

**Grenada Irrigation District**  
**Site Plan Agreement between Grenada Irrigation District, National Marine Fisheries Service (NMFS)**  
**and**  
**California Department of Fish and Wildlife (CDFW)**  
**For the Template Safe Harbor Agreement for Coho Salmon (*Oncorhynchus kisutch*)**

Grenada Irrigation District -Draft Site Plan Agreement between Grenada Irrigation District, National Marine Fisheries Service (NMFS) and California Department of Fish and Wildlife (CDFW) For the Template Safe Harbor for Coho Salmon (*Oncorhynchus kisutch*)

**A. Introduction**

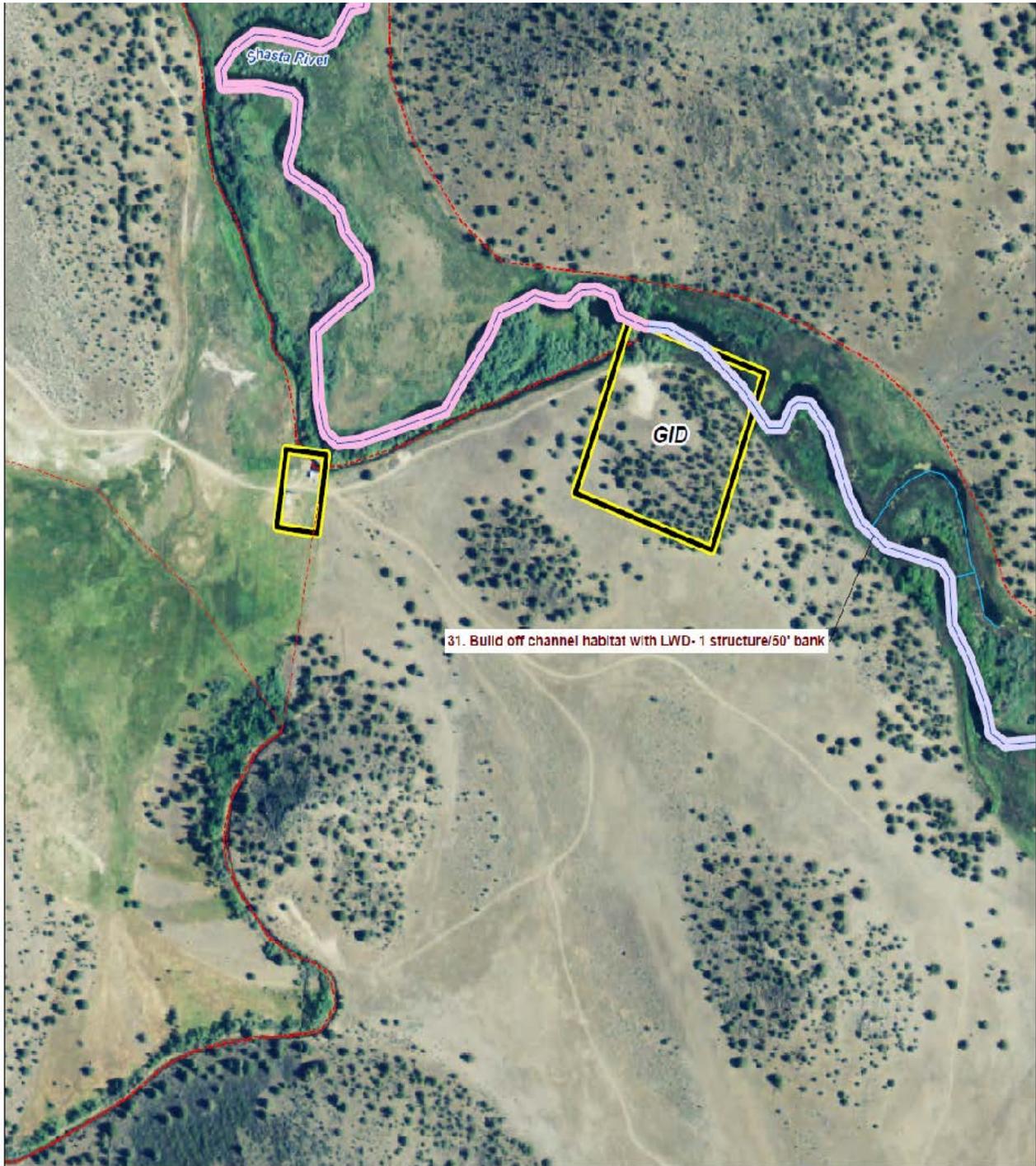
This Site Plan Agreement for the Template Safe Harbor Agreement for coho salmon is between the Grenada Irrigation District (hereinafter referred to as the Permittee or GID), National Marine Fisheries Service (NMFS) and California Department of Fish and Wildlife (CDFW). This Site Plan Agreement, combined with the measures prescribed in the Agreement, may serve as the basis for NMFS to issue a federal enhancement of survival permit (Permit) to the above named Permittee pursuant to section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended (ESA). The joint and respective responsibilities of NMFS, CDFW and the Permittees are detailed in the Template Safe Harbor Agreement. The Site Plan Agreement is subject to terms of the Template Safe Harbor Agreement and Permit.

This Site Plan Agreement documents site-specific information detailing the Permittee's enrolled property, including the location and management authority of the property, its baseline conditions, existing and, as available, proposed future land-use activities, and the duration of this Site Plan Agreement and requested permit. This Site Plan Agreement also documents the agreed-upon conservation measures to be undertaken by the Permittee on the enrolled property that are expected to benefit coho salmon.

**B. Enrolled Property**

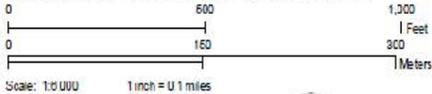
**B.1. General narrative and map describing property**

Grenada Irrigation District (GID), a Special District of Siskiyou County, is located in Siskiyou County (41°38'11.56'' N latitude, 122°29'22.88''W longitude). GID owns four parcels including a small reach of the Shasta River, further described in B.2, as well as provides irrigation water to the GID comprising of approximately 1477 irrigated acres. Only two parcels located on or near the Shasta River that include intake and pumping infrastructure are included within this agreement. Approximately 300-feet of the Shasta River is within GID ownership, designated to be in the Mid Shasta Reach in the Agreement. The map included below shows the approximate district boundaries and general location within the project area. GID's enrolled parcels are surrounded by Belcampo Farms - North Annex property, an entity also participating in the Shasta Watershed Conservation Group. The approximate property boundaries and general location of GID within the Agreement Area is shown in Figure 1.

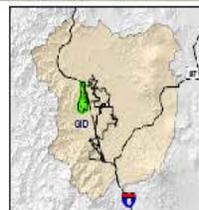


31. Build off channel habitat with LWD-1 structure/50' bank

Shasta River Safe-Harbor - Adjudication



Sheet 1 of 10  
GID



- Safe-Harbor Ownership
- Rivers and Streams
- Rivers
- Major Streams
- Minor Streams
- Diversions
- Roads
- Interstate
- US Highway
- State Highway
- County Highway

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Figure 1. Grenada Irrigation District – Enrolled Property

## B.2. Legal Description of Property Boundary

APNs:

020-250-070-000 - Riparian Property

020-250-060-000 - Pump Station

Legal Description of included parcels from GID establishment and By-laws is included as Appendix A.

## B.3. Description of Water Rights

GID's water right is identified in the Shasta River Decree as Diversion #249 and described under paragraph 149. GID is a special district that owns and operates several parcels including the point of diversion, a lift station and a parcel along the ditch. GID provides water to over 60 users who irrigate up to 1,477 acres within the 4,144 acre district boundary. GID has a 1916 permit to divert up to 40 cfs from the Shasta River. GID has limited property that is riparian to the stream (approx. 300 lineal-feet) and the district boundary is located nearly two miles from the Shasta River.

While GID's water right is large in volume, it is low in priority. Under recent use, GID will routinely divert up to 40 cfs for short periods of time to fill the ditch and catch up on rotation. GID diversion volumes are usually reduced or turned off due to priority during base flow conditions in August due the low priority of the water right. GID typically will be allowed to divert again later in September when higher priority rights reduce their diversion volume.

During wetter than average years, GID diverts throughout the irrigation season, irrigating approximately 165 days a year. During dry years, like WY 2014 and 2015 GID diversion season can be curtailed as early as July. During recent typical or normal years, GID may divert until about August 10th and again divert during the latter part of September. GID historically operated throughout the year but was limited during base flows. Increased groundwater development, including the conversion of Big Springs Irrigation District to groundwater reportedly impacted GID's diversion volume.

Table 1 shows the GID diversion and irrigation information. Figure 2 shows the GID's place of use as stipulated in the Shasta River Decree and the DWR irrigated acreage coverage.

Table 1-Water Rights Summary

Diversion # /Water Source	Permit/ Adjudicated/Filed Water Use Statement Amounts	Description	Season Duration	Total Ac-ft per season diverted	Acreage Irrigated with Diversion	Average Days per Season diverted
149	40 cfs	Grenada Irrigation District	April 1-September 30	14,599 ac-ft	4,144 acres	138

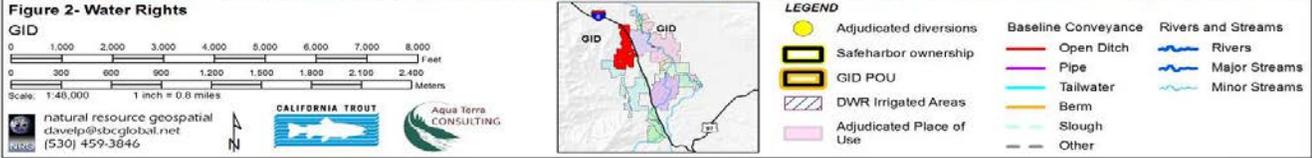
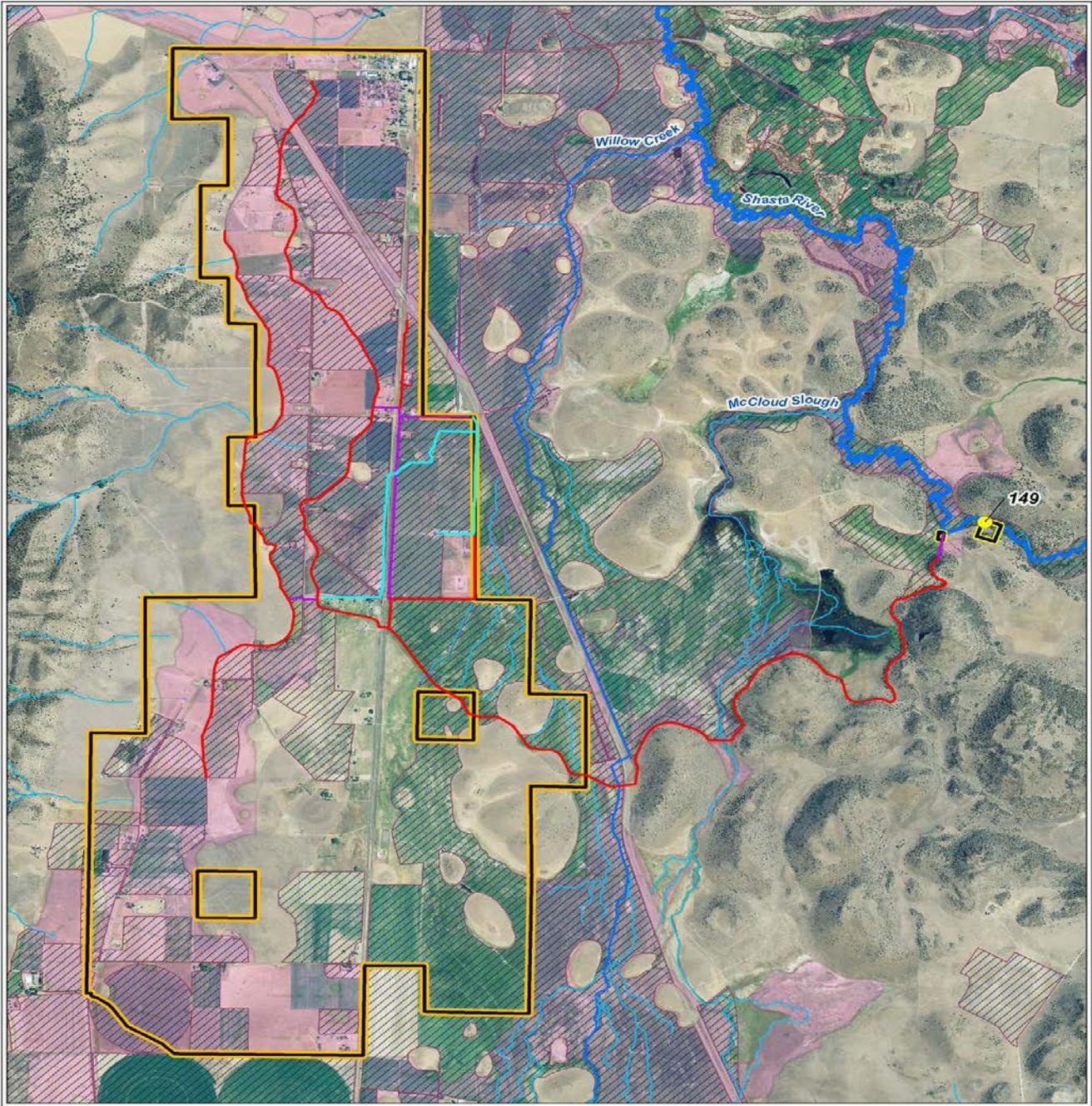


Figure 2- Place of Use and Irrigated Acreage Map

## **C. Routine Land Use**

### **C.1. Present Routine Land Use**

Grenada Irrigation District (GID) is a special district that owns and operates four parcels including the point of diversion, a lift station and a parcel along the main ditch. GID has limited property that is riparian to the stream (approximately 300 lineal-feet). GID provides water to over 60 users who irrigate up to 1,477 irrigable acres within the 4,144 acre district boundary (district boundary is 2-3 miles from Shasta River). Demand for water from district users varies significantly based on production prices in comparison to irrigation fees. Certainty based on water year types also factors into district user consideration. GID has a large water right to divert up to 40 cfs from the Shasta River. GID maintains 5.9 miles of open ditch that conveys water to the District.

#### **Irrigation Management**

While GID's water right is large in volume, it is low in priority. GID will divert 40 cfs for short periods of time to fill the ditch and catch up on rotation. Within the past 10-15 years, GID operates between 135-140 (138 average) days a year through the irrigation season (4/1- 9/30) with an average maximum diversion volume of approximately 28-32 cfs or 8,200 acre feet a year. GID is typically allowed to divert again in September when higher priority rights reduce their diversion volume.

GID's main canal is an inefficient earthen canal. Transmission losses as high as 35% can occur in the main canal when diverting at high levels according to recent investigations completed by NRCS and loss calculations extrapolated from a water balance conducted by Davids Engineering in 2006. On Average ditch loss values during 2006 were 17% per the study period and 1,100 acre feet were lost in delivery transmission.

Efficiency values are more variable on GID's main canal than other canals and ditches in Shasta Valley dependent on volume of water diverted and quality of ditch maintenance occurring at that time. The ditch contours along the toe of hill slopes in unconsolidated volcanic soils and rock formations for approximately 3.5 miles as it meanders towards the District boundary and service area. The total length of canal from GID's pumping station to the upper ditch pump is 5.3 miles. Considerable percentages of transmission loss occurs through the fill side of the ditch. Lower operating water elevations, associated with reduced diversion volumes or good canal maintenance reduce transmission loss percentage significantly but increase the duration of irrigation rotation. Conversely, higher diversion volumes or excessive aquatic vegetation in the canal result in increased transmission losses where up to 38% of the diverted water is lost during transmission when 35-40 cfs is being diverted.

A new diversion facility was constructed and has been in operation since 2014 and is compliant with current NOAA and CDFW criteria for fish passage and meets fish screening criteria, including lockable head gates, on-channel fish screen, functional intake without impoundment, flow measuring device and remote operation capability.

#### **Irrigation Maintenance Ditch Cleaning**

The ditch is maintained regularly by the District or selected sub-contractors, using heavy equipment sometimes up to twice a year.

#### **Diversion Cleaning**

The intake structure of the diversion is located on the active channel of the Shasta River. Graduated Stream Barbs train flow to remain laminar against the intake structure which is also the on-channel fish screen. It is expected that maintenance is required to remove sediment from the front edge of the fish screen as well as fine

sediment behind the screen panels. Desired channel elevation and grade will be maintained at the upstream and downstream approaches of the intake structure as well as deposition within the structure.

### **Fish Screen Cleaning**

GID operates a compliant self-cleaning fish screen and has a Streambed Alteration Agreement for operation of the intake structure and opposing stream barbs that dictate sweeping flow velocities. The fish screen requires monthly greasing of bearings, some infrequent hand cleaning of debris and checking electronic components to ensure they are operating properly.

### **Riparian Grazing Management**

GID's enrolled parcels are included within a fenced area owned by Belcampo Farms-North Annex. The fenced off area is about 4 acres and includes GID parcels but a majority of the ownership is Belcampo Property. The fence excludes livestock from GID parcels unless Belcampo elects to flash graze the area per their riparian grazing plan. In that case GID parcels will get flash grazed to reduce annual noxious weeds and fire risk. GID will continue to maintain riparian fencing with Belcampo Farms to ensure access is limited to flash grazing methods approved through their riparian grazing plan. The east side of the Shasta River is owned by TNC property is currently excluded from livestock.

### **Fence Maintenance**

An approximate 4.0 acre area including GIDs enrolled parcels and Belcampo Farms ownership has been fenced from livestock since 2007, except for flash grazing by Belcampo per their riparian grazing plan. The western boundary fence is out of the flood plain and doesn't require much yearly maintenance due to flood damage; wire maintenance is done regularly.

### **Road Maintenance**

Access road is through the extent of the property to the river. The road close to the river from pump station to screen is fully surfaced with aggregate base. A road continues to the previous POD which is rarely used and is re-vegetating. Any runoff from the unsurfaced road segment will be retained by a catch basin where the previous canal was located.

### **Crossing Maintenance**

GID has no low water crossings or expected future need for vehicles or livestock access to river beyond what exists.

### **Herbicide/Fertilizer/Pesticide Use**

GID does apply spot application of herbicides for noxious weeds only, with a handheld applicator near pump station and behind the fish screen for fire suppression but abides by label for treatment near water bodies.

## **C.2. Avoidance and Minimization Measures**

### **Covered Activities and Avoidance and Minimization Measures**

This section outlines and describes all activities that may be implemented under the Template Safe Harbor Agreement (SHA) including Routine Land and Water Use Activities and Avoidance and Minimization Measures (AMMs), monitoring and Beneficial Management Activities (BMAs).

The Template SHA provides permittees with ESA assurances that efforts to promote the conservation and recovery of the Covered Species on their enrolled property, including implementation of Routine Land and

Water Use Activities with AMMs, monitoring, and BMAs, will not result in additional restrictions on the use of the enrolled property.

Permits will authorize take of SONCC coho salmon incidental to the rights, obligations, and activities contemplated in the Template SHA provided that such take is consistent with maintaining the Present and Elevated Baseline Conditions identified in site plan agreements. The specific activities that will be implemented by each permittee on their enrolled property under the Template SHA are described in individual Site Plan Agreements. Each permittee will select appropriate activities from this section in coordination with NMFS and CDFW, and such measures will be included in Individual Site Plans.

## **I. Routine Land and Water Use**

Land and water management practices considered under the Template SHA for which incidental take will be authorized on the enrolled properties are standard practices for production of livestock, pasture and hay, and other routine associated activities. For the purposes of the Agreement, standard practices for production of livestock, pasture and hay means: any lawful practices performed by a permittee, and persons associated with the permittee, that are incident to or in conjunction with livestock, pasture and haying operations including crop production, cultivation, growing, replanting, diversion of water, irrigation, irrigation runoff management (tailwater), harvesting, preparation for market, vehicle operation, moving of livestock and watering of livestock. Other routine associated activities include riparian area cultivation and maintenance, monitoring infrastructure activities, erosion control, flood and emergency protection, invasive plant removal and control, and installation, repair, maintenance and operation of: diversions, fish screens, instream habitat structures, fences, roads, and stream crossings. These activities will be described, as appropriate, by each permittee through a completed Site Plan Agreement. The potential effects of Routine Land and Water Use activities on the Covered Species shall be minimized and avoided through the implementation of AMMs.

The Template SHA and Site Plan Agreements will grant NMFS and CDFW, after reasonable prior notice to the permittees, access (in any form, including aerial) to enrolled properties for purposes of technical assistance related to monitoring and implementation, and to ascertain compliance with the Template SHA and Site Plan Agreements. Implementation monitoring of Routine Land and Water Use Activities and AMMs as specified in Individual Site Plan Agreements will be accomplished by the permittees or their consultants, with the assistance of the Parties, when appropriate, on a schedule specified in each Individual Site Plan Agreement, and using specific protocols set forth below. Permittees will document implementation of AMMs on their enrolled property using the monitoring protocols set forth below and submit documentation to the Parties in the annual report.

### **A. Water Diversion and Diversion Facilities**

Water diversions included under the Template SHA include diversions of surface water through conduits or openings from streams, channels, or sloughs within the geographic scope of the Template SHA (as shown in Figure 1 of the Template SHA) by a permittee in accordance with a valid water right including the following activities associated with water diversion and diversion structures:

- Ongoing management and/or maintenance of existing flashboard dams, including the placement of boards into concrete abutments across the wetted channel to build head to divert water, and the removal of the boards.
- Ongoing maintenance, management, and repair of boulder weirs.

- Installing, operating, maintaining, and removing push-up dams or weirs. These are defined as temporary diversion structures created by using loaders, backhoes, or excavators to move bedload within the stream channel to form a flow barrier or weir that seasonally diverts a portion of the flow of the stream.
- Installing, operating, maintaining, and removing other temporary diversion structures that are not push-up dams. “Other temporary diversion structure” is defined as any temporary structure to divert water seasonally from a stream and is typically made with hay bales, hand-stacked rocks and cobble, tarps, wood, and/or a combination of these materials placed in the channel with or without the use of heavy equipment. Equipment may be used from the bank but not within the channel.
- Installing or placing pumps and sumps and maintaining existing pumps and sumps within or adjacent to the active channel of a stream, which sometimes requires the use of large machinery within or adjacent to the active channel.
- Installing head gates and measuring devices that meet NMFS and CDFW standards and is in compliance with Senate Bill 88 on or in a diversion channel, which usually is done by excavating the site to proper elevation using large machinery, positioning the head gate and measuring device at the appropriate elevation, and installing rock or other “armoring” around the head gate to protect the structure. During installation, the stream bank could be affected by the construction of concrete forms and other necessary construction activities.
- Operating head gates and measuring devices

A1. Install a locking head gate or valve sized appropriately for the authorized diversion, that can regulate flow, and a functional measuring device or flow meter on any structure or facility connected to a stream used to divert water to facilitate better control and monitoring of water delivery within three years, unless specified otherwise in the site plan, of the effective date of the Agreement on or in all water diversion structures identified in this Agreement. The designs for head gates or valves and measuring devices in State Watermaster or Special Watermaster District Service areas shall be approved by DWR or said Special District, if applicable, in coordination with the Parties. All measuring devices and methods of water measurement shall be constructed and maintained to meet a 10% measuring accuracy for points of diversion that divert greater than or equal to 200 acre feet per year, and a 15% measuring accuracy for points of diversion that divert less than 200 acre feet per year. Data from these devices will be included in the annual SHA report, if required in the individual site plans.

A2. Fish passage will be provided for all life stages when sufficient flows are available per individual site plan descriptions.

A3. Contact NMFS and CDFW at least five (5) days before installing any dam or instream structure that could result in stranding of fish, or before changing the operation of any existing dam or instream structure that could result in stranding of fish. The types of activities that typically could result in stranding include rapid drawdown of flow or dewatering of the stream channel downstream of the diversion or within diversion ditches between the point of diversion, fish screen and bypass return flow channel.

A4. Construct, operate, maintain, and remove push-up and other temporary dams as described in the Agreement. Push-up dam or weir construction activities shall commence no earlier than May 1 and no later than November 1. Participant may commence push-up dam construction activities prior to May 1 if (a) permittee notifies NMFS and CDFW at least seven (7) days in advance of any dam construction proposed to occur prior to May 1, (b) a survey is completed by NMFS, CDFW or a mutually agreed-upon qualified biologist sufficient to determine the presence and distribution of any Covered Species, and (c) a determination by NMFS and CDFW whether and when the activity may proceed.

A5. Routine push-up dam construction and removal will be accomplished by the operation of a bucket attached to an excavator, or backhoe that is situated outside of the wetted portion of the stream channel. Participant will check and maintain vehicles used for push-up dam construction and removal on a daily basis during the construction and removal activities to prevent leaks of materials that could be deleterious to aquatic life, wildlife, or riparian habitat; minimize disturbance to the stream bed and bank and keep turbidity of the water to a level that is not deleterious to aquatic life; and allow the work area to “rest” to allow the water to clear after any activity that causes a plume of turbidity above background levels, resuming work only after the stream has reached the original background turbidity levels.

### **Monitoring Protocols for Implementation**

All maintenance of instream diversion structures shall be monitored as follows:

- Log of what in-water work had occurred and what minimization measures were implemented will be included in the Annual SHA report
- Data from measuring devices will be included in the annual SHA report, if required in the individual site plans.
- Provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo’s code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc)

### **B. Irrigation Management and Maintenance**

This Routine Land and Water Use Activity includes management and maintenance of conveyance facilities on enrolled properties that are used for diverting surface waters including piping/buried mainline, buried mainline with risers, gated pipe, sprinkler systems, open ditches, sumps, storage ponds and tailwater capture ponds/sumps. The activities associated with irrigation management and maintenance may include; head gate on/off operation, moving sprinklers, turning risers on and off, board or tarp removal/placement in ditches, pump, ditch and pond maintenance, pipe clearing/cleaning, maintenance of fish screens, operations of tailwater collection (pick-up ditches and ponds), storing water and irrigation runoff (tailwater production) and general diversion of water per the Shasta River Decree.

Irrigation maintenance activities frequently require the use of heavy equipment. At times this requires equipment and vehicles to cross flowing streams or intermittent channels and/or the construction of stream crossings at designated locations where potential spawning gravels, incubating eggs, and fry are not present based on repeated site specific surveys. Vehicle wet crossings are described in more detail below.

Irrigation management and maintenance also includes operation and maintenance of all types of fish screens. Types of screens include self-cleaning screens, including flat plate self-cleaning screens, and other self-cleaning designs, including, but not limited to, rotary drum screens and cone screens, with a variety of cleaning mechanisms. These screens are designed to continuously clean the screen surface. Periodic maintenance may be needed to remove siltation, debris, sedimentation and anything else that could inhibit normal operation, which would require lifting the screen and using heavy equipment to remove sedimentation/debris. The screens also require regular greasing of bearing and other mechanical parts. Non-self cleaning screens, including tubular, box, and other screen designs consistent with NMFS and CDFW screening criteria are generally cleared daily to remove aquatic vegetation and debris, which is usually done by hand.

B1. During regular maintenance work at diversions and fish screens, the permittee will minimize the discharge of sediments, debris, fine organic matter, and/or muddy, turbid, or silt-laden waters into natural waterways. The permittee will clean instream structures as necessary to maintain proper function.

B2. The permittee will regularly inspect all fish screens and bypass pipes or channels to verify that they are effectively protecting salmonids and other fish species in accordance with CDFW and NMFS fish screening criteria. When necessary, the permittee will clean and repair all fish screens and bypass pipes or channels. If a fish screen is removed for cleaning or repair and in channel work is necessary, the permittee will ensure either that a replacement screen is installed immediately or water is not flowing through the area where the screen is removed by either implementing isolation or dewatering of the work site in coordination with the fish relocation effort described later in this document.

B3. When a bypass pipe is present, the bypass entrance(s) shall be installed and operated such that all life stages of the Covered Species can easily locate and enter them. All components of the bypass system, from entrance to outfall, shall be designed and operated to minimize the potential for debris blockage and must be sized to accommodate all life stages of fish and aquatic species which may be drawn into the diversion. Sufficient flow (site specifically determined depending on the volume and type of bypass structure) will be supplied from the diversion into a fish bypass to safely and efficiently return fish back to the stream. Bypass outfalls shall be designed and located so that there is sufficient depth and velocity to avoid injury to all life stages of fish and aquatic life which may be directed into a bypass pipe.

B4. When cleaning/maintaining irrigation or drainage ditches or ponds, the permittee will work when the ditch is as dry as possible to minimize or eliminate surface water turbidity and sediment transport. The permittee will place sediment and organic materials excavated from ditches or ponds in a location where the materials cannot wash into any stream channel or Covered Species habitat.

B5. Permittee will regularly monitor and repair as necessary any earthworks or facilities designed to minimize tailwater entering natural waterways.

B6. Planned Instream work shall occur only when Covered Species are least likely to be present or affected by the project; between June 15 and November 1, or as approved by NMFS and CDFW.

B7. In the case where the fish screen is down ditch, the Permittee shall notify CDFW at least 5 days prior to closing a headgate or valve when fish stranding may occur in the diversion conduit, to allow fish rescue notification and coordination by qualified individuals, NMFS and CDFW or otherwise mutually agreed upon individuals.

B8. Water releases from off-channel impoundments, ponds, and tailwater basins will be conducted in a manner that minimizes turbidity, siltation, elevated temperatures, or pollution impacts to waterways supporting Covered Species. Water shall be released in the early morning (prior to 10:00 am) and/or during cool times of the year, and will be released as gradually as possible to minimize fine sediment discharges. If the release timing and rate is not feasible, landowner will contact NMFS and CDFW prior to release.

B9. When permittee is diverting water under the rotational provision under the decree, the river shall not be dewatered and an agreed upon bypass amount will always be provided, as stipulated under the reach wide flow management plans and/or the permittee's individual site plans.

### **Monitoring Protocols for Implementation**

All relevant maintenance of irrigation facilities shall be monitored. Following are some examples of protocols:

- Log of maintenance activities carried out within the calendar year will be included in the yearly SHA report.

#### **D. Fence Maintenance**

Installation, construction, maintenance, and removal of fencing material, including mesh field fence, panels, or other designed fence barriers, within riparian areas for riparian zone protection, stream crossings & stock-water access.

D1. Inspect riparian exclusion fencing during and after each season of grazing and after high flow events where over bank flows may inundate fences and prior to and after riparian grazing has occurred. If riparian exclusion fencing is damaged, repair fencing and move livestock, as appropriate, to minimize resource impacts. If cattle are present, riparian fences shall be repaired within 30 days.

D2. If riparian fences are lost due to a catastrophic event, the permittee shall notify agencies of the loss in the annual report. The permittee will repair up to the percentage of fencing they committed to replace in the Individual Site Plan, and request funding assistance for the remaining repairs beyond the percentage of its commitment. Cattle shall not have access to areas of riparian areas normally excluded through other provisions of the AMM's.

### **Monitoring Protocols**

All maintenance of riparian fencing shall be monitored as follows:

- A short description of fence maintenance activities will be included in the annual report.

#### **E. Road Use and Maintenance**

Ranch roads are regularly used to access irrigation facilities, move cattle and equipment. Roads may be secondary, which are infrequently used or only utilized by cattle and ATVs, or primary, which are roads used more regularly by trucks and heavy equipment. This category is for both the use and the regular maintenance of all ranch roads, which could include grading, rocking, laying base, and culvert replacement.

E1. Ensure fish passage at road crossings of streams that are accessible to the Covered Species including at bridges, wet crossings and culverts. Any instream crossing structure will be designed and implemented in accordance with the fish passage evaluation methods specified in the 2010 4<sup>th</sup> edition of the Department's

California Salmonid Stream Habitat Restoration Manual. The most current edition of the manual is available at: <http://www.dfg.ca.gov/fish/Resources/HabitatManual.asp>.

E2. Minimize erosion and sedimentation from roads and road work. Rock road crossings and approaches to stream channels to minimize sedimentation. Utilize mulch or other suitable materials, as necessary, to minimize sediment runoff and transport to surface waters. Apply mulch so that not less than 90% of the disturbed areas are covered. Apply all mulches, except hydro-mulch, in a layer not less than two (2) inches deep. Where appropriate, all mulches shall be kneaded or tracked-in with track marks parallel to the contour, and tracked as necessary to prevent excessive movement. All exposed soils and fills, including the downstream face of the road prism adjacent to the outlet of culverts, will be reseeded with non-invasive species at a rate which will ensure establishment.

E3. Planned Instream work shall occur only when Covered Species are least likely to be present or affected by the project, typically from June 15 through November 1.

E.4 Avoid using native surface roads for heavy traffic during wet or thaw periods, and roads not designed and constructed for these conditions. Evaluate the future needs for a road and close roads that will not be needed. Inspect roads annually to determine the need for structural maintenance. Conduct maintenance practices, when conditions warrant, including cleaning and replacement of deteriorated structures and erosion controls, grading or upgrading road surfaces with aggregate. Properly maintain permanent stream crossings and associated fills and approaches to reduce the likelihood (a) that stream overflow will divert onto roads, and (b) that fill erosion will not occur if the drainage structures become obstructed

### **Monitoring Protocols**

All maintenance of roads that have an impact on water ways shall be monitored as follows:

- A short description of annual road maintenance activities will be included in the annual report.

### **G. Herbicide (Weed Management), Fertilizer and Pesticide Use**

This category includes weed management, in the form of livestock grazing, use of California legal weed spray products, manual removal, burning, and mowing.

G1. Ensure that any pesticide or herbicide is handled and applied by a licensed applicator (when required) in accordance with and all applicable, federal, state, local laws, regulations, procedures, and guidelines. Application of pesticides will be in conformance with the pesticide label as well as any required buffers from anadromous streams. The permittees will apply herbicides/pesticides, if any, in conformance with the applicable label directions, as well as any required buffers from anadromous streams in conformance with the Order entered in *Washington Toxics Coalition et al. v. Environmental Protection Agency et al.*, (W.D. Wash No. C01-132C) (January 22, 2004). When possible, areas will be spot treated to reduce the amount applied. Use of broad spectrum insecticides will be minimized or avoided as they are more likely to be harmful to non-target organisms including fish and aquatic insects if exposed. Chemicals with the lowest possible toxicity rating will be used when possible. Use of mobile, pre-emergent herbicides will be minimized or avoided as they can impact non-target plants in the riparian area leading to other impacts such as sedimentation. The Applicant will avoid or minimize exposing aquatic resources by managing spray drift. This includes using modern spray equipment (e.g., low volume or electrostatic sprayers); routinely checking for nozzle wear and calibrating the sprayer frequently throughout the growing season; turning off the sprayer along creeks, drainages and in the turn-around areas; supervising the spraying to minimize effects to surface waters.

G2. GID will not apply more than .5 acres of herbicide to the identified parcels per year.

G3. Review label information and avoid the use of any material known to be detrimental to fish where it could impact Covered Species.

G4. Use or store stationary petroleum-powered equipment in a manner to prevent the potential release of petroleum materials into natural waterways by use of drip pans or other measures.

G5. Refuel machinery and handle or store hazardous materials no less than one hundred and fifty (150) feet away from the edge of any water body. All unused or leftover materials will be transported off-site and properly disposed of, when applicable.

### **Monitoring Protocols**

Herbicide, Fertilizer and Pesticide use shall be monitored as follows:

- Log of herbicide, fertilizer and pesticide use activities carried out within the calendar year to be included in the annual report.

### **H. Flood or Emergency Events**

This category includes immediate work needed to prevent loss of or damage to property from emergencies, including flood, fire, storm, earthquake or other unexpected natural events. Activities may include sediment and debris removal, emergency fish screen repairs, fencing repairs, streambank or crossing stabilization and moving livestock or equipment across streams during emergencies. Emergency is defined in California Code of Regulations section 15359.

H1: Prior to, during or immediately after the event, NMFS and CDFW will be contacted and AMMs will be developed in coordination with the permittee for the particular flood or emergency circumstances.

H2: NMFS and CDFW will be notified within 14 days of beginning emergency work per Fish and Game Code 1610.

### **Monitoring Protocols**

All flood repair shall be monitored as follows:

- Photographs of the emergency site repairs and a detailed description of the repairs to be included in the annual report.

## **II. Beneficial Management Activities**

The primary objective of the Template SHA and Site Plan Agreements is to enhance, restore, or maintain habitat to benefit the Covered Species. To accomplish this, the Parties will implement BMAs (the types of actions to be implemented will vary with each Site Plan) that will result in improved habitat conditions for the Covered Species. Habitat restoration projects authorized under the Template SHA will be designed and implemented consistent with techniques and minimization measures presented in CDFG's *California Salmonid Stream Habitat Restoration Manual, Third Edition, Volume II* with four chapters (*Part IX: Fish Passage Evaluation at Stream Crossings, Part X: Upslope Assessment and Restoration Practices, Part XI: Riparian Habitat Restoration, and Part XII: Fish Passage Design and Implementation*) added in 2003, 2004, and 2009,

respectively (Flosi et al. 1998, hereafter referred to as CDFG Manual). The Template SHA requires AMMs for all projects to avoid or minimize adverse effects to the Covered Species and habitat.

Individual Site Plans will include property-specific BMAs that will be implemented on an enrolled property, and the monitoring protocol that will be implemented for each BMA. Project design and implementation of BMAs will include the AMMs provided below. Table 1 lists the entire suite of potential BMAs that could be implemented under the Template SHA on a given property and the type of monitoring that will be associated with each BMA. If grant funds are obtained to implement a given BMA on an enrolled property, data collection and reporting will be required to satisfy the grant contract obligations. Implementation monitoring of BMA's, as described below will be used to inform the Parties and to confirm that each BMA has been constructed as intended, without any structural changes or omissions that would compromise the integrity of the project or reduce it's intended benefits.

**Table 1. Beneficial Management Activities and Associated Monitoring Techniques.**

<b>Beneficial Management Activity</b>	<b>Monitoring Techniques</b>
Barrier Modification and Fish Passage Improvement	Photo monitoring, as-built surveys
Fish Screen Installation or Replacement	Photo monitoring, screening criteria compliance monitoring
Instream Habitat Structures and Improvements	Photo monitoring, as-built surveys
Riparian Habitat Restoration, Bioengineering and Fencing	Photo monitoring, transects, survival monitoring
Off-channel and Side-channel restoration	Photo monitoring, as-built surveys
Road and Trail Erosion Control	Photo monitoring
Water Conservation Measures*	Photo monitoring, SB88 compliant diversion monitoring

\*includes Water Exchange and Efficiency Measures, Tailwater Management and Collection Ponds, Irrigation Management, Water Storage Tanks, Piping Ditches and Loss Evaluation, Sprinkler/Pressurized Irrigation, Head gates and Water Measuring Devices)

**A. Instream Habitat Structures and Improvements**

Instream habitat structures and improvements are intended to provide predator escape and resting cover, increase spawning habitat, improve migration corridors, improve pool to riffle ratios, and add habitat complexity and diversity. Specific techniques for instream habitat improvement may include:

- placement of large woody debris (LWD) scour and cover structures, log weirs, upsurge weirs, single and opposing log-wing-deflectors, engineered log jams, Hewitt ramps, divide logs, digger logs, spider logs; and log, root wad, and boulder combinations),
- boulder structures (boulder weirs, vortex boulder weirs, boulder clusters, and single and opposing boulder-wing-deflectors),
- install post-assisted wood structures (PAWS) or beaver dam analog structures (BDAS) to increase rearing habitat, and placement of imported spawning gravel. Implementation of these types of projects

may require the use of heavy equipment (e.g., self-propelled logging yarders, excavators, backhoes, helicopters), however, hand labor will be used when possible. Projects will include both anchored and unanchored logs, depending on site conditions and wood availability.

**Monitoring Protocols:**

- Provide Photo Monitoring in the Annual SHA report upon completion of the habitat structures that can clearly document changes over time. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo's code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc.)

**B. Beaver Management**

Two of the most common undesirable impacts to ranching activities that are caused by beavers include cutting of trees and flooding of properties or facilities important to the routine agricultural activities that occur on the property. Potential non-lethal measures that may be considered to mitigate for unwanted tree cutting in critical locations include the installation of wire mesh cages or the application of paint and sand mix at the base of trees in need of protection. Where the construction of beaver dams have raised the water level to cause unwanted flooding of ranch infrastructure landowners should consider installation of pond levelers or Clemson levelers as described Chapter 9 of The Beaver Restoration Guidebook (Pollock et al. 2015). If it is determined that implementation of the measures described in the Beaver Restoration Guidebook would not alleviate the impacts to agricultural activities caused by beaver dam construction, then the landowner is permitted to modify the structure and discourage future beavers from utilizing the site in the future when NMFS and CDFW have assessed the situation and agree on the extent of dam modification.

**Monitoring Protocols:**

- Provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.

3. Photo log which includes:
  - Site code
  - Photo's code (digital label)
  - Date photos were taken
  - Description of what was being documented (riparian growth, project implementation, etc.)

### C. Barrier Modification for Fish Passage Improvement

Barrier modification projects are intended to improve passage for the Covered Species by (1) providing access to upstream habitat, and (2) increasing the duration of accessibility (both within and between years). Projects may include those that improve Covered Species passage through beaver dams, existing culverts, diversions, dams, bridges, and paved and unpaved fords through replacement, removal, or retrofitting. In particular, these practices may include the use of gradient control weirs upstream or downstream of barriers to control water velocity, water surface elevation, or provide sufficient pool habitat to facilitate jumps, or interior baffles or weirs to mediate velocity and the increased water depth. BMAs also include log jam and beaver dam modifications to facilitate passage by juvenile and adult life stages of the Covered Species. Implementing these types of projects may require the use of heavy equipment (*e.g.*, self-propelled logging yarders, mechanical excavators, backhoes), however, hand labor will be used wherever possible.

The chapter in the CDFG Manual (Part XII), entitled *Fish Passage Design and Implementation*, provides technical guidance for the design of Covered Species passage projects at stream crossings, small dams and water diversion structures and should be referenced when developing Covered Species passage remediation projects. Part XII is intended to “guide designers through the general process of selecting a design approach for passage improvement. Where there is further opportunity to protect the Covered Species, additional site-specific criteria may be appropriate and recommended by agencies.

### Monitoring Protocols

All Covered Species passage projects shall be monitored using the following protocols:

- Provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (*i.e.* fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo's code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc.)
- The NOAA Restoration Center's Fish Passage Barrier Removal Performance Measures and Monitoring Worksheet which includes longitudinal profiles, cross sections and socio/economic information.

#### D. Bioengineering and Riparian Habitat Restoration

These projects are intended to improve Covered Species habitat through increased stream shading intended to lower stream temperatures, increase future recruitment of LWD to streams, and increase bank stability and invertebrate production. Riparian habitat restoration projects will aid in the restoration of riparian habitat by increasing the number of plants and plant groupings, and will include the following types of projects: natural regeneration, livestock exclusion fencing, bioengineering, and revegetation. Part XI of the CDFG Manual, *Riparian Habitat Restoration*, contains examples of these techniques and should be referenced when planning riparian projects. Reduction of instream fine sediment will improve Covered Species habitat and Covered Species survival by increasing fish embryo and alevin survival in spawning gravels, reducing injury to juveniles from high concentrations of suspended sediment, and minimizing the loss of, or reduction in size of, pools from excess sediment deposition.

The proposed activities will reduce stream sedimentation from bank erosion by stabilizing stream banks with appropriate site-specific techniques including: boulder-streambank stabilization structures, log-streambank stabilization structures, tree revetment, native plant material revetment, willow wall revetment, willow siltation baffles, brush mattresses, check dams, brush check dams, water bars, and exclusion fencing.

Guidelines for stream bank stabilization techniques are described in Part VII of the CDFG Manual, *Project Implementation*. These types of projects usually require the use of heavy equipment but hand labor will be used where ever possible.

#### **Monitoring Protocols:**

- CDFW Quantitative Effectiveness Monitoring of Bank Stabilization and Riparian Vegetation Restoration, 2007. Reports on field testing specific protocols for bank stabilization and riparian vegetation restoration. <http://cesonoma.ucanr.edu/files/27283.pdf>
- Provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo's code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc.)

## F. Creation of Off-channel/Side Channel Habitat

The creation of off-channel or side channel habitat is not included in the CDFG Manual however, guidelines and minimization measures have been developed for this BMA. Types of side channel or off-channel restoration projects that are eligible as a BMA under the Template SHA are:

- Connection of abandoned side channel or pond habitats to restore Covered Species access
- Connection of adjacent ponds
- Connection of oxbow lakes on floodplains that have been isolated from the meandering
- Channel by river management schemes, or channel incision
- Creation of side channel or off-channel habitat with self-sustaining channels
- Creation of alcoves
- Improvement of hydrologic connection between floodplains and main channels

Projects that involve the installation of a flashboard dam, head gate or other mechanical structure are not part of the BMAs under the Template SHA. Off channel ponds constructed under the Template SHA will not be used as a point of water diversion. The use of logs or boulders as stationary water level control structures will be allowed.

Restoration projects in this category may include: removal or breaching of levees and dikes, channel and pond excavation, creating temporary access roads, constructing wood or rock tailwater control structures, and construction of LWD habitat features. Implementation of these types of projects may require the use of heavy equipment (*e.g.*, self-propelled logging yarders, mechanical excavators, backhoes).

Information regarding consideration of water supply (channel flow/overland flow/groundwater), water quality, and reliability; risk of channel change; as well as, channel and hydraulic grade should be considered when developing off channel habitat features. A good reference document for designing off channel habitat features can be found in “Section 5.1.2 Side Channel/Off Channel Habitat Restoration in the Washington Department of Fish and Wildlife 2004 Stream Habitat Restoration Guidelines” (Saldi-Caromile, et al. 2004).

### **Monitoring Protocols:**

- Provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (*i.e.* fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo’s code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc.)
- Pre- and post-construction and design flow surveys of constructed inlet and outlet structures, including any

other critical or controlling hydraulic features.

## H. Riparian Restoration and Revegetation

This category includes revegetation of riparian areas and only other types of restoration that are consistent with the methods specified in the most current edition of the CDFW Salmonid Stream Habitat Restoration Manual, or as otherwise approved in writing by CDFW. The most current edition of the manual is available at [www.dfg.ca.gov/fish/resources/habitatmanual.asp](http://www.dfg.ca.gov/fish/resources/habitatmanual.asp).

Typically, riparian vegetation is planted within or adjacent to the active channel, and often in or near the wetted channel. Plantings include native herbaceous perennials, emergent species, grasses, trees, and shrubs. Planting methods vary by species, site, and size of material planted, ranging from hand planting to using a backhoe or excavator. For riparian trees, planting densities range from 130 to 300 plantings per acre, depending on the restoration goals (e.g., shading, sediment trapping, and bank stabilization), substrate, soil chemistry and hydrology. Trees and cuttings range in size from small rooted plugs to large diameter pole plantings. When installing pole plantings, heavy equipment may be used to excavate to or below water table depth. Maintenance activities include the occasional use of hand tools, portable pumps, pick-up trucks and/or water trucks in or near the bed, bank, or channel, for irrigation, debris removal, and replanting of restoration sites.

### Monitoring Protocols:

- CDFW Quantitative Effectiveness Monitoring of Bank Stabilization and Riparian Vegetation Restoration, 2007. Reports on field testing specific protocols for bank stabilization and riparian vegetation restoration. <http://cesonoma.ucanr.edu/files/27283.pdf>
- Provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. Photo point locations will be selected to give a sense of extent of planting and survival. These locations will be likely located along the fence line and revisited yearly, for 5 years, to establish qualitative success rates.
- The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo's code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc.)

## I. Monitoring and Research

This includes monitoring required by permittee's ESA Section 10 permits, CDFW's 1600 permit and all other regulatory requirements. Other studies and research that landowners will allow to further the understanding of

the Shasta River are also included such as studies for riparian survival, Covered Species surveys, habitat improvement, and food availability.

**Monitoring Protocols:**

- Reports on all monitoring and research done within a reporting year be included in the annual SHA report if author of the research gives consent for inclusion.

K. Piping Ditches

Piping projects consist of constructing a pipe to transport irrigation water as an alternative to conveying water in an open ditch, thereby reducing water loss including from evaporation and absorption. A water budget/balance or consumptive use analysis will be completed to determine actual amount of water saved by these projects. The amount determined to be saved will remain in the stream to benefit the Covered Species. These projects must demonstrate that they intend to dedicate the saved water for instream beneficial use, and make progress towards instream dedication through a means mutually agreeable to the permittee and NMFS and CDFW.

**Monitoring Protocols:**

- Provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc.).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo's code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc.)
- Real time water diversion monitoring protocol (TBD) or water measuring protocol that is in concurrence with SB88.

L. Fish Screens

This category includes the installation, operation, and maintenance of the types of fish screens described below, provided they meet the NMFS (1996, 1997) fish screening criteria. Installing a fish screen usually includes site excavation, forming and pouring a concrete foundation and walls, excavation and installation of a fish bypass pipe or channel, and installation of the fish screen structure. Dewatering is often required and could be implemented through coffer dams or sheet piling. Heavy equipment is typically used for excavation of the screen site and bypass. If the fish screen is placed within or near flood prone areas, typically rock or other armoring is installed to protect the screen. Fish screen types include:

- Self-cleaning screens, including flat plate self-cleaning screens, and other self-cleaning designs, including, but not limited to, rotary drum screens and cone screens, with a variety of cleaning

mechanisms, consistent with NMFS fish screening criteria (1996, 1997).

- Non-self-cleaning screens, including tubular, box, and other screen designs consistent with NMFS screening criteria (1996, 1997).

#### **Monitoring Protocols:**

- In the event the fish screen is installed, repaired, replaced, and/or relocated, provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc).
  2. Provide a Photo Point monitoring map which includes:
    - Points showing the exact location of each photo monitoring point on the ranch
    - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
    - Directional orientation of photos
    - Map scale and North marker
    - Landmarks such as labeled road crossings and waterways.
  3. Photo log which includes:
    - Site code
    - Photo's code (digital label)
    - Date photos were taken
    - Description of what was being documented (riparian growth, project implementation, etc.)
- Pre- and post-construction and design flow surveys of structure and any other critical or controlling hydraulic features.

#### **M. Headgates and Water Measuring Devices**

Measuring devices are typically installed with the head gate to allow water users to determine the volume of water diverted. These devices will help diverters ensure that are diverting their legal water right. Head gate designs will be approved by a NMFS or CDFW engineer prior to installation; *provided, however*, that such approval will be deemed to have occurred if an agency fails to take action within 60 days of submission of head gate designs by a permittee to NMFS and CDFW. This category includes the installation and maintenance of stream gages in the active stream channel, usually using pipe 2" or greater in diameter. Typically, the pipe is secured to the bank by notching it into the bank and by then attaching it to the bedrock, a boulder, or a concrete buttress. Generally, heavy equipment is not needed to install and maintain stream gages. Water measuring devices will have the ability to record diversion volumes hourly for points of diversion that have water rights greater than or equal to 1,000 acre feet per year and daily for points of diversion with water rights less than 1,000 acre feet per year. For points of diversion with water rights less than or equal to 10 acre feet per year should be recorded monthly.

#### **Monitoring Protocols:**

- In the event a head gate is installed, replaced, repaired, and/or relocated, Permittee will provide Photo Monitoring in the Annual SHA report that can clearly document changes over time and/or management activities. The Permittee will do the following as part of photo point monitoring:
  1. Establish, label and re-occupy set photo points, with a permanent marker in view of the photo monitoring point (i.e. fencepost, hillside, large tree, etc.).
  2. Provide a Photo Point monitoring map which includes:

- Points showing the exact location of each photo monitoring point on the ranch
  - Labels for each photo monitoring point with a site code (Ranch ID/Photo Point #)
  - Directional orientation of photos
  - Map scale and North marker
  - Landmarks such as labeled road crossings and waterways.
3. Photo log which includes:
- Site code
  - Photo's code (digital label)
  - Date photos were taken
  - Description of what was being documented (riparian growth, project implementation, etc.)
- Include the water measuring data as specified in the individual site plan.

**P. Water Exchanges**

Water exchanges may be done in certain reaches where additional stream flow can be diverted in lieu of a cold water source. The act of diverting additional water at a point of diversion must not impact bypass flow requirements past that point of diversion or any downstream point. These exchanges must be monitored sufficiently to document the exchanges are of equal amounts (stream diversion to spring water) to ensure dewatering of the channel is not occurring. The State Water Board will require any exchanges to be documented through a 1740 and 1707 process.

**Monitoring Protocols:**

- Temperature Monitoring Protocol (TBD) as specified in an individual Site Plan Agreement or in the Flow Management Plan.
- Real time water diversion monitoring protocol (TBD) as specified in individual Site Plan Agreement or in the Flow Management Plan.

**Q. 1707 Dedications**

Permittees who divert water under any legal basis of right, including riparian, permitted, and licensed water rights, may petition the State Water Board pursuant to Water Code section 1707 for a “change for purposes of preserving or enhancing wetlands habitat, fish and wildlife resources, or recreation in, or on, the water.” The section 1707 petition may be coupled with an application for a water right or a petition to amend an existing permit or license in order to modify an existing project so that diversion will occur in a manner that improves conditions for Covered Species.

**Monitoring Protocols:**

- Temperature Monitoring Protocol (TBD)
- Real time water diversion monitoring protocol (TBD)

**IIA. Avoidance and Minimization Measures for Beneficial Management Activities**

The following general minimization measures, as they apply to particular BMAs, shall be incorporated into Site Plan Agreements authorized under the Template SHA, as appropriate.

## A. General Protection Measures

- The general construction season shall be from June 15 to November 1st. Restoration, construction, fish relocation, and dewatering activities within any wetted or flowing stream channel shall only occur within this period. Revegetation outside of the active channel may continue beyond November 1, if necessary.
- Prior to construction, any contractor shall be provided with the specific protective measures to be followed during implementation of the project. In addition, a qualified biologist shall provide the construction crew with information on the listed species in the project area, the protection afforded the species by the ESA, and guidance on those specific protection measures that must be implemented as part of the project.
- All activities that are likely to result in negative aquatic effects, including temporary effects, shall proceed through a sequencing of effect reduction: avoidance, reduction in magnitude of effect.
- Poured concrete shall be excluded from the wetted channel until the water surrounding the concrete structure has a PH between 6 and 8.5 to avoid water quality issues for Covered Species.
- If the thalweg (location of the deepest and fastest part) of the stream has been altered due to construction activities, efforts shall be undertaken to reestablish it to its original configuration<sup>1</sup>.

## B. Requirements for Covered Species Relocation and Dewatering Activities

**1. Guidelines for dewatering.** Project activities funded or permitted under the Template SHA may require Covered Species relocation or dewatering activities. Dewatering may not be appropriate for some projects that will result in only minor input of sediment, such as placing logs with hand crews, or installing boulder clusters. Dewatering can result in the temporary loss of aquatic habitat, and the stranding, or displacement of Covered Species. Increased turbidity may occur from disturbance of the channel bed. The following guidelines may minimize potential effects for projects that require dewatering of a stream:

- In those specific cases where it is deemed necessary to work in flowing water, the work area shall be isolated and all flowing water shall be temporarily diverted around the work site to maintain downstream flows during construction. Restoration actions such as installing LWD, boulder structures or spawning gravel, where heavy equipment does not enter the stream and can operate from the streambank, do not need to occur in a dewatered stream channel.
- Exclude Covered Species from occupying the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. Mesh will be no greater than 1/8 inch diameter. The bottom of a seine must be completely secured to the channel bed. Screens must be checked twice daily and cleaned of debris to permit free flow of water. Block nets shall be placed and maintained throughout the dewatering period at the upper and lower extent of the areas where Covered Species will be removed. Block net mesh shall be sized to ensure Covered Species upstream or downstream do not enter the areas proposed for dewatering between passes with the electrofisher or seine.
- Prior to dewatering, determine the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of Covered Species and other aquatic vertebrates (as described more fully below under **General conditions for all Covered Species capture and relocation activities.**)
- Coordinate project site dewatering with a qualified biologist in coordination with NMFS and CDFW to perform Covered Species relocation activities. The qualified biologist(s) must be familiar with the life history and identification of the Covered Species within the action area.
- Prior to dewatering a construction site, qualified individuals will capture and relocate Covered Species and other native fish and amphibians to avoid direct mortality and minimize adverse effects. This is especially

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<sup>1</sup> Projects that may include activities, such the use of willow baffles, which may alter the thalweg are allowed

important if listed species are present within the project site.

- Minimize the length of the dewatered stream channel and duration of dewatering, to the extent practicable.
- Any temporary dam or other artificial obstruction constructed shall only be built from materials such as sandbags or clean gravel which will cause little or no siltation. Cofferdams should be constructed to minimize water seepage into the construction areas. Cofferdams and stream diversion systems shall remain in place and fully functional throughout the construction period.
- When coffer dams with bypass pipes are installed, debris racks will be placed at the bypass pipe inlet. Bypass pipes will be monitored a minimum of two times per day, seven days a week. All accumulated debris shall be removed.
- Bypass pipes will be sized to not create scour at the outflow and to accommodate the existing streamflow.
- The work area may need to be periodically pumped dry of seepage. Place pumps in flat areas, well away from the stream channel. Secure pumps by tying off to a tree or stake in place to prevent movement by vibration. Refuel in an area well away from the stream channel and place fuel absorbent mats under pump while refueling. Pump intakes shall be covered with 1/8 inch mesh to prevent potential entrainment of Covered Species that failed to be removed. Check intake periodically for impingement of Covered Species.
- If pumping is necessary to dewater the work site, procedures for pumped water shall include requiring a temporary siltation basin for treatment of all water prior to entering any waterway and not allowing oil or other greasy substances originating from operations to enter or be placed where they could enter a wetted channel. Projects will adhere to NMFS Southwest Region *Fish Screening Criteria for Salmonids* (NMFS 1997).
- Discharge sediment-laden water from construction areas to an upland location or settling pond where it will not drain sediment-laden water back to the stream channel.
- When construction is complete, the flow diversion structure shall be removed as soon as possible in a manner that will allow flow to resume with the least disturbance to the substrate. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour. This will minimize the probability of Covered Species stranding as the area upstream becomes dewatered.

## ***2. General conditions for all Covered Species capture and relocation activities:***

- Covered Species relocation and dewatering activities shall only occur between June 15 and November 1 of each year.
- All seining, electrofishing, and relocation activities shall be performed by a qualified fisheries biologist. The qualified fisheries biologist shall capture and relocate the Covered Species prior to construction of the water diversion structures (*e.g.*, cofferdams). The qualified fisheries biologist shall note the number of salmonids observed in the affected area, the number and species of salmonids relocated, where they were relocated to, and the date and time of collection and relocation. The qualified fisheries biologist shall have a minimum of three years field experience in the identification and capture of salmonids.. The qualified biologist will adhere to the following requirements for capture and transport of Covered Species:
  1. Determine the most efficient means for capturing Covered Species (*i.e.*, seining, dip netting, trapping, electrofishing). Complex stream habitat generally requires the use of electrofishing equipment, whereas in outlet pools, Covered Species may be concentrated by pumping-down the pool and then seining or dipnetting Covered Species.
  2. Notify NMFS and CDFW one week prior to capture and relocation of Covered Species to provide NMFS and CDFW an opportunity to monitor.
  3. Initial Covered Species relocation efforts will be conducted several days prior to the start of construction. This provides the fisheries biologist an opportunity to return to the work area and

perform additional seining or electrofishing passes immediately prior to construction. In many instances, additional Covered Species will be captured that eluded the previous day's efforts.

4. In streams with high water temperature, perform relocation activities during morning periods.
- Prior to capturing Covered Species, determine the most appropriate release location(s). Consider the following when selecting release site(s):
    1. Similar water temperature as capture location
    2. Ample habitat for captured Covered Species
    3. Low likelihood of Covered Species reentering work site or becoming impinged on exclusion net or screen.
    4. Covered Species must be released in the nearest suitable location within the same stream . If another location is proposed, this will be approved in advance by NMFS or CDFW.
  - Periodically measure air and water temperatures. Cease activities when measured water temperatures exceed 18 °C if Covered Species are present. Temperatures will be measured at the head of riffle tail of pool interface.

**3. Electrofishing Guidelines.** The following methods shall be used if Covered Species are relocated via electrofishing:

- All electrofishing will be conducted according to NMFS *Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act (2000)*.
- The backpack electrofisher shall be set as follows when capturing Covered Species:

Voltage setting on the electrofisher shall not exceed 300 volts.

A) Voltage:	100 Volts	300 Volts
B) Duration:	500 $\mu$ s (microseconds)	5 ms (milliseconds)
C) Frequency:	30 Hertz	70 Hertz

- A minimum of three passes with the electrofisher shall be conducted to ensure maximum capture probability of Covered Species within the area proposed for dewatering.
- No electrofishing shall occur if water conductivity is greater than 350 microSiemens per centimeter ( $\mu$ S/cm) or when instream water temperatures exceed 18 °C. Water temperatures shall be measured at the pool/riffle interface. Direct current (DC) shall be used.
- A minimum of one assistant shall aid the fisheries biologist by netting stunned fish and other aquatic vertebrates.

**4. Seining guidelines.** The following methods, shall be used if Covered Species are removed with seines.

- A minimum of three passes with the seine shall be utilized to ensure maximum capture probability of Covered Species within the area.
- All captured Covered Species shall be processed and released prior to each subsequent pass with the seine.
- The seine mesh shall be adequately sized to ensure Covered Species are not gilled during capture and relocation activities.

**5. Guidelines for relocation of Covered Species.** The following methods shall be used during relocation activities associated with either method of capture (electrofishing or seining):

- Covered Species shall not be overcrowded into buckets; allowing approximately six cubic inches per young-of-the-year (0+) individual and more for larger individuals.
- Every effort shall be made not to mix 0+ salmonids with larger salmonids, or other potential predators. Have at least two containers and segregate 0+ age Covered Species from larger age-classes. Place larger amphibians in containers with larger fish.
- Covered Species predators, such as sculpins (*Cottus sp.*) collected and relocated during electrofishing or seining activities shall be relocated so as to not concentrate them in one area. Particular emphasis shall be placed on avoiding relocation of sculpins to relocation sites identified for the Covered Species. To minimize predation on Covered Species, these species shall be distributed throughout the wetted portion of the stream so as not to concentrate them in one area.
- All captured Covered Species shall be relocated, preferably upstream, of the proposed construction project and placed in suitable habitat. Captured Covered Species shall be placed into a pool, preferably with a depth of greater than two feet with available instream cover.
- All captured Covered Species will be processed and released prior to conducting a subsequent electrofishing or seining pass.
- All Covered Species and other native fish captured will be allowed to recover from electrofishing before being returned to the stream.
- Minimize handling of Covered Species. When handling is necessary, always wet hands or nets prior to touching Covered Species. Handlers will not wear DEET based insect repellents.
- Temporarily hold Covered Species in cool, shaded, aerated water in a container with a lid. Provide aeration with a battery-powered external bubbler. Protect Covered Species from jostling and noise and do not remove Covered Species from this container until time of release.
- Place a thermometer in holding containers and, if necessary, periodically conduct partial water changes to maintain a stable water temperature. If water temperature reaches or exceeds 18 °C., Covered Species shall be released and rescue operations ceased.
- In areas where aquatic vertebrates are abundant, periodically cease capture, and release at predetermined locations.
- Visually identify species and estimate year-classes of fishes at time of release. Record the number of Covered Species and other fish captured. Avoid anesthetizing or measuring Covered Species.
- If more than three percent of the Covered Species captured are killed or injured, the project lead shall contact NMFS and CDFW. The purpose of the contact is to allow the agencies a courtesy review of activities resulting in take and to determine if additional protective measures are required. All salmonid mortalities must be retained, placed in an appropriately sized whirl-pak or zip-lock bag, labeled with the date and time of collection, fork length, location of capture, and frozen as soon as possible. Frozen samples must be retained until specific instructions are provided by NMFS.

### **C. Measures to Minimize Disturbance from Instream Habitat Restoration Construction**

Measures to minimize disturbance associated with instream habitat restoration construction activities are presented below.

- Construction will only occur between June 15 and November 1.
- Debris, soil, silt, excessive bark, rubbish, creosote-treated wood, raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil or entering waterways. Any of these materials, placed within or where they may enter a stream or

lake, by the applicant or any party working under contract, or with permission of the applicant, shall be removed immediately. During project activities, all trash that may attract potential predators of Covered Species will be properly contained, removed from the work site, and disposed of daily.

- Where feasible, the construction shall occur from the bank, or on a temporary pad underlain with filter fabric.
- Use of heavy equipment shall be minimized in a channel bottom with rocky or cobbled substrate. If access to the work site requires crossing a rocky or cobbled substrate, a rubber tire loader/backhoe is the preferred vehicle. Only after this option has been determined infeasible will the use of tracked vehicles be considered. The amount of time this equipment is stationed, working, or traveling within the creek bed shall be minimized. When heavy equipment is used, woody debris and vegetation on banks and in the channel shall not be disturbed if outside of the project's scope.
- Hydraulic fluids in mechanical equipment working within the stream channel shall not contain organophosphate esters. Vegetable based hydraulic fluids are preferred.
- The use or storage of petroleum-powered equipment shall be accomplished in a manner to prevent the potential release of petroleum materials into waterways.
- Areas for fuel storage, refueling, and servicing of construction equipment must be located in an upland location.
- Prior to use, clean all equipment to remove external oil, grease, dirt, mud and potential invasive species. Wash sites must be located in upland locations so wash water does not flow into a stream channel or adjacent wetlands.
- All construction equipment must be in good working condition, showing no signs of fuel or oil leaks. Prior to construction, all mechanical equipment shall be thoroughly inspected and evaluated for the potential of fluid leakage. All mechanical equipment shall be inspected on a daily basis to ensure there are no motor oil, transmission fluid, hydraulic fluid, or coolant leaks. All leaks shall be repaired in the equipment staging area or other suitable location prior to resumption of construction activity.
- Oil absorbent and spill containment materials shall be located on site when mechanical equipment is in operation with 100 feet of the proposed watercourse crossings. If a spill occurs, no additional work shall commence in-channel until (1) the mechanical equipment is inspected by the contractor, and the leak has been repaired, (2) the spill has been contained, and (3) CDFW and NMFS are contacted and have evaluated the impacts of the spill.

#### **D. Measures to Minimize Degradation of Water Quality**

Construction or maintenance activities for projects covered under the Template SHA may result in temporary increases in turbidity levels in the stream. The following measures will be implemented to reduce the potential for adverse effects to water quality during and post-construction:

##### ***1. General erosion control during construction:***

- When appropriate, isolate the construction area from flowing water until project materials are installed and erosion protection is in place.
- Effective erosion control measures shall be in place at all times during construction. Do not start construction until all temporary control devices (*e.g.*, straw bales with sterile, weed free straw, silt fences) are in place downslope or downstream of project site within the riparian area. The devices shall be properly installed at all locations where the likelihood of sediment input exists. These devices shall be in place during and after construction activities for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and detaining sediment-laden water on site. If continued erosion is likely to occur after construction is complete, then appropriate erosion prevention measures shall

be implemented and maintained until erosion has subsided. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles (esp. snakes) and amphibians.

- Sediment shall be removed from sediment controls once it has reached one-third of the exposed height of the control. Whenever straw bales are used, they shall be sterile and weed free, staked and dug into the ground 12 cm. Catch basins shall be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.
- Sediment-laden water created by construction activity shall be filtered before it leaves the settling pond or enters the stream network or an aquatic resource area.
- The contractor/applicant to the Program is required to inspect, maintain or repair all erosion control devices prior to and after any storm event, at 24 hour intervals during extended storm events, and a minimum of every two weeks until all erosion control measures have been completed.

## ***2. Guidelines for temporary stockpiling:***

- Minimize temporary stockpiling of material. Stockpile excavated material in areas where it cannot enter the stream channel. Prior to start of construction, determine if such sites are available at or near the project location. If nearby sites are unavailable, determine location where material will be deposited. Establish locations to deposit spoils well away from watercourses with the potential to deliver sediment into streams supporting, or historically supporting populations of the Covered Species. Spoils shall be contoured to disperse runoff and stabilized with mulch and (native) vegetation. Use devices such as plastic sheeting held down with rocks or sandbags over stockpiles, silt fences, or berms of hay bales, to minimize movement of exposed or stockpiled soils.
- If feasible, conserve topsoil for reuse at project location or use in other areas. End haul spoils away from watercourses as soon as possible to minimize potential sediment delivery.

## ***Pre Rainstorm and Post construction erosion control:***

- Prior to a forecasted precipitation event of  $> \frac{1}{2}$  inch, immediately after project completion and before close of seasonal work window, stabilize all exposed soil with erosion control measures such as mulch, seeding, and/or placement of erosion control blankets. Remove all artificial erosion control devices after the project area has fully stabilized. All exposed soil present in and around the project site shall be stabilized after construction. Erosion control devices such as coir rolls or erosion control blankets will not contain plastic netting of a mesh size that would entrain reptiles (esp. snakes) and amphibians.
- All bare and/or disturbed slopes ( $> 100$  square ft of bare mineral soil) will be treated with erosion control measures such as hay bales, netting, fiber rolls, and hydroseed as permanent erosion control measures.
- Where straw, mulch, or slash is used as erosion control on bare mineral soil, the minimum coverage shall be 95 percent with a minimum depth of two inches.
- When seeding is used as an erosion control measure, only seeds from native plant species will be used. Sterile (without seeds), weed-free straw, free of exotic weeds, is required when hay or hay bales are used as erosional control measures.

## **E. Measures to Minimize Loss or Disturbance of Riparian Vegetation**

Measures to minimize loss or disturbance to riparian vegetation are described below. The revegetation and success criteria that will be adhered to for projects implemented under the Template SHA that result in disturbance to riparian vegetation are also described below.

### **1. Minimizing disturbance:**

- Retain as many trees and brush as feasible, emphasizing shade-producing and bank-stabilizing trees and brush.
- Prior to construction, determine locations and equipment access points that minimize riparian disturbance. Avoid entering unstable areas. Use project designs and access points that minimize riparian disturbance without affecting less stable areas, which may increase the risk of channel instability.
- Minimize soil compaction by using equipment with a greater reach or that exerts less pressure per square inch on the ground than other equipment, resulting in less overall area disturbed or less compaction of disturbed areas.
- If riparian vegetation is to be removed with chainsaws, only use vegetable-based bar oil.

### **2. Revegetation and success criteria:**

- Any stream bank area left barren of vegetation as a result of the implementation or maintenance of the practices shall be restored to a natural state by seeding, planting, or other means with native trees, shrubs, or grasses prior to November 1 of the project year. Barren areas shall typically be planted with a combination of willow stakes, native shrubs and trees and/or erosion control grass mixes.
- Native plant species shall be used for revegetation of disturbed and compacted areas. The species used shall be specific to the Shasta Valley, and comprise a diverse community structure (plantings shall generally include both woody and herbaceous species, in coordination with NMFS and CDFW).
- For projects where re-vegetation is implemented to compensate for riparian vegetation impacted by project construction, a re-vegetation monitoring report will be required after 5 years to document success. Success is defined as 50 percent survival of plantings or 50 percent native ground cover for broadcast planting of seed after a period of 3 years. If revegetation efforts will be passive (*i.e.*, natural regeneration), success will be defined as total cover of woody and herbaceous material equal to or greater than pre-project conditions. If at the end of five years, the vegetation has not successfully been re-established, the project applicant to the Program will be responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve the above success standards. If success is not achieved within the first 5 years, the project applicant will need to prepare a follow-up report in an additional 5 years. This requirement will proceed in 5 year increments until success is achieved.
- All exclusion netting or fencing placed around plantings will be removed after 3 years, or later until plantings are no longer being substantially impacted by livestock or wildlife.

### **F. Measures to Minimize Impacts to Roads in Project Area**

Upon the completion of restoration activities, roads within the riparian zone used for implementation of BMAs and AMMs shall be weather proofed according to measures as described in *Handbook for Forest and Ranch Roads* by Weaver and Hagans (1994) of Pacific Watershed Associates and in Part X of the CDFG Manual entitled “*Upslope Assessment and Restoration Practices.*” The following are some of the methods that may be applied to roads impacted by project activities implemented under the Template SHA.

- Establish waterbreaks (*e.g.*, waterbars and rolling dips) on all seasonal roads, skid trails, paths, and fire breaks by October 15. Do not remove waterbreaks until May 15.
- Maximum distance between waterbreaks shall not exceed the following standards: (1) 100 feet for road or trail gradients less than 10 percent slope; (2) 75 feet for road or trail gradients from 11 to 25 percent; (3) 50 feet for road or trail gradients from 26 to 50 percent slope; and (4) 50 feet for road or trail gradients greater

than 50 percent slope. Depending on site-specific conditions more frequent intervals may be required to prevent road surface rilling and erosion.

- Locate waterbreaks to allow water to be discharged onto some form of vegetative cover, slash, rocks, or less erodible material. Do not discharge waterbreaks onto unconsolidated fill.
- Waterbreaks shall be cut diagonally a minimum of six inches into the firm roadbed, skid trail, or firebreak surface and shall have a continuous firm embankment of at least six inches in height immediately adjacent to the lower edge of the waterbreak cut.
- The maintenance period for waterbreaks and any other erosion control facilities shall occur after every major storm event for the first year after installation.
- Rolling-dips are preferred over waterbars. Waterbars shall only be used on unsurfaced roads where winter use (including use by bikes, horses, and hikers) will not occur.
- After the first year of installation, erosion control facilities shall be inspected for failure prior to the winter period (October 15) after the first major storm event, and prior to the end of the winter period (May 15). If the erosion controls have failed, additional erosion control elements will be installed to the project site.
- Applicant will establish locations to deposit spoils well away from watercourses with the potential to deliver sediment into streams supporting, or historically supporting Covered Species. Spoils shall be contoured to disperse runoff and stabilized with mulch and (native) vegetation.
- No berms are allowed on the outside of the road edge.

### III. References

- National Marine Fisheries Service. 1996. Juvenile Fish Screen Criteria for Pump Intakes. National Marine Fisheries Service, Southwest Region.  
[http://www.westcoast.fisheries.noaa.gov/publications/hydropower/fish\\_screen\\_criteria\\_for\\_pumped\\_water\\_intakes.pdf](http://www.westcoast.fisheries.noaa.gov/publications/hydropower/fish_screen_criteria_for_pumped_water_intakes.pdf)
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- National Marine Fisheries Service. 2014. Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of Coho Salmon (*Oncorhynchus kisutch*). National Marine Fisheries Service. Arcata, CA.  
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- Saldi-Caromile, K., K. Bates, P. Skidmore, J. Barenti, D. Pineo. 2004. Stream Habitat Restoration Guidelines: Final Draft. Co- published by the Washington Departments of Fish and Wildlife and Ecology and the U.S. Fish and Wildlife Service. Olympia, Washington.

### D. Description of Baseline Conditions

Baseline Conditions means the habitat conditions for the Covered Species on the Enrolled Property when NMFS approves this Site Plan Agreement. The Enrolled Property is within the Mid-Shasta Reach of the Agreement Area. Baseline Conditions for the Enrolled Property are the conditions described in Appendix 2 of the Template Safe Harbor Agreement for these reaches of the Shasta River.

Elevated Baseline Conditions are certain Baseline Conditions improved as a result of certain Beneficial Management Activities. Elevated Baseline for this Site Plan Agreement are the improved fish passage and flow conditions that will result from the following actions:

Implement efficiency projects from point of diversion to place of use and commit to reduce diversion by 1,136 acre-feet per year and commits to a permissive dedication via 1707.

Table 2 summarizes the Beneficial Management Activities required to maintain Baseline Conditions and to achieve Elevated Baseline Conditions on the Enrolled Property for the term of the Site Plan Agreement.

**E. Beneficial Management Activities:** This section provides a detailed description of Conservation and Habitat Enhancement Activities to be implemented on the Enrolled Property for the benefit of the Covered Species.

Table 2-Grenada Irrigation District Summary of Net Conservation Benefit Actions

Habitat Parameter	Net Conservation Benefit Actions		
	Present Day Baseline (Maintain)  E1	Elevated Baseline Condition (Restore)  E2	Other Beneficial Management Activities (Restore; Measures to Avoid and Minimize Impacts)  E3
Hydrology/Water Quality	Maintain upgraded diversion facility as described in Sections E.1.a.	Conserved water will be provided for instream benefit through SWRCB Change Petition and Water Code 1707 if applicable. E.2.a.	<p>Participate in a reach wide diversion management strategy for the Mid Shasta as described in Section E.3.a1</p> <p>Implement conveyance pipeline to reduce transmission loss. Conserved water will be provided for instream benefit when project is implemented. Estimated 1,136 acre-feet will be conserved on an average year. E.3.a2</p> <p>Work with agencies and SWCG to use stream flow gage at GID riffle to reduce flow variability resulting from GID diversion and curtailment E.3.a3</p>

Passage/Migration/Screening	<p>Maintain unimpeded fish passage conditions at the GID diversion.</p> <p>Maintain self-cleaning fish screen at the GID diversion point.</p>		
Instream Habitat Complexity	Will maintain the instream barb structures opposite of the Fish Screen as described in Section E.1.c		<p>Provide access for implementation of large wood enhancement on GID riparian property if deemed applicable by the Agencies as described in Section E.3.c.</p> <p>Implement beaver BMPs as described in template.</p>
Riparian Condition /Function	Will continue to perform yearly maintenance on existing riparian fencing as described in E.1.d.		Replace riparian/boundary fencing if needed due to flood damage.

Substrate Quality	Allow Spawning gravel placed at head of riffle to remain E.1.e		
Pasture Management	-Not applicable		No grazing of riparian parcels will be conducted by GID. Belcampo Farms owns property within the fenced area that includes Belcampo Farms North Annex property. A letter confirming Belcampo will abide by it's approved grazing plan is included as Appendix E
Assessment/Studies	-Willing to maintain stream flow and water temperature gauging site if determined a SWCG flow monitoring site		-Agreeable to assessments/studies. Agreeable to flow gauging on GID riffle, water temp and diversion volume if determined SWCG flow monitoring site. .
Supplementation			-The Permittee will allow access for salmonid supplementation as described in Section E.3.h.

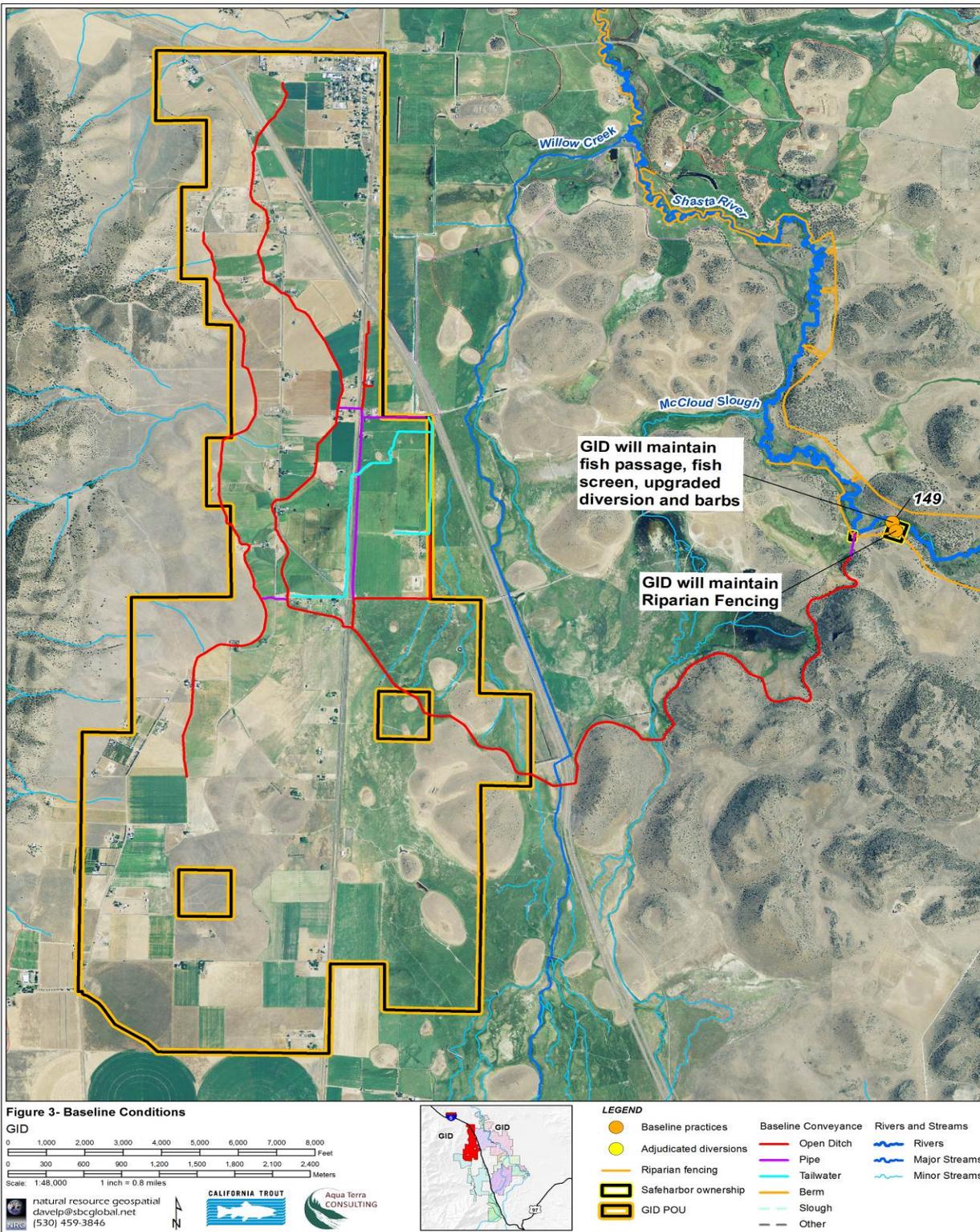


Figure 3. Grenada Irrigation District – Baseline Conditions

## E.1. Actions Required to Maintain Baseline Conditions

This section details the actions required to maintain Baseline Conditions. This includes any land and/or water management activities that are being implemented, or have been implemented on the enrolled property that benefit the Covered Species and will be maintained over the duration of the Template Safe Harbor Agreement.

### E.1.a. Hydrology/Water Quality

GID will continue to operate and maintain the recently upgraded diversion facility that eliminated a large diversion dam which impounded water and prevented fish passage. The new diversion is on the active channel of the Shasta River and does not require impoundment. The impounding of water also impacted water quality by increasing resident time and heating. The new intake facility and pumping station allow for remote operation of diversion facility including limiting diversion volume per schedule.

### E.1.b. Passage/Migration/ Diversion Screening

GID will continue to operate and maintain the recently upgraded diversion facility (operable in 2014) that eliminated a large diversion dam which impounded water and prevented fish passage. New diversion structure is on the active channel of the Shasta River and does not require impoundment, allowing for year round fish passage.

#### Fish Passage:

GID will maintain the intake structure and the roughened channel that was completed in 2014 which provides continuous fish passage to all life stages.

#### Fish Screen:

GID will maintain the compliant fish screen that was completed in 2014 when the diversion point was re-constructed.

### E.1.c. Instream Habitat Complexity

Instream Structures: GID will maintain stream barb structures that were installed in 2012 as part of the diversion upgrade including stream barbs opposite of the Fish screen.

### E.1.d. Riparian Condition/Function:

Riparian Fencing and Planting: GID will continue to maintain boundary fence with Belcampo Farms to protect riparian area and riparian plantings from unmanaged grazing. Riparian fencing has been constructed and will be maintained by GID as part of this Site Plan Agreement. Riparian planting occurred in 2014 and 2015 with limited survival. Plantings should have higher success with several years of maintenance.

### E.1.e. Substrate Quality:

Spawning gravel was placed at head of constructed riffle and has been utilized by Chinook for spawning in 2013, 2015 and 2016. Coho use not observed.

### E.1.f. Pasture Management:

GID riparian property is currently not grazed by GID but Belcampo Farms- North Annex has property within the fenced area with GID parcels. The area is grazed by Belcampo Farms per their riparian grazing plan and site plan.

**E.1.g Assessments/Studies:**

GID has flow gage (stage only) and temp gage on southern boundary that is connected to CDEC that is expected to be continued through SWCG compliance monitoring

**E.1.h Supplementation:**

The Permittee will not implement any measures specifically to supplementation under baseline, see section E.3.h.

**E.2. Actions Required to Achieve Elevated Baseline Conditions**

This section details the actions required to achieve and maintain Elevated Baseline conditions. This includes any land and water management activities that will be implemented and maintained on the enrolled property to improve unsuitable habitat conditions for the Covered Species for the duration of the Template Safe Harbor Agreement.

**E.2.a. Hydrology/Water Quality:**

GID will submit a Change Petition to add Fish and Wildlife as secondary beneficial use and increase delivery efficiency through installation of a pipeline from GID Pump Station to identified district boundary. GID proposes to install a pipeline which can be used in lieu of the existing Main Canal. The pipeline would be aligned to deliver water directly to the District (approx.3.3 miles of pipeline proposed) rather than following the existing contouring ditch alignment (5.3 miles). The pipeline design and permitting phase has received funding, allowing design work to commence. Remote pump control capabilities will allow for pump volume to be adjusted or turned off at any time without being present, including setting the pumping volume on a pre-programmed schedule. GID is actively working with SWRCB, CDFW, NOAA and stake holders to develop and submit a Change Petition to the SWRCB.

**E.2.b. Passage/Migration/ Diversion Screening:**

The Permittee will not implement any measures specifically to passage under elevated baseline, see section E.1.b.

**E.2.c. Instream Habitat Complexity:**

The Permittee will not implement any measures specifically to Instream habitat under elevated baseline, see section E.1.c and E.3.c.

**E.2.d. Riparian Function:**

The Permittee will not implement any measures specifically to Riparian Function under elevated baseline, see section E.1.d. and E.3.d.

**E.2.e Substrate Quality:**

The Permittee will not implement any measures specifically to Substrate Quality under elevated baseline, see section E.1.e and E.3.e.

**E.2.f. Pasture Management**

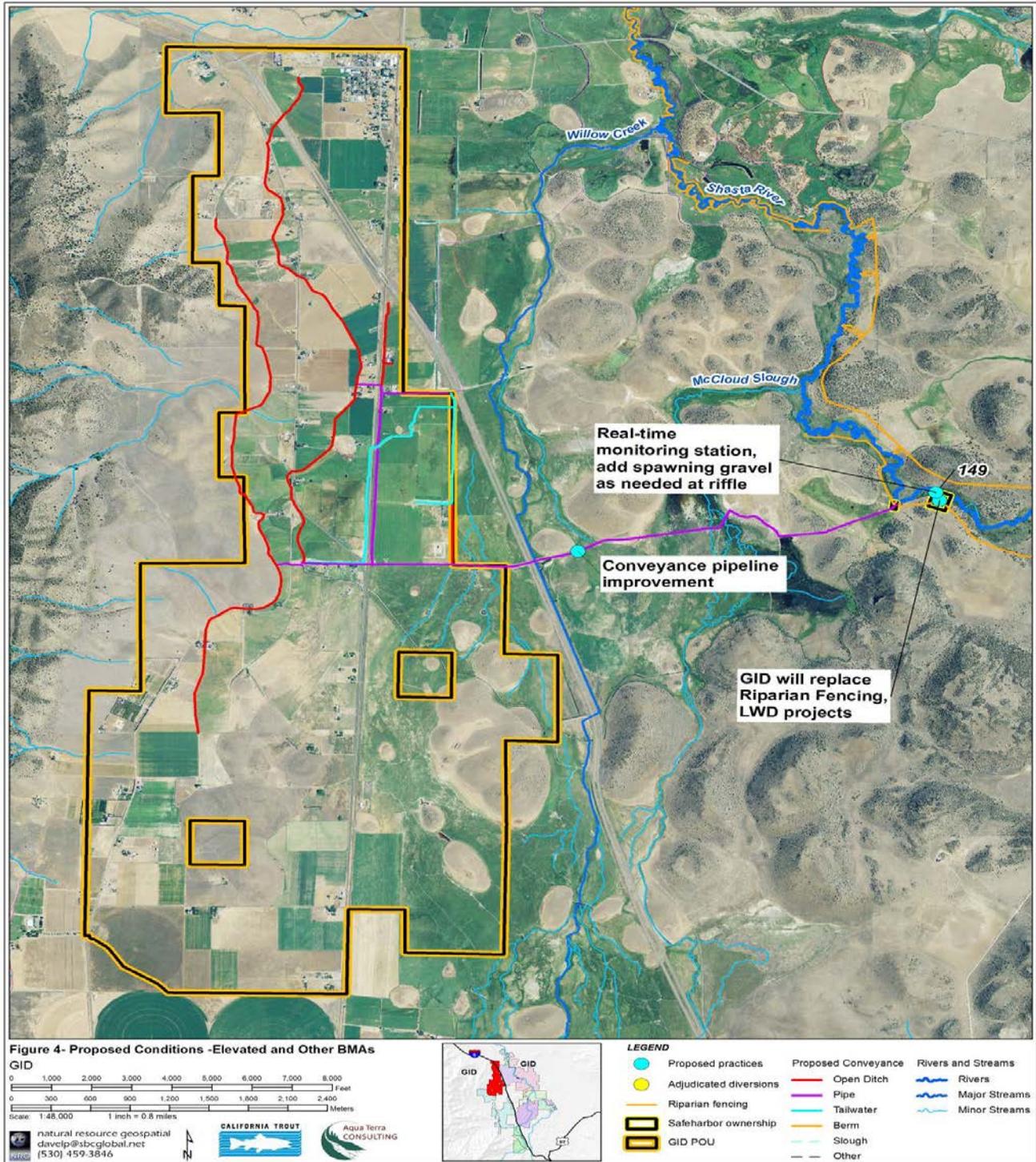
The Permittee does not graze lands covered under agreement. Belcampo Farms owns property within the fenced area that includes North Annex property. A letter confirming Belcampo will abide by it's approved grazing plan is included as Appendix E.

**E.2.g Assessments/Studies:**

The Permittee will not implement any additional measures specific to Assessments/Studies under elevated baseline, see section E.1.g and E.3.g.

E.2.h Supplementation:

The Permittee will not implement any measures specifically to supplementation under elevated baseline, see section E.3.h.



### E.3. Other Beneficial Land and Water Management Activities

This section summarizes any other land and water management activities that will be implemented on the enrolled property to benefit the Covered Species

#### E.3.a. Hydrology/Water Quality

##### E.3.a1: Participate in Reach-wide Flow Management Strategy:

The Permittee agrees to coordinate diversions with the other landowners along the reach to optimize reach-scale flow objectives in the Mid Shasta Reach. The flow objectives in the Mid-Shasta Reach are to participate in more gradual ramping into irrigation, reducing diversion to enhance conditions during important life stages for coho salmon and more quickly ramp out of irrigation season in September.

GID's commitment to the Mid-Shasta Reach objectives include:

- 1.) More gradual ramp into irrigation season: GID agrees not to divert from April 1 through April 9 to more gradually reduce diversion at the onset of diversion season per the Diversion Schedule in E.2.a
- 2.) Reduced diversion during out-migration and 0+ distribution: GID proposes to reduce diversion during irrigation season per the Diversion Schedules in E.2.a
- 3.) Reduced diversion at end of irrigation season: GID agrees to reduce diversion from 24 cfs to 18 cfs from September 7 through September 30 to aid Adult Chinook and other species per the Diversion Schedule in E.2.a

Implementation funding will be applied for within 2 years after receipt of the SHA permit. If implementation funding is not secured within 6 years after issuance of the permit, GID will meet with CDFW and NOAA to develop alternative proposals.E.3.a1

E.3.a2: Install a pipeline to connect GID pump station to GID district boundary to improve delivery efficiency: GID has considered numerous strategies to reduce the volume of water diverted based on enhancing flow conditions during life stage needs for Coho Salmon while still meeting the irrigation demands of its district users. Investigations show delivery inefficiency in GID's main canal is significant when diverting. During wet years, GID is typically not curtailed during the later part of the summer and would continue to be allowed to divert. During normal and drier years, curtailment and even cessation of diversion can occur during late summer period. Therefore, GID would propose two diversion schedules representing: 1.) Normal or drier years and 2.)Wet years. Water year type would be determined using Montague Water Conservation District's water year determination process modified for GID using two water year types: Normal and drier and Wet (See Appendix D-GID Operations Plan). Upon implementation of the pipeline, the Diversion Schedules reduce diversion compared to recent historical diversion volumes resulting in 1,136 -1,273 acre feet per year of conserved water remaining in the Shasta River during important life stages for Coho Salmon. Water Conservation through reduced diversion as a result of the projects will be verified through a data logger that will comply with SWRCB Water Measuring and Reporting requirements which will measure diverted volume every 15 minutes. GGID proposes the following Diversion Schedules to be implemented after the pipeline is installed:

### Diversion Volume Schedule -Normal and Drier Years

<u>Date</u>	<u>Life Stage</u>	<u>Current CFS</u>	<u>Proposed CFS</u>	<u>Conserved</u>
4/01-4/9 ( 9 days)	Juvenile	30	0 cfs	535 AF
4/10-5/20 (39 days)	Juvenile	30	24 cfs	464 AF
5/21-8/15 (86 days)	Over-summering	24	24 cfs*	00 AF
8/16-9/6 (22 days)	Over-summering	0-15	0-15*	00 AF
9/7-9/30 (23 days)	Over-summering	21	18 cfs*	137 AF
Average Annual Volume Conserved				1,136 AF

\*Schedule does not consider limitations of diversion caused by decree, priority and water master service and therefore claims no instream benefits resulting during the identified period.

### Diversion Volume Schedule -Wet Years

<u>Date</u>	<u>Life Stage</u>	<u>Current</u>	<u>Proposed</u>	<u>Conserved</u>
4/01-4/9 ( 9 days)	Juvenile	30	0 cfs	535 AF
4/10-5/20 (39 days)	Juvenile	30	24 cfs	464 AF
5/21-8/15 (86 days)	Over-summering	24	24 cfs*	00 AF
8/16-9/6 (22 days)	Over summering	24	24 cfs *	00 AF
9/7-9/30 (23 days)	Over-summering	24 cfs	18 cfs*	274 AF
Average Annual Volume Conserved				1,273 AF

\*Schedule does not consider limitations of diversion caused by decree, priority and water master service and therefore claims no instream benefits resulting during the identified period. .

Currently, due to GID's low priority water right, diversion volume is often curtailed or turned off by mid-August during normal and drier years to meet irrigation demand for higher priority and riparian water rights downstream. Approximately 70 cfs must be by-passed to higher priority or riparian rights downstream or GID is curtailed. GID and one other small diversion located approximately 10 river miles downstream are typically the only diversions curtailed on the Shasta River below Big Springs during normal water years. Curtailment is during the low flow period of the summer, after June 15. curtailment is overseen by the Scott-Shasta Watermaster Service (SSWD) who has authority to implement the Shasta River decree as directed by Siskiyou County Superior Court.

Therefore, on an average water year, the primary coho salmon life stages that GID's water conservation project and diversion schedule can aid includes reducing diversion during the spring to aid smolt out-migration and 0+ redistribution later in the spring (4/10-5/20). GID is not declaring the pipeline will conserve water during the mid and late summer due to annual variability in the volume of water diverted based on curtailment and irrigation demand. While GID does not identify periods within the summer as a period when conserved water would be realized instream, those conditions will occur with reduce diversion resulting from delivery efficiency. However, the instances of conserved water during the summer not predictable or quantifiable at this time.

GID is typically allowed and historically has diverted during the latter part of September as flow volumes increase, presumably as a result of reduced use upstream of GID. GID has agreed to reduce diversion during the last 23 days of irrigation season to aid conditions for adult Chinook.

E.3.a3: Investigate use of stream flow gage at GID riffle to aid in management: During the period of the permit, GID will work with involved parties to consider using the stream flow gauge at GID for more accurate and responsive capabilities to adaptively manage diversion volume and instream flow objectives compared to the current Montague gage. Currently, Water master service curtail GID using the flow gage near Montague, which is approximately 12 river miles downstream (which is noticed 15-18 hours after the flow change passes of GID point of diversion, resulting in erratic flow variability throughout the Shasta River during periods of curtailment. E.3.a3

E.3.a4: Forbearance Agreement: Permittee agrees to enter into a Forbearance Agreement with SWCG members for the purpose of improving habitat for covered species in the Shasta River.

E.3.b. Passage/Migration/ Diversion Screening:

The Permittee will not implement any measures specifically to passage other beneficial management actions, see section E.1.b.

E.3.c. Instream Habitat Complexity

GID will seek funding and participate in implementation of habitat enhancement projects including instream structures and winter rearing habitat development including enhancing backwater near old pump station and installing a LWD structures below roughened channel, if deemed feasible. Instream enhancement projects are expected to be investigated for feasibility and design within 3 years of executing the Agreement with implementation funds sought within 4 years of executing the Agreement.

Beaver Management for Instream Benefit: Permittee agree to encourage the development of beaver dams on the reach to further expand complexity. Such dams are found on other reaches and expected to occur along this reach in the future. The Permittee will adhere to the Beaver BMPs.

E.3.d. Riparian Condition/Function

GID will continue to allow riparian investigations, promote and assist with riparian planting and will agree to maintain and protect the riparian areas from GID operations. However, GID will not be held accountable for survival percentages or vigor. Considerable riparian plantings have been tried on neighboring TNC property with varied success rates over past three-five years. GID has planted and irrigated riparian areas on GID property and has had continuous beaver damage after high water removes caged protection. Limited riparian planting is expected to occur within 3 years of executing the Agreement.

E.3.e Substrate Quality

GID will install additional spawning substrate at the constructed riffle if deemed beneficial. Maintenance of site will include maintaining spawning size material grade which may also be used to hold riffle elevation and maintain consistent flow curve for potential gage monitoring site (CDEC SPU). Maintenance of substrate will occur once every ten years or as developed with Flow Monitoring Plan for SWCG.

E.3.f. Pasture Management: Grazing by GID is not anticipated. However, GID parcels are enclosed within a paddock of approximately 4 acres which also has property owned by Belcampo Farms-North Annex. Belcampo Farms may flash graze the paddock per their riparian grazing plan. See Appendix E that demonstrates BelCampo North Annex' commitment to abide by riparian grazing plan when livestock are grazing within the shared 5 acre paddock.

E.3.g Assessments/Studies: GID will allow for and assist with assessments and studies and monitoring, including existing gauging and temperature monitoring if that is part of the long term monitoring and verification plan.

E.3.h Supplementation: The Permittee will allow access for salmonid supplementation and all associated monitoring activities.

## F. Effective Date and Duration of the Site Plan and Agreement

The Template Safe Harbor Agreement, Site Plan Agreement and Permit take effect when signed by the Participants/Permittees, NMFS, and CDFW. The Template Safe Harbor Agreement, Site Plan Agreement and Permit have a term of 20 years, which may be extended by mutual written consent of the Participants/Permittees, NMFS, and CDFW. One (1) year prior to end of term of the Template Safe Harbor Agreement, Site Plan Agreement and Permit, the Participant/Permittees, NMFS, and CDFW will meet to decide whether to extend the term of the Template Safe Harbor Agreement, Site Plan Agreement and Permit.

## G. Monitoring and Reporting

### G.1. Avoid and Minimization Monitoring Commitments

The Permittee agrees to the following AMMs and Monitoring actions:

Table 3- Avoidance and Minimization Monitoring (AMM)

Covered Activity	GID - AMM	AMM Monitoring Technique
Irrigation Management	A1 A2	All maintenance of instream diversion structures shall be monitored as follows: -Log of what in-water work had occurred and what minimization measures were implemented will be included in the Annual SHA report -When construction or repair work is being done, three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 <a href="http://www.fs.fed.us/pnw/pubs/gtr526/">http://www.fs.fed.us/pnw/pubs/gtr526/</a> or an annual agency inspection can be requested.

Irrigation Maintenance	B1 B2 B4 B5 B6	All maintenance of instream irrigation facilities shall be monitored. Following are some examples of protocols: -Log of maintenance activities carried out within the calendar year be included in the yearly SHA report.
Fence Maintenance	D1 D2	-A short description of fence maintenance activities will be included in the annual report template.
Road Maintenance	E2 E3	-A short description of annual road maintenance activities will be included in the annual report.
Herbicide/r/Pesticide Use	G1 G2 G3 G4 G5	- Permittee commits to log use of herbicide, fertilizer and pesticide activities carried out within the calendar year be included in the annual report.
Flood Repair	H1 H2	- Permittee shall take photographs of the emergency site repairs and a detailed description of the repairs to be included in the annual report.

## G.2 Implementation and Effectiveness Monitoring Commitments

Table 4- Implementation and Effectiveness Monitoring

Habitat Parameter	GID -Net Conservation Benefit Actions	Implementation Monitoring Technique	Effectiveness Monitoring Commitment? Technique?
Hydrology/Water Quality	<ul style="list-style-type: none"> <li>-Maintain upgraded diversion facility as described in Sections E.1.a.</li> <li>-Implement conveyance pipeline to reduce diversion from 40 cfs to 24 cfs conserving 1,136 acre-feet on an average water year as described in Section E.2.a.</li> <li>-Permissive dedication via 1707.</li> <li>- Continue participation in fall flow bypass efforts as provided in GID’s diversion schedule E.3.a.</li> <li>-Support on-district efficiency practices on-farm to increase efficiency .</li> <li>-Participate in a reach wide diversion management strategy for the Mid Shasta as described in Section and accounted in GID’s Diversion Schedule E.3.a.</li> </ul>	<ul style="list-style-type: none"> <li>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 Documenting conveyance pipeline construction, any on-district efficiency practices implemented.</li> <li>-Map of on-district improvements</li> </ul>	

	<ul style="list-style-type: none"> <li>-Work with agencies and SWCG to use stream flow gage at GID to reduce flow variability resulting from GID diversion and curtailment</li> </ul>		
Passage/Migration/Screening	<ul style="list-style-type: none"> <li>-Maintain unimpeded fish passage conditions at the GID diversion.</li> <li>-Maintain self-cleaning fish screen at the GID diversion point.</li> </ul>	<ul style="list-style-type: none"> <li>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 Documenting of existing riffle and fish screen.</li> </ul>	
Instream Habitat Complexity	<ul style="list-style-type: none"> <li>-Maintain the instream barb structures opposite of the Fish Screen as described in Section E.1.c</li> <li>-Agrees to provide access for implementation of large wood enhancement on GID riparian property if deemed applicable by the Agencies as described in Section E.3.c.</li> <li>-Implement beaver BMPs as described in template.</li> </ul>	<ul style="list-style-type: none"> <li>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 Habitat improvements</li> </ul>	
Riparian Condition	<ul style="list-style-type: none"> <li>-Continue to perform yearly maintenance on existing riparian fencing as described in E.1.d.</li> <li>-Will maintain and replace</li> </ul>	<ul style="list-style-type: none"> <li>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 to document riparian area.</li> </ul>	

	riparian/boundary fencing if needed due to flood damage.		
Substrate Quality	-Maintain existing gravel placed at head of riffle that creates spawning habitat and provide access to implement spawning gravel enhancement on GID riparian property in collaboration with the Agencies as stipulated in Section E.3.e	- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 to document gravel enhancement.	
Assessment/Studies	-Work with SWCG to maintain stream flow and water temperature gauging site, if GID riffle is a monitoring site for flow. -Agreeable to assessments/studies. Agreeable to continued gauging on GID infrastructure.	-Submit monitoring data in annual report  -Reports of studies will be written/summarized/obtained and provided in the annual report	
Supplementation	-The Permittee will allow access for salmonid supplementation as described in Section E.3.h.		

## H. Annual Report and Adaptive Management

The Participant will complete the Annual Report Form, attached in Appendix D, yearly and reported as stipulated in the Agreement.

**I. Regulatory Assurances**

Upon execution of this Agreement by the Parties, and the satisfaction of all other applicable legal requirements, NMFS will issue a permit under Section 10(a)(1)(A) of the ESA to assure the Permittee may incidentally take Covered Species, in accordance with the Site Plan and Agreement, as a result of Routine Land Use and Beneficial Management Activities as described in each Agreement, and except where such Routine Land Use would result in the diminishment or non-achievement of the Baseline and/or Elevated Baseline Conditions established for the enrolled property. This assurance depends on the Permittee maintaining the Baseline and/or achieving the Elevated Baseline Conditions set forth in the Site Plan, complying fully with the Agreement and their Site Plan, and so long as the continuation of Routine Land Use and Beneficial Management Activities would not be likely to result in jeopardy to Covered Species or the adverse modification or destruction of their designated critical habitat. NMFS provides no assurances with regard to any action that may affect Non-Covered species, including the take of Non-Covered Species and the adverse modification or destruction of their designated critical habitat.

**J. Signatures of NMFS, CDFW and the Permittee**

\_\_\_\_\_  
**Permittee**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**NMFS**

\_\_\_\_\_  
**Date**

**SEPARATE SIGNATURE BLOCK FOR CDFW:**

By signing the Template Safe Harbor Agreement CDFW expresses its expectation that the Agreement along with a Permittee’s Site Plan Agreement signed by NMFS, and the NMFS ESP, could meet the requirements of section 2089.22 of the California Fish and Game Code with respect to the particular property described in the Site Plan Agreement. However, CDFW will not make such determination until reviewing that Site Plan Agreement signed by NMFS and the NMFS ESP.

\_\_\_\_\_  
**CDFW**

\_\_\_\_\_  
**Date**

**Grenada Irrigation District Deed**

2018 Grenada Irrigation District - SWRCB Water use Report and Paragraph from Shasta River Decree

PROGRESS REPORT BY PERMITTEE

Page 1 of 4

[SUMMARY OF FINAL SUBMITTED VERSION]

PROGRESS REPORT BY PERMITTEE FOR 2018

Primary Owner: GRENADA IRRIGATION DISTRICT  
 Primary Contact: Paul Willis

Date Submitted: 04/01/2019

Application Number: A000448  
 Permit Number: 000501

Source(s) of Water	POD Parcel Number	County
SHASTA RIVER		Siskiyou

MAX Direct Diversion Rate: 40 CFS  
 MAX Collection to Storage: 0 AC-FT  
 Face Value: 14598.6 AC-FT

Permitted Use(s)	Acres	Direct Diversion Season	Storage Season
Irrigation	4144	04/01 to 10/01	

1. Permit Review	
I have reviewed my water right permit	Yes

2. Compliance with Permit Terms and Conditions	
I am complying with all terms and conditions	Yes
Description of noncompliance with terms and conditions	

3. Changes to the Project	
Intake location has been changed	
Description of intake location changes	
Type of use has changed	
Description of type of use changes	
Place of use has changed	
Description of place of use changes	
Other changes	
Description of other changes	

4-6. Permitted Project Status	
Project Status	Complete
6a. Construction work has commenced	
6b. Construction is completed	
6c. Beneficial uses of water has commenced	
6d. Project will be completed within the time period specified in the permit	
6e. Explanation of work remaining to be done	
6f. Estimated date of completion	

7. Purpose of Use	
Irrigation	

[https://rms.waterboards.ca.gov/PermitPrint\\_2018.aspx?FORM\\_ID=389260](https://rms.waterboards.ca.gov/PermitPrint_2018.aspx?FORM_ID=389260)

4/21/2019

Irrigated Crops			
	Multiple Crops	Area Irrigated (Acres)	Primary Irrigation Method
Pasture	Yes	4144	Surface (example: flood)

Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

8. Maximum Rate of Diversion	
Month	Rate of Diversion (Cubic Feet Per Second)
January	0
February	0
March	0
April	40
May	40
June	40
July	40
August	32
September	32
October	0
November	0
December	0

9. Amount of Water Diverted and Used			
Month	Amount directly diverted (Acre-Feet)	Amount diverted or collected to storage (Acre-Feet)	Amount used (Acre-Feet)
January	0	0	0
February	0	0	0
March	0	0	0
April	420	0	420
May	471	0	471
June	622	0	622
July	244	0	244
August	256	0	256
September	351	0	351
October	0	0	0
November	0	0	0
December	0	0	0
Total	2364	0	2364
Type of Diversion	Direct Diversion Only		
Comments			

Water Transfers	
9d. Water transferred	No
9e. Quantity transferred (Acre-Feet)	
9f. Dates which transfer occurred	/ to /

9g. Transfer approved by

Water Supply Contracts	
9h. Water supply contract	No
9i. Contract with	
9j. Other provider	
9k. Contract number	
9l. Source from which contract water was diverted	
9m. Point of diversion same as identified water right	
9n. Amount (Acre-Feet) authorized to divert under this contract	
9o. Amount (Acre-Feet) authorized to be diverted in 2018	
9p. Amount (Acre-Feet) projected for 2019	
9q. Exchange or settlement of prior rights	
9r. All monthly reported diversion claimed under the prior rights	
9s. Amount (Acre-Feet) of reported diversion solely under contract	

10. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement Attachments			
Measurement ID Number	File Name	Description	Size
No attachments			

Measurement Data Files			
Measurement ID Number	File Name	Description	Size
No data files			

11. Storage					
Reservoir name	Spilled this year	Feet below spillway at maximum storage	Completely emptied	Feet below spillway at minimum storage	Method used to measure water level

Conservation of Water	
12. Are you now employing water conservation efforts?	No
Description of water conservation efforts	
13. Amount of water conserved	

Water Quality and Wastewater Reclamation	
14. During the period covered by this Report, did you use reclaimed water from a wastewater treatment facility, water from a desalination facility, or water polluted by waste to a degree which unreasonably affects the water for other beneficial uses?	No
15. Amount of reclaimed, desalinated, or polluted water used	

**Conjunctive Use of Groundwater and Surface Water**

16. During the period covered by this Report, were you using groundwater in lieu of available surface water authorized under your permit?	No
17. Amounts of groundwater used	

<b>Additional Remarks</b>

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Rod
Last Name	Dowse
Relation to Water Right	Primary Owner of Record

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Rod Dowse
Date of Signature	04/01/2019

Grenada Irrigation District - Shasta River Decree

78.

5.0 acres in the SE $\frac{1}{4}$  NW $\frac{1}{4}$ , Sec. 8, T. 45 N., R. 3 W., M.D.B. & M.  
5.0 acres--Total.

146. GOOSE NEST PROPERTIES INCORPORATED, a corporation,

is entitled to divert from the natural flow of an unnamed branch of Little Shasta River, through the Professor Guinett Ditch,

0.17 CUBIC FOOT PER SECOND--PRIORITY MARCH 1, 1856,  
or as much thereof as said corporation directly applies to beneficial use for the purpose hereinafter set forth, during the period between March first and November first of each year; said water to be diverted from said unnamed branch of Little Shasta River at a point (designated on Division of Water Rights Map as Diversion 445) which bears approximately N. 88° 00' W., approximately 2020 feet distant from the southeast corner of Sec. 6, T. 45 N., R. 3 W., M.D.B. & M., being within the SW $\frac{1}{4}$  SE $\frac{1}{4}$  of said Sec. 6, and said water to be used for the irrigation of the following described lands:

14.0 acres in the SE $\frac{1}{4}$  NE $\frac{1}{4}$ , Sec. 7, T. 45 N., R. 3 W., M.D.B. & M.  
14.0 acres--Total.

147. A. F. GRAHAM,

is entitled to divert from the natural flow of Inconstance Creek, through the Throop and McNeill Flume,

1.72 CUBIC FEET PER SECOND--PRIORITY APRIL 21, 1921,  
or as much thereof as he directly applies to beneficial use for the purpose hereinafter set forth, during the period between about June fifteenth and about September first of each year; said water to be diverted from said Inconstance Creek at a point which bears approximately S. 50° 30' W., approximately 1630 feet distant from the east quarter corner of Sec. 34, T. 43 N., R. 4 W., M.D.B. & M., being within the NW $\frac{1}{4}$  SE $\frac{1}{4}$  of said Sec. 34; and said water to be used for sand recovering purposes at the Throop and McNeill Plant, located in the NW $\frac{1}{4}$  SE $\frac{1}{4}$  of said Sec. 34.

148. A. F. GRAHAM,

is entitled to divert from the natural flow of Inconstance Creek by means of the Murray Dam,

6.00 CUBIC FEET PER SECOND--PRIORITY JUNE 15, 1911,  
or as much thereof as he directly applies to beneficial use for the purposes hereinafter set forth, during the period between June fifteenth and October first of each year; said water to be diverted from said Inconstance Creek at the E. J. Murray Dam in Sec. 34, T. 43 N., R. 4 W., M.D. B. & M., and used for sand recovering purposes at the E. J. Murray Sand Pit in said Section 34.

149. GRENADA IRRIGATION DISTRICT, an irrigation district organized and existing under and by virtue of the California Irrigation District Act,  
is entitled to divert from the natural flow of Shasta River, through the Grenada Irrigation District Pumping Plant and Canal,

(a) during the period between April first and October first of each year,  
40.00 CUBIC FEET PER SECOND--PRIORITY AUGUST 28, 1916,  
and

(b) during the period between April first and June fifteenth of each year,

10.00 CUBIC FEET PER SECOND--PRIORITY DECEMBER 10, 1919, or as much of said amounts as said district directly applies to beneficial use for the purpose hereinafter set forth; all of said water to be diverted from said Shasta River at a point (designated on Division of Water Rights Map as Diversion 249) which bears approximately S. 85° 30' E., approximately 1568 feet distant from the northwest corner of Sec. 6, T. 43 N., R. 5 W., M.D.B. & M., being within the NE $\frac{1}{4}$  NW $\frac{1}{4}$  of said Sec. 6; and all of said water to be used for the irrigation of 4000 acres within the boundaries of said Grenada Irrigation District as shown on Permit Map No. 501 on file with the Division of Water Resources; provided, that on or before December 1, 1933, or on or before such time or times as may be hereafter fixed by order of this court, said Grenada Irrigation District shall complete the above appropriation and apply said water to beneficial use pursuant to the terms of Division of Water Rights Permits 501 and 2771, the orders of this court and the provisions of section 36f of the Water Commission Act.

150. ESTATE OF A. C. HAIGHT, deceased.

is entitled to divert from the natural flow of Little Shasta River, through the Hart and Haight Ditch,

(a) during the period between March first and November first of each year,

0.15 CUBIC FOOT PER SECOND--PRIORITY MARCH 1, 1857,

0.13 CUBIC FOOT PER SECOND--PRIORITY MARCH 1, 1859,

0.27 CUBIC FOOT PER SECOND--PRIORITY MARCH 1, 1860,

0.55 CUBIC FOOT PER SECOND--TOTAL,

or as much thereof as said estate directly applies to beneficial use for stock watering purposes and for the irrigation of the lands hereinafter described in this paragraph:

(b) during the period between November first of each year and March first of the succeeding year,

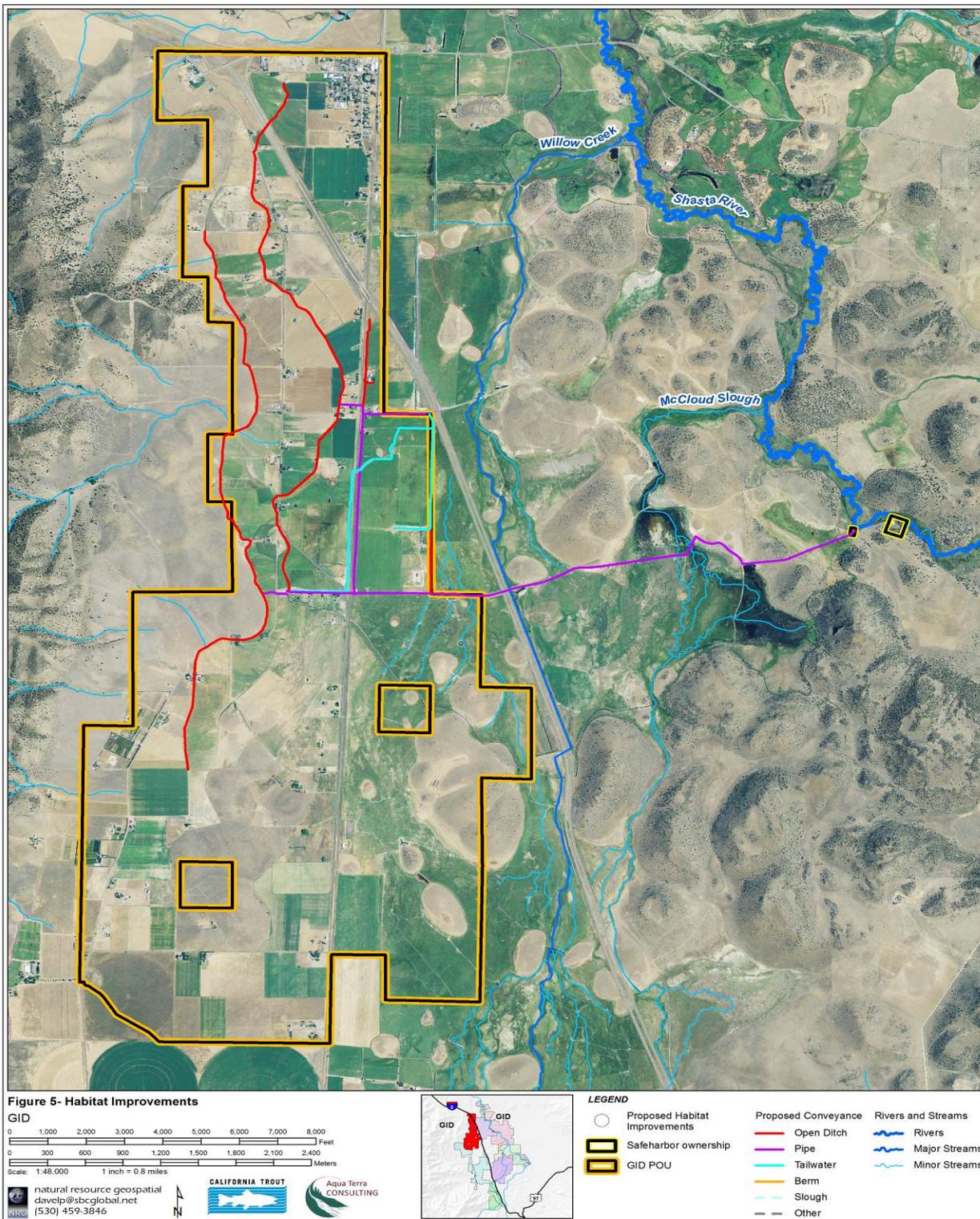
0.15 CUBIC FOOT PER SECOND--PRIORITY MARCH 1, 1857,

or as much thereof as said estate directly applies to beneficial use for stock watering purposes:

all of said water to be diverted from said Little Shasta River at a point (designated on Division of Water Rights Map as Diversion 471) which bears approximately S. 74° 00' E., approximately 1520 feet distant from the north quarter corner of Sec. 25, T. 45 N., R. 5 W., M.D.B. & M., being within the NE $\frac{1}{4}$  NE $\frac{1}{4}$  of said Sec. 25; and all of said water to be used upon the following described lands:

1.2 acres in the NE $\frac{1}{4}$  SW $\frac{1}{4}$ , Sec. 36, T. 45 N., R. 5 W., M.D.B. & M.  
 37.2 acres in the N $\frac{1}{2}$  SW $\frac{1}{4}$ , Sec. 36, T. 45 N., R. 5 W., M.D.B. & M.  
 5.6 acres in the SW $\frac{1}{4}$  SW $\frac{1}{4}$ , Sec. 36, T. 45 N., R. 5 W., M.D.B. & M.  
 44.0 acres--Total.

Figure 5- Map of Habitat Improvement Projects



## Grenada Irrigation District Operations Plan

Supply variation resulting from varied water years types require Grenada Irrigation District to manage for years of limited supply differently than wet years. Grenada Irrigation District is proposing to increase its delivery efficiency through the installation of a pipeline (rather than the existing earthen ditch) that will conserve 1,136 af on an average water year resulting in more flow being left in stream compared to current operation, when installed. When the pipeline is completed, GID will abide by the reduced diversion schedules for the term of the permit.

In coordination with NMFS and CDFW, Grenada Irrigation District developed two different diversion schedules based on a water year determination of either a wet year and a normal or drier year. Grenada Irrigation District will use the water year determination process utilized by Montague Water Conservation District (MWCD). When MWCD's Reservoir is full, it typically indicates a wet year for Grenada Irrigation District located downstream of MWCD and Big Spring Creek.

MWCD's water year type designation methodology utilizes first-of-month storage in Dwinnell Reservoir as the primary criterion for determining year types, and to a lesser extent, snowpack and water content expected to be released during the snowmelt period for that year. Snowpack is representative of near-future water that may become available but is not yet in storage.

MWCD's methodology uses five water year type designations: Very Dry, Dry, Normal, Wet, and Very Wet. While Grenada Irrigation District will utilize MWCD's water years determination, Grenada will only designate two water year types: Wet year or Normal and drier. The decision point for Grenada Irrigation District for wet and normal will be the between Normal and Wet years under MWCD's water year classification. For GID, a water year extends from April 1 through September 30 which is the duration of irrigation season. Dependent on the water year type determination, GID will adhere to a diversion schedule that was reviewed and approved by CDFW and NOAA. The schedules are reductions in current diversion volume based on GID's water conservation project, a piping project that will conserve approximately 1,136 acre feet during a normal water year. The conserved water will remain in Shasta River. Year type designations are evaluated on April 1, and re-evaluated again on May 1. The year type designations are determined based on Dwinnell Reservoir storage and snow pack (snow water content) for April and May as shown in Table 2 and Table 3. Storage volumes are determined from the *Dwinnell Reservoir Near Edgewood (DRE)* California Data Exchange Center (CDEC) data station, and snow pack (snow water content) is determined from the *Peterson Flat (PET)* CDEC station.

**April 1 Year Type Determination:** The April 1 year type designation is based primarily on storage in Dwinnell Reservoir, with a secondary criterion based on first-of-month accumulated snow pack at Peterson Flat (snow water content). When first of month storage in Dwinnell Reservoir is within 2,000 af of April 1 storage criterion threshold, snow water content is used to determine if the year type should be adjusted. If the storage is within 2,000 af of the lower storage criterion for a year type (e.g., lower storage criterion plus 2,000 af) and snow water content is less than 75 percent of normal, the year type will be adjusted down one step (e.g., normal to dry). If the storage is within 2,000 af of the upper storage criterion for a year type (e.g., upper storage criterion minus 2,000 af) and snow water content is greater than 125 percent of normal, the year type will be adjusted up one step (e.g., normal to wet). Table 2 provides the storage and snow water content-based water year determinations for April 1.

**Table 2. April 1 year type designation by storage and snow water content**

April 1 Storage (af)	April 1 Snow Water Content (% of normal)	Year Type
Less than 16,000	N/A	Very Dry
16,000-17,999	< 125%	Very Dry
	> 125%	Dry
18,000 - 19,999	< 75%	Very Dry
	> 75%	Dry
20,000 - 23,999	N/A	Dry
24,000 - 25,999	< 125%	Dry
	> 125%	Normal
26,000 - 27,999	< 75%	Dry
	> 75%	Normal
28,000 - 35,999	N/A	Normal
36,000 - 37,999	< 125%	Normal
	> 125%	Wet
38,000 - 39,999	< 75%	Normal
	> 75%	Wet
40,000 - 43,999	N/A	Wet
44,000 - 45,999	< 125%	Wet
	> 125%	Wet
46,000 - 47,999	< 75%	Wet
	> 75%	Wet
48,000 or greater	N/A	Wet

**May 1 Year Type Determination:** The May 1st year type designation has the same format as the April 1st designation, but with different storage criteria. The storage and snow water content-based water year determinations for May 1 are presented in Table 3.

**Table 3. May 1 year type designation by storage and snow water content**

May 1 Storage (af)	May 1 Snow Water Content (% of normal)	Year Type
Less than 12,500	N/A	Very Dry
12,500 - 14,499	< 125%	Very Dry
	> 125%	Dry

14,500 - 16,499	< 75%	Very Dry
	> 75%	Dry
26,500 - 21,999	N/A	Dry
22,000 - 23,999	< 125%	Dry
	> 125%	Normal
24,000 - 25,999	< 75%	Dry
	> 75%	Normal
26,000 - 35,999	N/A	Normal
36,000 - 37,999	< 125%	Normal
	> 125%	Wet
38,000 - 39,999	< 75%	Normal
	> 75%	Wet
40,000 - 42,999	N/A	Wet
43,000 - 44,999	< 125%	Wet
	> 125%	Wet
45,000 - 46,999	< 75%	Wet
	> 75%	Wet
47,000 or greater	N/A	Wet

**Grenada Irrigation District: Reduced Diversion Schedules based on water conservation project and water year determination:**

**Diversion Volume Schedule -Normal and Drier Years**

<u>Date</u>	<u>Life Stage</u>	<u>Current CFS</u>	<u>Proposed CFS</u>	<u>Conserved</u>
4/01-4/9 ( 9 days)	Juvenile	30	0 cfs	535 AF
4/10-5/20 (39 days)	Juvenile	30	24 cfs	464 AF
5/21-8/15 (86 days)	Over-summering	24	24 cfs*	00 AF
8/16-9/6 (22 days)	Over summering	0-15	0-15*	00 AF
9/7-9/30 (23 days)	Over-summering	21	18 cfs*	137 AF
Average Annual Volume Conserved				1,136 AF

\*Schedule does not consider limitations of diversion caused by decree, priority and water master service.

**Diversion Volume Schedule -Wet Years**

<u>Date</u>	<u>Life Stage</u>	<u>Current</u>	<u>Proposed</u>	<u>Conserved</u>
4/01-4/9 ( 9 days)	Juvenile	30	0 cfs	535 AF

4/10-5/20 (39 days)	Juvenile	30	24 cfs	464 AF
5/21-8/15 (86 days)	Over-summering	24	24 cfs*	00 AF
8/16-9/6 (22 days)	Over summering	24	24 cfs *	00 AF
9/7-9/30 (23 days)	Over-summering	24 cfs	18 cfs*	274 AF
Average Annual Volume Conserved				1,273 AF

\*Schedule does not consider limitations of diversion caused by decree, priority and water master service.