor's Water Reduction Program (WRP). Your request was received by the Service via email on August 5, 2024. At issue are the proposed project's effects on the federally-listed as threatened giant garter snake (*Thamnophis gigas*). Critical habitat has not been designated for this species. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The federal action on which we are consulting is Reclamation's proposal to enter into a contract with the Sacramento River Settlement Contractors (SRSC) that will establish the WRP. The WRP includes activities that will provide for water reductions by the SRSC, resulting in reduced diversions in years that meet certain criteria, and investment in future drought resiliency projects. The WRP is anticipated to allow for additional flexibility in Reclamation's management of the Central Valley Project (CVP) during drought conditions. Reclamation requested their federal action be addressed as a mixed programmatic action as defined at 50 CFR 402.02. SRSC is considered an applicant under this consultation.

In considering your request, we based our evaluation on the following: (1) the August 5, 2024, letter requesting formal consultation on the WRP; (2) the August 2024 *Biological Assessment for the Sacramento River Settlement Contractors Water Reduction Program* (BA) prepared by Reclamation and received via email on August 6, 2024; (3) electronic mail, telephone, and other communications between the Service and Reclamation and the SRSC from May 2024 to January 2025; and (4) other information available to the Service.

Manager, Bay Delta Office, U.S. Bureau of Reclamation

The remainder of this document provides our programmatic biological opinion on the effects of the proposed project on the giant garter snake.

Consultation History

May 17, 2024:	Service and Reclamation representatives held a video conference meeting to discuss the scope of the WRP and the timing and sequencing of the WRP as it related to the Reinitiation of Consultation of the Long-term Operations of the Central Valley Project and State Water Project (LTO).
May 22, 2024:	Service and Reclamation representatives held a video conference meeting to discuss the draft BA on the WRP.
May 24, 2024:	Reclamation emailed the draft BA and associated materials to the Service for review.
May 31, 2024:	Reclamation emailed an updated version of the draft BA and associated materials to the Service for review.
June 24, July 1 and 17, 2024:	Service, Reclamation, and Office of the Solicitor representatives held video conferences to continue discussions on the WRP.
July 29, 2024:	Service, Reclamation, Office of the Solicitor, and SRSC representatives held a video conference to discuss the WRP.
August 2, 2024:	Reclamation transmitted the draft initiation of consultation request and SRSC applicant status letters to the Service for review and input.
August 5, 2024:	Reclamation transmitted the request for consultation on the WRP, BA, and SRSC applicant status letter to the Service via email.
August 6, 2024:	Reclamation transmitted an updated version of the BA to the Service via email.
August 14, 2024:	Service, Reclamation, Office of the Solicitor, and SRSC representatives held a video conference to discuss the WRP. The Service shared information about the status of the water reductions analysis in the LTO Biological Opinion (BiOp).
August 16, 2024:	The Service emailed Reclamation and SRSC with questions on the BA.
August 27, 2024:	Service, Reclamation, Office of the Solicitor, and SRSC representatives held a video conference as a follow-up to the August 14 meeting.

September 23, 2024: Reclamation emailed responses to the Service's August 16 questions on the BA. On the same day, the Service emailed a draft effects analysis section for the giant garter snake to be incorporated in the LTO BiOp, which utilized information provided in the WRP BA.

October 18, 2024: Service and Reclamation representatives held a video conference to discuss questions on the draft LTO BiOp effects analysis. On the same day, Reclamation emailed comments on the draft analysis to the Service.

November 8, 2024: Reclamation emailed a draft of the WRP agreement to the Service.

November 19, 2024: Service, Reclamation, Office of the Solicitor, and SRSC representatives held a video conference as a follow-up to the August 14 meeting.

November 20, 2024: The Service emailed the mixed programmatic outline for the WRP to Reclamation and SRSC and requested comments.

November 21, 2024: In response to a request in the November 19 video conference, the Service emailed examples of mitigation in framework programmatic consultations to Reclamation and SRSC.

December 10, 2024: Reclamation and SRSC emailed comments on the mixed programmatic outline to the Service.

December 19, 2024: The Service emailed a response to comments on the mixed programmatic outline to Reclamation and SRSC.

December 20, 2024: Reclamation and SRSC emailed additional information on the mixed programmatic outline to the Service, including a project implementation approach and additional proposed mitigation measures.

January 2–3, 2025: Reclamation, SRSC and the Service held two video conferences to discuss incorporation of the additional information provided on December 20, 2024.

BIOLOGICAL OPINION

Description of the Proposed Action

The federal action proposed by Reclamation is to execute an agreement with the SRSC to establish a water reductions program and implement drought resiliency actions. The agreement entails Reclamation providing funding to SRSC to reduce diversions and idle/shift crops, substitute groundwater for reduced surface water supplies, and implement water conservation efforts in certain years that meet established criteria.

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This consultation addresses the effects of the WRP, which is in addition to diversion of water under existing SRSC water contracts. Reclamation previously consulted separately with the Service on the renewal and execution of individual contracts, primarily in 2004 and 2005. The contract renewal/execution consultations addressed the diversion of Sacramento River water by water contractors at prescribed diversion points and times for the use of that water on a specified land area (the contractors' service area). The agreement under the WRP would support a reduction in releases and diversions that would be in addition to Article 5 shortages included in the existing SRSC water contracts, and would result in the SRSC forgoing a larger percentage of their contract supply in specified drought years under two phases. In addition, the SRSC will engage in drought resiliency projects to reduce potential impacts due to reduced contract supply. The SRSC will agree to use at least 50.1% of the proceeds to invest in drought resiliency projects.

The effects of operating the CVP to deliver water under existing contracts, as well as reduced diversions and idling/shifting crops as a result of the implementation of the Shasta Framework (involving SRSC voluntary water reductions under the same conditions as those described below for the WRP), have been addressed in the November 8, 2024, LTO BiOp (Service 2024). This consultation on the effects of the WRP relates to the Shasta Framework analysis in the LTO consultation and addresses the execution of the proposed agreement between Reclamation and SRSC.

Consultation Approach

Reclamation is proposing a framework programmatic action for the development of future drought resiliency projects that are anticipated to occur as a result of the Proposed Action. Therefore, the WRP represents a mixed programmatic action, as defined in 50 CFR 402.02[1]. This consultation includes a mix of standard consultation (which includes an Incidental Take Statement [ITS]) and programmatic consultation (which can include an ITS or defer the ITS to a later time associated with subsequent Federal actions). All activities addressed programmatically will be subject to a subsequent consultation in order to proceed. Additionally, some project elements and their effects on listed species or critical habitat may change as Reclamation and the applicant, SRSC, continue to develop the Proposed Action for the programmatic elements and may require reinitiation of consultation.

This Proposed Action provides a framework for the development of future Federal actions that will be authorized, funded, or carried out at a later time and will be subject to future project-specific consultations because of these subsequent Federal actions. Reclamation will initiate these future consultations and will provide sufficient information as outlined in 50 CFR 402.12. The Service will complete these future consultations prior to final federal authorization and that

1 Mixed programmatic action means, for purposes of an incidental take statement, a Federal action that approves action(s) that will not be subject to further section 7 consultation, and also approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation.

additional review will be informed by sufficient detail to allow the development of incidental take statements for each of these projects.

Reclamation proposes to initiate section 7 consultations for the drought resiliency components of the Proposed Action that have the potential to adversely affect federally-listed species. As these separate, future consultations are completed for each project, each will become part of the Environmental Baseline.

Proposed Activities

Water Reductions

Under Phase 1 of the WRP (February 2025 – February 2035), SRSC would collectively incur a reduced contract supply of up to 500,000 acre-feet under their aggregated contracts in any year if the following four conditions are met which are defined as Phase 1 Program Years:

- Forecasted end-of-April Shasta Reservoir storage is less than 3.0 million acre-feet;
- Forecasted end-of-September Shasta Reservoir storage is less than 2.0 million acre-feet;
- Combined actual and forecasted natural inflow to Shasta Reservoir from October 1 through April 30 is less than 2.5 million acre-feet; and
- Reclamation forecasts a Critical Year under the Settlement Contracts.

Under Phase 2 (February 2035 – February 2045), the contractors may voluntarily incur a reduced contract supply of up to 100,000 acre-feet under their aggregated contracts in any year if the following two conditions are met which are defined as Phase 2 Program Years:

- Combined actual and forecasted natural inflow to Shasta Reservoir from October 1 through April 30 is less than 2.5 million acre-feet; and
- Reclamation forecasts a Critical Year under the Settlement Contracts.

The Phase 1 and Phase 2 reductions in diversions are likely to result in cropland idling, crop shifting, groundwater substitution, and water conservation actions. It is anticipated that with the implementation of the drought resiliency projects described below, the need for the water reduction activities (particularly crop idling/shifting and groundwater substitution) may reduce over time.

Under the WRP, the SRSC would receive less water supply from Reclamation and then would go through the process of allocating that water supply to landowners and lands within their respective service areas. Cropland idling could occur as a result of receiving less supply since the SRSC would need to balance water supply and crop demand. Cropland idling would be temporary in nature and would not result in a permanent conversion of agricultural lands. Landowners would likely place fields back into production the following season.

The acreage of cropland idling would be calculated based on water application to crops which consists of both consumptive and non-consumptive uses. For rice in the Sacramento Valley, consumptive uses have ranged from 3.0 to 3.3 acre-feet per acre. Additionally, nonconsumptive

components of irrigation water are also needed which may consist of irrigation delivery inefficiencies, soil types that effect groundwater recharge when water passes below the crop root zone, shallow groundwater moving laterally into non irrigated fields, uncapturable return flows, and other crop cultural practices. These components may require another additional 3.0 - 4.0 acre-feet per acre generally that is additive to the consumptive use component which results in a total water application factor of about 6.0 - 7.0 acre-feet per acre.

Additionally, there are SRSC canal conveyance losses which occur regardless of the amount of water supply; as water supply is reduced the conveyance loss becomes a larger percentage that must be deducted from the available water supply, with ranges from five to thirty percent of the water delivered from the SRSC points of diversion to landowner lands. Those conveyance losses will reduce the water available for cropping. Applying a range of 6.0 to 7.0 acre-feet per acre water application factor across the SRSC service area to the annual maximums of reductions in water diversions of 500,000 AF in Phase 1 and 100,000 AF in Phase 2 results in a maximum of 71,429 to 83,333 acres of rice in a Phase 1 Program Year and 14,285 to 16,667 acres of rice in a Phase 2 Program Year anticipated to be idled as a result of the WRP.

For crop shifting, water is made available when farmers shift from growing a higher water use crop to a lower water use crop. The difference in evapotranspiration of applied water values would be the amount of water that is reduced. Water generated by crop shifting is difficult to account for. Farmers generally rotate among several crops to maintain soil quality, so water agencies may not know what type of crop would have been planted in a given year. To calculate water reduced from crop shifting, an estimate of what would have happened absent water reductions based on average water use during a 5-year baseline period would be made. The change in consumptive use between this baseline estimate and the lower water use crop determines the amount of acreage shifted to generate diversion reductions.

Groundwater substitution occurs when groundwater is pumped in lieu of diverting surface water supplies, thereby making the surface water available for other uses. WRP participants that reduce surface water deliveries through groundwater substitution may choose to pump groundwater in lieu of or in addition to cropland idling/shifting. The maximum crop idling/shifting rice acreage described above may be reduced through groundwater substitution by the SRSC as part of the WRP.

Water conservation includes actions to reduce the diversion of surface water by improving water conservation and irrigation efficiencies. Water conservation actions will be based on an effective water conservation and efficiency program based on the Regional Water Management Plan and/or individual contractor's water conservation plan as required under the applicable contractor's contract. For contractors diverting less than 2,000 AF of project water, a written water conservation plan is not required, and water conservation actions would be based on state and local policies governing such actions.

The following conservation measures have been proposed by Reclamation and SRSC for the water reduction portion of the WRP:

1. At the start of the irrigation season, when a Program Year is identified, the SRSC will

provide a schedule of water diversions, including reductions under the WRP, and coordinate on alternatives that may reduce impacts to the giant garter snake.

2. Movement corridors for aquatic species (including giant garter snake) include major irrigation and drainage canals. Maintaining water in smaller drains and conveyance infrastructure supports key habitat attributes such as emergent vegetation for giant garter snake escape cover and foraging habitat. SRSC will keep adequate water in major irrigation and drainage canals and smaller drains and conveyance structures where possible given water conditions in a Program Year. When possible, at least 2 feet of water will be considered sufficient.
3. When a Program Year occurs, an annual meeting will be established to review the actions taken to implement the WRP and to discuss incidental take reporting including occurrences of incidental take of the giant garter snake. These meetings will be scheduled prior to February 28 of the following year.
4. Reclamation will ensure monitoring of the giant garter snake distribution and occupancy research under the separate Long-Term Water Transfers Project (Service 2019) does not lapse. The research, conducted by the U.S. Geological Survey (USGS), includes annual sampling of the giant garter snake within the action area and focuses on their distribution and occupancy dynamics. The research is designed to evaluate the effectiveness of the conservation measures on occupancy at sites forgoing water. The research is ongoing since 2015 and is expected to aid in maintaining effective conservation measures for actions that may impact the giant garter snake, including the Proposed Action, and identifying changes that may enhance their effectiveness in the future.

Drought Resiliency Projects

Drought resiliency projects are a broad range of actions intended to strengthen the resilience of the SRSC's water system and long-term water delivery capabilities by creating durable water savings. Drought resiliency projects are expected to be constructed and implemented during Phase 1, but it is possible some may still be constructed in Phase 2. While the detailed design, scope, and locations of drought resiliency projects are yet to be determined, they are expected to include the following types:

Piping open ditches or canals: Open ditches or canals are artificial waterways that are used to transport water from a water source for a variety of purposes, including agriculture uses. Open ditches or canals were typically constructed by excavating sloped, linear features or building embankments to contain and transport the water without the use of a cover. Some of these ditches and canals are made of earth, whereas others are made of concrete with varying levels of permeability. Piping open ditches or canals will replace the open water features using a series of interconnected pipes, valves, and pumps to convey water in an enclosed manner between the water source and the ultimate use. As a result, open water will no longer be present at the location of the piping. Piping offers numerous advantages for drought resiliency efforts, including precise control and distribution of water that minimizes loss and ensures optimal usage, reduction of evaporation, leakages, and seepages, and protection from external contaminants, which ensures better water quality. Compared to open channels, pipelines require less maintenance and have a longer lifespan.

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Canal lining: Canal lining is the process of reducing seepage loss of irrigation water by adding an impermeable layer to the trench. Seepage can result in losses of irrigation water from canals, so adding lining can make irrigation systems more efficient. Existing canals can benefit even more than new structures from being lined. Although a new bare soil canal will work properly for some amount of time before it begins to erode or collapse, older canals are already well into the cycle of damage caused by erosion. There would be two ways of lining existing canals: 1) canals that are composed of bare soil will be lined with a material such as geomembrane or concrete; and 2) for canals that are already made of geomembranes or concrete, a sealant such as resin or spray-on polymer will be applied to fix cracks that are resulting in seepage or they will be relined with new geomembranes or new concrete.

Canal Automation through Supervisory Control and Data Acquisition Systems: Supervisory Control and Data and Acquisition (SCADA) systems are focused on the supervision and acquisition of real-time data from a network of irrigation canals to improve efficiency and optimize water use. These systems allow centralized monitoring and control of devices and sensors in the network, such as gates, valves, and flow meters. The collected data are used to visualize network status, detect anomalies, and facilitate decision-making based on real-time information. SCADA systems may require electrical connections to power sensors and transmission units, which will require some excavation, grading, and fill, if electrical lines are buried. Besides these requirements and the actual system itself, SCADA systems will not result in any other construction or operational changes.

Automated Gates Installation: Automated canal gates, such as Rubicon or Langemann gates, may be installed for more efficient, reliable, and accurate canal and ditch operations and water deliveries. In some instances, automated gates may be paired with SCADA systems, which would be expected to result in additional water distribution efficiency improvements. Minor ground disturbance, including excavation, grading, and fill, may occur at the site of installation.

On-Farm Improvements to Irrigation Systems: This drought resiliency project involves converting certain types of existing on-farm irrigation systems and methods to more efficient irrigation systems and methods. As an example, flood/row irrigation is about 50% efficient, where a sprinkler-based system can be 75% efficient. Similarly, a properly installed drip or subsurface irrigation system, which applies water directly to crop root zones using buried drip lines or drip tape can also be typically more efficient than other irrigation systems. Since drip tubing is placed in the soil between each crop row, this system only wets a small portion of the soil. Small and controlled amounts of water help avoid water logging. Another improvement to irrigation systems including installing Variable Frequency Drives (VFDs). VFDs can be used to gradually ramp an irrigation pump motor to meet actual flow and pressure demands of the system, which can result in water savings. Construction will likely occur during the non-irrigation season to minimize the amount of time fields would be out-of-service.

Weirs or Check Structures: Weirs or check structures, are small dams that obstruct ditches, drains, or canals to collect water runoff from agricultural fields. By slowing down runoff, weirs and check structures help conserve existing water resources by adding capacity to canals and make water available for reuse. Weirs are often the size of a drainage ditch, with a channel in the

center for water drainage. Minor ground disturbance, including excavation, grading, and fill, will occur at the site of installation.

Pipeline Recirculation Programs: Pipeline recirculation programs allow water to be used as efficiently as possible by recirculating it back to fields for irrigation purposes. The system consists of ditches for collecting runoff, a flow pump and power unit (either an electric motor or a diesel engine), and a pipeline to transport water to for reapplication to a field. These systems will be installed on-farm.

New Groundwater or Deep Aquifer Wells: A maximum of 30 new wells are assumed to be constructed as part of the Proposed Action and will all comply with the minimum construction standards in California for water, monitoring, cathodic protection, and geothermal heat exchange wells, with the purpose of protecting California's groundwater quality. Coordination with the local applicable Groundwater Sustainable Agency will also occur to ensure that the well locations and related construction activities would not be inconsistent with the targets set by Groundwater Sustainability Plans under the Sustainable Groundwater Management Act and Executive Order N-3-23, Paragraph 4.

A new well consists of a bottom sump, well screen, and well casing surrounded by a gravel pack and appropriate surface and borehole seals. Water enters the well through perforations or openings in the well screen and is pumped to the surface with a motor that is typically located at the surface. Minor ground disturbance, including excavation, grading, and fill, will occur at the site of installation.

Conjunctive Use Program: Conjunctive management is the coordinated operation of surface water, groundwater storage and use, and conveyance facilities to meet water management objectives. Although surface water and groundwater are sometimes considered to be separate resources, they are connected by the hydrologic cycle. Conjunctive management allows surface water and groundwater to be managed in an efficient manner by taking advantage of surface water supplies when they are available and groundwater supplies when surface water is less available. For example, this could mean that surface water gets diverted by SRSC in non-program years while groundwater is recharging, and then SRSC and/or their landowners would pump groundwater in program years.

The following conservation measures have been proposed by Reclamation and SRSC for the drought resiliency project portion of the WRP:

1. **Erosion Control Plan**: To ensure that contaminants are not accidentally introduced into irrigation ditches and canals, the following measures will be implemented during construction of drought resiliency projects:
    - Surface disturbance will be limited to only those areas necessary for construction
    - Best Management Practices (e.g., sandbags, straw bales, mulch or wattles, silt fences, and filter fabric) be used to prevent pollutants from entering drainage channels and will be implemented prior to the wet season (November 1 through April 1)
    - Where natural topsoil occurs, it will be salvaged and stockpiled prior to

construction and the soil stockpiles will be stabilized
- Equipment be inspected daily for leaks or spills
- Materials for cleanup of spills be available on site
- Flammable materials be stored in appropriate containers
- Spill prevention kits be in close proximity when using hazardous materials
- Spills and leaks be cleaned up immediately and disposed of in accordance with local, state, and federal regulations
- Vehicles and equipment be kept clean
- Construction personnel to be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills
- For drought-resiliency projects involving over an acre of land disturbance a construction Stormwater Pollution Prevention Plan will be prepared.

2. **Implement General Biological Resources Protection Measures**: The construction contractor and operations personnel shall implement the following general biological resources protection measures during drought resiliency project construction:
    - Limit construction and operations activities to daylight hours to the extent feasible. If nighttime activities are unavoidable, then workers shall direct all lights for nighttime lighting into the work area and shall minimize the lighting of natural habitat areas adjacent to the work area. Light glare shields shall be used to reduce the extent of illumination into sensitive habitats. If the work area is located near surface waters, the lighting shall be shielded such that it does not shine directly into the water.
    - Vegetation clearing will be limited to only those areas necessary for construction.
    - Any excavated and stockpiled soils will be placed outside of designated listed species habitat.
    - Dispose of cleared vegetation and soils at a location that will not create habitat for listed species.
    - Dispose of food-related and other garbage in wildlife-proof containers and remove the garbage from the project area daily during construction. Vehicles carrying trash will be required to have loads covered and secured to prevent trash and debris from falling onto roads and adjacent properties.
    - Store all construction-related vehicles and equipment in the designated staging areas. These areas shall not contain native or sensitive vegetation communities and shall not support listed species.
    - Construction-related vehicles and equipment will not exceed a 15 mile-per-hour speed limit at the construction site, staging areas, or on unpaved roads.
    - Prior to the initiation of work each day, the contractor will inspect construction pipes, culverts, or similar features; construction equipment; or construction debris left overnight in areas that may be occupied by listed species that could occupy such structures prior to being used for construction.
    - Avoid wildlife entrapment by completely covering or providing escape ramps for all excavated steep-walled holes or trenches more than 1 foot deep at the end of each construction work day. A qualified biologist shall inspect open trenches and holes and shall remove or release any trapped wildlife found in the trenches or holes prior to filling by the construction contractors.
3. **Conduct Desktop Giant Garter Snake Habitat Evaluation**: Prior to implementing a

project element that involves grading, vegetation removal, or other form of construction in irrigation and drainage canals or upland areas outside of established agricultural croplands with a history of discing, planting, and maintenance, a qualified biologist will conduct a desktop evaluation of the site using digital web-based aerial photography. The purpose of the desktop evaluation will be to determine the potential for giant garter snake habitat to occur on site. A qualified biologist will also perform a review of the Service's Information for Planning and Consultation (IPaC) and the California Natural Diversity Database (CNDDB) to identify known records or potential for giant garter snakes to occur in the project vicinity. If through this assessment, the biologist determines that potential habitat for the giant garter snake exists, then site-specific surveys will be conducted per the measure below.

4. **Implement Giant Garter Snake Avoidance and Minimization Measures**: If a site-specific survey confirms the presence of habitat for the giant garter snake, the following measures must be implemented to avoid and minimize impacts to giant garter snakes during project construction:
    - Construction activities within giant garter snake habitat will be restricted to between May 1 and October 1.
    - A qualified biologist shall be present during construction to monitor construction activities.
    - Temporary fencing will be installed to exclude the giant garter snake from the work area. The design of the fence will be approved by the Service prior to installation.
    - Fence installation will be supervised by a qualified biologist.
    - The qualified biologist will provide the contractor with worker environmental awareness training, including instructing the contractor on how to inspect the exclusion fence.
    - Prior to the initiation of work each day, the contractor will inspect the exclusion fence to ensure it is functional for the intended purpose.
    - If a giant garter snake is observed within the temporary fencing around the construction site, the contractor will stop work and allow the species to leave the site of its own volition, or the snake will be captured by a qualified biologist and relocated to the nearest suitable habitat beyond the influence of the project work area.
    - Temporarily disturbed areas will be restored when construction is complete. Pre- and post-construction photographic documentation of the project site will be collected to document conditions.
    - All equipment will be removed from the project site following completion of construction.
5. **Compensate for Permanent Loss of Giant Garter Snake Habitat**: If it is determined that a drought resiliency project site includes high-quality foraging or breeding habitat for the giant garter snake and there will be a permanent loss of such habitat resulting from construction, compensation for such impacts will occur through onsite and/or offsite restoration, enhancement, and/or purchase of mitigation credits at an approved conservation bank. The qualified biologist will prepare a plan that outlines proposed compensatory mitigation and coordinate with the Service. Compensatory lands will be of similar or better quality than habitat lost, preferably located in the vicinity of the project

site, and be permanently preserved through a conservation easement. The plan will identify conservation actions to ensure that the compensatory lands are managed to provide for the continued existence of the giant garter snake. The plan will also identify an approach for funding assurance for the long-term management of the conserved land, as relevant.

Guiding Principles

The drought resiliency projects of the WRP will be subject to future evaluation and consultations under Section 7 of the Endangered Species Act (ESA) where needed. Along with the proposed conservation measures above, Reclamation provided a project implementation approach that has been incorporated into the following guiding principles. Guiding principles are proposed to be incorporated into specific project designs for future drought resiliency projects. Guiding principles inform the upfront development of operational criteria and measures to avoid or minimize effects to the giant garter snake that would be analyzed in the subsequent consultations. Incorporation of these guiding principles will be considered in the effects analysis of the future drought resiliency projects at a framework programmatic level.

The guiding principles are:

1. Conservation measures for the future drought resiliency projects (e.g., work during the active season, fencing) should be applied for any projects occurring in habitat for the giant garter snake within its range. Giant garter snakes are difficult to detect and would not be expected to be found by a simple pre-construction survey.
2. If all of the giant garter snake avoidance measures cannot be followed, Reclamation and the SRSC will propose minimization measures appropriate to the project type and location for discussion with the Service during subsequent technical assistance and consultation, if required as determined during the annual meeting (see Guiding Principle #6 below) or otherwise coordinated with the Service.
3. Permanent loss of habitat for the giant garter snake due to future drought resiliency projects (e.g., piping open ditches/canals, canal lining) will be mitigated. While these projects contribute to more water being available on the landscape, ditches and canals have been shown to be important for the snake. Identification of measures to mitigate the effects of permanent habitat loss depend on the nature of those projects and will be determined during the process outlined above for subsequent consultations.
4. Reclamation and the SRSC should ensure, in coordination with the Service, that anyone serving in a “qualified biologist” capacity has the appropriate qualifications for the specific actions to be implemented. For example, a qualified biologist giving worker environmental training should be familiar with the giant garter snake, its habitat, biology, and identification, and the Act; a qualified biologist that may relocate a giant garter snake should also have significant experience safely handling snakes; and a qualified biologist completing a compensatory mitigation plan should be well-versed in the ecology of the giant garter snake, as well as principles of mitigation and recovery.
5. The SRSC will maintain an ongoing list of proposed projects from its contractors and in the summer/fall of each year identify projects that are proposed to be constructed during the contractor’s normal construction periods (most projects will be constructed when

irrigation season has ceased and systems are dewatered). The SRSC will coordinate with its contractors to select a consultant to perform pre-project surveys for all planned projects.

6. Annual reporting/meeting. This is important in order to understand and evaluate ongoing impacts to the giant garter snake from the proposed project. Information expected includes:
    a. The reduction in water diversions, as well as when, where, and how much crop idling/shifting occurred.
    b. Cumulative accounting of drought resiliency projects that have been implemented, including associated habitat loss and take of the giant garter snake.
    c. A work plan including drought resiliency projects expected in the upcoming year.
    d. Results of associated giant garter snake research and monitoring.

Action Area

The Action Area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed project, the Action Area encompasses the SRSC service area as depicted in Figure 1.

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed Federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the current rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the current condition of the species in the Action Area without the consequences to the listed species caused by the Proposed Action, the factors responsible for that condition, and the relationship of the Action Area to the survival and recovery of the species; (3) the *Effects of the Action*, which includes all consequences that are caused by the proposed Federal action, including the consequences of other activities that are caused by the Proposed Action but that are not part of the action; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the Action Area on the species. The *Effects of the Action* and *Cumulative Effects* are added to the *Environmental Baseline* and in light of the status of the species, the Service formulates its opinion as to whether the Proposed Action is likely to jeopardize the continued existence of listed species.

Manager, Bay Delta Office, U.S. Bureau of Reclamation

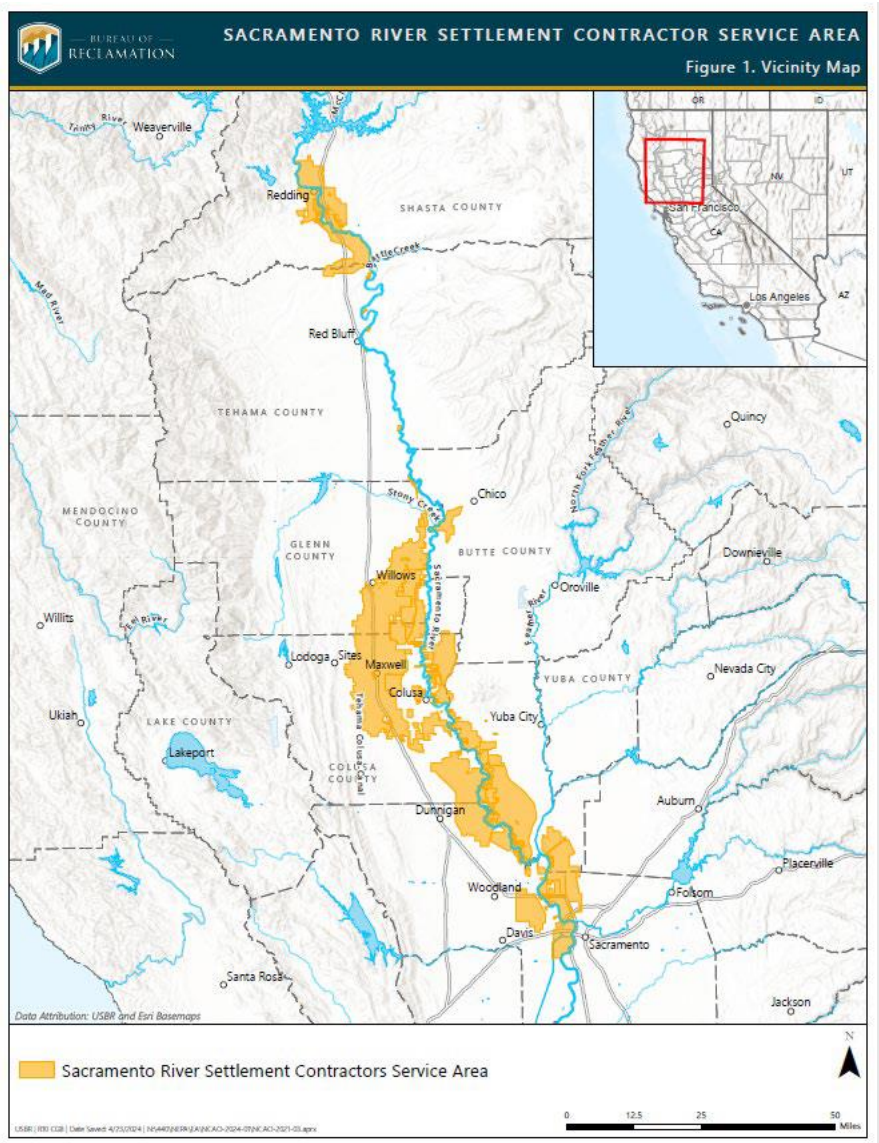

Figure 1. Map of Action Area which encompasses the Sacramento River Settlement Contractor Service Area

Status of the Species

The Service listed the giant garter snake as a threatened species on October 20, 1993 (Service 1993). In 2017, the Service issued the final *Recovery Plan for the Giant Garter Snake* (*Thamnophis gigas*) (Recovery Plan) (Service 2017, https://ecos.fws.gov/docs/recovery_plan/20170928_Signed%20Final_GGS_Recovery_Plan.pdf). Threats evaluated during the drafting of the Recovery Plan and discussed in the final document have continued to act on the species since its publication, with loss of habitat being the most significant effect. The most recent 5-year review was completed in June 2020 where no change in status was recommended (Service 2020, https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2976.pdf). Please refer to the

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Recovery Plan for the species' general description and the 2020 5-year review for the recent comprehensive assessment of the species' range-wide status and updated life history and habitat preferences. Critical habitat has not been designated for this species.

Environmental Baseline

Environmental baseline refers to the condition of the listed species or its designated critical habitat in the Action Area, without the consequences to the listed species or designated critical habitat caused by the Proposed Action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the Action Area, the anticipated impacts of all proposed Federal projects in the Action Area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The impacts to listed species or designated critical habitat from ongoing Federal agency activities or existing Federal agency facilities that are not within the agency's discretion to modify are part of the *Environmental Baseline*.

Five populations of giant garter snake described in the Recovery Plan occur in the Action Area:

Colusa Basin Population

The Action Area includes the sub-population in the Colusa Basin Population and Recovery Unit as defined in the *Recovery Plan for Giant Garter Snake* (Service 2017). The Colusa Basin Recovery Unit is comprised of mostly agriculture lands predominantly in rice production which also include the Sacramento National Wildlife Refuge (NWR), the Delevan NWR, Glenn-Colusa Canal, Colusa Trough, Colusa Drain, and several wetland habitats between the towns of Chico and Woodland from north to south and between the western edge of the Sacramento Valley to the Sacramento River from west to east.

There are 81 records in the CNDDB (CDFW 2024) of giant garter snakes in the Colusa Basin Recovery Unit. The USGS has conducted trapping surveys of giant garter snakes at the Sacramento NWR Complex (Wylie *et al.* 1996, 1997, 2000, 2002b). Wylie, in conjunction with Refuge staff, observed giant garter snakes at each of the Federal wildlife refuges (Colusa, Delevan, and Sacramento) that comprise the Sacramento NWR complex. Wylie *et al.* (2000, 2002a) located 81 and 102 giant garter snakes, respectively, in the years 2000 and 2001 within the Colusa NWR. It is also documented that giant garter snakes occur outside of NWR lands in the adjacent rice production areas. The Colusa NWR represents a stable, relatively protected sub-population of snakes within the Colusa Basin and continues to reflect a healthy population of giant garter snakes with successful recruitment of young (Wylie *et al.* 2003, 2004, 2005).

Outside of protected areas, however, giant garter snakes in the Colusa Basin clusters are still subject to all threats identified in the final listing rule, including habitat loss due to development, fluctuations in the number of acres in rice production, maintenance of water channels, and secondary effects of urbanization. Restored areas that provided summer water were more effective in meeting the habitat needs of giant garter snakes; therefore, giant garter snakes did not have to venture as far as in previous years to find aquatic habitat during their active period. This was also found to be true for monitoring conducted during 2005. Sampling of the restored areas

in Colusa NWR during the summers of 2002 and 2003 continued to document use of the restored wetland area as the habitat quality improves. The aquatic component of the habitat is important because the snake forages on frogs, tadpoles and fish. The 2005 Monitoring Report for the Colusa NWR (Wylie *et al.* 2005) concluded that, "The management of the Colusa Refuge for the giant garter snake, which began with the restoration of Tract 24, has clearly benefited the snakes in the restored wetlands and other habitats by maintaining and increasing stable summer water habitats for the snakes, maintaining connectivity among wetland habitats and carefully managing marsh vegetation." Stony, Logan, Hunters, and Lurline Creeks, as well as the Colusa Drain, and Glenn-Colusa, Tehama Colusa, and Colusa Basin Drainage Canals, and associated wetlands, are important as snake habitat and movement corridors for giant garter snakes. These waterways and associated wetlands provide vital permanent aquatic and upland habitat for snakes in areas with otherwise limited habitat (Wylie *et al.* 2005).

Butte Basin Population/Recovery Unit

The Butte Basin Recovery Unit encompasses the entire Butte Basin, extending from Red Bluff in the north to the Sutter Buttes in the south. The Butte Basin consists of 479,118 acres, including portions of Tehama, Butte, Sutter, and Colusa counties. Three management units have been defined for the Butte Basin Recovery Unit: Llano Seco, Upper Butte Basin, and Gray Lodge/Butte Sink. Most occurrences are located in the Upper Butte Basin Wildlife Area and the Gray Lodge Wildlife Area and are associated with rice fields. In addition, within the Butte Basin Recovery Unit, there are two important snake populations that occur within this unit (portions of Little Butte Creek, Butte Creek). Refer to the 2020 5-year review for occurrence and trapping data.

Sutter Basin Population/Recovery Unit

The Sutter Basin extends south from the Sutter Buttes to the confluence of the Feather and Sacramento rivers. The Sutter Basin consists of 239,810 acres, including portions of Butte and Sutter counties. Three management units have been defined for the Sutter Basin Recovery Unit: Sutter, Gilsizer Slough, and Robbins. Two important snake populations (portions of Willow Slough and Bypass, Sutter Bypass Toe Drain) are located within the Sutter Basin Recovery Unit. Refer to the 2020 5-year review for occurrence and trapping data.

American Basin Population/Recovery Unit

The American Basin extends south from Folsom Reservoir to the confluence of the Sacramento and American rivers. The Basin is about 376,104 acres, including portions of Butte, Yuba, Sutter, Placer, and Sacramento counties. Four management units have been defined for the American Basin Recovery Unit: District 10, Olivehurst, Nicolaus, and Natomas Basin. The American Basin Recovery Unit contains the most known occurrences with the majority of these occurrences located in the Natomas Basin. The entire Natomas Basin is identified as an important snake population. Refer to the 2020 5-year review for occurrence and trapping data.

Yolo Basin Population/Recovery Unit

The Yolo Basin extends from Cache Creek in the north to the Sacramento-San Joaquin River Delta in the south, including portions of Yolo and Solano counties, and is approximately 410,914 acres. Three management units have been defined for the Yolo Basin Recovery Unit: Ridgecut Slough, Willow Slough, and Yolo Bypass. Willow Slough is an important snake population

within the Yolo Basin Recovery Unit. Refer to the 2020 5-year review for occurrence and trapping data.

There are nine established giant garter snake conservation banks and preserves in the Action Area. The Colusa Basin Mitigation Bank has restored and conserved 163 acres for the giant garter snake, the Dolan Ranch Conservation Bank provides 24 acres of emergent marsh habitat, the Ridge Cut Giant Garter Snake Conservation Bank has restored and conserved 185.9 acres for the giant garter snake, the Sutter Basin Conservation Bank restored 407.55 acres of open water, perennial marsh, seasonal marsh, and upland habitat, Gilsizer Slough South Conservation Bank provides 379.4 acres of open water, perennial marsh, and upland habitat, Gilsizer Slough North Giant Gartersnake Preserve provides 145 acres of habitat, the Prichard Lake Preserve provides 42.7 acres of habitat, the Willey Wetlands Preserve provides 217 acres of habitat for the giant garter snake, and the Pope Ranch Mitigation Bank restored 387 acres.

Habitat has also been preserved, created, or restored in the Action Area as a result of section 7 consultations between the Service and other Federal agencies and habitat conservation plans. This includes 152 acres at two properties in the Colusa Basin, 77 acres at the Gray Lodge Wildlife Area in Butte Basin, 566 acres at four properties in the Sutter Basin, and 626 acres of restored habitat and ricelands in the Natomas Basin of the American Basin.

There are various section 7 consultations with biological opinions for giant garter snake that occur throughout the Action Area. As described above in the *Description of the Proposed Action* section, the November 8, 2024 LTO BiOp addressed the effects of operating the CVP to deliver water under existing contracts, as well as reduced diversions and idling/shifting crops as a result of the implementation of the Shasta Framework. The effects included an annual maximum of 71,429 to 83,333 acres (first ten years of implementation) and 14,285 to 16,667 acres (second ten years of implementation) of rice fallowed in the SRSC Service Area. The LTO BiOp effects analysis also found that it was not likely that all of that acreage is utilized by giant garter snakes and the amount fallowed could be reduced by other factors, such as groundwater substitution.

Reclamation has also previously consulted with the Service on its long-term water transfer program, under which water may be transferred from a similar area as the Action Area, resulting in idling and shifting of ricelands. The most recent consultation (Service 2019) covered the years 2019–2024, including crop idling/shifting of a maximum of 60,693 acres of ricelands a year for two of the six years. During the covered time period, 44,860 acres of ricelands were fallowed due to crop idling/shifting under the program in 2021. Monitoring conducted by USGS has found no indication that the water transfers are having unanticipated effects on the giant garter snake, or that conservation measures associated with the program are ineffective. Reclamation and the Service are currently in consultation on the program for future years. It is unlikely, although not impossible, that crop idling/shifting would occur in the same year under the proposed project and the long-term water transfer program.

Effects of the Proposed Action

Effects of the action are all consequences to listed species or critical habitat that are caused by the Proposed Action, including the consequences of other activities that are caused by the

Proposed Action but that are not part of the action. A consequence is caused by the Proposed Action if it would not occur but for the Proposed Action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action.

Water Reductions

Program phasing, cropland idling/shifting, and groundwater substitution

The effects of the execution of the agreement with SRSC and the associated program phasing, cropland idling/shifting, and groundwater substitution portion of the WRP on the giant garter snake are similar to the effects to this species from implementation of the Shasta Framework under LTO. Information from the WRP BA was utilized to analyze the effects of Shasta Framework implementation in the LTO BiOp for these activities. No additional adverse effects are likely to occur as a result of the WRP that weren't already analyzed in the LTO BiOp. Therefore, the following analysis is largely excerpted as applicable from the LTO BiOp but constitutes a stand-alone analysis of the effects of the WRP in this BiOp.

Reclamation's current approach to managing Shasta changes the balance between risks of flood control releases (i.e. spills) and maintaining water in storage for future drought protection and temperature management. This approach, described below, places a higher priority on maintaining storage for drought protection for all project purposes while limiting the frequency of spilling water due to flood control limitations.

The loss of wetland ecosystems and suitable habitat has resulted in the giant garter snake using modified habitats like agricultural fields. Located among cultivated farm lands, these areas include irrigation ditches, drainage canals, rice fields, and their adjacent uplands. Since giant garter snake surveys were first conducted in the 1970s, results have demonstrated that active rice fields and the supporting water conveyance infrastructure consisting of a matrix of canals, levees, and ditches have served as alternative habitat that is commonly used by the giant garter snakes in the absence of suitable natural marsh habitat (G. Hansen 1988; G. Hansen and Brode 1980, 1993; Brode and G. Hansen 1992; Wylie *et al.* 1997a; Wylie and Cassaza 2000; Halstead *et al.* 2010).

Actions that prioritize maintaining storage in Lake Shasta for drought protection may affect giant garter snake. The primary mechanism for this effect is through actions that delay or shift spring diversions to maximize storage, including actions proposed under the WRP. Delaying or shifting diversions could preclude the ability of contractors to plant crops conducive for giant garter snake, particularly rice and may affect the ability of giant garter snake to use flooded rice fields. This delay would occur in the spring, not the fall. Rice fields are typically planted and flooded beginning in April and would usually be available for giant garter snakes as they become active with the onset of warmer air temperatures and leave their overwintering hibernacula. Depending on the timing and amount of water diverted from the Sacramento River, rice fields might not be available when and where giant garter snake would typically utilize them.

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Reduced diversions not only result in rice fallowing result in but also reduced connectivity among giant garter snake populations through the reduction in the network of water-filled canals, which in the near term might have stronger effects than urbanization on most giant garter snake populations (Halstead *et al.* 2021). Spring and summer rice production in the Sacramento Valley is important for the reproductivity of the giant garter snake as much of the historic emergent aquatic habitats in Sacramento Valley has been converted to agriculture (Service 2017). Giant garter snake young of the year require these aquatic habitats for sufficient cover from predators and primarily for prey availability. Prey such as small fish, smaller amphibians (such as tree frogs and bullfrog tadpoles), and invertebrates are more numerous in these shallow water environments and can provide giant garter snake neonates with sufficient prey base. The growth and survival rates of juvenile (1 year old) giant garter snakes also have an important influence on population growth, especially when the probability of recruitment from neonate to 1 year old is higher (Rose *et al.* 2019).

These effects would not occur but for the implementation of the WRP and Shasta Framework since under baseline conditions more water would have been released from Shasta and diverted for agricultural purposes. These effects would occur in approximately 8.5% of years.

During Phase 1 (2025-2035), the contractors would collectively incur a reduced contract supply of up to 500,000 acre-feet under their aggregated contracts during certain years if the following four conditions are met:

1. Forecasted end-of-April Shasta Lake storage is less than 3.0 MAF;

2. Forecasted end-of-September Shasta Lake storage is less than 2.0 MAF;

3. Combined actual and forecasted natural inflow to Shasta Lake from October 1 through April 30 is less than 2.5 MAF; and

4. Reclamation forecasts a Critical Year under the Settlement Contracts.

During Phase 2 (2036-2045), the contractors would agree to incur a reduced contract supply of up to 100,000 acre-feet under their aggregated contracts collectively during certain years if the following two conditions are met:

1. Combined actual and forecasted natural inflow to Shasta Lake from October 1 through April 30 is less than 2.5 MAF; and

2. Reclamation forecasts a Critical Year under the Settlement Contracts.

These reductions and diversions are likely to result in cropland idling, crop shifting, groundwater substitution, and conservation. As explained above in the *Description of the Proposed Action* section, the acreage of cropland idling would be calculated based on water application to crops

which consists of both consumptive and non-consumptive uses resulting in a total water application factor of about 6.0 - 7.0 acre-feet per acre. When applied across the SRSC service area this results in an annual maximum of 71,429 to 83,333 acres of rice fallowed in a Phase 1 Program Year and 14,285 to 16,667 acres of rice fallowed in a Phase 2 Program Year (U.S. Bureau of Reclamation 2024). However, much of the acreage that may be fallowed is either unoccupied, not utilized, or currently unavailable for the giant garter snake.

When forecasting potential adverse effects from implementation of the WRP, there are several possibilities; however, the most likely adverse effects to individual giant garter snakes would occur in the form of mortality from exposure to predation (large fish, egrets, herons, and otters) that would otherwise not occur if agricultural fields in rice production were not fallowed or changed into a different crop type. Giant garter snakes require water during the active season of their life (May 1- October 1). For giant garter snakes that occur in the Sacramento Valley, ditches, canals, other agricultural conveyance features, and rice fields all provide suitable aquatic habitat for the snake. Rice fields in particular, provide additional aquatic habitat that snakes utilize for cover from predators and provide a prey base for foraging on fish and amphibians during their active season. Conveyance features and mature rice fields provide essential cover for the snake to escape from known predators that occur within these habitats. The loss of rice lands could increase snake mortality from predation if they are limited to reside exclusively in these conveyance canals and ditches. A reduction in rice production will likely make snakes relocate to other areas to find available foraging areas and giant garter snakes would likely be exposed to other predators such as raccoons, skunks, otters, coyotes, and raptors if giant garter snakes were forced into more dry upland terrestrial habitats with limited cover due to the lack of available emergent aquatic habitat or semi aquatic habitat such as rice agriculture.

Giant garter snakes would likely experience reduced fitness and fecundity as foraging and potentially breeding opportunities are reduced. Rice fallowing and reduction in the network of water-filled canals caused by the proposed water reductions further reduce connectivity among populations, and in the near term might have stronger effects than urbanization on most giant garter snake populations (Halstead *et al.* 2021). Spring and summer rice production in the Sacramento Valley is important for the reproductivity of the giant garter snake as much of the historic emergent aquatic habitats in Sacramento Valley has been converted to agriculture (Service 2017). Giant garter snake young of the year require these aquatic habitats for sufficient cover from predators and primarily for prey availability. Prey such as small fish, smaller amphibians (such as tree frogs and bullfrog tadpoles), and invertebrates are more numerous in these shallow water environments and can provide giant garter snake neonates with sufficient prey base. The growth and survival rates of juvenile (1 year old) giant garter snakes also have an important influence on population growth, especially when the probability of recruitment from neonate to 1 year old is higher (Rose *et al.* 2019).

The amount of rice fallowed could be reduced by the use of groundwater substitution, which could be used in lieu of surface water supplies. It is currently unknown to what extent this option may be available or utilized in any specific year.

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The actions proposed in the WRP are similar to those under the long-term water transfers program (2019–2024) (Service 2019). Under the water transfer program, Reclamation monitors giant garter snake distribution and that occupancy research does not lapse. The research includes annual sampling of giant garter snake within the Action Area and focuses on their distribution and occupancy dynamics. The research is designed to evaluate the effectiveness of the conservation measures for occupancy at sites forgoing water. The research is ongoing since 2015 and is expected to aid in maintaining effective conservation measures for actions that may impact giant garter snake and identifying any changes that may enhance their effectiveness in the future.

In Reclamation's *2023 Annual Compliance Report for the Bureau of Reclamation's Central Valley Project Long-term Water Transfers (2019-2024)*, Reclamation concluded from review of the preliminary data from the USGS research effort, that there is no indication that water transfers are having unanticipated effects on giant garter snake, or that conservation measures associated with the long-term water transfers program are ineffective. Since actions proposed under the WRP are similar to those proposed under the long-term water transfers program, any adverse effects from the WRP are likely to be similar in degree.

Water Conservation Actions and Conservation Measures

Water conservation associated with water reductions includes actions to reduce the diversion of surface water by improving water conservation and irrigation efficiencies. There was no information in the WRP BA regarding effects to the giant garter snake from these activities, but no adverse effects are foreseeable based on the information provided.

Effects to the giant garter snake will be minimized through Reclamation's and SRSC's commitments to maintaining habitat and coordinating with the Service annually on ways to reduce adverse effects to the giant garter snake at the beginning of the irrigation season. The commitment to provide movement corridors for giant garter snake during the active season will benefit this species by maintaining a prey base for the snake and maintaining vegetation needed for cover during foraging and avoidance from predators. Maintaining the monitoring program currently being implemented under the long-term water transfer program will continue to assist with our understanding of the effects of cropland idling/shifting on the giant garter snake, and designing and maintaining effective conservation measures in the future.

Drought Resiliency Projects

The effects of drought resiliency projects on the giant garter snake will vary depending on the proposed project type, scope, and location, which will be specified by Reclamation and the SRSC in future planning and consultation. It is expected that some of the drought resiliency projects will have no effect on the giant garter snake. Examples include projects that take place outside the range of the giant garter snake or in areas that don't provide habitat for the giant garter snake, such as established non-rice agricultural croplands with a history of discing, planting, and maintenance, and conjunctive management actions that don't alter the amount and location of surface water within the range of the snake. Reclamation and the SRSC have committed to conservation measures, including desktop evaluation and site-specific surveys,

which will identify drought resiliency projects that have the potential to affect the giant garter snake and will require subsequent consultation under this framework.

A number of the drought resiliency project types involve the use of construction equipment and small areas of ground disturbance, including excavation, grading, and fill. If there are any snakes sheltering in the proposed project footprint, they could be injured or killed by the construction equipment or disturbed so that they leave the work area and could be subjected to injury or mortality from vehicles or predators as they seek refuge. However, given the small work area associated with many of the proposed project types (e.g., automated gates, weirs or check structures, wells) and the fact that any canals or ditches will be dewatered in order to install the project components, it is unlikely that many giant garter snakes will be encountered. In addition, Reclamation and the SRSC have proposed conservation measures, including site-specific surveys, construction monitoring, and speed limits, that are expected to further prevent adverse effects to the giant garter snake.

Drought resiliency projects with higher potential to adversely affect the giant garter snake during construction include piping open ditches or canals. These projects involve larger areas of construction equipment use and ground disturbance, including excavation, grading, and fill. Any snakes sheltering in the proposed project footprint could be injured or killed by the construction equipment or disturbed so that they leave the work area and could be subjected to injury or mortality from vehicles or predators as they seek refuge. Reclamation and the SRSC have proposed conservation measures, including a seasonal work window, fencing, and construction monitoring that are expected to minimize these adverse effects to the giant garter snake. Any snakes found within the fencing may be captured and relocated to suitable habitat beyond the influence of the project work area if they do not leave the area on their own.

In addition, piping open ditches or canals and canal lining will result in the permanent loss of aquatic habitat for the snake. While giant garter snake survival has been found to be positively related to the overall amount of active rice agriculture in an area (Halstead et al. 2019), the snakes are strongly associated with the canals surrounding the rice fields rather than the fields themselves (Hansen et al. 2017, Reyes et al. 2017). Therefore, the permanent loss of this habitat due to canals or ditches being piped or lined is disproportionate to its relative acreage. Giant garter snakes would have to find replacement habitat, be subjected to injury or mortality from predators as they seek the new habitat, and potentially create competition with other snakes in the replacement habitat. However, the SRSC estimates that less than 2% of total canal and drain length will be piped or lined within the Action Area, which is a small percentage of available habitat. In addition, compensatory mitigation for this permanent loss of habitat will occur. This component of the action will have the effect of protecting and managing lands for the species' conservation in perpetuity. The compensatory lands will provide suitable habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the project. Providing this compensatory habitat as part of a relatively large, contiguous block of conserved land may contribute to other recovery efforts for the snake.

Appropriate measures to mitigate the effects of any permanent habitat loss will be determined during the subsequent consultations. Mitigation measures will offset, for example, impacts to giant garter snake breeding, feeding, or sheltering resulting from each individual project.

Due to the fact that few of the drought resiliency projects are expected to adversely affect the giant garter snake, the small percentage of canal and drain length providing aquatic habitat for the snake that is estimated to be lost, and the proposed guiding principles that provide a protective framework for subsequent consultations, the Service anticipates that a relatively small number of giant garter snakes will be adversely affected. The loss of a small number of snakes among the five recovery areas within the Action Area are not anticipated to reduce the rangewide reproductive capacity, overall numbers, or distribution of the giant gartersnake. Also, future drought resiliency projects are expected to increase the amount of water available across the landscape due to water savings. Therefore, the Proposed Action is not expected to preclude recovery of the giant garter snake.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the Action Area considered in this biological opinion. Future Federal actions that are unrelated to the Proposed Action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Additional water transfers that result in crop idling/shifting of ricelands occur for non-federal water under the State Water Project. It is difficult to estimate the water that may be made available, but from 2019–2024, it was estimated that an additional 26,342 acres of ricelands could be fallowed due to crop idling/shifting in the Sacramento and Feather River systems in any individual year. However, the state program implements similar conservation measures to Reclamation's long-term water transfer program that have been shown to be effective in minimizing adverse effects to the giant garter snake.

Conclusion

After reviewing the current *Status of Species* for the giant garter snake, the *Environmental Baseline* for the Action Area, the *Effects of the Proposed Action*, and the *Cumulative Effects*, it is the Service's biological opinion that the Sacramento River Settlement Contractor's Water Reduction Program, as proposed, is not likely to jeopardize the continued existence of the giant garter snake. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following: (1) based on the overall status of the species range-wide, the anticipated fraction of actual habitat temporarily affected through crop idling/shifting and permanently affected through some drought resiliency projects in the Action Area is relatively low; (2) the proposed conservation measures will adequately avoid or minimize the effects of water reductions to the species; (3) the proposed guiding principles for drought resiliency projects provide a protective framework to inform the upfront development of operational criteria and measures that would be analyzed in the subsequent consultations; and (4)

annual coordination and reporting to understand and evaluate ongoing impacts to the giant garter snake from the Proposed Action.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of "take" in the Act means an act which actually kills or injures wildlife and may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the proposed protective measures and the terms and conditions of an incidental take statement and occurs as a result of the action as proposed.

The measures described below are non-discretionary, and must be undertaken by Reclamation so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Reclamation and SRSC must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(4)].

The drought resiliency projects portion of the Proposed Action addressed in this biological opinion conforms to a "framework programmatic action" as that term is defined at 50 CFR 402.02 of the implementing regulations for section 7. On that basis, no take is anticipated to be caused by this portion of the Proposed Action. Pursuant to the authority under 50 CFR 402.14(i)(6), an incidental take statement is not required at the programmatic level for such an action. Incidental take resulting from any action subsequently authorized, funded, or carried out under such a program will be addressed in subsequent section 7 consultation, as appropriate, on these actions. For these reasons, no take exemption is provided herein for this portion of the Proposed Action.

Amount or Extent of Take

The Service anticipates incidental take of the giant garter snake is reasonably certain to occur as a result of the water reductions portion of the Proposed Action. The Service is unable to quantify the exact number of snakes that could be affected as a result of the water reductions. The Action Area with regard to the giant garter snake is thousands of acres and it would be impossible to know when and where or how many giant garter snakes would be present within the Action Area when water reductions are implemented. Giant garter snakes are secretive, cryptic, and highly

sensitive to human activity. They are extremely difficult to detect unless observed undisturbed at a distance. In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate. Since take is expected from effects to habitat through cropland idling/shifting resulting in less water in aquatic habitats for giant garter snakes to utilize for their essential behaviors such as feeding, breeding, and sheltering, the quantification of amount of habitat affected becomes a direct surrogate for all the individual giant garter snakes within that habitat.

The Service anticipates that an annual maximum amount of rice acreage to be fallowed will be 83,333 acres during Phase 1 of the WRP (2025–2035) and 16,667 acres during Phase 2 of the WRP (2035–2045). The total number of actual acres of croplands that would be idled/shifted is unquantifiable based on the information that Reclamation provided. Not all of the habitat within the Action Area is occupied nor do all of the properties subject to water reductions have known giant garter snake occurrences within or near their properties. Giant garter snakes also use the linear features of irrigation canals primarily as their preferred habitat as opposed to the large open acreages of the shallow water environment of a rice field. The Service anticipates that only a fraction of the total acreages that may be fallowed would result in effects to giant garter snakes. These water reduction actions will only occur in critical water year types, so not all years will be affected by crop idling/shifting. The action will result in the loss of an undetermined number of individual snakes through increased mortality levels of adults and juveniles due to decreased prey availability, reduced reproduction by snakes, and/or mortality of snakes due to predation as they may move out of areas subject to cropland idling/shifting. The anticipated level of incidental take will be considered exceeded, and reinitiation will be required pursuant to 50 CFR 402.16, if the amount of rice acreage fallowed as a result of implementation of the water reductions portion of the WRP exceeds 83,333 acres in any year between 2025–2035, and/or if the amount of rice acreage fallowed exceeds 16,667 acres in any year between 2035–2045.

Upon implementation of the following reasonable and prudent measures, incidental take of giant garter snakes associated with the water reduction portion of the WRP will become exempt from the prohibitions described in section 9 of the Act. No other forms of take are exempted under this opinion.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the giant garter snake.

Reasonable and Prudent Measures

The following reasonable and prudent measure is necessary and appropriate to minimize the effects of the proposed project to the giant garter snake:

1. Reclamation shall minimize effects to the giant garter snake from implementation of water reductions.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Reclamation must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. This term and condition is nondiscretionary.

1. Reclamation and the applicant shall ensure that all conservation measures for the water reductions portion of the WRP, as proposed and restated in the *Description of the Proposed Action* section of this biological opinion, are fully implemented and adhered to.

Salvage and Disposition of Individuals:

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact person is the Sacramento Valley Division Supervisor at the Sacramento Fish and Wildlife Office at (916) 414-6600.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

1. Reclamation should participate in recovery planning and implementation of conservation actions consistent with recovery planning documents.
2. Reclamation should conduct or fund research projects to address current information gaps in giant garter snake life history, conservation strategies, and recovery needs.
3. Reclamation should encourage adaptive management of storage, flows and conservation of water to benefit giant garter snake and other federally-listed species.
4. Reclamation should work with the Service to create and restore additional stable perennial wetland habitat for the giant garter snake in the Sacramento Valley so that they are less vulnerable to fluctuations in rice production. The Central Valley Project Improvement Act Habitat Restoration Program and Central Valley Project Conservation Program conservation grant programs are appropriate for such work.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Manager, Bay Delta Office, U.S. Bureau of Reclamation

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the Sacramento River Settlement Contractor's Water Reduction Program. As provided in 50 CFR §402.16,

(a) Reinitiation of consultation is required and shall be requested by the Federal agency, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

(1) If the amount or extent of taking specified in the incidental take statement is exceeded;

(2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or

(4) If a new species is listed or critical habitat designated that may be affected by the identified action.

(b) An agency shall not be required to reinitiate consultation after the approval of a land management plan prepared pursuant to 43 U.S.C. 1712 or 16 U.S.C. 1604 upon listing of a new species or designation of new critical habitat if the land management plan has been adopted by the agency as of the date of listing or designation, provided that any authorized actions that may affect the newly listed species or designated critical habitat will be addressed through a separate action-specific consultation. This exception to reinitiation of consultation shall not apply to those land management plans prepared pursuant to 16 U.S.C. 1604 if:

(1) Fifteen years have passed since the date the agency adopted the land management plan prepared pursuant to 16 U.S.C. 1604; and

(2) Five years have passed since the enactment of Public Law 115-141 [March 23, 2018] or the date of the listing of a species or the designation of critical habitat, whichever is later.

If you have any questions regarding this biological opinion, please contact Jana Affonso at jana_affonso@fws.gov or Lily Douglas at lily_douglas@fws.gov.

cc:
Thaddeus Bettner, Sacramento River Settlement Contractors
Morgan Kilgour, California Department of Fish and Wildlife
Cathy Marcinkevage, National Marine Fisheries Service

Manager, Bay Delta Office, U.S. Bureau of Reclamation

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