Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1 Sensitive Species Potentially in the ESL

Table 1 in **Section 3.3** list species known to occur or assumed present within the ESL. These species include Bidwell Knotweed (*Polygonum bidwelliae)*, BCM, vernal pool fairy shrimp, vernal pool tadpole shrimp, and giant garter snake (GGS).

4.2 Natural Communities of Special Concern

Vernal pools, vernal swale, seasonal wetlands, and other waters of the U.S. (other waters, which include, ephemeral and intermittent drainages) also occur within the ESL. Seasonal wetlands, and vernal pools occur in the eastern portion of the ESL adjacent to parcels 1, 2, 3, 4, 5, and 7 (**Figure 4 and Attachment A**). Valley Oak woodland, a CDFG natural community of special concern, also occurs within the ESL. Wetlands and Other Waters of the U.S., are discussed further in this section.

4.2.1. Survey Results

There is a total of 0.759 acre of jurisdictional features within the ESL. Wetlands are defined as "sites that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 [b], 40 CFR 230.3). To be considered under federal jurisdiction, a wetland must support positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology. Further descriptions of wetlands, as defined by Gallaway Consulting, Inc., can be found in the Wetland Delineation Map (**Attachment A**) and the soils descriptions (**Appendix E**) from the *Draft Delineation of Waters of the United States, State Route 32 Widening Project, City of Chico, Butte County, CA,* December 2005.

4.2.1.1 Avoidance and Minimization Efforts

Efforts were made to minimize and reduce impacts to wetlands within the proposed ESL; however, due the linear nature of the project, and the locations of the jurisdictional waters it was not logistically feasible to avoid all of the features. Construction will be limited to the existing right-of-way in all areas except for the Bruce Road intersection; thus, high quality habitat on adjacent parcels will be avoided.

4.2.1.2 Project Impacts

Choosing the alternative that is the least environmentally damaging practicable alternative to the resource has minimized direct and indirect impacts to waters of the

U.S. Directing the SR 32 Widening Project away from the sensitive habitats will preserve existing acreages of seasonal wetland communities. In areas where impacts are unavoidable compensatory mitigation will be used to offset loss.

Fresh Emergent Wetlands, Riparian Wetlands and Other Waters of the U.S.

Fresh Emergent Wetlands

Fresh emergent wetlands are those that can be defined as containing emergent vegetation such as Typha and Eleocharis. Emergent vegetation consists of rooted plants that have parts extending above the water surface for at least part of the year, and is intolerant of complete inundation over prolonged periods. Water depths vary but rarely exceed 2 meters (6.6 feet) for long periods. Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

Riparian

A narrow band of riparian vegetation is present along the banks of Dead Horse Slough in both locations as it crosses SR 32. The vegetation primarily consists of shrubs, including mule fat (*Baccharis salicifolius*), and arroyo willow (*Salix lasiolepis*). Trees are scattered along the stream, with an open canopy dominated by California sycamore (*Platanus racemosa*) and Fremont's cottonwood (*Populus fremontii*). The stream course generally dries in late July with small isolated pockets of water that typically evaporates by mid-August.

Other Waters of the United States

Within the SR 32 Widening Project, 11 other water features were delineated. Other Waters are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4). We applied the above definition when delineating all Other Waters of the US. The drainages exhibited ordinary high water marks and contained bed, bank, and scour morphology.

Of the 0.287 acre of fresh emergent wetlands and riparian wetlands 0.238 acre will be directly impacted (**Attachment A**). Direct impacts to other waters of the U.S. drainages will total 0.158 acre. Temporary impacts may occur to 0.139 acre of an ephemeral drainage ditch and three culverts that occur on the northeast corner of El Monte Avenue. These features will be restored back to the existing condition once construction is complete.

Seasonal features that occur in the parcels are in close proximity to vernal features and will be calculated as vernal features for mitigation purposes because of their

potential to support special-status species.

Vernal Pools

In addition to supporting positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology vernal pools exhibit unique characteristics. Vernal pools form where there is a soil layer below or at the surface that is impermeable or nearly impermeable (USFWS 2002). Precipitation and surface runoff become trapped or "perched" above this layer. Hardpans are formed by leaching, re-deposition, and cementing of silica materials from high in the soil horizon to a lower ("B") horizon (USFWS 2002). In addition, vernal pools typically occur in landscapes that, at a broad scale, are shallowly sloping or nearly level, but on a finer scale may be quite bumpy or uneven. Complex "mima" or mound-swale micro-relief, as is present on-site, results in the shallow un-drained depressions that form vernal pools. Since appropriate combinations of climate, soil, and topography often occur over continuous areas rather than in isolated spots, vernal pools in the Central Valley tend to occur in clusters called "complexes." Within these complexes, pools may be fed or connected by low drainage pathways called "swales". Swales are often themselves seasonal wetlands that remain inundated with water for much of the wet season. Vernal pools may remain inundated until spring or early summer, sometimes filling and emptying numerous times during the wet season. Vernal pools gradually dry down during the spring, often forming a unique "bathtub ring" of flowers from endemic vernal pool plants blooming successively at the pool margins.

Since presence of vernal pool invertebrates was assumed for vernal features, impacts to vernal pools and seasonal wetlands that have the potential to support vernal pool invertebrates are discussed in Section 4.4 below, which covers special-status animal species expected to occur within the project area.

4.2.1.3 Compensatory Mitigation

Fresh Emergent Wetlands, Riparian Wetlands and Other Waters of the U.S.

Compensation for direct impacts to an estimated 0.238-acre of fresh emergent wetlands and riparian habitat and 0.158-acre of other waters will be mitigated for at a ratio of 1:1 as approved by the COE. The City will purchase mitigation credits at a bank or mitigate off-site at a COE approved location.

4.3 Special-Status Plant Species

The only special-status plant species occurring within the project ESL is BCM. Butte County meadowfoam is a federally listed endangered species, a state listed endangered species, and has a CNPS listing of 1B. Bidwell's knotweed was also located within the ESL; however, this species is a CNPS List 4 species and is typically not afforded any protection under CEQA, thus it will not be discussed in further detail.

There is also marginal habitat for Red Bluff Dwarf Rush (*Juncus leiospermus* var. *leiospermus*), and Ahart's Paronychia (*Paronychia ahartii*) within the ESL. No plants of these species nor any other special-status species were found despite numerous survey visits by qualified botanists, therefore these species are assumed not present within the ESL (See **Appendix C** for surveyor qualifications).

4.3.1 Discussion of Plant Species

Butte County meadowfoam is a state and federal endangered species and a CNPS List 1B plant. According to V.H. Oswald Selected Plants of Northern California and Adjacent Nevada, 2002 (or Manual of the Vascular Plants of Butte County California), BCM inhabits vernally moist drainages and pools from the Chico Municipal Airport southward to Shippee Rd. and the Thermalito Forebay (2002). For this report, BCM "suitable habitat" is defined as habitat where BCM has the potential to occur or actually does occur. Documented populations of BCM that were located during surveys will be referred to as BCM occurrences.

The following BCM habitat description is taken from the *Draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon*, (USFWS, 2004):

> "*Limnanthes floccosa* ssp. *californica* found primarily in vernal swales and to a lesser extent on the margins of vernal pools. Both the swales and vernal pools where it grows are on alluvial terraces in annual grasslands with a mima mound topography. Swales vary in width from narrow channels to broad, pool-like areas. They may connect in branching, tree-like patterns or in net-like patterns around low mounds. Occupied swales are inundated periodically by water from the surrounding uplands, causing the soil to become saturated. However, *L. floccosa* ssp. *californica* does not persist in pools or swales that are inundated for prolonged periods or remain wet during the summer months, nor does it occur in drainages where water flows swiftly. One *L. floccosa* ssp. *californica* site near the Chico Municipal Airport is unusual in that it does not contain vernal pools or recognizable swales, which were most likely obliterated by earlier grading.
>
> The swales that support *L. floccosa* ssp. *californica* are generally less than 10 centimeters (3.9 inches) deep and pools are typically less than 30 meters (100 feet) long. In vernal pools, *L. floccosa* ssp. *californica* more often grows on the margins than in the bottom, but the pattern is reversed in swales, with the plants more often growing in the center. This plant typically occurs in long, narrow bands in connected swales or on pool margins but can be found in irregular clusters in isolated drainages. *L. floccosa* ssp. *californica* has also been found occasionally in disturbed areas, such as drainage ditches, firebreaks, and graded sites.
>
> *Limnanthes floccosa* ssp. *californica* occurs on soils of the Tuscan-Anita and

the Redding Igo complexes, specifically on the Anita and Igo soils, which are confined to the pools and swales. Tuscan and Redding soils are restricted to the mounds. Anita soils can be up to 50 centimeters (19.7 inches) deep, whereas Igo soils are no more than 18 centimeters (7.1 inches) deep; the two soils are underlain by iron-silica cemented and indurated hardpan, respectively, presumably because the former can hold roughly twice as much moisture. Confirmed occurrences have been found at 50 to 90 meters (165 to 300 feet) in elevation."

4.3.1.1 SURVEY RESULTS

Butte County meadowfoam was detected during botanical surveys performed by Shirley Innecken, and Mary Bailey, botanists, during the appropriate survey window on March 10, 14, and 24, 2005. Botanical surveys were also conducted on April 14, and 19 of 2004; however, BCM was not found. The discrepancy in sightings between 2004 and 2005 is probably due to the abnormally productive conditions during the spring of 2005.

4.3.1.2 Avoidance and Minimization Efforts

During botanical surveys, BCM was observed and recorded within the southern portion of the ESL. Based on the proposed road alignment, the road widening will directly impact 0.0001 acre of BCM and indirectly impact 0.1829 acre of BCM (**Figure 5**). Widening will occur symmetrically on both the north and the south sides to avoid impacting BCM on the adjacent properties.

4.3.1.3 Project Impacts

Direct Effects

The proposed action will have direct impacts on BCM populations during road widening activities on the south side of the road, just north of parcel 5. These impacts will result in direct impacts of 0.0001 acre of BCM and/or BCM suitable habitat (**Figure 5**). Direct impacts are areas where the proposed road widening will pave over or dig up existing BCM locations and/or suitable habitat. No direct impacts will occur to BCM populations west of Bruce Road.

Impacts from construction will occur predominantly from heavy equipment including, but not limited to, trucks, bulldozers, graders and other earthmoving equipment. The City will be responsible for mitigation for all impacts (**Table 2**).

Table 2. Butte County meadowfoam impacts estimate, SR 32 Widening Project, Chico, CA.

Impact Type	Area (sq.ft.)	Acres
Total of All Indirect Impacts =	7968.1	0.1829
Total of All Direct Impacts =	2.0	0.0001

Indirect Effects
Indirect effects will occur to populations of BCM within parcel 3 west of the black line depicted in **Figure 6** and are the same for both Alternatives 1 and 2. Some populations occur very close to the road but will still incur only indirect impacts due to protective measures such as erecting Environmentally Sensitive Area (ESA) and silt fencing, which should be placed as close to the limit of construction as feasible in order to provide the widest buffer possible. Indirect effects to BCM due to the widening of SR32 will total 0.183 acre.

Indirect impacts to BCM may occur due to possible changes in hydrology or run-off associated with construction. No indirect impacts are expected to occur east of the black line in parcel 3 based on the following reasoning: the elevation of the area is 2 to 10 feet above the road bed where all the construction will be taking place, all runoff from the road in this area will travel down the ditch and not into BCM populations or habitat. Dust control measures as described herein will be implemented to prevent dust associated impacts.

4.3.1.3 Compensatory Mitigation
To compensate for 0.0001 acre of direct impact and 0.1829 acre of indirect impact to BCM and BCM suitable habitat, the City will preserve and/or create additional habitat for BCM, using compensation ratios previously approved by the USFWS or a combination of the following options as described below.

The City will preserve directly impacted BCM habitat at a ratio of 19:1, for a total of 0.0019 acre, and indirectly impacted BCM habitat at a ratio of 5:1, for a total of 0.915 acre. Direct and indirect impacts to BCM habitat will total 0.917 acres. Preservation credits must be acquired from a USFWS-approved mitigation bank or conservation area. The exact amount of impact and mitigation must be confirmed after preliminary engineering design is completed.

The following three preservation options are being considered by the City:

1) Purchase 0.917 acre of BCM credits (if available at the time of purchase) from Dove Ridge Mitigation Bank. The actual fee paid will be that in effect at the time of payment.

2) Preserve and/or create 0.917 acre of BCM at the proposed Bidwell Ranch conservation area. As part of the mitigation plan for the Chico Municipal Airport project, Bidwell Ranch has been identified by USFWS as a suitable BCM conservation area; however, a final management plan has not been developed at this time. A final management plan will be developed by the City prior to the start of construction.

3) Establish 0.917 acre of new BCM preserve within a USFWS pre-approved off-site location. The City will be responsible for developing a monitoring plan, placing the property in a USFWS conservation easement, and assuring

an endowment fund will be available to protect the property for perpetuity.

Final compensation requirements and mitigation ratios for this project will be determined through consultation with USFWS. The exact cost to purchase preservation credits for project-related impacts will be determined at the time of purchase. Mitigation credits will be purchased and/or a conservation area and management plan will be established prior to any ground-disturbing activities in the ESL, including grading. Future consultation will consist of requesting a consistency determination from CDFG concerning state listed BCM.

Consultation. The exact cost to purchase preservation credits for project-related impacts will be determined at the time of purchase. Mitigation credits will be purchased prior to any ground-disturbing activities in the ESL, including grading. Future consultation will consist of requesting a consistency determination from CDFG concerning state listed BCM.

4.3.1.4 Cumulative Effects

Currently, there are several BCM populations that are in the process of or are proposed for protection in preserves. In addition to several large areas of BCM that are being placed in preserves, the USFWS is requiring that impacts be mitigated for at a 19:1 ratio for direct impacts, and a 5:1 ratio for indirect impacts, which is consistent with the Recovery Goal the this species. Thus, with the preservation of 0.917 acre of BCM and the minimal impacts (0.0001 acre) associated with the project, no cumulative effects are expected to occur.

4.4 Special-Status Animal Species Occurrences

Special-status animal species known to occur or with potential to occur within the ESL include: vernal pool invertebrates, western spadefoot toad, GGS, nesting swallows, tree nesting raptors, Swainson's hawk, and bald eagles. Based on consultations with NOAA for projects in the area, anadromous fish are not expected to occur. The western spadefoot toad and swallows do not require specific mitigation under the ESA or CESA; however, mitigation may be required by the lead agency if impacts are expected to occur.

4.4.1 Discussion of Animal Species

Aquatic Invertebrates

Based on previous surveys conducted near the ESL the three species of aquatic invertebrates including vernal pool fairy shrimp, California linderiella, and vernal pool tadpole shrimp are inferred to occur in the ESL. Protocol level surveys for these species have not been conducted within the ESL. However, previous protocol level surveys found special-status invertebrates in vernal pools within 0.5 mile of the ESL that are hydrologically connected to vernal pools within the ESL. The previously surveyed areas had similar pool size and characteristics, creating a high probability

that those species occur within the ESL as well.

Vernal pool tadpole shrimp are small crustaceans in the Triopsidae family and are federally listed as endangered. Their diet consists of organic debris and living organisms, such as fairy shrimp and other invertebrates. They inhabit vernal pools containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County, to the 89-acre Olcott Lake at Jepson Prairie. The vernal pool tadpole shrimp is known from 18 populations in the Central Valley, ranging from east of Redding in Shasta County south to the San Luis National Wildlife Refuge in Merced County, and from a single vernal pool complex on the San Francisco Bay National Wildlife Refuge in the City of Fremont, Alameda County (USFWS 1996).

Vernal pool fairy shrimp are federally listed as threatened and are widespread but not abundant. Known populations extend from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County. Along the central coast, they range from northern Solano County to Pinnacles National Monument in San Benito County. Four additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County, one in the mountain grasslands of northern Santa Barbara County, one on the Santa Rosa Plateau in Riverside County, and one near Rancho California in Riverside County. The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools including one exceeding 25 acres, it tends to occur in smaller pools. It is most frequently found in pools measuring less than 0.05 acre. These are most commonly in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands. Vernal pool fairy shrimp have been collected from early December to early May.

California fairy shrimp, also known as the California linderiella are a federal species of special concern and tend to live in large, fairly clear vernal pools and lakes. However, they can survive in clear to turbid water with a pH from 6.1 to 8.5, and they have been found in very small pools. They are tolerant of water temperatures from 41° to 85° F, making them the most heat tolerant fairy shrimp in California. The California fairy shrimp is the most common fairy shrimp in the Central Valley. It has been documented on most land forms, geologic formations and soil types supporting vernal pools in California, at altitudes as high as 3800 feet above sea level. Adults have been collected from late December to early May.

Giant Garter Snake is a federal and state listed threatened species. The 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. Because of the direct loss of natural habitat, the GGS relies heavily on rice fields in the Sacramento and San Joaquin Valley, but also uses managed marsh areas in federal national wildlife refuges and state wildlife areas. Giant garter snakes are typically absent from larger rivers because of lack of suitable habitat and emergent

vegetative cover, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations. However, some riparian woodlands do provide good habitat.

Primary habitat requirements consist of 1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; 2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; 3) grassy banks and openings in waterside vegetation for basking; and 4) higher elevation uplands for cover and refuge from floodwaters during the snake's dormant season.

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. However, when abundant cover is available, GGS may be able to persist with numerous predators that share the same habitats (Hansen 1990).

The Swainson's hawk is a state listed threatened species. It is a medium-sized hawk with relatively long, pointed wings and a long, square tail. Adult females weigh 28 to 34 ounces and males 25 to 31 ounces. Central Valley birds winter in Mexico and Columbia. Hawks from northeastern California have been satellite-transmitter tracked to Argentina. The diet of the Swainson's hawk is varied with the California vole being the staple in the Central Valley. A variety of bird and insect species are also taken. Over 85% of Swainson's hawk territories in the Central Valley are in riparian systems adjacent to suitable foraging habitats. Swainson's hawks often nest peripherally to riparian systems of the valley as well as utilizing lone trees or groves of trees in agricultural fields. Valley oak, Fremont cottonwood, walnut, and large willow with an average height of about 58 feet are the most commonly used nest trees in the Central Valley. Swainson's hawks require large, open grasslands with abundant prey in association with suitable nest trees. Suitable foraging areas include native grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Unsuitable foraging habitat includes crops such as vineyards, orchards, certain row crops, rice, corn and cotton crops. Suitable nest sites may be found in mature riparian forest, lone trees or groves of oaks, other trees in agricultural fields, and mature roadside trees (CDFG 1983).

Swainson's hawks were once found throughout lowland California and were absent only from the Sierra Nevada, north Coast Ranges and Klamath Mountains, and portions of the desert regions of the State. Today, Swainson's hawks are restricted to portions of the Central Valley and Great Basin regions where suitable nesting and foraging habitat is still available. Central Valley populations are centered on Sacramento, San Joaquin, and Yolo counties. During historical times (pre-1900), Swainson's hawks may have maintained a population in excess of 17,000 pairs. Based on a study conducted in 1994, the statewide population is estimated to be approximately 800 pairs. Surveys in 1998 and 1999 in the Owens Valley area of the

State revealed a larger population (about 20 pairs) than previously documented, centered around alfalfa fields in the area (CDFG 1983). The loss of agricultural lands to various residential and commercial developments is a serious threat to Swainson's hawks throughout California. Additional threats are habitat loss due to riverbank protection projects, conversion from agricultural crops that provide abundant foraging opportunities to crops such as vineyards and orchards which provide fewer foraging opportunities, shooting, pesticide poisoning of prey animals and hawks on wintering grounds, competition from other raptors, and human disturbance at nest sites (CDFG 1983).

Swainson's hawk foraging and nesting habitat exist on-site within the ESL, therefore mitigation for impacts will be required, as well as a pre-construction raptor nest survey.

A white-tailed kite is a state and federal listed species of concern. One was observed foraging within the ESL. According to Mayer and Laudenslayer (1998-90), white-tailed kites are common to uncommon, yearlong residents in coastal and valley lowlands; rarely found away from agricultural areas. They inhabit herbaceous and open stages of most habitats mostly in cismontane California and have extended range and increased numbers in recent decades. White-tailed kites prey mostly on voles and other small, diurnal mammals, occasionally on birds, insects, reptiles, and amphibians. They forage in undisturbed, open grasslands, meadows, farmlands and emergent wetlands.

Raptors in the orders Falconiformes (hawks, eagles, and falcons) and Strigiforms (owls) are protected in varying degrees under California Fish and Game Code, Section 3503.5, the Migratory Bird Treaty Act, as well as state and federal ESAs and CEQA.

Western spadefoot toad breeds from January to May in temporary pools where water temperatures must be between 48° F and 86° F. Typical of toads, they forage on a variety of insects, worms, and other invertebrates, including grasshoppers, true bugs, moths, ground beetles, predaceous diving beetles, ladybird beetles, click beetles, flies, ants and earthworms. Eggs are deposited on plant stems or pieces of detritus in temporary rain pools, or sometimes pools in ephemeral stream courses. Eggs hatch in 0.6-6 days depending on temperature. Larval development can be completed in 3 to 11 weeks and must be completed before pools dry. Age at sexual maturity is unknown, but considering the relatively long period of subterranean dormancy (8 to 9 months), individuals may require at least two years to mature.

Historically, the western spadefoot ranged from Redding to northwestern Baja California throughout the Central Valley, Coast Ranges and coastal lowlands. The species is found mostly below 3000 feet, but can occur up to 4500 feet. The average elevation of sites where the species still occurs is significantly higher than the average elevation for historical sites, suggesting that declines have been more pronounced in lowlands.

Nesting Migratory Birds. The Migratory Bird Treaty Act (MBTA) and related international treaties and domestic laws provide protection for migratory birds. The Migratory Bird Treaty Act established that all migratory birds and their parts (including eggs, nests, and feathers) are fully protected, including nesting swallows. The Migratory Bird Treaty Act is the domestic law that affirms, or implements, the United States' commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. Each of the conventions protects selected species of birds that are common to both countries (i.e., they occur in both countries at some point during their annual life cycle). USFWS is the federal agency primarily responsible for protection of migratory birds.

4.4.1.1 Survey Results

Species specific surveys for the abovementioned species (except swallows) were not conducted. However, based on existing data or observations made during field surveys, there is the potential for these species to occur. Vernal pool fairy shrimp, vernal pool tadpole shrimp, and California linderiella were assumed present based on known occurrences within the vicinity of the project. Swallows have been observed nesting under the South Fork Dead Horse Slough Bridge just east of Forest Avenue and a white-tailed kite was observed foraging within the ESL.

4.4.1.2 Avoidance and Minimization Efforts

The following minimization measures will be used to prevent impacts and the need for an incidental take permit per Section 9 of the ESA.

Vernal Pool Species

Widening will occur symmetrically on both the north and the south sides to avoid impacting vernal pool species on the adjacent properties to the greatest extent feasible. Vernal pools and swales occur in parcels 2, 3, 4, 5, 7, 8, and along the east side of El Monte Avenue near the intersection with SR 32 and may incur indirect impacts from run-off and dust during construction. In these areas, environmentally sensitive area (ESA) fencing and silt fencing will be installed as close to the limit of construction as feasible in order to provide the widest buffer possible, to prevent impacts from construction. The City will notify construction personnel of the sensitivity of the area.

Giant Garter Snake

The following terms and conditions implement reasonable and prudent measures for protecting GGS per the USFWS *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*, 1997 (GGS Programmatic) to minimize impacts.

1. The following terms and conditions implement reasonable and prudent measures

for protecting GGS per the GGS Programmatic:

A. All construction activity within GGS habitat shall be conducted between May 1 and October 1. This is the active period for GGS and direct impacts are lessened, because snakes are actively moving and avoiding danger. More danger is posed to snakes during their inactive period, because they are occupying underground burrows or crevices and are more susceptible to direct effects, especially during excavation. Between October 2 and April 30 the City will be required to contact the USFWS's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take. If the project is expected to go past the October 1 deadline the City must notify the USFWS by July 15 of the same construction season.

B. Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

C. Construction personnel shall participate in a USFWS worker environmental awareness program. Under this program, workers shall be informed about the presence of GGS and habitat associated with the species and that unlawful take of the animal or destruction of its habitat is a violation of the Act. Prior to construction activities, a qualified biologist approved by the USFWS shall instruct all construction personnel about: (1) the life history of the GGS; (2) the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas, such as rice fields, to the GGS; and (3) the terms and conditions of the BO. Proof of this instruction shall be submitted to the Sacramento Fish and Wildlife Office.

D. Within 24-hours prior to commencement of construction activities, the site shall be inspected by a qualified biologist who is approved by the USFWS's Sacramento Fish and Wildlife Office. The biologist will provide the USFWS with a field report form documenting the monitoring efforts within 24-hours of commencement of construction activities. The monitoring biologist needs to be available thereafter; if a snake is encountered during construction activities, the monitoring biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. GGSs encountered during construction activities shall be allowed to move away from construction activities on their own. Capture and relocation of trapped or injured individuals can only be attempted by personnel or individuals with current USFWS recovery permits pursuant to section 10(a)1(A) of the Act. The biologist shall be required to report any incidental take to the USFWS immediately by telephone at (916) 979-2725 and by written letter addressed to the Chief, Endangered Species Division, within one working day. The ESL shall be re-inspected whenever a lapse in construction activity of two weeks or greater has occurred.

E. Clearing of wetland vegetation will be confined to the minimal area

necessary to excavate toe of bank for riprap or fill placement. Excavation of channel for removal of accumulated sediments will be accomplished by using equipment located on and operated from top of bank, with the least interference practical for emergent vegetation.

F. Movement of heavy equipment to and from the ESL shall be restricted to established roadways to minimize habitat disturbance.

G. Preserved GGS habitat shall be designated as Environmentally Sensitive Areas and shall be flagged by a qualified biologist and avoided by all construction personnel.

H. After completion of construction activities, any temporary fill and construction debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions. Restoration work may include replanting emergent vegetation.

I. All wetland and upland acres created and provided for GGS compensatory mitigation shall be protected in perpetuity by a USFWS-approved conservation easement or similarly protective covenants in the deed. The conservation easement on the off-site compensatory mitigation habitat shall be recorded at the county recording office within 60 days of groundbreaking. The easement/deed, including a title report for the land area, shall be reviewed and approved by the USFWS prior to recording in the appropriate County Recorders Office(s). A true copy of the recorded easement/deed shall be provided to the USFWS within 30 days after recordation. Standard examples of deed restrictions and conservation easements are available from the USFWS upon request.

J. The City shall ensure compliance with the reporting requirements below.

Giant Garter Snake Reporting Requirements

The qualified biologist shall notify the USFWS immediately if GGSs are found on-site as detailed in term and condition 1D, and will submit a report including date(s), location(s), habitat description, and any corrective measures taken to protect the snake(s) found. The qualified biologist shall submit locality information to the CDFG, using completed California Native Species Field Survey Forms or their equivalent, no more than 90 calendar days after completing the last field visit of the ESL. Each form shall have an accompanying scale map of the site such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map and shall provide at least the following information: township, range, and quarter section; name of the 7.5' or 15' quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type.

A post-construction compliance report, if required by the USFWS shall be forwarded to the Chief, Endangered Species Division, at the Sacramento Fish and Wildlife

Office within 60 calendar days of the completion of each project. This report shall detail (I) dates that construction occurred; (ii) pertinent information concerning the applicant's success in meeting project mitigation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on federally listed species, if any; (v) occurrences of incidental take of federally listed species, if any; and (vi) other pertinent information.

The Sacramento Fish and Wildlife Office is to be notified within three (3) working days of the finding of any dead listed species or any unanticipated harm to the species addressed in this biological opinion. The USFWS contact person for this is the Chief, Endangered Species Division at (916) 414-6600.

Swallows

Work on the South Fork Dead Horse Slough Bridge will be prohibited during the swallows nesting season (generally March 1 to August 1) if swallows are nesting on the structure. This can be avoided if all old swallow nests are removed from the bridge prior to March 1 of the construction year. Old nests can be removed with water and/or knocking them down with poles and scrapers. Since swallows are strongly attracted to old nests or remnants of nests, all traces of mud shall be removed. After all old nests have been removed one of the following measures shall be implemented:

- Place exclusionary netting with a diameter of ¾ inches or less (high density, ultra-violet stabilized polyethylene twine) shall be installed on the underside of the existing bridge structure and extended 3 to 4 inches from the sides of the bridge so as to prevent swallows from gaining access or,

- Install “bird tape” prior to egg laying (late Feb to early March). Regularly (every 2-3 days, especially if construction is not ongoing) monitor the bridge for nest starts and remove with a pressure washer or shovel; which ever is the most convenient for the City. Make sure that no mud or other nesting material remains, because it increases the likelihood that they will continue trying to build nests. It requires constant monitoring during the nesting season (mid-February through August 15), as swallows are persistent nesters.

Swainson’s Hawk

There have been a number of reports of breeding pairs in the Chico vicinity; however, their nest trees have not been identified. The City has many large nest trees and open foraging areas in close proximity to the project that Swainson’s and other hawks may use opportunistically. The CDFG requires avoiding unnecessary destruction of nesting habitat, and where feasible, protect nesting and foraging habitat for these species in perpetuity. The paving of new areas for the widening of SR 32 will result in impacts to 27.75 acres of Swainson’s hawk foraging habitat and will occur within 1 mile of potential nest habitat and approximately 4 miles from the last known active nest.

Nesting Raptors

A pre-construction raptor survey shall be conducted April-May, or prior to construction activities, to determine the presence and location of nesting raptors in the ESL. Should nesting raptors be observed and impacted, appropriate mitigation or avoidance measures will be required per CDFG. Direct take of active nests, eggs, or birds is prohibited by CDFG and measures must be taken to minimize disturbance. Construction shall be avoided within 250 feet of nests during nesting season from March-July, or as required by CDFG. The project expects no impacts to raptor foraging or nesting habitat.

4.4.1.3 Project Impacts

Direct Effects
Direct effects occur at, or very close to, the time of the action itself. Examples include loss of habitat or sedimentation resulting from construction activities. Direct effects caused by the proposed action are expected to occur when suitable habitats of the special-status species included in this NES are removed and/or altered by heavy, earth-moving equipment.

Vernal Pool Species

The proposed project assuming Alternative 2 (which has the greatest direct impacts) will directly impact a total of 0.274 acre of habitat that may support federally listed vernal pool tadpole shrimp and vernal pool fairy shrimp (**Attachment A, Table 3**). The seasonal wetlands and swales are treated as habitat for vernal pool invertebrates based on the following parameters: 1) close proximity to vernal pools (step-over habitat); 2) hydrological connection to vernal pools during flood events; 3) seasonal fluctuation of water depth, which is required for the survival of vernal pool species; and 4) potential to support vernal pool species.

Table 3. Direct and indirect vernal impacts estimate for Alternatives 1 and 2, SR 32 Widening Project, Chico, CA.

Alternative 1		Alternative 2	
Direct Vernal Impacts	0.265 acre	Direct Vernal Impacts	0.274 acre
Indirect Vernal Impacts	0.906 acre	Indirect Vernal Impacts	0.904 acre

Giant Garter Snake

The proposed project has the potential to directly affect GGS habitat and GGS during the widening of Bridge No. 12-0135 and lengthening or replacement of the box culvert east of Bruce Road. Alternative 2, which has the greatest potential for impacts to GGS habitat, a total of 2.266 acres of GGS upland and aquatic habitat may be impacted. Direct impacts will occur to 2.115 acres of upland habitat and 0.135 acre

of aquatic habitat in the ESL (**Figure 6, Table 4**). An additional 0.015-acre of temporary impacts is expected to occur during the construction process (**Figure 6, Table 4**). Although Alternative 1 has less direct impacts, it has the potential to have greater temporary impacts (0.227 acre). All efforts will be made to minimize construction activity within the GGS upland habitat (undeveloped areas within 200 feet of Dead Horse Slough). In addition, minimization recommendations per the USFWS *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*, 1997 (GGS Programmatic) to minimize impacts. All construction within GGS habitat will be conducted May 1 through October 1, when water levels are low and GGS are active and will presumably avoid danger.

Table 4. Giant garter snake habitat impacts estimates for Alternatives 1 and 2, SR 32 Widening Project, Chico, CA.

Alternative 1			Alternative 2		
Type	**Area (ft^2)**	**Acres**	**Type**	**Area (ft^2)**	**Acres**
Aquatic (direct) Total	4058.8	0.093	Aquatic (direct) Total	5901.5	0.135
Upland (direct) Total	66169.8	1.519	Upland (direct) Total	92116.1	2.115
Aquatic (Temporary) Total	9880.7	0.227	Aquatic (Temporary) Total	668.7	0.015
Total of All Impacts	80109.3	1.839	Total of All Impacts	98686.3	2.266

Other Species

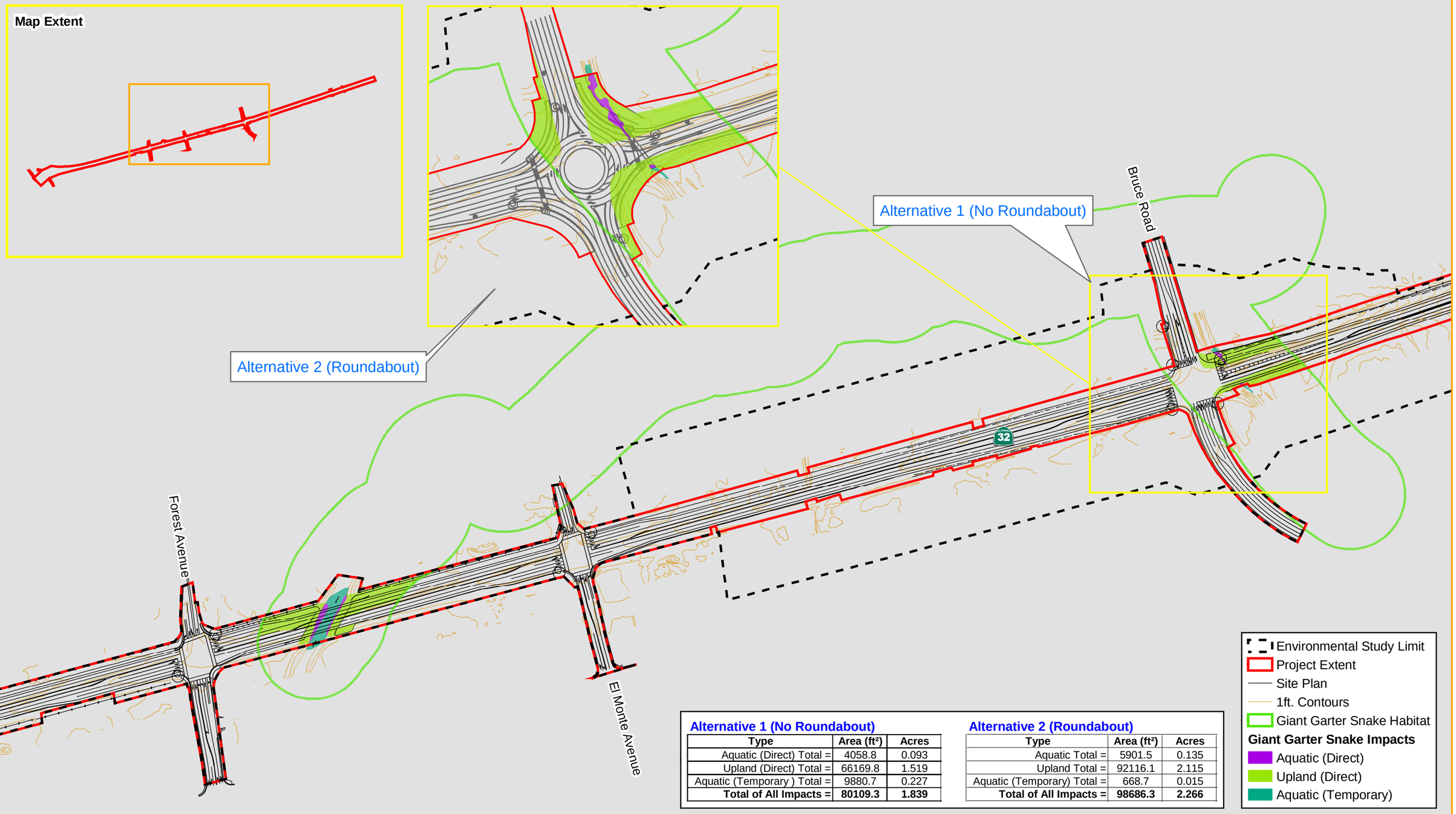
Impacts to nesting swallows or bald eagles are not expected to occur. Impacts are expected to occur to 27.75 acres of Swainson's hawk nesting and foraging habitat. Impacts to foraging were calculated per the CDFG recommended guidelines *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Centeral Valley of California* (CDFG 1994 [Staff Report]).

Direct impacts to 0.265 acre of vernal pools and indirect impacts to 0.906 acre of vernal pools could potentially adversely affect vernal pool species, including western spadefoot toad.

Indirect Effects

Indirect effects are caused by, or result from a proposed action, occur later in time, and are reasonably certain to occur.

The proposed action has the potential of indirectly affecting vernal pool tadpole shrimp and vernal pool fairy shrimp. Potential soil erosion generated from construction activities and changes in the hydrology around suitable habitat have the potential to harm special-status species. These indirect effects also have the potential to degrade habitat, and could result in the loss of a federally listed species. Therefore,



Alternative 1 (No Roundabout)

Type	Area (ft²)	Acres
Aquatic (Direct) Total =	4058.8	0.093
Upland (Direct) Total =	66169.8	1.519
Aquatic (Temporary) Total =	9880.7	0.227
Total of All Impacts =	**80109.3**	**1.839**

Alternative 2 (Roundabout)

Type	Area (ft²)	Acres
Aquatic Total =	5901.5	0.135
Upland Total =	92116.1	2.115
Aquatic (Temporary) Total =	668.7	0.015
Total of All Impacts =	**98686.3**	**2.266**

- Environmental Study Limit
- Project Extent
- Site Plan
- 1ft. Contours
- Giant Garter Snake Habitat

Giant Garter Snake Impacts

- Aquatic (Direct)
- Upland (Direct)
- Aquatic (Temporary)

Project Extent derived from MTCO CAD, Butte County parcel right of way & proposed avoidance.
GGS impacts derived from 200 ft. buffer of creek within proposed construction footprint.
Date of Aerial: Feb. 26, 2002/Map Date: Dec. 5, 2005.
Revised Jul. 5, 2006 & Sep. 13, 2006

0 200 400 Feet

GALLAWAY CONSULTING, INC.

Figure 6.

indirect effects associated with the proposed project could adversely affect special-status species occurring in the ESL. Impacts were calculated based on a 250 foot buffer per the *Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California. Sacramento, CA* (USFWS 1996 [Vernal Pool Programmatic]).

Indirect impacts to vernal pool species are expected to occur within 250 of construction within parcel 3 and total 0.906 acres of vernal pool habitat (**Attachment A, Table 2**). Alternative 1 has the greatest number of indirect impacts and was used when estimating the impact numbers (**Table 2**).

Based on topography, the area delineated by the black line east to Bruce Road is not expected to incur indirect impacts (**Attachment A**). This area is approximately 10 feet higher in elevation than the existing road; thus, there will not be a change to existing hydrology or impacts from run-off associated with construction.

Giant Garter Snake

Indirect impacts to GGS may occur due to the increase of human activities in the area. These impacts may include vehicular mortality, human intrusion, predation from domestic and wild animals associated with urban growth, and change in stream hydrology.

4.4.1.4 Compensatory Mitigation

Vernal Pool Species

To compensate for direct effects on an estimated 0.274 acre of potential habitat for federally listed vernal pool tadpole and fairy shrimp, the City will purchase suitable vernal pool fairy shrimp and vernal pool tadpole shrimp habitat at a ratio of 1:1 (1 acre preserved for every 1 acre of habitat affected) at a USFWS approved mitigation bank, for a total of 0.274 acre per the predetermined ratios set forth by the Vernal Pool Programmatic. If creation credits are not available at a bank the City will investigate mitigating at a USFWS approved off-site location at a 2:1 ratio (2 acres preserved for every 1 acre of habitat affected) for a total of 0.548 acre per the Vernal Pool Programmatic. If mitigation takes place at an off-site location the City will be responsible for developing a monitoring plan, placing the property in a USFWS conservation easement, and assuring an endowment fund will be available to protect the property for perpetuity.

To compensate for indirect effects on an estimated 0.906 acre of potential habitat for federally listed vernal pool tadpole and fairy shrimp, the City will preserve suitable vernal pool fairy shrimp and vernal pool tadpole shrimp habitat at a ratio of 2:1 (2 acres preserved for every 1 acre of habitat affected), for a total of 1.812 acres per the predetermined ratios set forth by the Vernal Pool Programmatic. The City

proposes to purchase vernal pool preservation credits from Dove Ridge Mitigation Bank or preserve features within in a USFWS approved off-site location. The actual fee paid will be that in effect at the time of payment. Mitigation credits will be purchased prior to any ground-disturbing activities in the ESL, including grading, or site grubing.

Giant Garter Snake

The City will mitigate for the loss of GGS habitat by acquiring a fee title or conservation easement for an off-site location. If an off-site location is not logistically feasible, alternative options will be investigated, such as purchasing mitigation credits in a bank (if available), or through the in-lieu species fund.

Per the GGS Programmatic, the City will mitigate for direct impacts to GGS upland and aquatic habitat at a ratio of 3:1 per Level 3 requirements. A total of 6.75 acres of GGS habitat will be created and/or preserved off-site. Temporary disturbances will be limited to one season, and on-site restoration in those areas will act as mitigation per the GGS Programmatic. These impact calculations are based on 35% project design. Once the project design has reached 65% project design, the numbers will be recalculated and, if different, will be submitted to the USFWS to assess the final required mitigation.

Other Species

The western spadefoot toad does not require specific mitigation under the ESA or CESA; however, mitigation may be required by the lead agency. Mitigation conducted for indirect impacts to vernal pools will satisfy any mitigation required for western spadefoot toad.

Impacts to Swainson's hawk involve disturbance to foraging habitat and disturbance within 10 miles of a nest that has been active anytime in the last 5 years, requiring mitigation under CESA.

Due to the lack of Swainson's hawk foraging habitat mitigation credits available, the City will purchase credits from the City wide in-lieu fund, which will be used to purchase Swainson's hawk habitat in the future or they will find a CDFG approved off-site location. Compensatory mitigation will occur per the Staff Report at a ratio of 0.75:1 (0.75 acre preserved for every 1 acre of habitat affected). The City will purchase credits or preserve 20.81 acres of Swainson's hawk habitat as their compensatory mitigation.

4.4.1.5 Cumulative Effects

Due to the fact that the special-status vernal pool species covered in this report, including vernal pool tadpole shrimp and vernal pool fairy shrimp, are endemic to vernal pools in the Central Valley, coastal ranges and a limited number of sites in the

transverse range and Santa Rosa plateau of California, the USFWS anticipates that a wide range of activities will be determined to effect these species (USFWS 1996). Such activities include, but are not limited to, urban, water, flood control, highway and utility projects, as well as conversion of vernal pools to agricultural use. Many of these activities will be reviewed under Section 7 of the ESA as a result of the federal nexus provided by issuance of a COE permit. The USFWS is currently unaware of any state, local, or private actions which, when considered in conjunction with the known environmental baseline for these species, will be likely to preclude the survival and recovery of listed vernal pool invertebrates (USFWS 1996).
Due to the fact that the special-status vernal pool species covered in this report, including vernal pool tadpole shrimp and vernal pool fairy shrimp, are endemic to vernal pools in the Central Valley, coastal ranges and a limited number of sites in the transverse range and Santa Rosa plateau of California, the USFWS anticipates that a wide range of activities will be determined to effect these species (USFWS 1996). Such activities include, but are not limited to, urban, water, flood control, highway and utility projects, as well as conversion of vernal pools to agricultural use. Many of these activities will be reviewed under Section 7 of the ESA as a result of the federal nexus provided by issuance of a COE permit. The USFWS is currently unaware of any state, local, or private actions which, when considered in conjunction with the known environmental baseline for these species, will be likely to preclude the survival and recovery of listed vernal pool invertebrates (USFWS 1996).

As previously mentioned, there are several projects that are scheduled to start near the SR 32 ESL. However, since no impacts are expected to occur to anadromous fish, nesting swallows, raptors, or bald eagles no cumulative impacts are expected. Impacts to western spadefoot toad will be mitigated for under the compensatory mitigation for vernal pools and Swainson's hawk habitat will be purchased through the in-lieu fund collected by the City. Cumulative impacts to Swainson's hawk will be minimal due to the sub-marginal habitat adjacent to SR 32, which is not ideal for foraging raptors due to the high volume of traffic and continuous noise. Thus, no cumulative impacts are expected.

Cumulative effects are not expected to occur to GGS due to the minimal impacts to habitat, compensatory mitigation, and the implementation of avoidance measures and BMPs.

4.5 Native and Non-native Trees

Oak woodlands consist of open to dense woodlands dominated interior live oak and valley oak. Understory is comprised of scattered shrubs, such as poison oak, coffeeberry, and manzanita. Various annual grasses including brome, wild oat, foxtail, and others make up the herbaceous layer. With the exception of riparian habitat, hardwood habitats including blue oak woodlands, provide breeding habitat for more wildlife species than any other habitat in California. Mayer and Laudenslayer (Mayer and Laudenslayer 1988) estimated in 1988 that these woodlands provide important breeding habitat for over 29 amphibian and reptile species, 57 bird

species and 10 mammal species. Bird species include primary and secondary cavity nesters and insectivores such as acorn woodpeckers, Nuttall's woodpecker, northern flickers, American kestrels, western screech owl, ash-throated flycatcher, western wood- peewee, oak titmouse.

4.5.1 Survey Results

Within the ESL, 345 trees of varying species occur that were either native oaks 2 inches or greater, or other tree species 4 inches or greater DBH (**Appendix F**, **Attachment B**). The majority of trees surveyed occur between SR 99 overpass and Forest Avenue in the east and westbound right-of-ways along SR 32. Most noted in the survey area are 173 valley oaks, primarily along existing fence lines separating private property from the SR 32 right-of-way, both on the north and south sides of SR 32. Fifty-nine trees of various species occur in the study area 24 inches or greater in DBH. In a well-planted section in the eastbound right-of way between the Highway 99 overpass and Forest Avenue, 60 redwood trees occur in a row, presumably from previous landscaping by CalTrans or the City. These trees are quite large and range from 10 to 41 DBH, most are 25 inches or greater DBH. Chinese pistache occur frequently (*n*=62) throughout the survey area, and were also planted for landscape. Other species occurring less frequently in the ESL are, catalpa, walnut, pecan, black locust, willow, mimosa, crab apple, magnolia, elm, ornamental plum, cork oak, poplar, and camphor.

The survey area is also highly vegetated by understory plants that were both landscape planted and which have naturally propagated on their own. These include redbud, bottlebrush, holly, toyon, privet, manzanita, and California grape. These species were prevalent in the survey area, though were not 4 inches or greater in DBH.

4.5.2 Avoidance and Minimization Efforts

All efforts were made to avoid native and heritage trees to the greatest extent possible. Trees that cannot be avoided due to safety reasons or the actual construction of the project will be replaced at prescribed ratios to minimize impacts.

4.5.3 Project Impacts

A total of 70 trees will need to be removed to construct the widening. Of theses 70 trees only 19 native trees will be impacted; 1 live oak and 18 valley oak. The remaining trees are not native to the Sacramento Valley. In addition, there are a number of trees located on the south side of the roadway from Fir Street to Forest Avenue that the City would like to remain. Final tree impacts will be determined prior to construction once the project plans reach 65% design.

4.5.4 Compensatory Mitigation

Per City of Chico 'Standard Mitigation Measures for Sites Containing Oak Trees', all native oak trees over 6 inches in diameter at breast height (DBH) on the project site shall be preserved to the maximum extent practical. Removal of any site trees shall not be permitted without review and approval by the City of Chico Urban Forester. The final development plan shall depict all trees proposed for removal. Any trees that are removed shall be replaced at a two to one landscaping tree replacement ratio. Prior to issuance of a grading permit, the applicant shall submit a tree preservation plan prepared by a qualified professional to the City Planning Division and Urban Forester for review and approval. The Tree Preservation Plan must meet standards outlined in the City's Tree Preservation Measures included in the City of Chico's 'Best Practices Technical Manual'. The Tree Preservation Plan shall also include the location and foliar extent of proposed pruning of tree branches, and the number, location, species, type and size of proposed replacement plantings.

All trees to be removed occur within the Caltran's right-of-way. A tree removal permit from the City is required prior to the removal of trees on City-owned property or within public right-of-way. Additionally, the City will be required to submit a tree removal request for trees within Caltrans right-of way. The Urban Forester has the authority to mitigate the loss of trees through replanting, and will determine appropriate mitigation on a project-by-project basis.