RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Butte Water District Canal Automation – Thresher Weir

July 2011

Mission Statements

The mission of the United States Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitment to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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List of Acronyms

ac-ft	Acre feet
APE	Area of Potential Effect
BWD	Butte Water District
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CNDDB	California Natural Diversity Database
EA	Environmental Assessment
ITA	Indian Trust Assets
NAHC	Native American Heritage Commission
NEIC	Northeast Information Center
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
Project	Thresher Weir Replacement Project
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
SEWD	Sutter Extension Water District
SHPO	State Historic Preservation Officer
THPO	Tribal Historic Preservation Officer
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

List of Appendices

1.0 Purpose and Need for Action

1.1 Introduction

In conformance with the National Environmental Policy Act of 1969 (NEPA), as amended, the Bureau of Reclamation (Reclamation) has prepared this draft Environmental Assessment (EA) to evaluate and disclose any potential environmental impacts associated with Reclamation's decision to provide funding for the Canal Automation - Thresher Weir Replacement Project (Project). The proposed Project is located along a segment of the Sutter-Butte Main Canal in Butte County, California.

This EA: (1) describes the existing environmental resources in the proposed Project area; (2) evaluates the effects of the Proposed Action and No Action alternative on those resources; and (3) proposes measures to avoid, minimize, or mitigate any adverse effects. This EA is in compliance with NEPA and the Council on Environmental Quality regulations (40 CFR 1500-1508). Reclamation has also prepared a Finding of No Significant Impact which explains why the Proposed Action would not have any significant effects on the human environment.

The Sutter-Butte Main Canal (Main Canal) is located in Butte and Sutter counties and is operated jointly by the two districts it serves, Butte Water District (BWD) at the northern end of the Main Canal and Sutter Extension Water District (SEWD) to the south. The Main Canal conveys water from the Thermalito Afterbay of Oroville Dam to serve approximately 36,800 acres of irrigated land in the two districts. The Main Canal is now operated approximately 10 months out of the year. Historically, the purpose of the Main Canal has been to deliver water during the irrigation season, typically from April through October. Irrigation continues to be the Main Canal's primary mission; however, the Main Canal now delivers water in the late fall and early winter for flooding of fields to decompose rice stubble, a function that also supports waterfowl habitat. The expansion of purposes has extended the operating season to the middle or end of January, at which time the Main Canal is drained for annual maintenance before being refilled in March or April. The prolonged period of operation enhances the value of the Main Canal but increases the need for efficient management.

Daily operations include responding to orders from the BWD and SEWD by releasing water from Thermalito Afterbay. When in operation, water levels are generally held near the top of the Main Canal with little freeboard. Maintaining a nearly-constant pool in the Main Canal facilitates management of laterals, but given the existing Main Canal controls, requires conveyance of operational water that must be spilled in instances where canal flows exceed actual demands.

1.2 Purpose and Need

Presently, the Main Canal is operated by controlling water released into it from Thermalito Afterbay. Because of the Main Canal's length, the ability to manage water in the canal prism is essential for controlling water deliveries. The capacity to control flows is now limited both by the distances separating the water source from points of demand and by the manually-operated weirs used to control the Main Canal flows. Under current operating practices, settings on weirs are changed no more than twice daily and are generally changed less frequently.

The purpose of this proposed Project is take a first step toward improving irrigation service and reducing water shortages by replacing the existing undersized, manually-operated structure at Thresher Weir with an enlarged weir equipped with electrically-driven, remotely-operated gates. In addition to improving irrigation service, installation of automated gates will improve regional water supply reliability by reducing spillage from the canal and laterals and will reduce tailwater now caused by the inability to adjust lateral flows to meet scheduled shutoffs of deliveries.

In summary, this initial step in the BWD's long-term Canal Automation Project is intended to achieve the following benefits:

- During the peak use period:
  - Increase water supply reliability by increasing conveyance capacity and reducing requirements for operational water. This will increase deliveries to areas within the BWD that do not receive service during certain years because peak period demands exceed conveyance capacity.
- Following the peak use period:
  - Continue to provide more reliable and effective irrigation service.
  - Conserve water by reducing requirements for operational water and better regulating inflows to laterals to reduce spillage and tailwater. This will reduce spillage at Cox Spill and reduce lateral spillage and tailwater.

Under the Sacramento Valley Integrated Regional Water Management Plan (SVIWRMP) Grants Program, Reclamation provides financial assistance to support activities that promote the preparation and revision of written regional water management/conservation plans, implement activities identified in written water management plans, demonstrate new or previously unknown water management technologies and practices, and promote improved understanding of good water use practices and principles. Reclamation is providing financial assistance to BWD for SVIRWMP revision and implementation, which includes the Proposed Project. The projects are authorized under the Reclamation Act of 1902 (32 Stat. 388), as amended and supplemented; Public Law 108-361, Section 103(d)(5), Section 9504(a).

1.3 Potential Resource Issues

The resource areas listed below have the potential to be affected by the Proposed Action and are discussed further in Section 3.

- Surface Water Resources
- Groundwater Resources
- Biological Resources
- Cultural Resources
- Indian Trust Assets
- Environmental Justice
- Global Climate Change

1.4 Resources Not Analyzed in Detail

It was determined that the following resources would not be impacted by the Proposed Action and are therefore not analyzed in this EA: air quality, geology and soils, land use, fisheries, recreation, transportation, noise, visual resources, growth, and hazards and hazardous materials.

2.0 Alternatives Including Proposed Action

2.1 No Action Alternative

Under the No Action Alternative, the Thresher Weir would not be replaced. No project would be constructed, and the current condition of the Main Canal would be unchanged.

2.2 Proposed Action Alternative

The proposed action alternative is to remove the existing Thresher Weir (Figure 1) and replace it with an enlarged weir equipped with electrically-driven, remotely-operated gates. The Thresher Weir Replacement Project is located along a segment of the Sutter-Butte Main Canal, east of Thresher Avenue, approximately one mile west of the Feather River, and approximately two miles east of Gridley, in Butte County, California (Figure 2).

The Proposed Action would involve removing the existing weir, and constructing a new weir approximately 100 feet downstream in the Main Canal and raising the existing canal embankment. There would be limited land recontouring (Figure 3). Lands affected total approximately one acre located within a portion of Section 9, Township 17 North, Range 3 East, as shown on the U.S. Geological Survey (USGS) Gridley, California, 7.5-foot series quadrangle. Construction and lay down areas have been identified on both sides of the canal bank (Figure 3).

The new weir would be located a maximum of 100 feet downstream from the existing structure. To keep the contractor's work area dry, the existing structure would remain in place during construction for use as a barrier to contain flow generated by water seeping from the canal banks during construction.

The embankments would be raised a maximum of three feet between the existing and new structure (maximum length of 100 feet) because the embankment downstream is lower than the upstream bank. If the embankments are not raised, the Districts would not be able to maintain current maximum operating water levels. An additional 50 to 60 feet downstream of the new structure would be needed to ramp down from the new embankment elevations to the existing embankment. The existing top width of the embankments would be maintained, which vary from 12 to 16 feet. It is expected that raising the embankments would push the toe of the new embankments out an additional 12 feet, approximately.

Construction is expected to begin February 1, 2012 and end April 1, 2012. However the contractor may be under contract as early as December 2011 and automated gates are to be ordered in the fall of 2011 because of the lead time required for manufacture of these items. After April 1, 2012, the contractor is expected to be finalizing miscellaneous items and testing during April 2012.

Site access would be via existing roads. Access to the Project site would be on Keith Avenue to Thresher Avenue, as shown on Figure 4.

Figure 1: Existing Thresher Weir

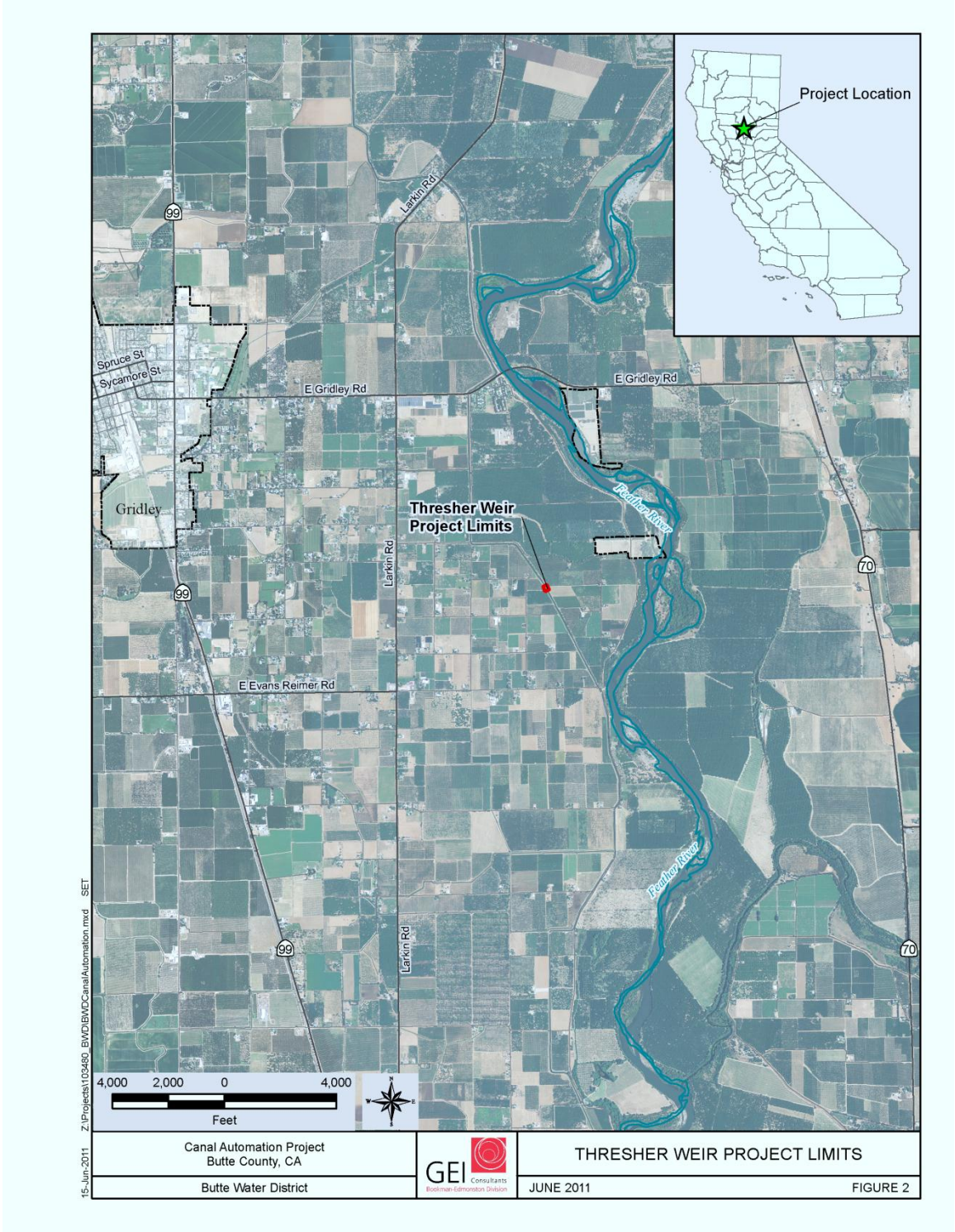

Figure 2: Project Location

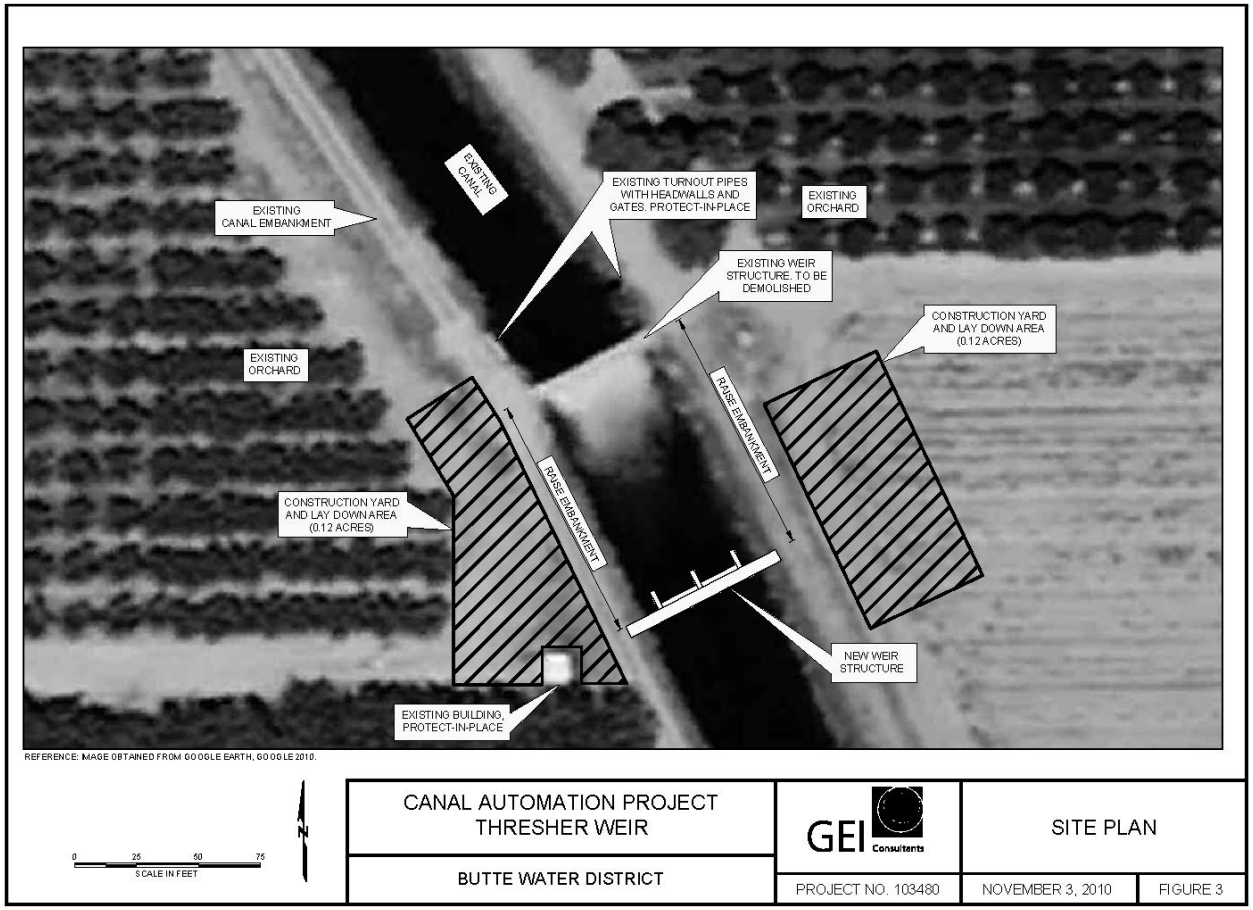

Figure 3: Site Plan

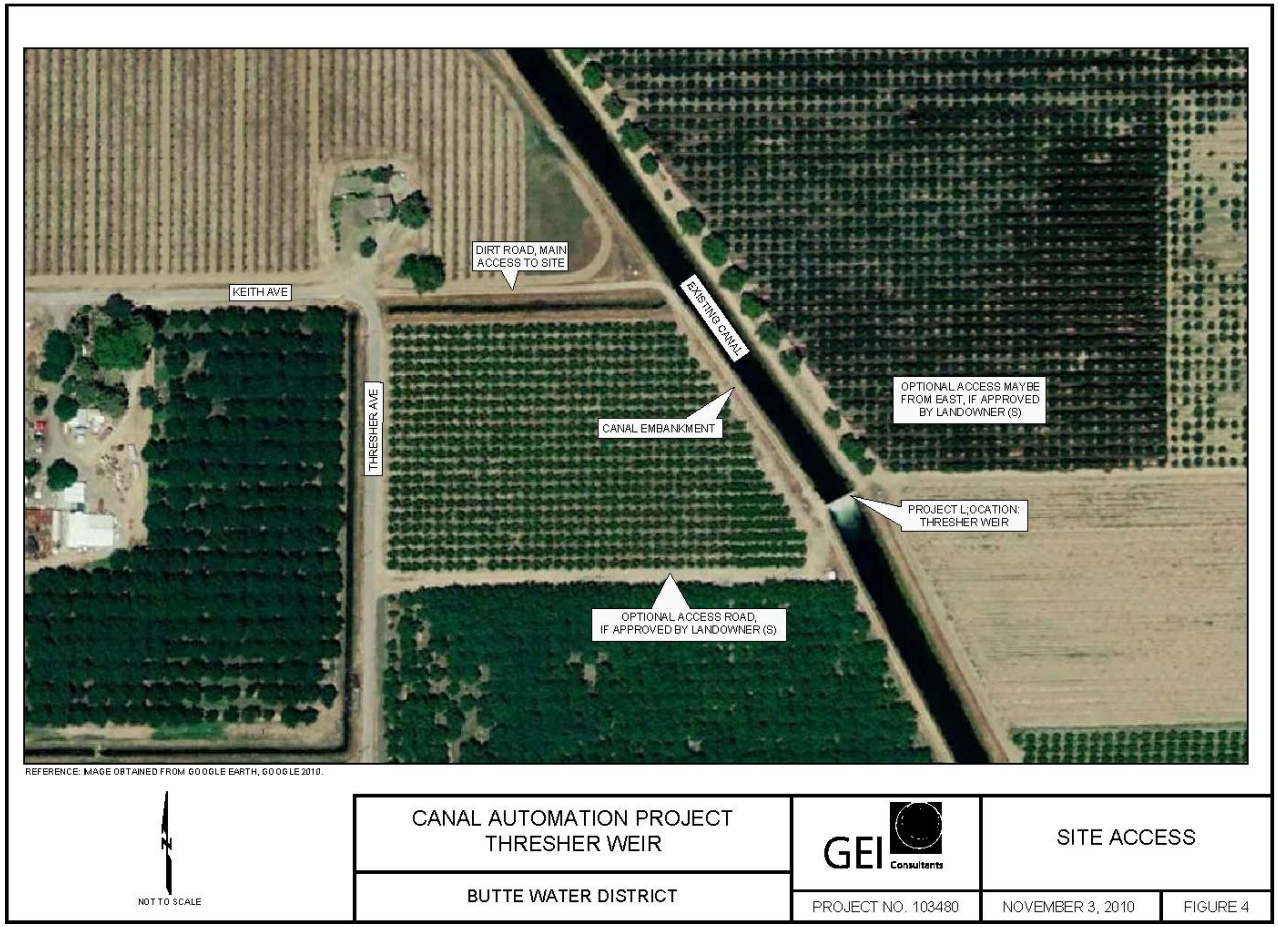

Figure 4: Site Access Locations

3.0 Affected Environment & Environmental Consequences

3.1 Surface Water Resources

3.1.1 Affected Environment

The Main Canal is fed from Thermalito Afterbay of Oroville Reservoir and extends for a distance of approximately 33 miles through Butte Water District and Sutter Extension Water District. In the two districts the canal serves approximately 32,800 acres of irrigated land and has a conveyance capacity of approximately 1,000 cubic feet per second (cfs) at the upstream end that tapers down to approximately 100 cfs in its southern-most reach. In addition to receiving water from Thermalito Afterbay, supplemental water is pumped into the canal from the Feather River at Sunset Pumps. Thresher Weir is located in the upstream portion of the Main Canal in an area where the canal capacity is approximately 900 cfs.

There are no natural streams, rivers, lakes, pools or other naturally-occurring bodies of water present in the Project area (the Project area is defined as the area that would have surface disturbance, or would be potentially affected by surface disturbance, caused by the proposed Project). The Feather River is within one mile east of the Proposed Project site. However, because of the small Proposed Project footprint and the nature of the project, the Proposed Project will have no impact on the river.

3.1.2 Environmental Consequences

No Action
Under the No Action Alternative, surface waters would be unaffected. The baseline condition would remain unchanged. Under the No Action Alternative, the Proposed Project would not be constructed; therefore the water conservation benefit of reducing spillage from the Main Canal and from laterals upstream of Thresher Weir would not be accomplished. This water conservation is estimated to total approximately 2,400 acre feet (ac-ft) per year.

Proposed Action
The Proposed Action would result in more efficient use of available irrigation water supplies by reducing spillage from the Main Canal and from laterals upstream of Thresher Weir by a total of approximately 2,400 ac-ft per year. The amount of water within the canal would remain unchanged as a result of the Proposed Action.

Construction of the Proposed Action would occur during the winter months when little to no water is present within the canal. Therefore, water quality would remain unchanged from the baseline condition.

The Proposed Project would not have an impact on either the quality or quantity of irrigation water supply. Natural surface waters would also be unaffected by the Proposed Project.

3.2 Groundwater Resources

3.2.1 Affected Environment

Seepage from the Main Canal has historically resulted in high groundwater in areas immediately adjacent to the Main Canal. While these high water tables have been problematic to growers owning land adjacent to the canal, they have helped support the local aquifer which is used by owners of private wells and by the District to conjunctively manage the groundwater resource so that groundwater is available to supplement canal deliveries during water-short years.

3.2.2 Environmental Consequences

No Action
Under the No Action Alternative, the weir would not be replaced. No impacts to groundwater conditions would occur.

Proposed Action
The Proposed Project does not involve lining, seepage control measures, or modification of the Main Canal or reoperation of the Main Canal; therefore, the Project's impact on groundwater resources would be negligible as would the Project's impact on regional groundwater levels influenced by seepage from the Main Canal.

3.3 Biological Resources

3.3.1 Affected Environment

The Main Canal is bordered by roads on both sides in the vicinity of the Proposed Project. Between the Main Canal and the roads, there is a narrow border of typical roadside weedy species of grasses and other herbaceous plants.

There are deciduous orchards immediately adjacent to the roads on both sides of the canal (Figures 5 and 6). The deciduous orchards in the Proposed Project area are open single-species tree dominated habitats with low, bushy trees and an open understory to facilitate harvest. Trees are arranged in a linear pattern, with uniform spacing between trees. The understory is managed to prevent understory growth totally or partially, but where understory growth occurs it is composed of low-growing grasses, legumes, and other herbaceous plants.

Figure 5: Main Canal, just downstream of Thresher Weir (note vegetation along canal, and orchards adjacent to the canal)

Figure 6: Main Canal at Thresher Weir (note vegetation on the far bank of the canal)

Deciduous orchards provide habitat for some species of birds and mammals such as rabbit, deer, squirrel, raccoon, American crow, house finch, and mourning dove (Schultze, 1999).

There are no undisturbed habitats such as vernal pools or wetlands in the Proposed Project area that would provide habitat for rare plants or animals. The specific habitat requirements of the species of interest potentially occurring in the Project area are listed in Table 1.This table was generated from the U.S. Fish and Wildlife Service (USFWS) California Natural Diversity Database (CNDDB), April 2011 for the two USGS quadrangles that surround the Proposed Project area (Gridley and Honcut).

Table 1: Species Identified in the Gridley and Honcut USGS 7.5-minute Quadrangles

Common Name	Scientific Name	Federal Status	CA State Status	Habitat in Area	Quad	Habitat Requirements
Vertebrates						
Bald Eagle	*Haliaeetus leucocephalus*	Delisted	Endangered	Presumed Extant	Gridley	Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches for feeding. Perches high in large, stoutly limbed trees, on snags or broken-topped trees, or on rocks near water. Roosts communally in winter in dense, sheltered, remote conifer stands. Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine, generally within one mile of water.
Bank Swallow	*Riparia riparia*	None	Threatened	Presumed Extant	Gridley and Honcut	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert; requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole
Giant Garter Snake	*Thamnophis gigas*	Threatened	Threatened	Presumed Extant	Gridley	Prefers freshwater marsh and low gradient streams, has adapted to drainage canals and irrigation ditches

Greater Sandhill Crane	*Grus Canadensis tabida*	None	Threatened	Presumed Extant	Gridley	Nesting territories in wet meadows, often interspersed with marsh land habitat
Silver-Haired Bat	*Lasionycteris noctivagans*	None	None	Presumed Extant	Gridley	Forested areas, especially old growth forests
Swainson's Hawk	*Buteo swainsoni*	None	Threatened	Presumed Extant	Gridley	Breeds in stands with few trees in juniper-sage flats, riparian areas and in oak savannah, and requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations
Tricolored Blackbird	*Agelaius tricolor*	None	None	Possibly Extirpated/ Presumed Extant	Honcut/ Gridley	Highly colonial species, most numerous in central valley vicinity, largely endemic to California; requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony…. often found nesting in freshwater marshes dominated by cattail (*Typha* spp.) and tules (*Scirpus* spp.), or in upland sites with blackberries, nettles or thistles.

Insects						
Valley Elderberry Longhorn Beetle	*Desmocerus californicus dimorphus*	Threatened	None	Presumed Extant	Gridley and Honcut	Endemic to moist valley oak riparian woodlands along margins of rivers and streams in the lower Sacramento and upper San Joaquin Valley where blue elderberry trees/shrubs (*Sambucus mexicana*) grow… some habitat found along Feather River
Plants						
Ahart's Dwarf Rush	*Juncus leiospermus var ahartii*	None	None	Presumed Extant	Honcut	vernal pool, altered vernal pool, grassland with vernal swale complex, and blue oak savanna with vernal swale complex land cover types
Ahart's Paronychia	*Paronychia ahartii*	None	None	Presumed Extant	Honcut	Vernal pools
Baker's Navarretia	*Navarretia leucocephala ssp. Bakeri*	None	None	Presumed Extant	Gridley	Meadows and vernal pools
Sanford's Arrowhead	*Sagittaria sanfordii*	None	None	Presumed Extant	Gridley	Freshwater marsh

Based on the habitat requirements described above, the Proposed Project area does not provide suitable habitat for the following species:

- Bald Eagle
- Bank swallow
- Greater Sandhill Crane
- Swainson's hawk
- Silver haired bat
- Valley elderberry longhorn beetle
- Ahart's Dwarf Rush
- Ahart's Paronychia
- Baker's Navarretia
- Sanford's Arrowhead

The Proposed Project does have potential to impact vegetation adjacent to the Main Canal and species associated with this habitat type such as the tricolored blackbird and giant garter snake, if suitable habitat is present at the Project site. The known locations for sensitive species in the Gridley and Honcut quadrangles are shown in Figure 7. No sensitive species have been recorded in the Project area.

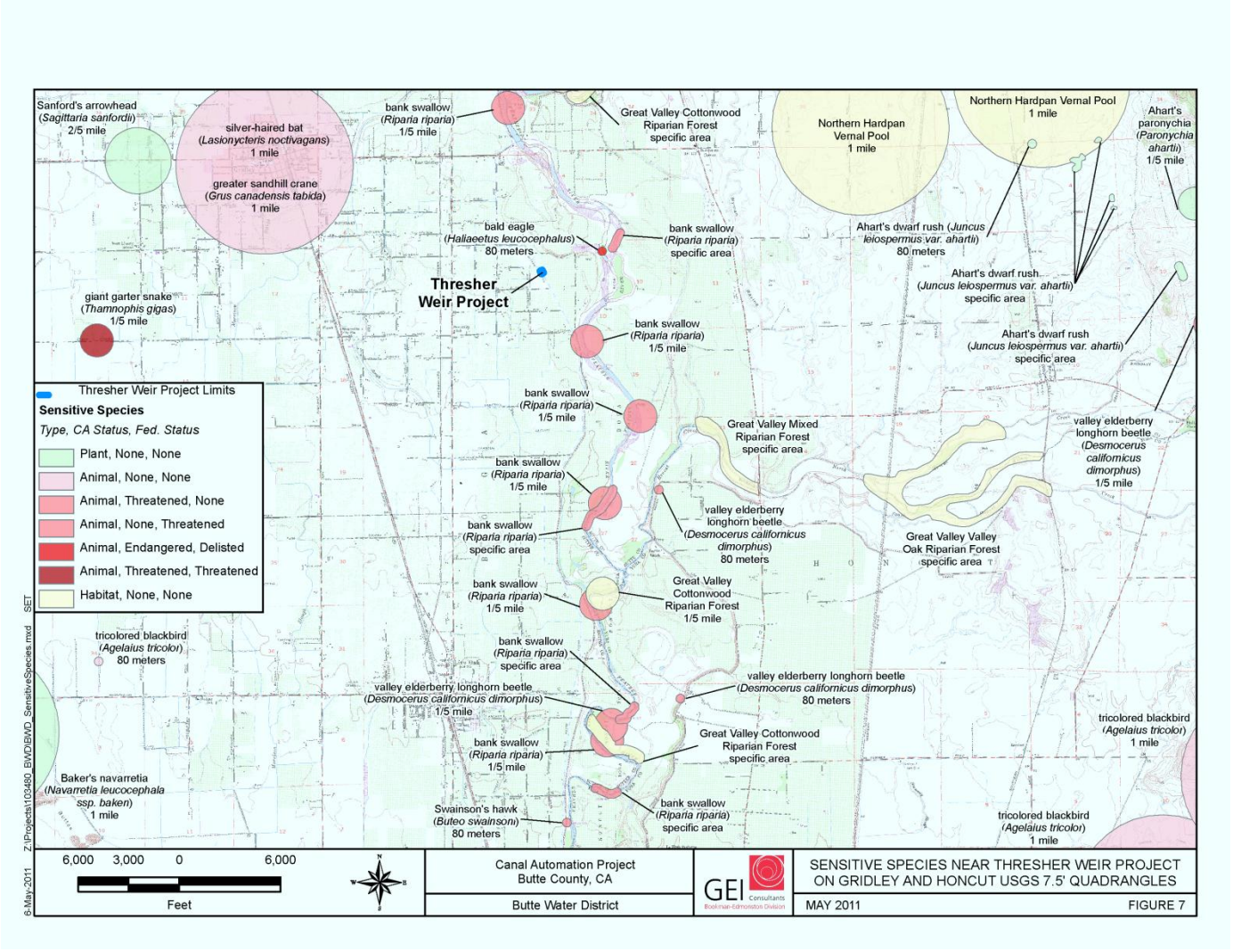

Figure 7: Sensitive Species near Project Area (Source: CNDDB, April 2011)

Tricolored Blackbird

According to the CNDDB, there is no documentation of tricolored blackbirds near the Proposed Project site. Habitat observed along the edges of the Main Canal does not appear suitable to support a large breeding colony due to the lack of wetland vegetation (cattails or tules) and the level of disturbance by humans (continuous road access along the Main Canal and agricultural activities).

Giant Garter Snake

Optimal or suitable habitat for the giant garter snake requires the presence of the following attributes (USFWS 1999):

- Adequate water during the active season early spring through mid-fall (March/April-October) to provide ample supply of food (e.g. tadpoles, frogs, small fish, small vertebrates)
- Emergent, herbaceous wetland vegetation providing cover during the active season and often found in the following habitat types:
  - Rice fields
  - Irrigation canals or drainage ditches
  - Freshwater marshes
  - Sloughs
  - Ponds
  - Other aquatic habitats
- Upland habitat with grassy cover and opening in waterside vegetation for basking
- Higher elevation upland habitats for cover and refuge (e.g. rodent burrows) from flood waters during the snake's inactive season in the winter (October-April)

The Proposed Project area is surrounded by orchards. Orchards do not provide suitable habitat for the giant garter snake, as they lack aquatic habitats and consequently, an adequate prey source.

According to the USFWS, there does not appear to be any upland habitat for giant garter snakes in the Project area. However, the Project area is within the historic range of giant garter snake and could be a movement corridor (J. Hanni, USFWS, personal communication, December 15, 2010).

3.3.2 Environmental Consequences

No Action
Under the No Action Alternative, there would be no impact to biological resources.

Proposed Action
Tricolored Blackbird
Since there are no documented breeding colonies in the vicinity of the Proposed Project and suitable breeding habitat is not available along the Main Canal, the Proposed Project is not expected to impact the tricolored blackbird.

Giant Garter Snake

Although the Proposed Project area does not contain suitable giant garter snake habitat, it could be a movement corridor for snakes. Potential impacts would be a disruption of migration if the Proposed Project were to be constructed during the migratory season. However, construction would occur during the non-migratory season when giant garter snakes are dormant. Reclamation has determined that the Proposed Project is not likely to adversely affect giant garter snakes and has informally consulted with USFWS. Mitigation measures as described below would be implemented by BWD to further avoid and minimize any potential impacts to giant garter snakes.

3.3.3 Mitigation Measures

Potential impacts to giant garter snake would be further reduced by limiting work to the snake's inactive period (October 2-April 30). During that time, giant garter snakes are dormant and would not be migrating. Since the project site is not habitat for giant garter snakes, but is a potential movement corridor, limiting work to the inactive period reduces the potential for impact.

The following Standard Avoidance and Minimization Measures[1] (USFWS, 1997) would be applied. By implementing these measures, take of these special-status species would be further reduced or eliminated. Since giant garter snake habitat is not being directly impacted, there are no mitigation or conservation measures, or compensation/set-asides proposed.

To avoid potential take of giant garter snake, the following measures would be implemented:

- Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.
- 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.
- Construction personnel should receive a USFWS-approved worker environmental awareness training. This training instructs workers to recognize giant garter snake and its habitat(s).

[1] The standard avoidance measures for giant garter snakes include a requirement to do construction during the active season (*versus* the migratory season). In this case, the USFWS has recommended construction in the inactive season (October 2-April 30), as described above. In addition, the standard avoidance measures require that any dewatered habitat remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat. Since the Proposed Project is not located in giant garter snake habitat, this mitigation measure does not apply to this Project.

- The project area should be surveyed for giant garter snakes 24 hours before construction activities. Survey of the project area should be repeated if a lapse in construction activity for 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 USFWS immediately by telephone at (916) 414-6600.
- 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 replanting species removed from banks or with emergent vegetation in the active channel.
- In the event that take cannot be avoided, contact the USFWS for information before starting the action.

During replacement of the weir, best management practices would be followed to ensure that this project is completed with minimal environmental impacts:

- Disturbance of vegetation shall be kept to a minimum.
- No debris, soil, etc., other than that already present within the well shall be allowed to enter the water.
- No intentional harassment, killing, or collection of plants or animals at or around the work sites.
- No firearms are allowed on site, except for those used by peace officers or CDFG wardens.
- No pets allowed.
- No off-road travel or work is permitted; all vehicles must be confined to existing levee roads.
- All trash, including food-related trash and cigarette butts, must be properly disposed of and removed.
- Storage of hazardous materials, such as fuel, oil, etc. shall not be allowed within 150 feet of waterways. Any chemical spills must be cleaned up immediately and reported as soon as possible.

3.4 Cultural Resources

Cultural resources is a term used to describe both "archaeological sites" depicting evidence of past human use of the landscape and the "built environment" which is represented in structures such as dams, roadways, and buildings. The National Historic Preservation Act (NHPA) of 1966, as amended, is the primary Federal legislation which outlines the Federal government's responsibility to cultural resources. Section 106 of the NHPA requires the Federal government to take into consideration the effects of an undertaking on historic properties included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Those resources that are included in, or eligible for inclusion in, the NRHP are referred to as "historic properties."

The Section 106 process is outlined in the Federal regulations under 36 CFR Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify historic properties and the level of effect that the proposed undertaking will have on historic properties. In summary, Reclamation must first determine if the action is undertaking that has the potential to affect historic properties. If so, then Reclamation must identify the Area of Potential Effects (APE); determine if historic properties are present within that APE; determine the effect that the undertaking will have on historic properties; and consult with the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO), where applicable, to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian tribes concerning the identification of sites of religious or cultural significance and to consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

The APE for the Project, as determined by Reclamation, consists of the old and new weir locations, the canal embankments subject to raising and recontouring, and the areas on either side of the canal that may be used for construction access and staging. The APE amounts to less than 1.0 acre in total. In an effort to identify historic properties in the APE, a cultural resources inventory was initiated by Genesis Society, a private cultural resources consulting firm. The inventory included a records search at the California Historical Resources Information System's Northeast Information Center (NEIC), correspondence with the Native American Heritage Commission (NAHC) as well as Native Americans identified by the NEIC as having interest in the project area, and a pedestrian survey of the entire APE. Reclamation's cultural resources staff also conducted archival research through the Butte County Historical Society, initiated Section 106 consultation with Indian tribes pursuant to 36 CFR Part 800, and conducted an additional survey of the APE. Reclamation will conclude consultation with the California SHPO prior to Project implementation.

3.4.1 Affected Environment

The Proposed Project is located in the northern Sacramento Valley, approximately one mile west of the Feather River, a major tributary of the Sacramento River. Human use of the Sacramento River and surrounding environs has a long history, dating back more than 7,000 years, and archaeological evidence indicates that by 4,000 years ago large villages were being established along major Sacramento Valley waterways (Rosenthal et al. 2007). At the time of Euro-American contact, the territories of the ethnographically-known Konkow, or Northwestern Maidu, and the Nisenan, or Southern Maidu converged near the Yuba River, located less than 15 miles south of the Project area. The Konkow preferentially settled on ridges and flats within river canyons but utilized a variety of valley resources during their yearly seasonal gathering cycle (Riddell 1978).

Historic-era impacts to the Feather River and surrounding areas include those associated with 19th century mining activities and the use and distribution of water for agriculture and domestic purposes as well as energy production. Construction of the Sutter-Butte Canal, on which the Project is located, began in 1904 under the auspices of the Butte County Canal Company. The approximately 30-mile long canal was originally designed to divert water from the Feather River, transporting it to users in Butte and Sutter counties. In 1911, canal ownership changed to the Sutter Butte Canal Company, and later, in 1957, a four-way joint water district partnership was formed among Richvale Irrigation District, Biggs-West Gridley Water District, BWD and Sutter Extension Water District to operate the canal (McGie 1980). In 1969, with the completion of Oroville Dam, the Sutter-Butte Canal point of diversion was moved from its original location on the Feather River to the Thermolito Afterbay and the current operating agreement among the four members of the joint water district partnership was established (Orme 2011). The existing Thresher Weir was constructed in 1967, replacing an earlier wooden weir that was positioned approximately one mile upstream (Melton 2011).

No prehistoric or ethnographic historic properties or cultural resources were identified in the APE as a result of the identification efforts described above. Two historic era cultural resources were identified in the APE. These are a segment of the Sutter-Butte Canal and the Thresher Weir. Due to the small scale and limited scope of the Project, the entirety of the Sutter-Butte Canal was not formally evaluated for NRHP eligibility; however, based on its historical impact on local agricultural and economic development in the region, the Sutter-Butte Canal is assumed eligible for NRHP inclusion. As the existing Thresher Weir is not yet 50 years old and does not represent a property of significant or exceptional importance, Reclamation has determined that the Thresher Weir is not eligible for NRHP inclusion.

3.4.2 Environmental Consequences

No Action
Under the No Action Alternative, there would be no impact to cultural resources from implementation of this Project.

Proposed Action
Under the Proposed Action Alternative, the existing Thresher Weir would be removed and a new automated weir would be constructed approximately 100 feet downstream from its current location in the Sutter-Butte Canal. The Sutter-Butte Canal is assumed to be eligible for NRHP inclusion; however, the removal and replacement of the weir as proposed will not adversely affect the function or overall design of the canal, nor will it alter the characteristics for which it is assumed NRHP-eligible, i.e., water conveyance, agricultural development, and economic growth in the area. The Thresher Weir was determined to be not eligible for NRHP inclusion. Overall, the Proposed Action will result in no adverse effect to historic properties pursuant to 36 CFR Part 800.5(b). As

such, there will be no significant impacts to cultural resources from implementation of this project.

3.5 Indian Trust Assets

3.5.1 Affected Environment

Indian Trust Assets (ITAs) are legal interests in property or rights held in trust by the United States for Indian Tribes or individuals. Trust status originates from rights imparted by treaties, statutes, or executive orders. These rights are reserved for, or granted to, tribes. A defining characteristic of an ITA is that such assets cannot be sold, leased, or otherwise alienated without federal approval.

Indian reservations, Rancherias, and allotments are common ITAs. Allotments can occur both within and outside of reservation boundaries and are parcels of land where title is held in trust for specific individuals. Additionally, ITAs include the right to access certain traditional use areas and perform certain traditional activities.

It is the policy of Reclamation to protect ITAs from adverse impacts resulting from its programs and activities whenever possible. Types of actions that could affect ITAs include an interference with the exercise of a reserved water right, degradation of water quality where there is a water right or noise near a land asset where it adversely affects uses of the reserved land.

3.5.2 Environmental Consequences

No Action
The No Action Alternative would have no effect on ITAs.

Proposed Action
The Proposed Action does not have a potential to affect ITAs. The nearest ITA is Mooretown Rancheria, which is approximately 11 miles northeast of the Project location.

3.6 Environmental Justice

3.6.1 Affected Environment

Executive Order 12898 requires each federal agency to achieve environmental justice as part of its mission, by identifying and addressing disproportionately high adverse human health or environmental effects, including social and economic effects, of its programs and activities on minority populations and low-income populations of the United States.

3.6.2 Environmental Consequences

No Action
The No Action Alternative would have no effect on low-income or minority individuals within the Project area.

Proposed Action
No significant changes in agricultural communities or practices would result from this Proposed Action. Accordingly, the Proposed Action would not have any impacts on low-income or minority individuals within the Project area.

3.7 Global Climate Change

3.7.1 Affected Environment

The United Nations Intergovernmental Panel on Climate Change predicts that changes in the earth's climate will continue through the 21st century and that the rate of change may increase significantly in the future because of human activity. Many researchers studying California's climate believe that changes in the earth's climate have already affected California and will continue to do so in the future. Climate change may seriously affect the State's water resources. Temperature increases could affect water demand and aquatic ecosystems. Changes in the timing and amount of precipitation and runoff could occur.

Climate change is identified in the 2005 update of the California Water Plan (Bulletin 160-05) as a key consideration in planning for the State's future water management. The 2005 Water Plan Update qualitatively describes the effects that climate change may have on the State's water supply. It also describes efforts that should be taken to quantitatively evaluate climate change effects for the next update to the Water Plan.

3.7.2 Environmental Consequences

No Action
The No Action Alternative would have no effect on climate change.

Proposed Action
The construction period for the Proposed Project is anticipated to be two months. The equipment that will be used for the construction include: small earth moving equipment, tools required for construction of formwork, equipment needed for placement of concrete, and cranes for placing pre-assembled gates. The quantity of greenhouse gases produced during this construction period would be insignificant. The Proposed Action would not include any significant change on the composition of the atmosphere and therefore would not result in adverse impacts to climate change.

4.0 Cumulative Impacts

According to the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA, a cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Reasonably foreseeable future actions include implementation of the SVIRWMP projects which include groundwater wells at Anderson-Cottonwood Irrigation District, Pelger/Sutter Mutual, and Meridian Farms. These sites are all several miles south of the Butte Water District and the Proposed Project would not contribute to any changes to groundwater conditions.

In 2005, BWD prepared an Environmental Resources Assessment to determine potential impacts of improvements along the Main Canal, including: 1) removal of bottlenecks in the Main Canal system, 2) concrete lining of the Main Canal system or part of the Main Canal, 3) installation of automated gates and weirs in all or part of the Main Canal, and 4) conjunctive management of surface and groundwater. The Proposed Action is the first of the improvements considered in the 2005 Assessment to be constructed. BWD does not anticipate removal of bottlenecks, concrete lining, or conjunctive management to be implemented any time in the foreseeable future, therefore no cumulative impacts are anticipated. However, BWD does anticipate rehabilitating other weirs along the Main Canal (projects similar to the Thresher Weir rehabilitation) at some point in the future. Rehabilitation of other weirs in the Main Canal would not result in cumulative impacts.

The Proposed Action would not result in cumulative impacts to any of those resources described within this EA.

5.0 Consultation and Coordination

This EA has been prepared in accordance with the requirements of NEPA. In addition to these laws described below, Reclamation is also complying with other applicable laws including the Clean Water Act of 1977, Clean Air Act of 1970, Executive Order 11988-Floodplain Management, Executive Order 11990-Protection of Wetlands, the Council of Environmental Quality Memorandum-Analysis of Prime or Unique Farmlands, and the Wild and Scenic Rivers Act.

5.1 Fish and Wildlife Coordination Act (16 USC. 651 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could affect biological resources. This is not a water development project; therefore, the FWCA does not apply.

5.2 Endangered Species Act (16 USC. 1521 et seq.)

Section 7 of this Act requires Federal agencies to ensure that all federally associated activities within the United States do not jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of the critical habitat of these species. Action agencies must consult with the USFWS, which maintains current lists of species that have been designated as threatened or endangered, to determine the potential impacts a project may have on protected species. Reclamation determined that the Proposed Action is not likely to adversely affect federally proposed or listed threatened and endangered species or their proposed or designated critical habitat (in this case, GGS). A BA was prepared and request for concurrence that the project is not likely to adversely affect GGS sent on June 24, 2011. At the time of this writing, a response has not been received from USFWS, but is anticipated and will be received prior to preparation of the Final EA and signing of the Finding of No Significant Impact.

5.3 Migratory Bird Treaty Act (16 USC § 703 ET SEQ.)

The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the Act, the Secretary of the Interior (Secretary) may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing,

selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns. The Proposed Action would not affect migratory birds therefore no further coordination is needed under the MBTA.

5.4 National Historic Preservation Act (16 USC 470 et seq.)

The NHPA of 1966, as amended, is the primary Federal legislation outlining the Federal government's responsibility to cultural resources. Specifically, Section 106 of the NHPA requires "[t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking." The process for implementing Section 106 of the NHPA is found at 36 CFR Part 800.

The Section 106 process requires consultation with Indian tribes, other interested parties, and the State Historic Preservation Officer (SHPO), or Tribal Historic Preservation Officer (THPO) if applicable. Reclamation has identified and consulted with Indian tribes pursuant to 36 CFR Part 800, and will conclude consultation with the California SHPO prior to Project implementation.

6.0 List of Preparers and Reviewers

GEI Consultants, Inc
David Miller, P.E., Project Manager
Ginger Gillin, Principal Environmental Scientist

Genesis Society
Sean Michael Jensen, Archeologist

Bureau of Reclamation
Shelly Hatleberg, Natural Resources Specialist
Joanne Goodsell, Archeologist
Laurie Sharp, Water Conservation Specialist

7.0 References

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U.S. Fish and Wildlife Service (USFWS). 1997. "Programmatic Consultation with the U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo counties, California. Appendix C Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake (Thamnophis gigas) Habitat." November 13, 1997 (http://www.fws.gov/sacramento/es/programmatic_consultations.htm) Directly accessed via: http://www.fws.gov/sacramento/es/documents/ggs%20appendix%20c.PDF Accessed April 4, 2011.

Appendix A: Biological Assessment

RECLAMATION

Managing Water in the West

BIOLOGICAL ASSESSMENT

Butte Water District Canal Automation – Thresher Weir Replacement Project

Project Location:
BUTTE COUNTY, CALIFORNIA
USGS 7.5 minute Quadrangles: Gridley & Honcut

June 2011

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Chapter 1 INTRODUCTION

The Bureau of Reclamation (Reclamation) proposes to provide funding to the Butte Water District (BWD) for its Main Canal Automation – Thresher Weir Replacement Project (Proposed Action). Under the Sacramento Valley Integrated Regional Water Management Plan (SVIWRMP) Grants Program, Reclamation provides financial assistance to support activities that promote the preparation and revision of written regional water management/conservation plans, implementation of activities identified in the written water management plans, demonstration of new or previously unknown water conservation management technologies and practices, and promote improved understanding of appropriate water conservation practices and principles. Reclamation is proposing to provide financial assistance to the BWD for the SVIRWMP revision and associated Proposed Action implementation. The Proposed Action would entail the automation of the BWD's Main Canal and the removal and relocation of their existing Thresher Weir (Figure 1). The Proposed Action would aid in achieving the water conservation objective of the SVIWRMP grants program.

Figure 1: Existing Thresher Weir

This BA has been prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536)) and follows the guidance standards Reclamation established under the National Environmental Policy Act (NEPA) and ESA.

1.1 Species Considered

A list of federally listed endangered, threatened, and proposed threatened or endangered species that have the potential to occur in the vicinity of the Proposed Action was obtained from the Sacramento USFWS website for the Gridley and Honcut U.S. Geological Survey (USGS) 7.5-minute quadrangles (Appendix A). These species would not be affected by the Proposed Action due to the lack of suitable habitat in the project area and will not be further addressed in this document.

Of the federally listed species considered for inclusion in this BA, only giant garter snake (GGS) (*Thamnophis gigas*) has the potential to occur in the action area and may be affected by the Proposed Action; accordingly, this species is the subject of this BA.

1.2 Authority

Each federal agency has an obligation to insure that any discretionary action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify its critical habitat unless that activity is exempt pursuant to the ESA (16 U.S.C. 1536(a)(2); 50 CFR 402.03).

Reclamation is providing financial assistance to BWD for SVIRWMP revision and implementation. The project is authorized under the Reclamation Act of 1902 (32 Stat. 388), as amended and supplemented; Public Law 108-361, Section 103(d)(5), Section 9504(a).

1.3 Consultation to Date

Reclamation staff (S. Hatleberg and J. Pinero) met with USFWS staff (J. Hanni) to informally discuss the Proposed Action in December 2010. It was agreed that the Proposed Action is not likely to adversely affect GGS because of the lack of suitable habitat and low likelihood that GGS would be found within the project area, but that the Main Canal could be used as a migratory corridor.

Chapter 2 PROPOSED ACTION

2.1 Proposed Action Area

The Proposed Action area for this project includes all areas affected directly or indirectly by project construction and operation, including areas outside the immediate construction area. For the purposes of this BA, the action area is defined as the project construction area, consisting of the existing weir, proposed new weir site, and associated staging areas (Figure 2).

2.2 Description of Proposed Action

The Proposed Project is located along a segment of the Sutter-Butte Main Canal, east of Thresher Avenue, approximately one mile west of the Feather River, and approximately two miles east of Gridley, in Butte County, California. The Proposed Action would involve removing the existing Thresher Weir and constructing a new weir approximately 100 feet downstream in the Main Canal. The new weir would be equipped with electrically-driven, remotely-operated gates and would require raising the existing canal embankment a maximum of three feet. There would be limited land recontouring adjacent to the canal (Figure 3). Lands affected total approximately one acre located within a portion of Section 9, Township 17 North, Range 3 East, as shown on the U.S. Geological Survey (USGS) Gridley, California, 7.5-foot series quadrangle. Construction and lay down areas have been identified on both sides of the canal bank (Figure 4).

The new weir would be located a maximum of 100 feet downstream from the existing structure. To keep the contractor's work area dry, the existing structure would remain in place during construction for use as a barrier to contain flows generated by water seeping from the canal banks during construction.

The embankments would be raised between the existing and new structures because the embankment downstream is lower than the upstream bank. If the embankments are not raised, the District would not be able to maintain current maximum operating water levels. The embankments would be raised a maximum of three feet between the existing and new structure (maximum length of 100 feet). An additional 50 to 60 feet downstream of the new structure would be needed to ramp down from the new embankment elevations to the existing embankment. The existing top width of the embankments would be maintained, which vary from 12 to 16 feet. It is expected that raising the embankments would push the toe of the new embankments out an additional 12 feet, approximately.

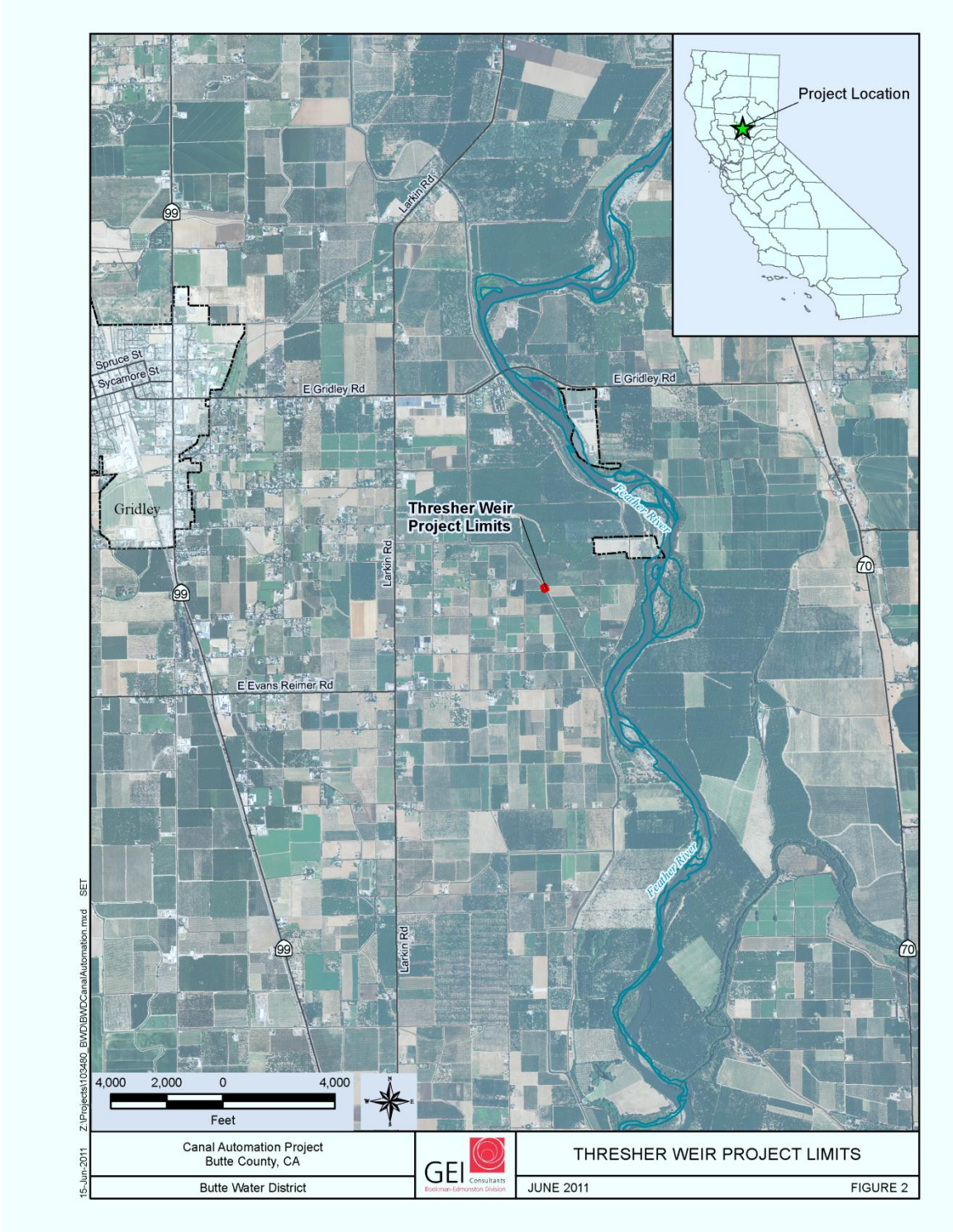

Figure 2: Project Location

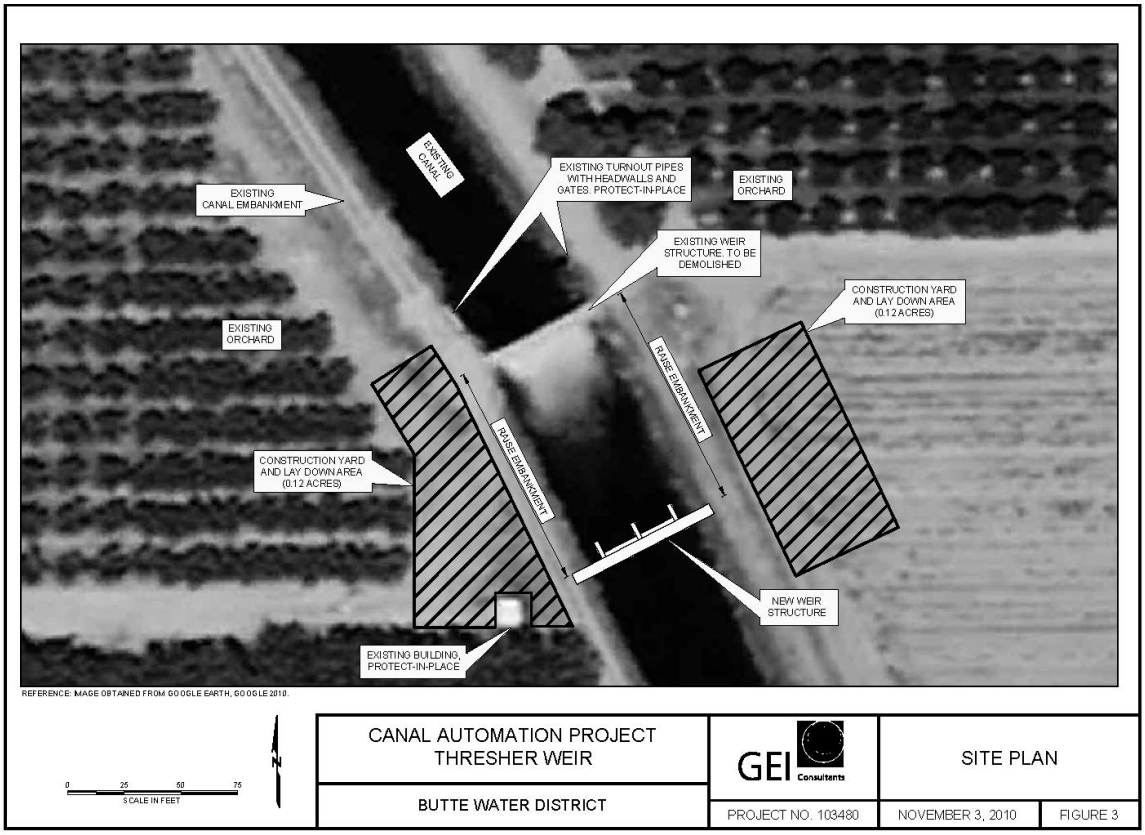

Figure 3: Site Plan

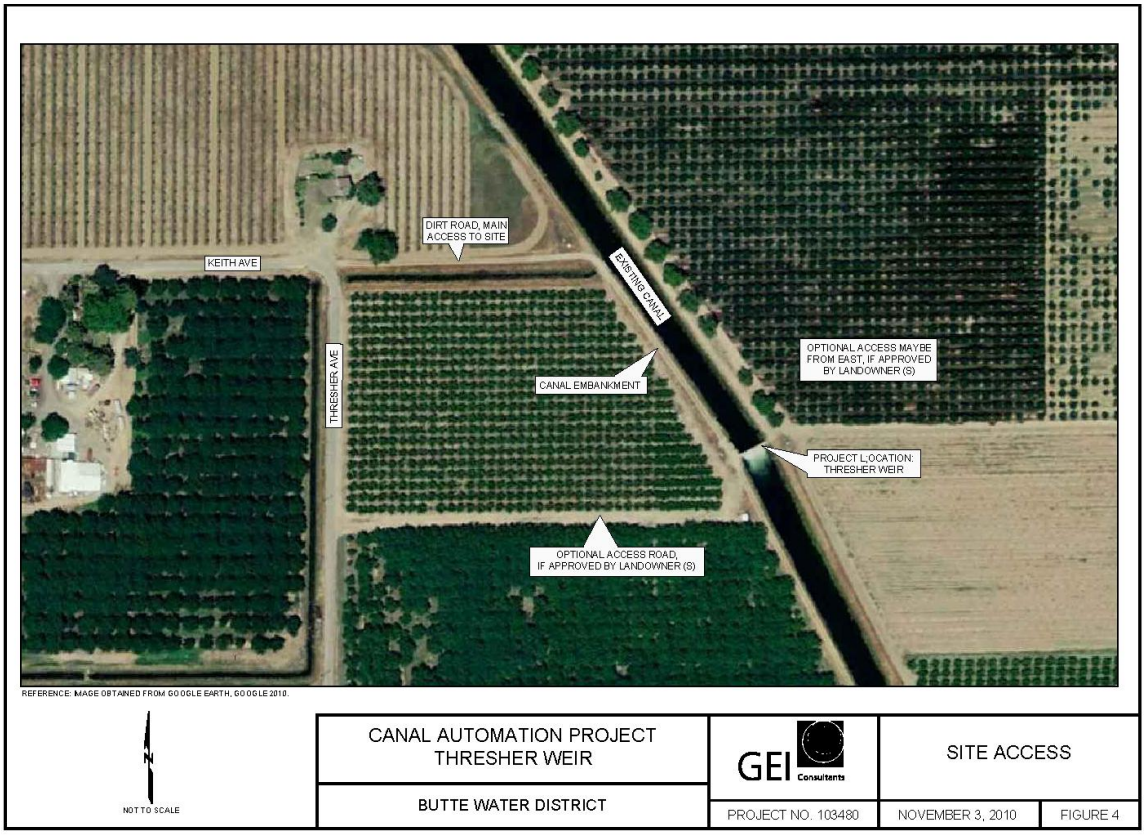

Figure 4: Site Access Locations

Site access would be via existing roads. Access to the Project site would be on Keith Avenue to Thresher Avenue, as shown on Figure 4.

Construction is expected to begin February 1, 2012 and end April 1, 2012. However the contractor may be under contract as early as December 2011. After April 1, 2012, the contractor is expected to be finalizing miscellaneous items and testing during April 2012.

Chapter 3 ENVIRONMENTAL BASELINE

Surveys over the last two decades have located GGS as far north as the Butte Basin in the Sacramento Valley (USFWS 1997). The USFWS recognizes 13 separate populations of GGS, with each population representing a cluster of discrete locality records which largely coincide with historical riverine flood basins and tributary streams throughout the Central Valley (Hansen 1980, Brode and Hansen 1992 as referenced in USFWS 1997). These populations are: (1) Butte Basin, (2) Colusa Basin, (3) Sutter Basin, (4) American Basin, (5) Yolo Basin-Willow Slough, (6) Yolo Basin-Liberty Farms, (7) Sacramento Basin, (8) Badger Creek-Willow Creek, (9) Caldoni Marsh, (10) East Stockton-Diverting Canal and Duck Creek, (11) North and South Grasslands, (12) Mendota, and (13) Burrel/Lanare. These populations span the Central Valley from just southwest of Fresno (i.e., Burrell-Lanare) north to Chico (i.e., Hamilton Slough). The 11 counties where GGS is still presumed to occur are: Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo. Since April 1995, the National Biological Survey (NBS; now known as the Biological Resources Division (BRD) of USGS) has further documented occurrences of GGS within some of the 13 populations identified in the final rule (58 FR 54053, October 1993). The BRD has studied populations of GGS at the Sacramento and Colusa National Wildlife Refuges (NWRs) within the Colusa Basin, at Gilsizer Slough within the Sutter Basin, and at the Badger Creek area of the Cosumnes River Preserve within the Badger Creek-Willow Creek area. These populations, along with the American Basin population of GGS represent the largest extant populations. With the exception of the American Basin, these populations are largely protected from many of the threats to the species. Outside of these protected areas, GGS in these population clusters are still subject to all threats identified in the final rule. The remaining nine population clusters identified in the final rule are distributed discontinuously in small isolated patches and are vulnerable to extirpation by stochastic environmental, demographic, and genetic processes. All 13 population clusters are isolated from each other with no protected dispersal corridors. Opportunities for recolonization of small populations which may become extirpated is unlikely given the isolation from larger populations and lack of dispersal corridors between them. (USFWS 1997)

In 2005, BWD prepared an Environmental Resources Assessment to determine potential impacts of improvements along the Main Canal, including: 1) removal of bottlenecks in the Main Canal system, 2) concrete lining of the Main Canal system or part of the Main Canal, 3) installation of automated gates and weirs in all or part of the Main Canal, and 4) conjunctive management of surface and groundwater. The Proposed Action is the first of the improvements considered in the 2005 Assessment to be proposed for construction. BWD does not anticipate removal of bottlenecks, concrete lining, or conjunctive management to be implemented any time in the foreseeable future. However, they do anticipate rehabilitating other weirs along the Main Canal (projects similar to the Thresher Weir rehabilitation) at some point in the future.

No additional projects have been identified within the area that could potentially impact GGS.

3.1 Potentially Affected Listed & Candidate Species & Critical Habitats

The following listed species is not likely to be adversely affected by the Proposed Action and is further addressed in this document:

- Giant Garter Snake (*Thamnophis gigas*)

3.1.1 Current Status

According to the USFWS Draft Recovery Plan for the Giant Garter Snake (1999), GGS inhabits wetland habitats within the Central Valley of California. Loss and fragmentation of wetland habitats have extirpated the GGS from the majority of its historic range. The USFWS listed GGS as threatened on October 20, 1993 (Federal Register 58:54053). No critical habitat has been designated for GGS.

3.1.2 Habitat Requirements and Limiting Factors

GGS inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley. Essential habitat components consist of: (1) adequate water during the snake's active season (early spring through mid-fall) to provide adequate permanent water to maintain dense populations of food organisms; (2) emergent, herbaceous wetland vegetation, such as cattails (*Typha spp*.) and bulrushes (*Scirpus spp*.), for escape cover and foraging habitat during the active season; (3) upland habitat with grassy banks and openings in waterside vegetation for basking; and (4) higher elevation upland habitats for cover and refuge from flood waters during the snake's inactive season in the winter (G. Hansen 1980, G. Hansen 1988, Brode and Hansen 1992, Hansen and Brode 1993 referenced in USFWS 1999).

GGS bask in bulrush, cattails, shrubs overhanging the water, patches of waterweed (*Ludwigia peploides*) and other floating vegetation, and on grassy banks. Riparian vegetation such as saltbush and willows (*Salix spp*.) provide cover from predation. GGS also bask in openings in vegetation, created by riprap placed around water control structures. GGS use small mammal burrows, typically with sunny exposures along south and west facing slopes, and other soil crevices above prevailing flood elevations during winter (November to mid-March) (G. Hansen 1993 referenced in USFWS 1999). Small mammal burrows, crayfish burrows, and soil crevices provide retreats from extreme heat for GGS during the active season (Hansen and Brode 1993 referenced in USFWS 1999). Wintering sites varied from canal banks and marsh locations, to riprap along a railroad grade near the marsh (Wylie et al. 1997 referenced in USFWS 1999). Wintering locations of radio-telemetered snakes tended to be in the vicinity of spring capture sites. GGS use burrows in the summer as much as 50 meters (164 feet) away from the marsh edge, whereas, overwintering snakes use burrows as far as 250 meters (820 feet) from the edge of marsh habitat (Wylie et al. 1997 referenced in USFWS 1999).

The width of uplands used by GGS varies considerably. Many summer basking and refuge areas used by GGS are immediately adjacent to canals and other aquatic habitats and may even be located in the upper canal banks. USFWS has considered 200 feet as the width of upland vegetation providing habitat along the borders of aquatic habitat for GGS (USFWS 2006 referenced in Reclamation 2009). GGS also seek refuge in upland burrows during hot summer weather and have been documented up to 164 feet from aquatic habitat during this time. In a dynamic habitat, GGS frequently move in response to changing conditions in their rice, marsh, canal and ditch habitats, especially during the dry summer months. Connectivity between GGS home range size has been estimated from multiple studies conducted at Colusa NWR, and movement patterns have been described from studies within the Natomas and Colusa Basins. Home range size at Colusa NWR was reported to be as large as 2,792 acres in 1997 (Wylie et al. 1997 referenced in Reclamation 2009) and 427 acres in 2001 (Wylie et al. 2002 referenced in Reclamation 2009). The Draft Recovery Plan for Giant Garter Snake reports home range sizes as large as 642 acres at Gilsizer Slough and 202 acres at Badger Creek (USFWS 1999). Home range size is likely inversely correlated with habitat quality; such that smaller home range sizes occur in areas with the highest quality habitat. Recent work by Wylie and Hansen suggest that as long as conditions are optimal, snakes will stay close to where they over-winter and larger home range sizes are typically in response to adverse conditions.

GGS can move relatively long distances. Wylie et al. 1997 documented snakes moving up to 4.8 miles over a few days in response to de-watering at Colusa NWR. In the Natomas Basin, snakes routinely moved over a half mile and distances of over a mile were recorded on more than one occasion (Wylie and Casazza 2000 referenced in Reclamation 2009). A Colusa Basin study recorded the longest average movement distances of 0.62 miles, with the longest being 1.7 miles, for sixteen snakes in 2006, and an average of 0.32 miles, with the longest being 0.6 miles, for eight snakes in 2007 (Wylie and Amarello 2008 referenced in Reclamation 2009).

Due to the direct loss of natural habitat, GGS rely heavily on rice fields in the Sacramento Valley, but also use managed marsh areas in Federal NWRs and State Wildlife Areas. Habitat loss and fragmentation, flood control activities, changes in agricultural and land management practices, predation from introduced species, parasites, water pollution, and continuing threats are the main causes for the decline of this species.

It has been suggested that selenium contamination and impaired water quality may be contributing factors in the decline of GGS (USFWS 1993 and USFWS 1999 as referenced in Hansen 2007). However, reptile toxicology information is lacking and no studies have been conducted that specifically examine toxicology in GGS (Hansen 2007). Research on species occupying a similar ecological niche as GGS (eastern water snakes) shows that bioaccumulation of trace elements, pesticides and other contaminants does occur in snakes and can result in adverse biological effects (Hansen 2007). While the effects of contaminants such as selenium on reptiles is not fully understood, toxicity thresholds are anticipated to be similar for reptiles, fish and birds, particularly for GGS which feeds exclusively on aquatic prey (USFWS 1993 and USFWS 1999 as referenced in Hansen 2007).

3.1.3 Status of Giant Garter Snake in Action Area

Rice fields represent a large area in Sutter and Butte Counties. Rice fields have become important habitat for GGS since the species' biological needs appear to coincide with the cycle of rice production. GGS are attracted to rice fields in the spring because the fields are flooded and provide an ample source of prey (amphibians and small fish) (USFWS 1999). About the time the fields are drained and harvested (September), GGS move to adjacent wetland habitats, ditches or canals where there is greater abundance of prey. Generally by late October/early November, GGS retreat into rodent burrows or sometimes riprap to hibernate through winter (USFWS 1999).

Near the Sutter NWR, Gilsizer Slough and Gray Lodge Wildlife Area, GGS often inhabit rice fields during the active season and adjacent wetland areas, drainage ditches, and canals. Orchards, also common in the project area (bordering both sides of Thresher Weir), do not provide suitable habitat for GGS due to the lack of aquatic habitats and prey source.

Chapter 4 EFFECTS OF THE PROPOSED ACTION

The potential environmental consequences resulting from construction, operation and maintenance of the Proposed Action are discussed below.

4.1 Direct Effects Analysis for Giant Garter Snake

The Proposed Action is not anticipated to adversely affect GGS due to the lack of suitable habitat within the Proposed Action area. In addition, construction timing will occur during the non-active period for GGS. Effects on GGS from construction activities are extremely unlikely to occur and, are thus, discountable. The Proposed Action area could be used as a migratory corridor; however, GGS would not be migrating through the area during the time of construction (January through April) and the Action area would be restored to pre-project conditions and therefore no indirect effects would occur as a result of the Proposed Action.

4.2 Interrelated and Interdependent Effects on Giant Garter Snake

There are no interrelated or interdependent actions associated with the Proposed Action.

4.3 Measures to Avoid Take of Special-status Species

Standard Avoidance and Minimization Measures for GGS would be implemented during construction although construction would occur during the non-active period (see below). By implementing these measures, take of these special-status species would be further reduced or eliminated. Since GGS habitat is not being directly impacted, there are no mitigation or conservation measures, or compensation/set-asides proposed.

To avoid potential take of GGS, the following measures would be implemented:

- Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.
- Confine clearing to the minimal area necessary to facilitate construction activities. Construction personnel should receive a USFWS-approved worker environmental awareness training. This training instructs workers to recognize GGS and its habitat(s).

- The project area should be surveyed for GGS 24 hours before construction activities. Survey of the project area should be repeated if a lapse in construction activity for 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 USFWS immediately by telephone at (916) 414-6600.
- After completion of construction activities, remove any temporary fill and construction debris, and wherever feasible, restore disturbed areas to pre-project conditions.
- In the event that take cannot be avoided, contact the USFWS for information before starting the action.

During replacement of the weir, best management practices would be followed to ensure that this project is completed with minimal environmental impacts:

- Disturbance of vegetation shall be kept to a minimum.
- No debris, soil, etc., other than that already present within the canal shall be allowed to enter the water.
- No intentional harassment, killing, or collection of plants or animals at or around the work sites.
- No firearms are allowed on site, except for those used by peace officers or CDFG wardens.
- No pets allowed.
- No off-road travel or work is permitted; all vehicles must be confined to existing levee roads.
- All trash, including food-related trash and cigarette butts, must be properly disposed of and removed.
- Storage of hazardous materials, such as fuel, oil, etc. shall not be allowed within 150 feet of waterways. Any chemical spills must be cleaned up immediately and reported as soon as possible.

4.4 Determination of Effects

Based on information presented within this BA and on discussions with USFWS, Reclamation has determined that the Proposed Action is not likely to adversely affect GGS.

Chapter 5 REFERENCES

Federal Register 58:54053. October 20, 1993. Listing of Giant Garter Snake as Threatened. http://ecos.fws.gov/docs/federal_register/fr2446.pdf

Hansen, E.C. 2007. Implementation of Priority 1 Recovery Tasks for the Giant Garter Snake (*Thamnophis gigas*) in Merced County, California. Report prepared for the U.S. Fish and Wildlife Service pursuant to FWS Agreement No. 802706G120, April 15, 2007.

U.S. Bureau of Reclamation. 2009. Drought Water Bank Biological Assessment.

U.S. Fish and Wildlife Service. 1999. Draft Recovery Plan for the giant Garter Snake (*Thamnopsis gigas*). USFWS, Portland, Oregon. ix+ 192 pp.

_____. 1997. Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California. November 13, 1997.

APPENDIX A
USFWS SPECIES LIST

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office
Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the GRIDLEY (560C) U.S.G.S. 7 1/2 Minute Quad

Database last updated: April 29, 2010
Report Date: June 20, 2011

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Candidate Species

Birds

Coccyzus americanus occidentalis

Western yellow-billed cuckoo (C)

Key:

(E) *Endangered* - Listed as being in danger of extinction.
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.
(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
Critical Habitat - Area essential to the conservation of a species.
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
(C) *Candidate* - Candidate to become a proposed species.
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
(X) *Critical Habitat* designated for this species

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office
Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the HONCUT (560D) U.S.G.S. 7 1/2 Minute Quad

Database last updated: April 29, 2010
Report Date: June 20, 2011

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

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