UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

September 18, 2012

In Response, refer to:
2011/02033:MRM

Aaron O. Allen, Ph.D.
U.S. Army Corps of Engineers
Los Angeles District
Ventura Field Office
2151 Alessandro Dr., Suite 110
Ventura, California 93001

Dear Dr. Allen:

Enclosed with this letter is NOAA's National Marine Fisheries Service's (NOAA Fisheries) Biological Opinion for the U.S. Army Corps of Engineers (Corps) permitting of a San Luis Obispo County Department of Public Works' (County) project to stabilize a 12-meter (m) section of streambank on See Canyon Creek near San Luis Obispo, California. This Biological Opinion addresses the effects of the proposed action on the threatened South Central California Coast Distinct Population Segment of steelhead (*Oncorhynchus mykiss*) in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U. S. C. 1531 *et seq.*).

The Biological Opinion concludes that the proposed action is not likely to jeopardize the continued existence of the Federally threatened steelhead or adversely modify critical habitat. NMFS believes the proposed action is likely to result in incidental take of steelhead, and therefore an incidental take statement is attached to the Biological Opinion. The incidental take statement includes reasonable and prudent measures that NMFS believes are necessary and appropriate to minimize and monitor incidental take of steelhead. Please call Matt McGoogan at (562) 980-4026 if you have a question concerning the Biological Opinion or if you would like additional information.

Sincerely,

for

Rodney R. McInnis
Regional Administrator

BIOLOGICAL OPINION

AGENCY: U.S Army Corps of Engineers

ACTION: The U.S Army Corps of Engineers' permitting of a bank stabilization project on See Canyon Creek near San Luis Obispo, California.

CONSULTATION CONDUCTED BY: National Marine Fisheries Service, Southwest Region

DATE ISSUED: **September 18, 2012**

TRACKING #: 2011/02033

I. CONSULTATION HISTORY

On May 12, 2011, NOAA's National Marine Fisheries Service (NMFS) received a written request for formal consultation from the U.S Army Corps of Engineers (Corps). The Corps is permitting a San Luis Obispo County Department of Public Works' (County) project to stabilize a 12-meter (m) section of streambank on See Canyon Creek near San Luis Obispo, California. This project is of concern because Federally threatened South-Central California Coast (SCCC) Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss*) are present in See Canyon Creek and this creek is designated critical habitat for the species. Because aspects of the project may cause short-term adverse effects to steelhead, the Corps requested formal consultation with NMFS. The consultation package received by NMFS on May 12, 2011, met the requirements for initiating formal consultation as defined in 50 CFR §402.14, and formal consultation was initiated on the same day. In a September 14, 2011, email the Corps notified NMFS of a change in the project description related to the addition of a habitat feature within the design. In order to develop a clear understanding of the effects the action including the proposed habitat feature, NMFS requested that the Corps provide a more detailed description of the habitat feature and the manner in which it would be installed before consultation could be concluded. On February 13, 2012 the Corps provided NMFS supplemental information related to the habitat feature sufficient for developing a complete understanding of the effects of the proposed action and concluding the consultation. Accordingly, NMFS prepared this biological opinion for the proposed action.

This biological opinion is based on the best scientific and commercial data available, including the project description and expected effects of the project on steelhead (Corps 2011), observations of See Canyon Creek and instream habitat noted by a NMFS biologist, and the ecological literature. A complete administrative record for this consultation is maintained on file

at NMFS' Southwest Regional Office (501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802).

II. DESCRIPTION OF THE PROPOSED ACTION

The Federal action is the Corps' permitting of the County's bank stabilization project on See Canyon Creek about 1.4 miles northeast of Avila Beach, in San Luis Obispo County, California. The main purpose of the project is to stabilize a 12 m section of streambank of See Canyon Creek that is threatening to undermine a portion of See Canyon Road immediately adjacent to the west of the creek. The instream portion of the work is expected to take about two weeks and will be conducted in late summer or early fall and is proposed to be completed no later than October 31st. The main components of the effort to stabilize this streambank include (1) isolating the work area from flowing water, (2) streambank and channel work to stabilize the area, and (3) restoration of the work area. Specific project activities and measures to minimize adverse impacts to steelhead as part of these major components are proposed as follows:

Isolating the Work Area from Flowing Water:

- Installing a stream diversion to allow for the isolation and dewatering of the work area (about 30 m of stream channel) prior to instream construction activities. The diversion would consist of a coffer dam installed at the upstream end of the work area and a pipe (to pass stream flow) extending from the coffer dam to a point downstream of the work area.

- Having a NMFS approved biologist conduct pre-construction surveys of the action area and remain present during installation (and removal) of the stream diversion. The biologist will relocate any steelhead found during dewatering to a suitable nearby instream habitat.

- Having a qualified biological monitor check the project site daily during construction on days where project activities could impact steelhead or critical habitat to ensure that all equipment and crews prevent contaminants, including sediment, from entering the stream. On days that no work will be completed on site or work to be completed is outside of the stream channel and determined to be unlikely to indirectly or directly impact steelhead or critical habitat, it is possible that no biological monitor will be deployed to check the site that day.

Streambank and Channel Work to Stabilize the Area:

- Operating heavy equipment (backhoe and/or excavator with auger or drill attachment) only from the roadway at the top of the western streambank. This is considered an existing access point that would require no new ingress point into the stream and would reduce disturbance to the stream channel and riparian vegetation.

- Removing some low lying herbaceous plants and a limited amount of woody vegetation (mostly poison oak) as well as minimal trimming of an oak tree overhanging the project

site.

- Drilling of holes in the streambed at the base of the failing bank for about 7 steel piles to support the bank stabilization structure.

- Installing concrete or steel lagging panels between each set of piles including backfill with crushed gravel, concrete, or grout.

- Backfilling space between panels and earthen bank with gravel and earthen road base material.

- Staging of heavy equipment offsite and away from the stream channel during non-work hours.

Restoration of the Work Area:

- Installing a digger log (a root wad) and associated 1.5 to 1-ton anchor boulders at the downstream end of the stabilized bank.

- Removing the stream diversion and all associated materials once instream work activities are complete.

- Revegetating any disturbed areas within the project site with appropriate native species.

The action area of the project covers about 75 m of stream channel in See Canyon Creek and about 0.15 acre of streambank on the west side of the creek. Steelhead have been observed in See Canyon Creek within the action area and See Canyon Creek is designated as critical habitat for the species. See Canyon Creek is a tributary to San Luis Obispo Creek, which is also designated critical habitat.

III. STATUS OF THE LISTED SPECIES

Because this biological opinion considers the potential effect of the proposed action on the Federally endangered SCCC DPS of steelhead and critical habitat for the species, the status of steelhead and critical habitat as well as the species' life history and habitat requirements are described as follows.

A. Status

Steelhead, an ocean-going form of rainbow trout, are native to Pacific Coast streams from Alaska to California and have decreased significantly from their historic levels (Swift *et al.* 1993). Reasons for the decline of steelhead (including factors affecting steelhead) include past and present destruction, modification or curtailment of the species habitat; over-utilization for commercial, recreational and educational purposes; disease and predation; and inadequacy of existing regulatory mechanisms (August 18, 1997, 62 FR 43937; January 5, 2006, 71 FR 834).

The decline of the species prompted listing of the SCCC DPS of steelhead as threatened on 18 August 1997 (62 FR 43937). This coastal steelhead occupies rivers from the Pajaro River, Santa Cruz County, south to but not including the Santa Maria River, Santa Barbara County.

NMFS characterized the abundance of steelhead in the SCCC DPS when the species was originally listed (August 18, 1997, 62 FR 43937) and cited this information as the basis for the recent relisting of SCCC steelhead (January 5, 2006, 71 FR 834). In the mid-1960s the California Department of Fish and Game estimated an annual run size of 17,750 adult steelhead spawning in this coastal DPS. Recent estimates for those SCCC rivers where comparative abundance information is available generally show a substantial decline during the past 30 years. For instance though no recent estimates for total run size exist for the entire DPS, there are recent run size estimates available for five rivers (the Pajaro River, Salinas River, Carmel River, Little Sur River, and Big Sur River). The total annual run of steelhead for these five rivers is currently estimated at fewer than 500 adults compared with a total of 4,750 for the same rivers in 1965, which suggests a substantial decline for this entire DPS from 1965 levels. Abundance observations for adult steelhead in the Carmel River are the only time series within the SCCC DPS with data gathered for 1964 through 1977 and 1988 to 2002 (Good *et al.* 2005). Based on these data there was a declining trend in the population from 1964 to the early 1990's but an increase in localized abundance (Good *et al.* 2005) in this system from the early 1990's to 2002. Despite this recent increase in abundance the estimated population of steelhead in this system is still less than 5% of historic population estimates and it is uncertain if this upward trend will be sustained into the future.

As part of the assessment and relisting of SCCC steelhead, NMFS convened a biological review team (BRT) composed of an expert panel of scientists. The BRT evaluated the viability and extinction risk of naturally spawning populations within each DPS. The BRT found high risks to abundance, productivity, and the diversity of the SCCC DPS and expressed particular concern for the DPS's connectivity and spatial structure. When a species is listed, Section 4(c)(2) of the Endangered Species Act (ESA) requires a review of the status of that species at least once every five years to determine if a change in status is necessary. During the most recent status review for SCCC steelhead (NMFS 2011) it was determined that there is little evidence to suggest that the biological status of the overall population has changed appreciably and factors for the population's decline appeared to have essentially remained unchanged. As a result, the review concluded that the SCCC population of steelhead should continue to be listed as a threatened population.

B. Life History and Habitat Requirements

The major freshwater life history stages of steelhead include freshwater rearing and emigration of juveniles, upstream migration of adults, spawning, and incubation of embryos (Shapovalov and Taft 1954; Moyle 1976; Barnhart 1991; Meehan and Bjornn 1991; Busby *et al.* 1996; August 18, 1997, 62 FR 43937). Steelhead rear in freshwater for one to three years before migrating to the ocean, usually in the spring and fall (Shapovalov and Taft 1954; Bjornn and Reiser 1991), where they may remain for up to four years. The timing of emigration appears to be influenced by photoperiod, streamflow, and temperature (Shapovalov and Taft 1954; Bjornn and Reiser

1991; Holubetz and Leth 1997). In some drainages, immature steelhead may rear in lagoon or estuary for several weeks prior to entering the ocean. Steelhead grow and reach maturity at age two to four while in the ocean. Generally, adults immigrate to natal streams for spawning during October to March, but some adults may not enter coastal streams until spring. In southern landscapes, such as San Luis Obispo County, adult steelhead enter streams during December through March for spawning. Adults may migrate several miles, hundreds of miles in some watersheds, to reach their spawning grounds. Although spawning may occur in late winter and early spring, the specific timing of spawning may vary a month or more among streams within a region. Steelhead do not necessarily die after spawning and may return to the ocean, sometimes repeating their spawning migration one or more years. Female steelhead dig a nest in the streambed and then deposit their eggs. After fertilization by the male, the female covers the nest with a layer of gravel; the embryos incubate within this gravel pocket. Hatching time varies from about three weeks to two months depending on water temperature. The young fish emerge from the nest two to six weeks after hatching.

Habitat requirements of steelhead in streams generally depend on the life history stage (NMFS 2005), and essential features of steelhead habitat include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. Generally, discharge, water temperature, and water chemistry must be appropriate for adult and juvenile migration (specific habitat requirement data can be found in Bjornn and Reiser 1991). Low discharge, high water temperature, physical barriers, low dissolved oxygen, and high turbidity can delay or halt upstream migration of adults and timing of spawning, and downstream migration of juveniles and subsequent entry into estuary, lagoon, or ocean. Suitable water depth and velocity, and substrate composition are the primary requirements for spawning, but water temperature and turbidity are also important. Dissolved oxygen concentration, pH, and water temperature are factors affecting survival of incubating embryos. Fine sediment, sand and smaller particles, can fill interstitial spaces between large substrate particle types, thereby reducing waterflow through and dissolved oxygen levels within a nest. Juvenile steelhead require different combinations of water depth and velocity, shelter from predators and harsh environmental conditions, food resources, and suitable water quality and quantity, for growth and survival during summer and winter. Young-of-the-year and yearling steelhead generally use riffles, runs and pools (e.g., Roper *et al.* 1994) during much of a given year where these habitats exist. Young-of-the-year and older juveniles may seek cover and cool water in pools during summer (Nielsen *et al.* 1994) particularly as discharge, and therefore space, declines in summer and fall (Kraft 1972).

C. Status of Critical Habitat

Critical habitat for the SCCC DPS was designated on September 2, 2005, and consists of the stream channels listed in 70 FR 52488, including See Canyon Creek and the action area. Critical habitat has a lateral extent as defined by the bankfull discharge, also known as a 2-year flood event. Estuarine areas of listed streams are also included in the designation, but the riparian zone is not included in the designation. Primary constituent elements (PCE) within these streams essential for the conservation of the DPS are those sites and habitat components that support one

or more steelhead life stages. These include freshwater spawning sites and rearing sites with water quantity and quality sufficient to form and maintain physical habitat conditions that support juvenile growth and mobility. PCEs also include natural cover such as shade, submerged and overhanging large wood, logjams, beaver dams, aquatic vegetation, large rocks, boulders, side channels and undercut banks (September 2, 2005, 70 FR 52488). Additional PCEs of critical habitat consist of freshwater migration corridors free of obstruction and excessive predation that have sufficient water quantity and quality, and physical cover within migration corridors that supports steelhead mobility and survival, as well as estuarine areas that also share these attributes. Also listed as PCEs are juvenile and adult steelhead food forage, including aquatic invertebrates and fishes that support steelhead growth and maturation (September 2, 2005, 70 FR 52488).

Streams designated as critical habitat in the SCCC DPS have the above PCE attributes to varying degrees, depending on the stream location and the impacts associated with the watershed. NMFS' most recent status reviews for SCCC steelhead (Good *et al*. 2005, NMFS 2011) identified habitat destruction and degradation as serious ongoing risk factors for this DPS. Urban development, flood control, water development, and other anthropogenic factors have adversely affected the proper functioning and condition of some spawning, rearing, and migratory habitats in streams designated as critical habitat. Urbanization has resulted in some permanent impacts to steelhead critical habitat due to stream channelization, increased bank erosion, riparian damage, migration barriers, and pollution (Good *et al*. 2005). Many streams within the DPS have dams and reservoirs that mute flushing stream flows, withhold or reduce water levels suitable for fish passage and rearing, physically block upstream fish passage, and retain valuable coarse sediments for spawning and rearing. In addition, some stream reaches within the DPS' designated critical habitat may be vulnerable to further perturbation resulting from poor land use and management decisions.

IV. ENVIRONMENTAL BASELINE

This section describes the status of steelhead in the action area and factors affecting steelhead.

A. Status of Steelhead in the Action Area

Generally, the instream habitat within the action area currently provides opportunity for migration, rearing, and spawning by steelhead. This section of See Canyon Creek is characterized mostly as a sequence of pool and riffle habitats with an occasional run. This section of stream is perennial, though flows are lowest during the summer months. There are two or three small pools connected by riffles within the project reach. The substrate is largely composed of gravel and small cobbles with some deposits of sand and finer material. There are undercut banks and overhanging vegetation through the reach that provide good cover habitat. Riparian vegetation in the area is composed of willow, sycamore, alder, and some oak trees.

At least five juvenile steelhead were observed in the small pool at the base of the failing bank during a June 2011, site visit by NMFS' biologist (Matt McGoogan); however a large undercut

in the bank and other cover in the stream made it difficult to determine if additional steelhead were present in this pool. In a recent study, NMFS' biologists sampled 672 juvenile steelhead from 9 pool habitats (an average of about 75 steelhead per pool) in See Canyon Creek in reaches with similar characteristics to those found in the action area (Spina *et. al.* 2006). This study found a mean density (± 1 standard deviation) of 1.2 (0.5) fish/m² for age-0 steelhead and 0.1 (0.1) fish/m² for age-1 and older steelhead. In consideration of densities observed in the study, observations of juvenile steelhead in the action area, and habitat size (*i.e.*, two to three pools and an additional 10 to 20 m² riffle and run habitat within the portion of the action area to be dewatered), NMFS expects that there would be no more than 250 juvenile steelhead in the area during the summer months when instream project activities would occur.

B. Factors Affecting Steelhead in the Action Area

The majority of adjacent land to See Canyon Creek is rural with a few scattered private residences, farms, and occasional pastures and orchards. There is potential for increased turbidity or nutrient loading due to runoff from agriculture and livestock areas adjacent to the creek. High turbidity concentrations can cause fish mortality, reduce fish feeding efficiency and decrease food availability (Berg and Northcote 1985, McLeay *et al.* 1987, Gregory and Northcote 1993, Velagic 1995). Prolonged exposure to elevated concentrations of inorganic sediment can caused decreased growth in salmonids (Shaw and Richardson 2001). In addition, there is evidence that pumping groundwater for municipal consumption and agricultural use may be reducing the amount, extent and duration of surface flows in See Canyon Creek (M.McGoogan, NMFS, pers. obs.). Lowered flows or stream drying can mean a significant reduction or loss of habitat and even mortality to steelhead (Spina *et. al.* 2006, Cushman 1985).

At least one impediment to upstream steelhead migration within the See Canyon Creek watershed has been identified (M.McGoogan, NMFS, pers. obs) a couple miles upstream of the action area. The impediment appears to be some form of grade-control structure to protect a stream crossing or possibly a water line. Under certain flow conditions this structure delays or entirely prevents upstream steelhead passage and thereby reduces opportunities for steelhead to access additional spawning and rearing areas higher in the watershed. As a result, overall steelhead productivity and rearing capacity in the watershed can be reduced, and thereby reducing the viability of the overall population of steelhead in See Canyon Creek including the action area.

V. EFFECTS OF THE PROPOSED ACTION

This section describes potential effects of the proposed action on SCCC steelhead and critical habitat for the species. To identify the potential effects, NMFS reviewed the ecological literature concerning the effect of habitat changes on steelhead and aquatic habitat, and carefully considered the type, amount and extent of habitat changes that are expected to result from the proposed action. A general knowledge of physical and biological processes, population dynamics, and the life history and habitat requirements of steelhead supplemented the literature review, particularly where there was little or no information concerning effects of an impact on steelhead or the aquatic environment. This Biological Opinion does not rely on the regulatory

definition of "destruction or adverse modification" of critical habitat at 50 C.F.R. § 402.02, which was invalidated by the Ninth Circuit Court of Appeals in 2004. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

A. Alteration of Aquatic Habitat

Installing the temporary water diversion is expected to cause a temporary loss of aquatic habitat and potentially put steelhead at the diversion site at a greater risk for harm during the dewatering process. For the subject action the loss of habitat would be confined to a discrete section of See Canyon Creek, and would be temporary because the affected workspace would be re-watered after the proposed action is complete. Steelhead require suitable living space for growth and survival; living space absent surface water is not suitable. Streamflow diversion could harm individual steelhead by concentrating or stranding them in residual wetted areas that are predisposed to dewatering or desiccation, increased water temperature, decreased dissolved oxygen concentration and predation (Cushman 1985) or by causing them to migrate to adjacent less suitable habitats (Kraft 1972; Campbell and Scott 1984). The potential impacts resulting from handling and relocating steelhead during dewatering will be addressed in the following section (Section B. Capture and Relocation of Steelhead). The purpose of this section is to assess the effect that dewatering the project area will have on steelhead due to the loss of the habitat availability for use by steelhead during the time the habitat is dewatered.

The loss of this habitat for use by steelhead is not expected to result in significant effects to the species for several reasons. First, the diversion is temporary and only expected to be in place for a couple of weeks. Second, there are several miles of good rearing habitat within See Canyon Creek and the area to be dewatered represents a small fraction of the total available habitat and therefore the action will only affect a small fraction of the overall population of steelhead in the watershed. Finally, any steelhead relocated during the dewatering process will be relocated to similar nearby habitats that provide adequate cover, temperature, dissolved oxygen, and food resources. Therefore, the temporary loss of service that the steelhead may experience during the time this section of See Canyon Creek is dewatered is not expected to result in a noticeable or significant impact to the species or its habitat.

The installation of the support wall to stabilize the bank will result in the permanent loss of an undercut bank that currently is providing cover habitat for rearing juvenile steelhead. However, the County has proposed the installation of a digger log (root wad) immediately downstream of the proposed support wall that is expected to provide the same level or greater habitat benefits than currently exist with the undercut bank. Therefore no permanent or long-term loss of habitat function is expected as a result of this project.

B. Capture and Relocation of Steelhead

During the dewatering process the applicant proposes to monitor installation of the diversion and construction activities, and capture and relocate steelhead that are stranded in the residual wetted

area. Based on the habitat available and numbers of steelhead observed in the watershed during previous surveys, NMFS expects no more than 250 juvenile steelhead to be relocated as a result of dewatering the project area. If general minimization measures, dewatering procedures, and fish capture and relocation methods are implemented correctly, mortality of steelhead due to the proposed action is expected to be no more than 2% (5 juveniles). This estimated mortality potential is based on NMFS' experience and knowledge with similar actions observed in San Luis Obispo County during the last five years. For example during the implementation of a recent project involving a similar dewatering plan, 105 steelhead were relocated successfully and only 1 mortality (~1%) was observed (San Luis Obispo County Public Works 2011).

Overall, the area to be dewatered and the steelhead that are relocated from this area represent a small fraction of steelhead and viable habitat within See Canyon Creek. Further, See Canyon Creek is located within the San Luis Obispo Creek watershed and San Luis Obispo Creek and some of its other tributaries support an even larger population of juvenile steelhead overall with an estimated population of 37,700 juveniles (95% confidence intervals of 19,100 to 56,700) (Alley 2008). Therefore, if lethal take of five juvenile steelhead are observed, NMFS believes the loss would have a negligible, if detectable effect on the population of steelhead in See Canyon Creek and even less likely to the population of steelhead in the San Luis Obispo Creek watershed as a whole.

C. Loss of Aquatic Insects

The benthic (bottom-dwelling) aquatic insect assemblage of most waterways typically comprises numerous species. Food resources are important in supporting rearing functions for juvenile steelhead. Aquatic insects provide a source of food for stream fish populations, and may represent a substantial portion of food items consumed by juvenile steelhead at various times of a year. The section of stream to be dewatered for this project has two to three pools connected by riffle and run habitats. Some species of insects are found in swift-water habitats such as riffle and runs, whereas other species are found in slow-water habitats such as glides and pools. Riffles are generally accepted as the principal food-producing habitat in streams. Nevertheless, any activity that affects instream habitat could reasonably be expected to affect these food resources.

Individual benthic aquatic insects are expected to be lost when the section of the creek within the action area is temporarily dewatered. Effects to aquatic insects resulting from streamflow diversion will be temporary because construction activities will be relatively short-lived, and rapid (on the order of one to two months) recolonization of disturbed areas by macroinvertebrates is expected (Thomas 1985; Harvey 1986). Furthermore, the effect of insect loss on steelhead is likely to be negligible because food from upstream sources (via macroinvertebrate drift through the diversion pipe) would be available to steelhead immediately downstream of the affected area.

D. Disturbance to Streamside Vegetation

Streamside vegetation provides numerous functional values to stream fish that may benefit

migrating, rearing, or spawning steelhead (Hall and Lantz 1969; Karr and Schlosser 1978; Lowrance *et al.* 1985; Wesche *et al.* 1987; Gregory *et al.* 1991; Platts 1991; Welsch 1991; Castelle *et al.* 1994; Lowrance *et al.* 1995; Wang *et al.* 1997). However, heavy equipment will perform all work from the top of the roadway adjacent to the failing bank and no new access points will need to be created as part of this project. As such, it is expected there will only be removal of some low lying herbaceous plants and woody vegetation (poison oak) with only minimal (if any) trimming of an overhanging oak tree in the project area. Therefore it is anticipated that there will be no significant impacts to streamside vegetation as a result of the proposed action.

E. Alteration of Water Quality

Water quality is important for maintaining quality of critical habitat for rearing and spawning. Installing and then removing the temporary stream diversion is expected to temporarily increase the potential for sedimentation (rapid settling of suspended sediment) and turbidity (suspended particulate matter affecting the amount of light that is scattered or absorbed by a fluid). This is of concern because high turbidity concentrations can cause fish mortality, reduce fish feeding efficiency and decrease food availability (Berg and Northcote 1985; McLeay *et al.* 1987; Gregory and Northcote 1993; Velagic 1995). Prolonged exposure to elevated concentrations of inorganic sediment can caused decreased growth in salmonids (Shaw and Richardson 2001). The magnitude and degree of the potential water-quality alteration is unknown because the specific sedimentation and turbidity rates have not been predicted. The actual sedimentation and turbidity rates would depend in part on the amount of time required to install the diversion and slope protection. Gross increases in sedimentation and turbidity owing to construction activities are not likely because the applicant proposes to implement and maintain erosion control measures, and construction activities will occur in the dewatered portion of the stream. Although NMFS expects that turbidity and sedimentation rates will increase, in particular during installation of the temporary diversion, these increases are not expected to be sufficient to diminish the functional value of habitat for steelhead because they are localized, of less magnitude than steelhead can experience as part of natural storm flow events at other times of the year, should settle back to baseline quickly after the diversion is installed or removed, and be unnoticeable after 35 m or less downstream of the point of disturbance based on observations of similar disturbances to stream sediments. Further, installation and work activities will be conducted during the dry season when stream flows are lowest allowing for greater ease in setting up diversion structures and less opportunity for sediment to be transported downstream.

Heavy equipment may accidentally release fluid (including large spills during refueling) that once in the creek is harmful to aquatic life. To further reduce potential inputs of hazardous substances to the stream all equipment and vehicles will operate only outside of flowing water and all servicing and staging of vehicles will be conducted away from the stream channel (a minimum of 50 m) and in designated areas enclosed by spill-containing berms.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. NMFS is generally familiar with activities occurring in the action area, and at this time is unaware of such actions that would be reasonably certain to occur. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Endangered Species Act. Consequently, NMFS believes no cumulative effect, beyond the continuing effects of present land uses as described in the Environmental Baseline, is likely.

VII. CONCLUSION

After reviewing the best scientific and commercial information available, the recent status of steelhead, the environmental baseline for the action area, and expected effects of the proposed action, and cumulative effects, for the reasons stated above, it is NMFS' Biological Opinion that the proposed action is not likely to jeopardize the continued existence of the Federally threatened SCCC DPS of steelhead or result in the destruction or adverse modification of its critical habitat. The proposed action is not expected to reduce the likelihood of survival or recovery of the See Canyon Creek population because short-term effects are expected to be temporary, confined onsite, and are not expected to result in any detectable changes in the number, reproduction, or distribution of the See Canyon Creek population.

VIII. INCIDENTAL TAKE STATEMENT

Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Harm is further defined by NMFS to include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the project proponent for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions, or (2) fails to require a permittee or contractor to adhere to the terms and conditions of this incidental take statement through enforceable terms that are added to the grant, permit, or contract, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement (50 CFR §402.14(I)(3)).

A. Amount and Extent of Take

For reasons discussed within this Biological Opinion, NMFS believes the proposed action on See Canyon Creek near San Luis Obispo, California, will result in the incidental take (capture, injury, and mortality) of steelhead when the work area is dewatered, and when juvenile steelhead are captured for relocation to suitable habitats outside work areas. NMFS anticipates no more than 250 juvenile steelhead will be captured relocated during project activities and that no more than 5 of the 250 juvenile steelhead captured, may be killed. Incidental take will have been exceeded if more than 250 juvenile steelhead are captured, or more than 5 juvenile steelhead are injured or killed as a result of project activities. The accompanying Biological Opinion does not anticipate any other form of take incidental to the proposed action.

B. Effect of Take

In the accompanying Biological Opinion, NMFS concludes that the anticipated level of take associated with the proposed action is not likely to jeopardize the continued existence of the federally threatened SCCC DPS of steelhead.

C. Reasonable and Prudent Measures

NMFS believes following reasonable and prudent measures are necessary and appropriate to minimize and monitor incidental take of steelhead. The results of the effect analysis provide the basis for the following reasonable and prudent measures:

1. Employ a fisheries biologist for the purposes of monitoring the affected area, and for removing and relocating steelhead from the affected area.

2. Minimize effects of construction on steelhead and their critical habitat.

3. Report activities to NMFS associated with minimizing and monitoring the proposed action's effects on steelhead.

TERMS AND CONDITIONS

In order to be exempt from the take prohibitions of the Endangered Species Act, the Corps and the applicant must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring conditions. These terms and conditions are non-discretionary:

1. The following terms and conditions implement reasonable and prudent measure No. 1.

    A. The person identified as the lead fisheries biologist for the project shall continuously monitor the placement and removal of the diversion (coffer dam and pipe) to ensure all steelhead are removed from the affected area. This biologist shall capture steelhead stranded in residual wetted areas as a result of streamflow diversion and workspace dewatering, and relocate steelhead to a suitable instream

location immediately downstream of the workspace. One or more of the following NMFS approved methods shall be used to capture steelhead: dip net, seine, throw net, minnow trap, or by hand. It is likely that the lead fisheries biologist will require one or more people (that also have experience with fish handling) to assist with these activities. Electrofishing is also hereby authorized but may only be carried out by a NMFS approved biologist.

B. The habitat(s) to be used for relocation of steelhead shall be identified and evaluated for suitability of steelhead occupancy by the lead fisheries biologist prior to dewatering and/or capture of any steelhead. The lead fisheries biologist shall evaluate potential relocation sites based on attributes such as adequate water quality (at a minimum dissolved oxygen and temperature shall be a measured), cover (instream and over-hanging vegetation or woody debris), and living space. Multiple relocation habitats may be necessary to prevent overcrowding of a single habitat depending on the number of steelhead captured, current number of steelhead already occupying the habitat, and the size of the available habitat(s) to be relocated to.

C. A project biologist shall monitor (both visually and with a turbidity meter) the amount and extent of increased turbidity downstream of the work area during the installation and removal of the coffer dam for the water diversion. Turbidity measurements should be taken through the work area up to a point at least 100 m downstream of the anticipate location of the coffer dam prior to any instream disturbance to establish baseline stream turbidity. This baseline should then be used as a baseline to detect elevated turbidity levels during the installation and removal of the coffer dam. During installation and removal of the coffer dam the biologist shall record the distance between the coffer dam and furthest point downstream that increased turbidity is observed during these activities. Once the downstream extent of increased turbidity has been determined turbidity measurements should be taken through the impacted reach at 10 minute intervals to determine the duration required for turbidity levels to return to baseline after the disturbance activities (coffer dam installation and removal) were initiated. Turbidity measurement shall be conducted in a manner that does not increase risk of harm or interfere with capture and relocation of steelhead during the dewatering process (minimizing risk of mortality to and relocating steelhead is the top priority). To accomplish these tasks successfully an additional biologist(s) may be needed to assist with turbidity measurements if these measurements coincide with steelhead relocation activities.

D. The project biologist shall monitor construction activities, instream habitat, and performance of sediment control/detention devices for the purpose of identifying and reconciling any condition (i.e., associated effects from increased sedimentation or turbidity noted in the effects section of this biological opinion) that could adversely affect steelhead or their habitat. The biologist shall be empowered to halt work activity and to recommend measures for avoiding

adverse effects to steelhead and their habitat.

E. The project biologist shall contact NMFS (Matt McGoogan, 562-980-4026) immediately if one or more steelhead are found dead or injured. The purposes of the contact shall be to review the activities resulting in take, to determine if additional protective measures are required, and to discuss handling procedures for injured or dead steelhead.

F. If a steelhead mortality does occur, the project biologist shall coordinate with NMFS (Matt McGoogan, 562-980-4026) to ship the carcass as soon as possible on dry ice through overnight, express mail to NMFS Southern California Office (Matt McGoogan, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802).

2. The following terms and conditions implement reasonable and prudent measure No. 2.

A. Checking equipment daily for leaks prior to beginning any construction activities.

B. Storing a spill kit near the creek and having it readily available during construction in case of any contaminant release.

C. Monitor and report the revegetation of the project site. Take photos of the site before, during, and after construction to the location and degree to which vegetation disturbance occurred. Take another series of photos at the same angle and location at 1 year and 5 years after the completion of the project.

D. Monitor and report the performance and retention of the digger log. Photos of the digger log shall be taken after installation once water is flowing through the site again. Take another series of photos at the same angle and location at 1 year and 5 years after the completion of the project. With the year 1 and year 5 inspection, it should also be noted whether undercut pool habitat has been created at this feature and the maximum depth of that habitat. If it is discovered that this feature has been removed or is not creating undercut pool habitat,

3. The following terms and conditions implement reasonable and prudent measure No. 3.

A. The Corps shall provide a written monitoring report to NMFS (Matt McGoogan, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802) within 30 days following completion of the proposed action. The report shall include the number of steelhead killed or injured during the proposed action and biological monitoring; the number and size of steelhead removed and relocated; latitude and longitude coordinates of the project site; the length of the stream that was dewatered; the square area of the site that was dewatered; the habitat type(s) present in the area that was dewatered and estimated percent of each (i.e., % pool, % riffle, % run, % glide, % side channel, etc); results of the turbidity monitoring; any effect of the proposed action on steelhead that was not previously considered (reinitiation of consultation may be required, see section IX (2) of the Biological

Opinion); and, photographs taken during, before and after work activity.

B. The Corps shall provide a written report to NMFS (Matt McGoogan, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802) describing the results of the revegetation and digger log monitoring to NMFS within 30 days following completion of the site inspections at 1 year and 5 years following completion of the project. The annual report shall include color photographs taken of the project area during each inspection and before and after implementation of the project, and estimated percent of exposed soil remaining within each area affected by the project. It should also be noted in each monitoring report whether undercut pool habitat has been created at this feature and the maximum depth of that habitat. If it is discovered that this feature has been removed, damaged to the point it is not properly functioning, or is not adequately creating undercut pool habitat, a proposal to create the desired habitat shall be developed and included with the monitoring report.

IX. REINITIATION OF CONSULTATION

This concludes formal consultation on the actions outlined in the project proposal. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in this opinion, (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

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