



## United States Department of the Interior



### FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

In reply refer to:  
1-1-06-F-0080

MAR 29 2006

Mr. Gene K. Fong  
Division Administrator  
Federal Highway Administration  
980 Ninth Street, Suite 400  
Sacramento, California 95814

Subject: Review of the State Route 16 Improvement Project (FHWA File Number 03-Yol-16 KP 29.3/50.9), Yolo County, California, for Inclusion with the Valley Elderberry Longhorn Beetle Programmatic Consultation (1-1-96-F-0156) and the Giant Garter Snake Programmatic Consultation (1-1-03-F-0154)

Dear Mr. Fong:

This letter responds to your March 14, 2006, request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed State Route 16 Improvement Project (proposed project). Your letter was received on March 16, 2006. The Service has reviewed the biological information submitted by your office describing the effects of the proposed project on the federally-threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle) and the threatened giant garter snake (*Thamnophis gigas*) (snake). The Service concurs with your determination that these two federally-listed species would be adversely affected by the proposed project. We have determined that the proposed project can be appended to the Service's *Formal Programmatic Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle within the Jurisdiction of the Sacramento Field Office, California* (Service file number 1-1-96-F-0156) (Beetle Programmatic Consultation) and the *Programmatic Biological Opinion on the Effects of Small Highway Projects on the Threatened Giant Garter Snake in Butte, Colusa, Glenn Sacramento, San Joaquin, Solano, Sutter, Yolo, and Yuba Counties, California* (Snake Programmatic Consultation). The proposed project is not located in proposed or designated critical habitat for any federally-listed species. This response is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

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The findings and recommendations in this formal consultation are based on: (1) the February 2006, *State Route 16 Safety Improvement Project Biological Assessment* (Biological Assessment); (2) a site visit on February 2, 2006, attended by representatives of the California Department of Transportation (Caltrans) and Rick Kuyper of the Service; and (3) other information available to the Service.

The proposed project is located along State Route 16 between the towns of Esparto and Brooks, in Yolo County. The proposed project is approximately 13 miles in length. The proposed improvements would widen the roadway from approximately 24 feet to approximately 40 feet to provide standard 8 foot shoulders on both sides of State Route 16 for the length of the proposed project. In addition, 12 feet would be cleared of any fixed objects. The eight-foot shoulder and 12-foot cleared area would create a 20-foot clear recovery zone (CRZ), which would provide drivers of errant vehicles an increased opportunity to regain control. In addition to the CRZ, the project includes the widening or replacement of three bridges, constructing standard horizontal, vertical and super elevation roadway geometrics and providing left turn lanes at several public road connections. SR 16 between Esparto and I-505 would be raised above the 100-year flood level. At the west end, improvements are proposed to facilitate ingress and egress from the Cache Creek Casino. A more detailed project description is provided in Caltrans' February 2006 Biological Assessment.

#### Valley Elderberry Longhorn Beetle Programmatic Consultation

Protocol-level surveys for the beetle were conducted within the entire project study area on February 5-7, March 4-6, and April 11-12, 2002 to identify suitable habitat and to look for signs of beetle habitation in elderberry shrubs. A more recent elderberry stem count was conducted on October 13 and 17, 2005. The survey protocol was based on survey guidelines specified by the Service's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Conservation Guidelines). Elderberry shrubs with one or more stems measuring 1.0 inch or greater in diameter at ground level were closely examined for beetle exit holes, which is often the only evidence of the beetle. Records indicate the occurrence of valley elderberry longhorn beetle within the Esparto quadrangle (CNDDDB 2006). The location is approximately 1.7 miles south of the proposed project area, where the Pacific Gas and Electric line crosses the South Fork of Willow Slough.

The proposed project would require the removal of 21 elderberry shrubs (*Sambucus* sp.), which are the obligate host plant for the federally-listed beetle. Elderberry shrub stems that are greater than 1.0 inch in diameter at ground level are required for the beetle to complete its life cycle. The elderberry shrubs that would be removed contain 111 stems that are 1.0 inch or greater in diameter at ground level. Six of the elderberry shrubs had exit holes. In addition, one adult beetle was observed within the proposed project area by biologists contracted by Caltrans. Ten of the elderberry shrubs are located in riparian habitat.

**Caltrans has proposed the following conservation measures in the February 2006 Biological Assessment to minimize adverse effects to the beetle:**

1. Prior to any ground-disturbing activities associated with the proposed project, Caltrans shall install 4-foot-tall temporary, plastic mesh construction fence (Tensor Polygrid or equivalent) 20 feet, where possible, from the driplines of elderberry shrubs that are not to be removed. The fencing is intended to prevent encroachment by construction vehicles and personnel. The exact location of the fencing will be determined by a qualified biologist, with the goal of protecting beetle habitat. The fencing will be strung tightly on posts set at a maximum interval of ten feet. The fencing will be installed in a way that prevents equipment from enlarging the work area beyond what is necessary to complete the work. The fencing will be checked and maintained weekly until all construction is completed.
2. A sign will mark this buffer zone and state the following 'This is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines and imprisonment'. The fencing and a note reflecting this condition will be shown on the construction plans. Signs will be legible from a distance of 20 feet and will be maintained for the duration of construction.
3. Prior to any ground disturbances, Caltrans would ensure that all elderberry shrubs with one or more stems measuring one-inch or more in diameter that cannot be avoided during construction will be transplanted to a conservation area in accordance with the Conservation Guidelines (Table 1).

**Table 1: Proposed compensation for the elderberry shrubs proposed for transplanting as a result of the State Route 16 Improvement Project.**

Location	Stem diameter	Number of Stems Impacted	Exit Holes Present on Shrub (Y/N)	Elderberry Seedling Ratio	Elderberry Seedling Plantings	Associated Native Plant Ratio	Associated Native Plantings
Non-Riparian	1"-3"	9	No	1:1	9	1:1	9
		22	Yes	2:1	44	2:1	88
	3"-5"	8	No	2:1	16	1:1	16
		14	Yes	4:1	56	2:1	112
	> 5"	4	No	3:1	12	1:1	12
		3	Yes	6:1	18	2:1	36
Riparian	1"-3"	29	No	2:1	58	1:1	58
		4	Yes	4:1	16	2:1	32
	3"-5"	5	No	3:1	15	1:1	15
		4	Yes	6:1	24	2:1	48
	> 5"	7	No	4:1	28	1:1	28
		2	Yes	8:1	16	2:1	32
	<b>Total</b>		<b>111</b>		<b>312</b>		<b>486</b>

4. Prior to ground disturbing activities at the proposed project site, Caltrans shall do one of the following:
  - a. Purchase credits sufficient to compensate for the transplanting of the 21 elderberry shrubs and planting of 312 elderberry shrub seedlings and 486 associated native plantings from a Service-approved conservation bank that services the proposed project area; or
  - b. Preserve riparian habitat at a Service-approved conservation site and transplant the 21 elderberry shrubs, and plant 312 elderberry shrub seedlings and 486 associated natives, per the Service's 1999 Conservation Guidelines. In accordance with the Conservation Guidelines, this preserve would require 3.033 acres and would require a Service-approved conservation easement, management and monitoring plan, and endowment fund.

#### Giant Garter Snake Programmatic Consultation

The proposed project site provides potential snake habitat in the form of aquatic habitat and associated adjacent uplands. This habitat provides (1) water during the snake's active period, (2) upland habitat for basking, cover, and retreat sites, and (3) higher elevation upland habitat for cover and refuge from flood waters. Yolo is among the 11 counties where the giant garter snake is still presumed to occur. Within the Yolo Basin, Willow Slough provides suitable habitat for the giant garter snake. The nearest known occurrences of the snake are both located 15 miles east of the project area in Willow Slough, southeast of Woodland (occurrence #120) and in Willow Slough Bypass, northeast of Davis (occurrence #80) (CNDDDB 2006). Because of the presence of on-site suitable habitat, including both the irrigation ditches and the surrounding upland habitat, and the proximity of verified recorded observations of the snake, the Service believes that the snake is reasonably certain to occur within the proposed project's action area and, therefore, the proposed project is likely to adversely affect the snake through permanent and temporary loss of habitat.

Roadway construction activities will disturb 5.1 acres of suitable snake habitat. Of this total amount, the relocation of South Fork Willow Slough will temporarily disturb 4.4 acres of snake habitat. While the primary reason to relocate South Fork Willow Slough is to attenuate flooding, Caltrans will be incorporating features into the newly-created slough in order to improve habitat for the giant garter snake and associated species. Upon completion of the relocation and re-vegetation of snake habitat, South Fork Willow Slough will provide 17.5 acres of suitable habitat for the snake. This quantity is the total amount of the new aquatic and upland habitat that will be created prior to construction of the roadway improvement project. Since project design entails re-locating South Fork Willow Slough prior to construction of the road improvement project, and within a single construction season, existing habitat along South Fork Willow Slough for the snake will only be temporarily impacted. The relocation of the agricultural drainage ditch that runs parallel to State Route 16 would permanently disturb 0.7 acre of snake habitat. A more detailed discussion of these disturbances is provided in Caltrans' February 2006 Biological Assessment.

The Snake Programmatic Consultation identifies three levels of project impacts and appropriate conservation measures for each impact level. It is the Service's intent that following the *Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat* (Guidelines) and the *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake (*Thamnophis gigas*) Habitat* (Avoidance Measures) will reduce habitat degradation while increasing the protected habitat areas across the species' range. The Guidelines and Avoidance Measures are included as Appendix A and C of the Snake Programmatic Consultation and are enclosed with this biological opinion. These measures include the following:

1. Avoidance of take and disturbance of habitat (Levels 1, 2, and 3);
2. Minimization of disturbance and habitat loss (Levels 1, 2, and 3);
3. Restoration of temporary habitat disturbance and associated impacts to snake habitat (Levels 1 and 2);
4. Replacement of permanent and temporal habitat loss (Levels 2 and 3);
5. Management and monitoring of restored and replacement habitat (Levels 1, 2, and 3); and
6. A management plan for the long-term protection of the restored and replaced habitat area(s) to protect the area(s) in perpetuity as habitat for the snake (Levels 2 and 3).

**Caltrans has proposed the following conservation measures in the February 2006 Biological Assessment to minimize adverse effects to the snake:**

1. Construction activity within suitable snake habitat will be conducted between May 1 and October 1 to minimize impacts to this species. This is the active period for giant garter snakes and thus direct mortality is lessened because snakes are expected to actively move and avoid danger. Clearing will be confined to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as an Environmentally Sensitive Area.
2. Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s). Twenty-four hours prior to construction activities, the project area should be surveyed for giant garter snakes. Surveys of the project area should be repeated if a two-week or greater lapse in construction activity occurs. If a giant garter snake is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the giant garter snake will not be harmed. Any sightings and any incidental take will be reported to the Service immediately by telephone at (916) 414-6600.

3. Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat. After completion of construction activities, any temporary fill and construction debris will be removed and, wherever feasible, disturbed areas restored to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.
4. Level 1 effects: Caltrans shall restore all 4.4 acres of temporarily disturbed snake habitat as described in the Service's Guidelines. The 4.4 acres of temporarily disturbed snake habitat would result from the relocation of the South Fork of Willow Slough. Onsite relocation, slope improvement and re-vegetation of South Fork Willow Slough would compensate for disturbance of snake habitat. Following slough relocation, 17.5 acres of improvements of snake habitat would occur onsite at the relocated slough location. Section 4.1.2.4 of Caltrans' February 2006 Biological Assessment provides a detailed description of restoration and improvement activities that will be completed by Caltrans at the South Fork of Willow Slough prior to any ground disturbing activities associated with the roadway improvement component of the proposed project. Temporal loss of giant garter snake habitat will not occur because the replacement and restoration of South Fork of Willow Slough will be completed before the original South Fork of Willow Slough is filled.

In addition, per the Snake Programmatic Consultation, compensation also includes one year of monitoring of the restored habitat and the project site with a photo documentation report containing pre- and post-project area photos due one year from the date that the restoration action was completed. The restoration and monitoring will follow the Service's Guidelines. If the restoration is unsuccessful, as determined by the Service, consultation shall be reinitiated by FHWA. Reinitiation will include the appropriate actions necessary to fulfill the success criteria for restoration of the temporary disturbance.

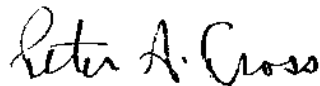
5. Level 3 effects: Prior to the start of any ground-disturbing activities associated with the proposed project, Caltrans shall compensate for the loss of 0.7 acre of aquatic snake habitat (the agricultural drainage ditch) by the following measures: (1) the 0.7 acre of agricultural drainage ditch that would be permanently destroyed would be replaced with 0.7 acre of agricultural drainage ditch (a 1:1 ratio); and (2) prior to ground disturbing activities at the proposed project site, credits sufficient to preserve 1.4 acres of snake habitat would be purchased at a Service-approved conservation bank that services the proposed project area (a 2:1 ratio). Because the 0.7 acre of agricultural drainage ditch habitat is of minimal habitat quality, highly disturbed, and adjacent to State Route 16, it was determined by the Service that it is acceptable to utilize 1:1 restoration and 2:1 replacement for the agricultural drainage ditch rather than 3:1 replacement, as specified in the Snake Programmatic Consultation.

6. Caltrans shall also adhere to the avoidance and minimization measures described in the February 2006 Biological Assessment, the Service's Avoidance Measures, Guidelines, and the terms and conditions of the Snake Programmatic Consultation.

This concludes the Service's review of the State Route 16 Improvement Project outlined in your request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding the State Route 16 Improvement Project, please contact Rick Kuyper or Holly Herod, the Sacramento Valley Branch Chief, of my staff at (916) 414-6645.

Sincerely,



Peter A. Cross  
Deputy Assistant Field Supervisor

cc:

Chris Collison, California Department of Transportation, Sacramento, California  
Jenny Marr, California Department of Fish and Game, Chico, California

## Appendix A

### **Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat**

Replacement and Restoration Guidelines are provided together, as the two conservation measures may not be mutually exclusive. Replacement of habitat may also require restoration of some areas. Preserved habitat may additionally be improved for giant garter snake by using some of the restoration guidelines.

#### **Reference sites**

A nearby reference site should be chosen both for restoration of giant garter snake habitat and for creation of replacement habitat. The reference site will be used to determine the success of conservation efforts. For restoration of habitat, the pre-project condition may be used as a reference site if adequate documentation exists. For creation of replacement habitat or for restoration where pre-project conditions are not documented, the reference site should be nearby or adjacent and should represent high quality giant garter snake habitat.

#### **Restoration of giant garter snake habitat**

Restoration may include incorporating some of the Replacement guidelines to enhance habitat value for giant garter snake. Restoration should follow the guidelines outlined below:

1. Restoring giant garter snake habitat includes minimizing impacts of project activities to the existing habitat, including using silt fencing, designating environmentally sensitive areas, using protective mats, preventing runoff, and providing worker awareness training. Measures to minimize impacts include:
  - a. Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.
  - b. Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.
  - c. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

- d. Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and its habitat(s).
  - e. 24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 414-6600.
  - f. Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.
2. Remove all construction debris and stockpiled materials.
  3. Regrade area to preexisting contour, or a contour that would improve restoration potential of the site.
  4. Replant and hydroseed the restoration area. Recommended plantings consist of a) wetland emergents, b) low-growing cover on or adjacent to banks, and c) upland plantings/hydroseeding mix to encourage use by other wildlife. Riparian plantings are not appropriate because shading may result in lack of basking sites. Native plantings are encouraged except where non-natives will provide additional values to wildlife habitat and will not become invasive in native communities. The applicant should obtain cuttings, plantings, plugs, or seeds, from local sources wherever possible. The applicant should attempt to restore conditions similar to that of adjacent or nearby habitats.
    - a. Emergent wetland plants recommended for giant garter snake habitat are California bulrush (*Scirpus californicus*), cattail (*Typha* spp.), and water primrose (*Ludwigia peploides*). Additional wetland plantings may include common tule (*Scirpus acutus*), Baltic rush (*Juncus balticus*), or duckweed (*Lemna* spp.).
    - b. Cover species on or adjacent to the bank may include California blackberry (*Rubus vitifolius*) or wild grape (*Vitis californica*), along with the hydroseeding mix recommended below.
    - c. Upland plantings/hydroseeding mix: Disturbed soil surfaces such as levee slopes should be hydroseeded to prevent erosion. The Service recommends a mix of at least 20-40 percent native grass seeds [such as annual fescue (*Vulpia* spp.), California brome (*Bromus carinatus*), blue wildrye (*Elymus glaucus*), and needle grass (*Nassella* spp.)], 2-10 percent native forb seeds, five percent rose clover

(*Trifolium hirtum*), and five percent alfalfa (*Medicago sativa*). Approximately 40-68 percent of the mixture may be non-aggressive European annual grasses [such as wild oats (*Avena sativa*), wheat (*Triticum* spp.), and barley (*Hordeum vulgare*)]. The Corps will not include aggressive non-native grasses, such as perennial ryegrass (*Lolium perenne*), cheatgrass (*Bromus tectorum*), fescue (*Festuca* spp.), giant reed (*Arundo donax*), medusa-head (*Taeniatherum caput-medusae*), or Pampas grass (*Cortaderia selloana*) in the hydroseed mix. The Corps will not include endophyte-infected grasses in the mix. Mixes of one-hundred percent native grasses and forbs may also be used, and are encouraged.

### Replacement of giant garter snake habitat

#### Location

Replacement location should be within the same population cluster boundaries (population clusters are defined in 58 FR 54053) as the habitat lost. For example: The boundaries of the Sacramento Basin population cluster are approximately, Highway 16 to the north, Sacramento River to the west, Twin Cities Road to the south, and the Folsom Aqueduct to the east. Habitat lost within this area must also be replaced within this area.

#### Habitat components

*Giant Garter Snake Habitat.* The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, other waterways and agricultural wetlands such as irrigation and drainage canals and rice fields, and the adjacent uplands. Essential habitat components consist of (1) adequate water during the snake's active period, (early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3) upland habitat for basking, cover, and retreat sites; and (4) higher elevation uplands for cover and refuge from flood waters. For the purposes of this programmatic opinion, a basic giant garter snake habitat unit will incorporate 2.00 acres (0.81 hectares) of surrounding upland for every 1.00 acre (0.40 hectare) of aquatic habitat. The 2.00 acres (0.81 hectares) of upland also may be defined as 218 linear feet (66 meters) of bankside habitat which incorporates adjacent uplands to a width of 200 feet (61 meters) from the edge of the bank.

Replacement habitat must provide the above mentioned essential habitat components and include the following:

1. All replacement habitat must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres
2. A semi-permanent or permanent aquatic habitat which provides water during the active

period for giant garter snakes (April through October) with suitable vegetative cover present. Linear or meandering channels with slow flowing water over mud or silt substrate are preferred.

3. Upland basking and retreat sites with low growing vegetation cover adjacent to aquatic habitat, and upland retreats and flood refugia with partially buried broken concrete or animal burrows.
4. Small fish and amphibian larvae for foraging, but predatory "gamefish" (bass, *Micropterus* spp.; sunfish, *Lepomis* spp.; catfish, *Ictalurus* spp. and *Ameiurus* spp.) absent or controlled.
5. An adequate buffer (at least 200 feet) from roadways to reduce vehicular mortality.
6. Follow planting recommendation provided above under restoration guidelines.

## Monitoring

### Habitat restoration

Restoration of habitat should be monitored for one year following implementation. Monitoring reports documenting the restoration effort should be submitted to the Service: (1) upon completion of the restoration implementation; and (2) one year from restoration implementation. Monitoring reports should include photodocumentation, when restoration was completed, what materials were used, plantings (if specified) and justification of any substitutions to the Service recommended guidelines. Monitoring reports should also include recommendations for remedial actions and approval from the Service, if necessary, and justification from release of any further monitoring, if requested.

### Creation of replacement habitat

Replacement habitat should be monitored for 5 years following implementation. Hydrology should be monitored for the first two years after creation of wetlands. The monitoring effort should continue for three additional years to ensure success criteria are met. Monitoring reports documenting implementation of conservation measures should be submitted to the Service: (1) upon completion of wetland creation; (2) yearly for the first two years of monitoring; and (3) 5 years from implementation. Monitoring reports should include photodocumentation, when restoration was completed, what materials were used, plantings (if specified) and justification of any substitutions to the Service recommended guidelines. Monitoring reports should also include recommendations for remedial actions and approval from the Service, if necessary, and justification from release of any further monitoring, if requested.

Success criteria for replacement habitat:

1. At completion of monitoring, the cover measured on the habitat area should be 90 percent of cover measured on the reference site.
2. At completion of monitoring, the species composition measured on the habitat area should be 90 percent of that measured on the reference site.
3. At completion of monitoring, wetlands created on the site should meet Corps jurisdictional criteria.

**Maintenance and management of replacement giant garter snake habitat**

1. A final management plan of replacement habitat must be approved by the Service.
2. All maintenance activities should follow Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat.
3. Additional guidance includes:
  - a. Canal Maintenance - Hand clearing of canals is preferred for removal of excessive vegetation or debris. Any equipment should be operated from the bank top. Excavate from only one side of the canal during a given year. Avoid excavating the banks above the high water level. Preferably, one side of the canal should be left undisturbed indefinitely (the preferred side would be the west or north side) so that emergent vegetation and bank side cover is left in place.
  - b. Place the spoils from canal clearing in a designated location, rather than along bank tops. This will prevent burying or crushing snakes basking on the banks, or trapping snakes taking cover in burrows or bank-top soil crevices.
  - c. Vegetation control - Uplands should not be disced. Leave vegetation on levees and canal sides wherever possible. Mowing to control vegetation should take place July through September and mower blades should be raised at least six inches to avoid injuring snakes and to leave some grassy cover.
  - d. Traffic - Control vehicle access to avoid vehicular mortality of giant garter snakes.
4. Use a water maintenance regime that will maintain some open water to provide vegetated edge for giant garter snake to forage along.
5. Eradicate/control non-natives and invasive exotics.

Compatible uses of giant garter snake replacement habitat

Rice farming is a compatible land use for adjacent properties.

Uses of giant garter snake replacement habitat that are incompatible with the habitat of giant garter snake, or represent threats to giant garter snakes include row cropping on uplands, orchards on uplands, OHV (off-highway vehicle) use, and combining with riparian habitat creation which requires dense cover or SRA (shaded riverine aquatic) habitat.

## Appendix C

### Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake (*Thamnophis gigas*) Habitat

#### HABITAT TYPE:

Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, and rice fields. Permanent aquatic habitat, or seasonally flooded during the snake's active season (early-spring through mid-fall), with herbaceous wetland vegetation, such as cattails and bulrushes, grassy banks (often salt grass), and uplands for cover and retreat sites during the snake's active season and for refuge from flood waters during the dormant season (winter). Giant garter snakes are typically absent from larger rivers because of lack of suitable habitat, and from wetlands with sand, gravel, or rock substrates. Some riparian woodlands may not provide suitable habitat because of excessive shade, lack of basking sites, and absence of giant garter snake prey.

#### AVOIDANCE AND MINIMIZATION MEASURES:

1. Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.
2. Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.
3. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.
4. Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s).
5. 24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 414-6600.
6. Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and

- prior to excavating or filling of the dewatered habitat.
7. After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.
  8. Follow the conservation measures in Table 1 to minimize the effects of loss and disturbance of habitat on giant garter snakes. Replacement ratios are based on the acreage and on the duration of disturbance.

**TABLE 1 - SUMMARY OF GIANT GARTER SNAKE CONSERVATION MEASURES**

	<b>IMPACTS: DURATION</b>	<b>IMPACTS: ACRES</b>	<b>CONSERVATION MEASURE: COMPENSATION</b>
<b>LEVEL 1</b>	1 season	Less than 20 and temporary	Restoration
<b>LEVEL 2</b>	2 seasons	Less than 20 and temporary	Restoration plus 1:1 replacement
<b>LEVEL 3</b>	More than 2 seasons and temporary	Less than 20 and temporary	3:1 Replacement (or restoration plus 2:1 replacement)
	Permanent loss	Less than 3 acres total giant garter snake habitat AND Less than 1 acre aquatic habitat; OR Less than 218 linear feet bank habitat	3:1 Replacement

Giant garter snake habitat includes 2.0 acres of surrounding upland habitat for every 1.0 acre of aquatic habitat. The 2.0 acres of upland habitat also may be defined as 218 linear feet of bankside habitat which incorporates adjacent uplands to a width of 200 feet from the edge of each bank. Each acre of created aquatic habitat should be supported by two acres of surrounding upland habitat. Compensation may include creating upland refuges and hibernacula for the giant garter snake that are above the 100-year flood plain.

A season is defined as the calendar year period between May 1 and October 1, the active period

for giant garter snake when mortality is less likely to occur.